

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549**

FORM 10-K

- ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2018

or

- TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____ Commission file number 1-16411

NORTHROP GRUMMAN CORPORATION

(Exact name of registrant as specified in its charter)

DELAWARE

(State or other jurisdiction of incorporation or organization)

**2980 Fairview Park Drive
Falls Church, Virginia**

(Address of principal executive offices)

80-0640649

(I.R.S. Employer Identification Number)

22042

(Zip code)

(703) 280-2900

(Registrant's telephone number, including area code)
Securities registered pursuant to section 12(b) of the Act:

Title of each class

Name of each exchange on which registered

Common Stock, \$1 par value

New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act:

None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.

Yes

No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act.

Yes

No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.

Yes

No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (\$232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).

Yes

No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act:

Large accelerated filer

Accelerated filer

Smaller reporting company

Emerging growth company

Non-accelerated filer

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act.

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act).

Yes

No

As of June 30, 2018, the aggregate market value of the common stock (based upon the closing price of the stock on the New York Stock Exchange) of the registrant held by non-affiliates was approximately \$53.4 billion.

As of January 28, 2019, 169,737,507 shares of common stock were outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of Northrop Grumman Corporation's Proxy Statement to be filed with the Securities and Exchange Commission pursuant to Regulation 14A for the 2019 Annual Meeting of Shareholders are incorporated by reference in Part III of this Form 10-K.

NORTHROP GRUMMAN CORPORATION

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PART I

Item 1. Business

HISTORY AND ORGANIZATION

History

Northrop Grumman Corporation (herein referred to as “Northrop Grumman,” the “company,” “we,” “us,” or “our”) is a leading global security company. We offer a broad portfolio of capabilities and technologies that enable us to deliver innovative platforms, systems and solutions for applications that range from undersea to outer space and into cyberspace. We provide capabilities in autonomous systems; cyber; command, control, communications and computers, intelligence, surveillance and reconnaissance (C4ISR); space; strike; and logistics and modernization. We participate in many high-priority defense and government programs in the United States (U.S.) and abroad. We conduct most of our business with the U.S. government, principally the Department of Defense (DoD) and intelligence community. We also conduct business with foreign, state and local governments, as well as commercial customers. For a discussion of risks associated with our operations, see “Risk Factors.”

The company originally was formed in Hawthorne, California, in 1939, as Northrop Aircraft Incorporated and was reincorporated in Delaware in 1985, as Northrop Corporation. Northrop Corporation was a principal developer of flying wing technology, including the B-2 Spirit bomber. The company developed into one of the largest defense contractors in the world through a series of acquisitions, as well as organic growth. In 1994, we acquired Grumman Corporation (Grumman), after which time the company was renamed Northrop Grumman Corporation. Grumman was a premier military aircraft systems integrator and builder of the Lunar Module that first delivered humans to the surface of the moon. In 1996, we acquired the defense and electronics businesses of Westinghouse Electric Corporation, a world leader in the development and production of sophisticated radar and other electronic systems for the nation’s defense, civil aviation, and other U.S. and international applications. In 2001, we acquired Litton Industries, Inc., a global electronics and information technology company, and one of the nation’s leading full service shipbuilders. Also in 2001, we acquired Newport News Shipbuilding Inc., a leading designer and builder of nuclear-powered aircraft carriers and submarines. In 2002, we acquired TRW Inc., a leading developer of military and civil space systems and payloads, as well as a leading global integrator of complex, mission-enabling systems and services. In 2011, we completed the spin-off to our shareholders of Huntington Ingalls Industries, Inc. (HII). HII operates our former Shipbuilding business, comprised largely of a part of Litton Industries and Newport News Shipbuilding.

On June 6, 2018 (the “Merger date”), the company completed its previously announced acquisition of Orbital ATK, Inc. (“Orbital ATK”) (the “Merger”). On the Merger date, Orbital ATK became a wholly-owned subsidiary of the company and its name was changed to Northrop Grumman Innovation Systems, Inc., which we established as a new, fourth business sector (“Innovation Systems”). The operating results of Innovation Systems subsequent to the Merger date have been included in the company’s consolidated results of operations. See Note 2 to the consolidated financial statements for further information regarding the acquisition of Orbital ATK.

AEROSPACE SYSTEMS

Aerospace Systems, headquartered in Redondo Beach, California, is a leader in the design, development, integration and production of manned aircraft, autonomous systems, spacecraft, high-energy laser systems, microelectronics and other systems and subsystems. Aerospace Systems’ customers, primarily the DoD and other U.S. government agencies, use these systems in mission areas including intelligence, surveillance and reconnaissance (ISR), strike operations, communications, earth observation and space science. The sector is reported in three business areas, which reflect our core capabilities: Autonomous Systems, Manned Aircraft and Space.

Autonomous Systems – designs, develops, manufactures, integrates and sustains autonomous aircraft systems for tactical and strategic ISR missions. Key programs include high-altitude long-endurance (HALE) systems, such as the Global Hawk system, which provides near real-time high resolution imagery of land masses for theater awareness; the Triton system, which provides real-time ISR over vast ocean and coastal regions for maritime domain awareness; and the North Atlantic Treaty Organization (NATO) Alliance Ground Surveillance (AGS) system for multinational theater operations; and the ship-based vertical take off and landing (VTOL) Fire Scout system, which provides situational awareness for maritime forces and precision targeting support.

Manned Aircraft – designs, develops, manufactures, and integrates long-range strike aircraft systems, airborne C4ISR systems, tactical aircraft systems and directed energy systems. Key long-range strike aircraft programs include the B-21 Raider long-range strike bomber and modernization and sustainment services for the B-2 Spirit bomber. Key airborne C4ISR programs include the E-2D Advanced Hawkeye and Joint Surveillance Target Attack

Radar System (JSTARS). Tactical aircraft programs include the design, development, manufacture and integration of F-35 Lightning II center fuselage and F/A-18 Super Hornet center/aft fuselage sections. Directed energy involves the design, development, and integration of laser weapon systems for air, ground, and sea platforms, and production of the Airborne Laser Mine Detection System for the U.S. Navy and international customers.

Space – designs, develops, manufactures, and integrates spacecraft systems, subsystems, sensors and communications payloads in support of space C4ISR and science missions. Much of this business is performed through restricted programs. Key unrestricted programs include the James Webb Space Telescope (JWST), a large infrared telescope being built for the National Aeronautics and Space Administration (NASA) that will be deployed in space to study the origins of the universe; Advanced Extremely High Frequency (AEHF) and Enhanced Polar System (EPS) payloads providing survivable, protected communications to U.S. forces; and Next-Generation Overhead Persistent Infrared Program (OPIR) satellites and payloads and Space-Based Infrared System (SBIRS) payloads providing data for missile surveillance, missile defense, technical intelligence and battlespace characterization.

INNOVATION SYSTEMS

Innovation Systems, headquartered in Dulles, Virginia, is a leader in the design, development, integration and production of flight, armament and space systems to enable national security, civil government and commercial customers to achieve their critical missions. Major products include launch vehicles and related propulsion systems; missile products and defense electronics; precision weapons, armament systems and ammunition; satellites and associated space components and services; and advanced aerospace structures. The sector is reported in three business areas, which reflect our core capabilities: Defense Systems, Flight Systems and Space Systems.

Defense Systems – develops and produces small-, medium- and large-caliber ammunition; precision weapons and munitions; high-performance gun systems; and propellant and energetic materials. Operations include the Lake City Army Ammunition Plant in Independence, Missouri, and a Naval Sea Systems Command facility in Rocket Center, West Virginia. Competencies include tactical solid rocket motor development and production for a variety of air-, sea- and land-based missile systems propulsion control systems that support U.S. Missile Defense Agency (MDA) and NASA programs; airborne missile warning systems; advanced fuzes and defense electronics. Key programs include the U.S. Navy's Advanced Anti-Radiation Guided Missile (AARGM) and the development of advanced air-breathing propulsion systems and special-mission aircraft for defense applications.

Flight Systems – designs, develops and manufactures small- and medium-class space launch vehicles to place satellites into earth orbit and escape trajectories; interceptor and target vehicles for missile defense systems; and suborbital launch vehicles that place payloads into a variety of high-altitude trajectories. Competencies also include the production of medium- and large-class rocket propulsion systems for human and cargo launch vehicles; missile defense interceptors; and target vehicles. Key programs include the development and production of solid rocket motors for NASA's Space Launch System (SLS) heavy lift vehicle; interceptor boosters for the MDA Ground-based Midcourse Defense (GMD) system; the Antares rocket used in the execution of our Commercial Resupply Services (CRS) contracts with NASA; medium-class solid rocket motors for the U.S. Navy's Trident II Fleet Ballistic Missile program; and production of the majority of the composite fuselage stringers and frames for the Airbus A350 XWB wide-body passenger jetliner.

Space Systems – develops and produces small- and medium- class satellites for global and regional communications and broadcasting, space-related scientific research, and national security; human-rated space systems for earth orbit and deep-space exploration, including delivering cargo to the International Space Station (ISS); and spacecraft components and subsystems as well as specialized engineering and operations services to U.S. government agencies. Key programs include the Cygnus spacecraft used in the execution of our CRS contracts with NASA, restricted national security space programs and science and environmental satellite programs.

MISSION SYSTEMS

Mission Systems, headquartered in Linthicum, Maryland, is a leader in advanced end-to-end mission solutions and multifunction systems for DoD, intelligence community, international, federal-civil and commercial customers. Major products and services include C4ISR systems; radar, electro-optical/infrared (EO/IR) and acoustic sensors; electronic warfare systems; cyber solutions; space systems; intelligence processing systems; air and missile defense (AMD) integration; navigation; and shipboard missile and encapsulated payload launch systems. The sector is reported in three business areas, which reflect our core capabilities: Advanced Capabilities, Cyber and ISR and Sensors and Processing.

Advanced Capabilities – provides integration and interoperability of net-enabled battle management, sensors, targeting and surveillance systems; air and missile defense command and control (C2); and global battlespace awareness. It also delivers products, systems and services that support maritime platforms and embedded navigation and positioning sensors for a range of platforms including ships, aircraft, spacecraft and weapons. Competencies include advanced AMD integration with land, air and space assets; shipboard missile and encapsulated payload launch systems; unmanned maritime vehicles and high-resolution undersea sensors; and inertial navigation systems. Key programs include the Integrated Air and Missile Defense Battle Command System (IBCS); Ground-based Midcourse Defense (GMD) system; Surface Electronic Warfare Improvement Program (SEWIP) Block III; the Embedded Global Positioning System (GPS)/Inertial Navigation Systems-Modernization; AQS-24B Minehunting System; and Trident and Virginia-Class payload launch systems.

Cyber and ISR – delivers products, systems and services that support full-spectrum cyber solutions, space-based payload and exploitation systems, space-based communications, C2 and processing systems, and enterprise integration of multi-intelligence mission data across all domains. Competencies include cyber mission management; large-scale cyber solutions for national security applications; missile warning and defense systems; weather and satellite communications; ground software systems; and geospatial intelligence and data fusion, specializing in the collection, processing and exploitation of data. Key programs include exploitation and cyber programs; operational services to the United States Computer Emergency Readiness Team (US-CERT); worldwide IT coverage and support services through Solutions for the Information Technology Enterprise (SITE); the Enterprise Application Managed Services (EAMS) program; and restricted programs.

Sensors and Processing – delivers products, systems and services that support ground-based and fixed wing and rotary wing aircraft platforms with radar, electronic warfare, C2, Signals Intelligence (SIGINT), and situational awareness mission systems. Competencies include targeting, surveillance, air defense, and early warning & control radar systems; EO/IR and radio frequency (RF) self-protection, targeting and surveillance systems; electronic attack and electronic support systems; communications and intelligence systems; digitized cockpits; and multi-sensor processing. Key programs include Airborne Early Warning & Control (AEW&C) and air-to-ground sensors; Battlefield Airborne Communications Node (BACN); F-35 fire control radar, Distributed Aperture System (DAS), and Communications, Navigation and Identification (CNI) integrated avionics system; Ground/Air Task Oriented Radar (G/ATOR); Joint Counter Radio-Controlled Improvised Explosive Device Electronic Warfare (JCREW); RF and Infrared Countermeasures (IRCM) programs for both fixed wing and rotary wing platforms; EO/IR targeting and surveillance programs; Scalable Agile Beam Radar (SABR); UH-60V Black Hawk integrated mission equipment package; and restricted programs.

TECHNOLOGY SERVICES

Technology Services, headquartered in Herndon, Virginia, is a leader in logistic solutions supporting the full life cycle of platforms and systems and delivering innovative, technology-driven solutions and services for DoD, global defense and federal-civil customers. Major products and services include software and system sustainment; modernization of platforms and associated subsystems; advanced training solutions; and integrated logistics support. The sector is reported in three business areas, which reflect our core capabilities: Advanced Defense Services; Global Logistics and Modernization; and System Modernization and Services.

Advanced Defense Services – provides advanced defense and security services including cyber; network operations and security; system and software sustainment and modernization; and training to strengthen the national security of the U.S. and its allies. Key programs include the Marine Corps Cyber Operations Group, which provides network defense services for the U.S. Marine Corps; Ministry of the National Guard (MNG) Training Support, through our interest in a joint venture for which we consolidate the financial results, which provides equipment fielding, training and maintenance, logistics and operations support to the Saudi Arabia MNG; and the Mission Command Training Program, the Army's premier leadership and staff training exercise program at the tactical and operational level.

Global Logistics and Modernization – provides global logistics support, sustainment, operations and modernization for air, sea and ground systems and weapon system components. Competencies include aircraft, electronics and software sustainment and engineering; electronic warfare/attack and avionics/electronics subsystems modernization; supply chain management; manned and unmanned weapon systems deployed logistics support; field services, on-going maintenance and technical assistance; and rapid response in support of global customers. Capabilities include: integration, delivery and global support of unmanned special mission aircraft solutions for platforms such as the MQ-5B Hunter, Global Hawk and Triton autonomous systems; subsystem and component-level depot repair and modernization for electronic/avionic products such as AAQ-24, APN-241, ALQ-135 and ALQ-131A sensors; missile sustainment and modernization solutions for the Intercontinental Ballistic Missile Minuteman III; and weapon

systems sustainment, refurbishment, overhaul, modernization and contractor logistics support for several unique small fleet, high-demand platforms, including the B-2 Spirit bomber, JSTARS E-8 surveillance aircraft, KC-30A multi-role tanker, C-27J transport, UK E-3D Airborne Early Warning and Control System, and special mission electronic surveillance aircraft.

System Modernization and Services – provides full life cycle information systems modernization and sustainment primarily in support of civilian government agencies. Competencies include analytics; mission information processing; cyber and secure networking; and software development. Capabilities include fraud detection and compliance services, data analysis and decision support tools, software system sustainment and modernization, and application migration to the cloud; services to U.S. government healthcare agencies, including benefits systems administration, fraud prevention, payment modernization, bioinformatics, and precision health; and information sharing and analysis solutions as well as sophisticated enterprise-wide solutions to design, build and manage resilient and secure next generation IT infrastructures. Our capabilities provide proactive network monitoring, patch management and desktop optimization to control and reduce overall operating costs.

Subsequent Realignment – Effective January 1, 2019, Advanced Defense Services and System Modernization and Services merged to create the Global Services business area. This realignment is not reflected in the business descriptions above or in the financial information contained in this report.

SELECTED FINANCIAL DATA

For a summary of selected consolidated financial information, see “Selected Financial Data” under Part II - Item 6.

CUSTOMER CONCENTRATION

Our largest customer is the U.S. government. Sales to the U.S. government accounted for 82 percent, 85 percent and 84 percent of sales during the years ended December 31, 2018, 2017 and 2016, respectively. For further information on sales by customer category, see Note 15 to the consolidated financial statements. No single program accounted for more than ten percent of total sales during any period presented. See “Risk Factors” for further discussion regarding risks related to customer concentration.

COMPETITIVE CONDITIONS

We compete with many companies in the defense, intelligence and federal civil markets. BAE Systems, Boeing, Booz Allen Hamilton, General Dynamics, Harris, L3 Technologies, Leidos, Leonardo, Lockheed Martin, Raytheon and Thales are some of our primary competitors. Key characteristics of our industry include long operating cycles and intense competition, which is evident through the number of competitors bidding on program opportunities and the number of bid protests (competitor protests of U.S. government procurement awards).

It is common in the defense industry for work on major programs to be shared among a number of companies. A company competing to be a prime contractor may, upon ultimate award of the contract to another competitor, become a subcontractor to the ultimate prime contracting company. It is not unusual to compete for a contract award with a peer company and, simultaneously, perform as a supplier to or a customer of that same competitor on other contracts, or vice versa.

SEASONALITY

No material portion of our business is considered to be seasonal.

BACKLOG

At December 31, 2018, total backlog, which is equivalent to the company’s remaining performance obligations, was \$53.5 billion as compared with \$42.6 billion at December 31, 2017. For further information, see “Backlog” in “Management’s Discussion and Analysis of Financial Condition and Results of Operations” (MD&A) and Note 1 to the consolidated financial statements.

INTELLECTUAL PROPERTY

We routinely apply for and own a number of U.S. and foreign patents related to the technologies we develop. We also develop and protect intellectual property as trade secrets. In addition to owning a large portfolio of proprietary intellectual property, we license some intellectual property rights to third parties and we license or otherwise obtain access to intellectual property from third parties. The U.S. government typically holds licenses to patents developed in the performance of U.S. government contracts and may use or authorize others to use the inventions covered by these patents for certain purposes. See “Risk Factors” for further discussion regarding risks related to intellectual property.

RAW MATERIALS

We have not experienced significant delays in the supply or availability of raw materials, nor have we experienced a significant price increase for raw materials. See “Risk Factors” for further discussion regarding risks related to raw materials.

EMPLOYEE RELATIONS

We believe that we maintain good relations with our approximately 85,000 employees. Approximately 4,800 are covered by 16 collective agreements in the U.S., of which we negotiated three renewals in 2018 and expect to negotiate two renewals in 2019. See “Risk Factors” for further discussion regarding risks related to employee relations.

REGULATORY MATTERS

Government Contract Security Restrictions

Certain classified programs with the U.S. government are prohibited by the customer from being publicly discussed and are therefore generally referred to as “restricted” in this Annual Report. The consolidated financial statements and financial information in this Annual Report reflect the operating results of our entire company, including restricted programs.

Contracts

We generate the majority of our business from long-term contracts with the U.S. government for development, production and support activities. Unless otherwise specified in a contract, allowable and allocable costs are billed to contracts with the U.S. government pursuant to the Federal Acquisition Regulation (FAR) and U.S. government Cost Accounting Standards (CAS). Examples of costs incurred by us and not billed to the U.S. government in accordance with the FAR and CAS include, but are not limited to, certain legal costs, charitable donations, advertising costs, interest expense and unallowable employee compensation and benefits costs.

We monitor our contracts on a regular basis for compliance with our policies and procedures and applicable government laws and regulations. In addition, costs incurred and allocated to contracts with the U.S. government are routinely audited by the Defense Contract Audit Agency (DCAA).

Our long-term contracts typically fall into one of two contract types:

Cost-type contracts – Cost-type contracts include cost plus fixed fee, cost plus award fee and cost plus incentive fee contracts. Cost-type contracts generally provide for reimbursement of a contractor’s allowable costs incurred plus fee. As a result, cost-type contracts have less financial risk associated with unanticipated cost growth but generally provide lower profit margins than fixed-price contracts. Cost-type contracts typically require that the contractor use its best efforts to accomplish the scope of the work within some specified time and stated dollar limitation. Fees on cost-type contracts can be fixed in terms of dollar value or can be variable due to award and incentive fees, which are generally based on performance criteria such as cost, schedule, quality and/or technical performance. Award fees are determined and earned based on customer evaluation of the company’s performance against contractual criteria. Incentive fees are generally based on cost or schedule and provide for an initially negotiated fee to be adjusted later, based on the relationship of total allowable costs to total target costs or as schedule milestones are met. Award and incentive fees are included in total estimated sales to the extent it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved. We estimate variable consideration as the most likely amount to which we expect to be entitled.

Fixed-price contracts – Firm fixed-price contracts include a specified scope of work for a price that is a pre-determined, negotiated amount and not generally subject to adjustment regardless of costs incurred by the contractor, absent changes in scope by the customer. As a result, fixed-price contracts have more financial risk associated with unanticipated cost growth, but generally provide the opportunity for higher profit margins than cost-type contracts. Certain fixed-price incentive fee contracts provide for reimbursement of the contractor’s allowable costs plus a fee up to a cost ceiling amount, typically through a cost-sharing ratio that affects profitability. These contracts effectively become firm fixed-price contracts once the cost-share ceiling is reached. Time-and-materials contracts are considered fixed-price contracts as they specify a fixed hourly rate for each labor hour charged.

Profit margins on our contracts may vary materially depending on, among other things, the contract type, contract phase (e.g., development, low-rate production or mature production), negotiated fee arrangements, achievement of performance objectives, and cost, schedule and technical performance.

See Notes 1 and 15 to the consolidated financial statements and “Risk Factors” for further information regarding our contracts.

The following table summarizes sales for the year ended December 31, 2018, recognized by contract type and customer category:

<i>\$ in millions</i>	U.S. Government ⁽¹⁾		International ⁽²⁾	Other Customers		Total	Percentage of Total Sales
Cost-type contracts	\$	14,234	\$ 680	\$	90	\$ 15,004	50%
Fixed-price contracts		10,562	3,754		775	15,091	50%
Total sales	\$	24,796	\$ 4,434	\$	865	\$ 30,095	100%

⁽¹⁾ Sales to the U.S. government include sales from contracts for which we are the prime contractor, as well as those for which we are a subcontractor and the ultimate customer is the U.S. government. Each of the company’s segments derives substantial revenue from the U.S. government.

⁽²⁾ International sales include sales from contracts for which we are the prime contractor, as well as those for which we are a subcontractor and the ultimate customer is an international customer. These sales include foreign military sales contracted through the U.S. government.

Environmental

Our operations are subject to and affected by federal, state, local and foreign laws, regulations and enforcement actions relating to protection of the environment. In 2015, we announced our 2020 environmental sustainability goals: to reduce absolute greenhouse gas emissions by 30 percent from 2010 levels; to reduce potable water use by 20 percent from 2014 levels; and to achieve a 70 percent solid waste diversion rate (away from landfills).

We have incurred and expect to continue to incur capital and operating costs to comply with applicable environmental laws and regulations and to achieve our environmental sustainability commitments. See “Risk Factors” and Notes 1 and 12 to the consolidated financial statements for further information regarding environmental matters.

EXECUTIVE OFFICERS

See “Directors, Executive Officers and Corporate Governance” for information about our executive officers.

AVAILABLE INFORMATION

Our principal executive offices are located at 2980 Fairview Park Drive, Falls Church, Virginia 22042. Our telephone number is (703) 280-2900 and our home page is www.northropgrumman.com.

Our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and proxy statement for the annual shareholders’ meeting, as well as any amendments to those reports, are available free of charge through our website as soon as reasonably practicable after we file them with the U.S. Securities and Exchange Commission (SEC). You can learn more about us by reviewing our SEC filings on the investor relations page of our website.

The SEC also maintains a website at www.sec.gov that contains reports, proxy statements and other information about SEC registrants, including Northrop Grumman Corporation.

References to our website and the SEC’s website in this report are provided as a convenience and do not constitute, and should not be viewed as, incorporation by reference of the information contained on, or available through, such websites. Such information should not be considered a part of this report, unless otherwise expressly incorporated by reference in this report.

Item 1A. Risk Factors

Our consolidated financial position, results of operations and cash flows are subject to various risks, many of which are not exclusively within our control, that may cause actual performance to differ materially from historical or projected future performance. We encourage you to consider carefully the risk factors described below in evaluating the information contained in this report as the outcome of one or more of these risks could have a material adverse effect on our financial position, results of operations and/or cash flows.

- ***We depend heavily on a single customer, the U.S. government, for a substantial portion of our business. Changes in this customer's priorities and spending could have a material adverse effect on our financial position, results of operations and/or cash flows.***

Our primary customer is the U.S. government, from which we derived 82 percent, 85 percent and 84 percent of our sales during the years ended December 31, 2018, 2017 and 2016, respectively; we have a number of large programs with the U.S. Air Force, in particular. The U.S. government has been implementing significant changes and spending levels have fluctuated and may continue to fluctuate over time. We cannot predict the impact on existing, follow-on, replacement or future programs from potential changes in priorities due to changes in defense spending levels, the threat environment, military strategy and planning and/or changes in social, economic or political priorities.

The U.S. government generally has the ability to terminate contracts, in whole or in part, for its convenience or for default based on performance. In the event of termination for the U.S. government's convenience, contractors are generally protected by provisions covering reimbursement for costs incurred on the contracts and profit on those costs up to the amount authorized under the contract, but not the anticipated profit that would have been earned had the contract been completed. Termination by the U.S. government of a contract due to default could require us to pay for re-procurement costs in excess of the original contract price, net of the value of work accepted from the original contract, as well as other damages. Termination of a contract due to our default could have a material adverse effect on our reputation, our ability to compete for other contracts and our financial position, results of operations and/or cash flows.

The U.S. government also has the ability to stop work under a contract for a limited period of time for its convenience. It is possible that the U.S. government could invoke this ability across a limited or broad number of contracts. In the event of a stop work order, contractors are typically protected by provisions covering reimbursement for costs incurred on the contract to date and for costs associated with the temporary stoppage of work on the contract plus a reasonable fee. However, such temporary stoppages and delays could introduce inefficiencies and result in financial and other damages for which we may not be able to negotiate full recovery from the U.S. government. They could also ultimately result in termination of a contract (or contracts) for convenience or reduced future orders.

A significant shift in government priorities to programs in which we do not participate and/or reductions in funding for or the termination of programs in which we do participate, unless offset by other programs and opportunities, could have a material adverse effect on our financial position, results of operations and/or cash flows.

- ***Significant delays or reductions in appropriations for our programs and U.S. government funding more broadly may negatively impact our business and programs and could have a material adverse effect on our financial position, results of operations and/or cash flows.***

U.S. government programs are subject to annual congressional budget authorization and appropriation processes. For many programs, Congress appropriates funds on an annual fiscal year basis even though the program performance period may extend over several years. Consequently, programs are often partially funded initially and additional funds are committed only as Congress makes further appropriations. If we incur costs in excess of funds obligated on a contract, we may be at risk for reimbursement of those costs unless and until additional funds are obligated to the contract. We cannot predict the extent to which total funding and/or funding for individual programs will be included, increased or reduced as part of the annual appropriations ultimately approved by Congress and the President or in separate supplemental appropriations or continuing resolutions, as applicable. Laws and plans adopted by the U.S. government relating to, along with pressures on and uncertainty surrounding the federal budget, potential changes in priorities and defense spending levels, sequestration, the appropriations process, use of continuing resolutions (with restrictions, e.g., on new starts) and the permissible federal debt limit, could adversely affect the funding for individual programs and delay purchasing or payment decisions by our customers. In the event government funding for our significant programs becomes unavailable, or is reduced or delayed, or planned orders are reduced, our contract or subcontract under such programs may be terminated or adjusted by the U.S. government or the prime contractor.

The U.S. continues to face an uncertain political environment and substantial fiscal and economic challenges, which affect funding for discretionary and non-discretionary budgets. The Budget Control Act of 2011 (BCA) mandated spending caps for all federal discretionary spending across a ten-year period (FY 2012 through FY 2021), including specific limits for defense and non-defense spending. In prior years, these spending caps have been revised by separate bills for specific fiscal years.

Most recently, on February 9, 2018, Congress passed the Bipartisan Budget Act (BBA) of 2018, which raised the statutory budget caps for defense spending, including for Overseas Contingency Operations (OCO), by \$80 billion for FY 2018 and by \$85 billion for FY 2019. The BBA also raised non-defense spending by \$63 billion for FY 2018 and \$68 billion for FY 2019 and suspended the debt ceiling until March 1, 2019. The original spending caps established by the BCA will return for FY 2020 and FY 2021 without another statutory change. Similarly, the suspension of the debt ceiling is expected to end on March 1, 2019 absent further action.

On March 23, 2018, the President signed the Omnibus Appropriations Act for FY 2018, which provided \$1.3 trillion in discretionary funding for federal agencies. In total for FY 2018, Congress appropriated approximately \$700 billion for national security, including approximately \$630 billion for base discretionary funding and approximately \$70 billion in OCO funding.

On September 28, 2018, full-year appropriations for FY 2019 were enacted representing over half of discretionary federal spending. For FY 2019, Congress appropriated approximately \$716 billion for national security, including approximately \$647 billion for base discretionary funding and approximately \$69 billion in OCO funding. A continuing resolution was approved to provide further funding for other agencies (including NASA and other civil agencies) through December 7, 2018, which was subsequently extended through December 21, 2018. On December 22, 2018, U.S. government agencies that had not yet received full-year appropriations and did not otherwise have funding entered into a temporary shutdown. On January 25, 2019, a third continuing resolution was enacted, which funds these agencies through February 15, 2019.

The federal budget and debt ceiling are expected to continue to be the subject of considerable debate, which could have significant impacts on defense spending broadly and the company's programs in particular.

The budget environment, including budget caps mandated by the BCA for fiscal years 2020 and 2021, and uncertainty surrounding the debt ceiling and the appropriations processes, remain significant short and long-term risks. Considerable uncertainty exists regarding how future budget and program decisions will unfold, including the defense spending priorities of the Administration and Congress, what challenges budget reductions (required by the BCA and otherwise) will present for the defense industry and whether annual appropriations bills for all agencies will be enacted for FY 2020. If annual appropriations bills are not timely enacted for FY 2020 or beyond, the U.S. government may continue to operate under a continuing resolution, restricting new contract or program starts, presenting resource allocation challenges and placing limitations on some planned program budgets, and we may face another government shutdown of unknown duration. If a prolonged government shutdown of the DoD were to occur, it could result in program cancellations, disruptions and/or stop work orders and could limit the U.S. government's ability effectively to progress programs and to make timely payments, and our ability to perform on our U.S. government contracts and successfully compete for new work.

We believe continued budget pressures would have serious negative consequences for the security of our country, the defense industrial base, including Northrop Grumman, and the customers, employees, suppliers, investors, and communities that rely on companies in the defense industrial base. It is likely budget and program decisions made in this environment would have long-term implications for our company and the entire defense industry.

Funding for certain programs in which we participate may be reduced, delayed or cancelled. In addition, budget cuts globally could adversely affect the viability of our subcontractors and suppliers, and our employee base. While we believe that our business is well-positioned in areas that the DoD and other customers have indicated are areas of focus for future defense spending, the long-term impact of the BCA, other defense spending cuts, challenges in the appropriations process, the debt ceiling and the ongoing fiscal debates remain uncertain.

Significant delays or reductions in appropriations; long-term funding under a continuing resolution; an extended debt ceiling breach or government shutdown; and/or future budget and program decisions, among other items, may negatively impact our business and programs and could have a material adverse effect on our financial position, results of operations and/or cash flows.

•We are subject to various investigations, claims, disputes, enforcement actions, litigation, arbitration and other legal proceedings that could ultimately be resolved against us.

The size, nature and complexity of our business make us susceptible to investigations, claims, disputes, enforcement actions, litigation and other legal proceedings, particularly those involving governments. We are and may become subject to investigations, claims, disputes, enforcement actions and administrative, civil or criminal litigation, arbitration or other legal proceedings globally and across a broad array of matters, including, but not limited to, government contracts, commercial transactions, false claims, false statements, mischarging, contract performance, fraud, procurement integrity, products liability, warranty liability, the use of hazardous materials, personal injury

claims, environmental, shareholder derivative actions, prior acquisitions and divestitures, intellectual property, tax, employees, export/import, anti-corruption, labor, health and safety, accidents, launch failures, employee benefits and plans, including plan administration, and improper payments, as well as matters relating to the former Orbital ATK, Inc. and our acquisition of that company. These matters could divert financial and management resources; result in administrative, civil or criminal fines, penalties or other sanctions (which terms include judgments or convictions and consent or other voluntary decrees or agreements); compensatory, treble or other damages; non-monetary relief or actions; or other liabilities; and otherwise harm our business. Government regulations provide that certain allegations against a contractor may lead to suspension or debarment from government contracts or suspension of export privileges for the company or one or more of its components. Suspension or debarment or criminal resolutions in particular could have a material adverse effect on the company because of our reliance on government contracts and export authorizations. An investigation, claim, dispute, enforcement action or litigation, even if not substantiated or fully indemnified or insured, could also negatively impact our reputation among our customers and the public, and make it substantially more difficult for us to compete effectively for business or obtain adequate insurance in the future. Investigations, claims, disputes, enforcement actions, litigation or other legal proceedings could have a material adverse effect on our financial position, results of operations and/or cash flows.

•We use estimates when accounting for contracts. Contract cost growth or changes in estimated contract revenues and costs could affect our profitability and our overall financial position.

Contract accounting requires judgment relative to assessing risks, estimating contract revenues and costs, and making assumptions regarding performance. Due to the size and nature of many of our contracts, the estimation of total revenues and costs at completion is complex and subject to many variables. Incentives, awards and/or penalties related to performance on contracts are considered in estimating revenue and profit rates when there is sufficient information to assess anticipated performance. Suppliers' expected performance is also assessed and considered in estimating costs and profitability.

Our operating income can be adversely affected when estimated contract costs increase. Reasons for increased estimated contract costs may include: design issues; changes in estimates of the nature and complexity of the work to be performed, including technical or quality issues or requests to perform additional work at the direction of the customer; production challenges, including those resulting from the availability and timeliness of customer funding, unavailability or reduced productivity of qualified and timely cleared labor or the effect of any delays in performance; the availability, performance, quality or financial strength of significant subcontractors; supplier issues, including the costs, timeliness and availability of materials and components; the effect of any changes in laws or regulations; actions deemed necessary for long-term customer satisfaction; and natural disasters or environmental matters. We may file requests for equitable adjustment or claims to seek recovery in whole or in part for our increased costs and aim to protect against these risks through contract terms and conditions when practical.

Our risk varies with the type of contract. Due to their nature, fixed-price contracts inherently tend to have more financial risk than cost-type contracts. In 2018, approximately half of our sales were derived from fixed-price contracts. We typically enter into fixed-price contracts where costs can be more reasonably estimated based on actual experience, such as for production programs. In addition, our contracts contain provisions relating to cost controls and audit rights. If the terms specified in our contracts are not met, our profitability may be reduced and we may incur a loss.

Our fixed-price contracts may include fixed-price development work. This type of work is inherently more uncertain as to future events than production contracts, and, as a result, there is typically more variability in estimates of the costs to complete the development stage. As work progresses through the development stage into production, the risks associated with estimating the total costs of the contract are typically reduced. While management uses its best judgment to estimate costs associated with fixed-price development contracts, future events could result in adjustments to those estimates.

Under cost-type contracts, allowable costs incurred by the contractor are generally subject to reimbursement plus a fee. We often enter into cost-type contracts for development programs with complex design and technical challenges. These cost-type programs typically have award or incentive fees that are subject to uncertainty and may be earned over extended periods or towards the end of the contract. In these cases, the associated financial risks are primarily in recognizing profit, which ultimately may not be earned, or program cancellation if cost, schedule, or technical performance issues arise. We also may face additional financial risk due to an increasing number of contract solicitations requiring the contractor to bid on cost-type development work and related fixed-price production lots and/or options in one submission, or cost-type development work requiring the contractor to provide certain items to the customer at the contractor's expense or at little or no fee.

Because of the significance of management's judgments and the estimation processes described above, it is possible that materially different amounts could be obtained if different assumptions were used or if the underlying circumstances were to change. Changes in underlying assumptions, circumstances or estimates, and the failure to prevail on claims for equitable adjustments could have a material adverse effect on the profitability of one or more of the affected contracts and on our overall financial position, results of operations and/or cash flows. See "Critical Accounting Policies, Estimates and Judgments" in MD&A.

▪ ***Our international business exposes us to additional risks, including risks related to geopolitical and economic factors, laws and regulations.***

Sales to customers outside the U.S. are an increasingly important component of our strategy. Our international business (including our participation in joint ventures and other joint business arrangements) is subject to numerous political and economic factors, legal requirements, cross-cultural considerations and other risks associated with doing business globally. These risks differ in some respects from those associated with our U.S. business and our exposure to such risks may increase if our international business continues to grow as we anticipate.

Our international business is subject to both U.S. and foreign laws and regulations, including, without limitation, laws and regulations relating to import-export controls, technology transfer restrictions, government contracts and procurement, data privacy and protection, investment, exchange rates and controls, the Foreign Corrupt Practices Act (FCPA) and other anti-corruption laws, the anti-boycott provisions of the U.S. Export Administration Act, labor and employment, works councils and other labor groups, anti-human trafficking, taxes, environment, immunity, security restrictions and intellectual property. Failure by us, our employees, affiliates, partners or others with whom we work to comply with applicable laws and regulations could result in administrative, civil, commercial or criminal liabilities, including suspension or debarment from government contracts or suspension of our export privileges. Our customers outside of the U.S. generally have the ability to terminate contracts for default based on performance. Suspension or debarment, or termination of a contract due to default, in particular, could have a material adverse effect on our reputation, our ability to compete for other contracts and our financial position, results of operations and/or cash flows. New regulations and requirements, or changes to existing ones in the various countries in which we operate can significantly increase our costs and risks of doing business internationally.

Changes in laws, regulations, political leadership and environment, or security risks may dramatically affect our ability to conduct or continue to conduct business in international markets. Our international business may be impacted by changes in U.S. and foreign national policies and priorities, and geopolitical relationships, any of which may be influenced by changes in the threat environment, political leadership, geopolitical uncertainties, world events, bilateral and multi-lateral relationships, government budgets, and economic and political factors more generally, and any of which could impact funding for programs, alter export authorizations, or delay purchasing decisions or customer payments. We also could be affected by the legal, regulatory and economic impacts of Britain's anticipated exit from the European Union, the full impact of which is not known at this time. Global economic conditions and fluctuations in foreign currency exchange rates could further impact our business. For example, the tightening of credit in financial markets outside of the U.S. could adversely affect the ability of our customers and suppliers to obtain financing and could result in a decrease in or cancellation of orders for our products and services or impact the ability of our customers to make payments.

Our contracts with non-U.S. customers may also include terms and reflect legal requirements that create additional risks. They may include industrial cooperation agreements requiring specific in-country purchases, investments, manufacturing agreements or other operational or financial obligations, including offset obligations, and provide for significant penalties if we fail to meet such requirements. They may also require us to enter into letters of credit, performance or surety bonds, bank guarantees and/or other financial arrangements to secure our performance obligations. We also increasingly are dependent on in-country suppliers and we face risks related to their failure to perform in accordance with the contracts and applicable laws, particularly where we rely on a sole source supplier. Our ability to sell products outside the U.S. could be adversely affected if we are unable to design our products for export on a cost effective basis or to obtain and retain all necessary export licenses and authorizations on a timely basis. We face risks related to our products that are approved for export, but may be subject to the U.S. government changing or canceling the export license after the product is ordered. Our ability to conduct business outside of the U.S. also depends on our ability to attract and retain sufficient qualified personnel with the skills and/or security clearances in the markets in which we do business.

More broadly, our ability effectively to pursue and execute contracts outside the U.S. also may be impacted by our ability to partner successfully with non-U.S. companies, including through joint ventures, teaming agreements, co-

production or other arrangements, in support of such pursuits. This risk includes the ability to timely identify and negotiate appropriate arrangements with local partners as well as potential exposure for their actions.

The products and services we provide internationally, including those provided by subcontractors and joint ventures in which we have an interest, are sometimes in countries with unstable governments, economic or fiscal challenges, military or political conflicts and/or developing legal systems. This may increase the risk to our employees, subcontractors or other third parties, and/or increase the risk of a wide range of liabilities, as well as loss of property or damage to our products.

The occurrence and impact of these factors is difficult to predict, but one or more of them could have a material adverse effect on our financial position, results of operations and/or cash flows.

- ***Our reputation, our ability to do business and our financial position, results of operations and/or cash flows may be impacted by the improper conduct of employees, agents, subcontractors, suppliers, business partners or joint ventures in which we participate.***

We have implemented policies, procedures, training and other compliance controls, and have negotiated terms designed to prevent misconduct by employees, agents or others working on our behalf or with us that would violate the applicable laws of the jurisdictions in which we operate, including laws governing improper payments to government officials, the protection of export controlled or classified information, false claims, procurement integrity, cost accounting and billing, competition, information security and data privacy, or the terms of our contracts. However, we cannot ensure that we will prevent all such misconduct committed by our employees, agents, subcontractors, suppliers, business partners or others working on our behalf or with us. We have in the past experienced and may in the future experience such misconduct, despite a vigorous compliance program. This risk of improper conduct may increase as we expand globally. In the ordinary course of our business we form and are members of joint ventures (with that term used throughout to refer to joint efforts or business arrangements of any type). We may be unable to prevent misconduct or other violations of applicable laws by these joint ventures (including their officers, directors and employees) or our partners. Improper actions by those with whom or through whom we do business (including our employees, agents, subcontractors, suppliers, business partners and joint ventures) could subject us to administrative, civil or criminal investigations and enforcement actions; monetary and non-monetary penalties; liabilities; and the loss of privileges and other sanctions, including suspension and debarment, which could negatively impact our reputation and ability to conduct business and could have a material adverse effect on our financial position, results of operations and/or cash flows.

- ***Our business could be negatively impacted by cyber and other security threats or disruptions.***

As a defense contractor, we face various cyber and other security threats, including attempts to gain unauthorized access to sensitive information and networks; insider threats; threats to the safety of our directors, officers and employees; threats to the security of our facilities, infrastructure and supply chain; and threats from terrorist acts or other acts of aggression. Our customers and partners (including our supply chain and joint ventures) face similar threats. Although we utilize various procedures and controls to monitor and mitigate the risk of these threats, there can be no assurance that these procedures and controls will be sufficient. These threats could lead to losses of sensitive information or capabilities; theft of data; harm to personnel, infrastructure or products; and financial liabilities, as well as damage to our reputation as a government contractor and provider of cyber-related or cyber-protected goods and services.

Cyber threats are evolving and include, but are not limited to, malicious software, destructive malware, attempts to gain unauthorized access to data, disruption or denial of service attacks, and other electronic security breaches that could lead to disruptions in mission critical systems, unauthorized release of confidential, personal or otherwise protected information (ours or that of our employees, customers or partners), and corruption of data, networks or systems. In addition, we could be impacted by cyber threats or other disruptions or vulnerabilities found in products we use or in our partners' or customers' systems that are used in connection with our business. These events, if not prevented or effectively mitigated, could damage our reputation, require remedial actions and lead to loss of business, regulatory actions, potential liability and other financial losses.

We provide systems, products and services to various customers (government and commercial) who also face cyber threats. Our systems, products and services may themselves be subject to cyber threats and/or they may not be able to detect or deter threats, or effectively to mitigate resulting losses. These losses could adversely affect our customers and our company.

The impact of these factors is difficult to predict, but one or more of them could result in the loss of information or capabilities, harm to individuals or property, damage to our reputation, loss of business, contractual or regulatory

actions and potential liabilities, any one of which could have a material adverse effect on our financial position, results of operations and/or cash flows.

•Our earnings and profitability depend, in part, on subcontractor and supplier performance and financial viability as well as raw material and component availability and pricing.

We rely on other companies to provide raw materials, chemicals and components and subsystems for our products and to produce hardware elements and sub-assemblies, provide software and intellectual property, and perform some of the services we provide to our customers, and to do so in compliance with all applicable laws, regulations and contract terms. Disruptions or performance problems caused by our subcontractors and suppliers, or a misalignment between our contractual obligations to our customers and our agreement with our subcontractors and suppliers, could have various impacts on the company, including on our ability to meet our commitments to customers.

Our ability to perform our obligations on time could be adversely affected if one or more of our subcontractors or suppliers were unable to provide the agreed-upon products or materials or perform the agreed-upon services in a timely, compliant and cost-effective manner or otherwise to meet the requirements of the contract. Changes in economic conditions, including changes in defense budgets or credit availability, or other changes impacting a subcontractor or supplier (including changes in ownership or operations) could adversely affect the financial stability of our subcontractors and suppliers and/or their ability to perform. The inability of our suppliers to perform, or their inability to perform adequately, could also result in the need for us to transition to alternate suppliers, which could result in significant incremental cost and delay or the need for us to provide other resources to support our existing suppliers.

In connection with our U.S. government contracts, we are required to procure certain materials, components and parts from supply sources approved by the customer. We also are facing increased and changing regulatory requirements, both domestically and internationally, many of which apply to our subcontractors and suppliers. In some cases, there may be only one supplier, or one domestic supplier, for certain components. For example, a single domestic source currently supplies us, as well as the U.S. domestic solid propellant industry, with a principal raw material used in the production of solid rocket motors. If a supplier cannot appropriately meet our needs, experiences disruptions to production or is otherwise unavailable or not fully available, we may be unable to find a suitable alternative.

Our procurement practices are intended to reduce the likelihood of our procurement of counterfeit, unauthorized or otherwise non-compliant parts or materials. We rely on our subcontractors and suppliers to comply with applicable laws, regulations and contract terms, including regarding the parts or materials we procure from them; in some circumstances, we rely on certifications provided by our subcontractors and suppliers regarding their compliance. We also rely on our subcontractors and suppliers effectively to mitigate the risk of cyber and security threats or other disruptions with respect to the products, components and services they deliver to us and the information entrusted to them by us or our customers and to comply with applicable contractual terms and laws and regulations, including cybersecurity requirements.

If our subcontractors or suppliers fail to perform or we are unable to procure, or experience significant delays in deliveries of, needed products, materials or services; or if they do not comply with all applicable laws, regulations, requirements and contract terms, including if what we receive is counterfeit or otherwise improper, our financial position, results of operations and/or cash flows could be materially adversely affected.

•As a U.S. government contractor, we and our partners are subject to various procurement and other laws and regulations applicable to our industry and we could be adversely affected by changes in such laws and regulations or any negative findings by the U.S. government as to our compliance with them. We also may be adversely affected by changes in our customers' business practices globally.

U.S. government contractors (including their subcontractors and others with whom they do business) must comply with many significant procurement regulations and other specific legal requirements. These regulations and other requirements, although often customary in government contracts, increase our performance and compliance costs and risks and are regularly evolving. New laws, regulations or procurement requirements or changes to current ones (including, for example, regulations related to cybersecurity, privacy, recovery of employee compensation costs, counterfeit parts, anti-human trafficking, specialty metals and conflict minerals) can significantly increase our costs and risks and reduce our profitability.

We operate in a highly regulated environment and are routinely audited and reviewed by the U.S. government and its agencies, such as the Defense Contract Audit Agency (DCAA), Defense Contract Management Agency (DCMA) and the DoD Inspector General. These agencies review performance under our contracts, our cost structure and our

compliance with applicable laws, regulations and standards, as well as the adequacy of our systems and processes in meeting government requirements. Costs ultimately found to be unallowable or improperly allocated to a specific contract will not be reimbursed or must be refunded if already reimbursed. If an audit uncovers improper or illegal activities, we may be subject to civil and criminal penalties, sanctions, forfeiture of profits or suspension or debarment. Whether or not illegal activities are alleged, the U.S. government has the ability to decrease or withhold certain payments when it deems systems subject to its review to be inadequate, with significant financial impact. In addition, we could suffer serious reputational harm if allegations of impropriety were made against us or our business partners.

Our industry has experienced, and we expect it will continue to experience, significant changes to business practices globally as a result of an increased focus on affordability, efficiencies, business systems, recovery of costs and a reprioritization of available defense funds to key areas for future defense spending. As a result of certain of these initiatives, we have experienced and may continue to experience an increased number of audits and/or a lengthened period of time required to close open audits. For example, the thresholds for certain allowable costs in the U.S., including compensation costs, have been significantly reduced; the allowability of other types of costs are being challenged, debated and, in certain cases, modified, all with potentially significant financial costs to the company. In connection with these cost reduction initiatives, the U.S. government is also pursuing alternatives to shift additional responsibility and performance risks to the contractor. The U.S. government has been pursuing and may continue to pursue policies that could negatively impact our profitability. Changes in procurement practices favoring incentive-based fee arrangements, different award criteria, non-traditional contract provisions and government contract negotiation offers that indicate what our costs should be also may affect our profitability and predictability.

We (again, including our subcontractors and others with whom we do business) also are subject to, and expected to perform in compliance with, a vast array of federal laws, regulations and requirements related to our industry, our products and the businesses we operate. These laws and regulations include, but are not limited to, the Truth in Negotiations Act, False Claims Act, Procurement Integrity Act, Federal Communications Commission Act, CAS, FAR, International Traffic in Arms Regulations promulgated under the Arms Export Control Act, Close the Contractor Fraud Loophole Act and FCPA, as well as rules and regulations administered by the Bureau of Alcohol, Tobacco, Firearms and Explosives. If we are found to have violated such requirements, or are found not to have acted responsibly, we may be subject to reductions of the value of contracts; contract modifications or termination; the withholding of payments from our customer; the loss of export privileges; administrative or civil judgments and liabilities; criminal judgments or convictions, liabilities and consent or other voluntary decrees or agreements; other sanctions; the assessment of penalties, fines, or compensatory, treble or other damages or non-monetary relief or actions; or suspension or debarment.

If we or those with whom we do business do not comply with the laws, regulations and processes to which we are subject or if customer business practices or requirements change significantly, including with respect to the thresholds for allowable costs, it could affect our ability to compete and have a material adverse effect on our financial position, results of operations and/or cash flows.

- ***Competition within our markets and bid protests may affect our ability to win new contracts and result in reduced revenues and market share.***

We operate in highly competitive markets and our competitors may have more financial capacity, more extensive or specialized engineering, manufacturing, or marketing capabilities in some areas, or be willing to accept more risk or lower profitability in competing for contracts. We have seen, and anticipate we will continue to see, increased competition in some of our core markets, especially as a result of budget pressures for many customers, a continued focus on affordability and competition, and our own success in winning business. We are facing increasing competition in the U.S. and outside the U.S. from U.S., foreign and multinational firms. In some instances outside the U.S., foreign companies may receive loans, marketing subsidies and other assistance from their governments that may not be available to U.S. companies and foreign companies may be subject to fewer restrictions on technology transfer. Additionally, some customers, including the DoD, may turn to commercial contractors, rather than traditional defense contractors, for some products and services, or may utilize small business contractors or determine to source work internally rather than hiring a contractor.

We are also seeing a significant number of bid protests from unsuccessful bidders on new program awards. Bid protests could result in contract modifications or the award decision being reversed and loss of the contract award. Even where a bid protest does not result in the loss of an award, the resolution can extend the time until the contract activity can begin, and delay earnings.

If we are unable to continue to compete successfully against our current or future competitors, or prevail in protests, we may experience declines in future revenues and market share, which could, over time, have a material adverse effect on our financial position, results of operations and/or cash flows.

- ***Our ability to win new competitions and meet the needs of our customers depends, in part, on our ability to maintain a qualified workforce.***

Our operating results and growth opportunities are heavily dependent upon our ability to attract and retain sufficient personnel with security clearances and requisite skills in multiple areas, including science, technology, engineering and math. Additionally, as we grow our international business, it is increasingly important that we are able to attract and retain personnel with relevant local qualifications and experience. In addition, in a tightened labor market, we are facing increased competition for talent, both with traditional defense companies and commercial companies. If qualified personnel are scarce or difficult to attract or retain or if we experience a high level of attrition, generally or in particular areas, or if such personnel are unable to obtain security clearances on a timely basis, we could experience higher labor, recruiting or training costs in order to attract and retain necessary employees.

Certain of our employees are covered by collective agreements. We generally have been able to renegotiate renewals to expiring agreements without significant disruption of operating activities. If we experience difficulties with renewals and renegotiations of existing collective agreements or if our employees pursue new collective representation, we could incur additional expenses and may be subject to work stoppages, slow-downs or other labor-related disruptions. Any such expenses or delays could adversely affect our programs served by employees who are covered by such agreements or representation.

If we are unable to attract and retain a qualified workforce, we may be unable to maintain our competitive position and our future success could be materially adversely affected.

- ***Many of our contracts contain performance obligations that require innovative design capabilities, are technologically complex, require state-of-the-art manufacturing expertise or are dependent upon factors not wholly within our control. Failure to meet our contractual obligations could adversely affect our profitability, reputation and future prospects.***

We design, develop and manufacture technologically advanced and innovative products and services, which are applied by our customers in a variety of environments, including some under highly demanding operating conditions. Problems and delays in development or delivery, or system failures, as a result of issues with respect to design, technology, intellectual property rights, labor, inability to achieve learning curve assumptions, inability to manage effectively a broad array of programs, manufacturing materials or components, or subcontractor performance could prevent us from meeting requirements and create significant risk and liabilities. Similarly, failures to perform on schedule or otherwise to fulfill our contractual obligations could negatively impact our financial position, reputation and ability to win future business.

In addition, our products cannot be tested and proven in all situations and are otherwise subject to unforeseen problems. Examples of unforeseen problems that could negatively affect revenue, schedule and profitability include loss on launch or flight of spacecraft, loss of aviation platforms, premature failure of products that cannot be accessed for repair or replacement, problems with design, quality and workmanship, country of origin of procured materials, inadequate delivery of subcontractor components or services and degradation of product performance. These failures could result, either directly or indirectly, in loss of life or property. Among the factors that may affect revenue and profitability could be inaccurate cost estimates, design issues, human factors, unforeseen costs and expenses not covered by insurance or indemnification from the customer, diversion of management focus in responding to unforeseen problems, loss of follow-on work, and, in the case of certain contracts, repayment to the government customer of contract cost and fee payments we previously received, or replacement obligations.

Certain contracts, primarily involving space satellite systems, contain provisions that also entitle the customer to recover fees in the event of failure of the system upon launch or subsequent deployment for less than a specified period of time. Under such terms, we could be required to forfeit fees previously recognized and/or collected.

If we are unable to meet our obligations, including due to issues regarding the design, development or manufacture of our products or services, or we experience launch, platform or satellite system failures, it could have a material adverse effect on our reputation, our ability to compete for other contracts and our financial position, results of operations and/or cash flows.

- ***Environmental matters, including unforeseen costs associated with compliance and remediation efforts, and government and third party claims, could have a material adverse effect on our reputation and our financial position, results of operations and/or cash flows.***

Our operations are subject to and affected by a variety of federal, state, local and foreign environmental laws and regulations, including as they may be changed or enforced differently over time. Compliance with these environmental laws and regulations requires, and is expected to continue to require, significant operating and capital costs. We may be subject to substantial administrative, civil or criminal fines, penalties or other sanctions (including suspension and debarment) for violations. If we are found to be in violation of the Federal Clean Air Act or the Clean Water Act, the facility or facilities involved in the violation could be placed by the Environmental Protection Agency on a list maintained by the General Services Administration of facilities that generally cannot be used in performing on U.S. government contracts until the violation is corrected.

We incur, and expect to continue to incur, substantial remediation costs related to the cleanup of pollutants previously released into the environment. Stricter or different enforcement of existing laws and regulations; new laws, regulations or cleanup requirements; discovery of previously unknown or more extensive contamination; imposition of fines, penalties, compensatory or other damages (including natural resource damages); a determination that certain environmental costs are unallowable; rulings on allocation or insurance coverage; and/or the insolvency or other inability or unwillingness of other parties to pay their share of such costs could require us to incur material additional costs in excess of those anticipated.

We also are and may become a party to various legal proceedings and disputes involving government and private parties (including individual and class actions) relating to alleged impacts from pollutants released into the environment. These matters could result in compensatory or other damages, fines, penalties, and non-monetary relief, and adverse determinations on allowability or insurance coverage.

We are engaged in remediation activities relating to environmental conditions allegedly resulting from historic operations at the former United States Navy and Grumman facilities in Bethpage, New York. We have incurred, and expect to continue to incur, substantial remediation and other costs and liabilities related to environmental conditions in Bethpage. The remediation standards or requirements to which we are subject may change and costs may increase materially. The State of New York has notified us that it intends to seek to impose additional remedial requirements and, among other things, is evaluating natural resource damages. We are, and expect we may further become, a party to various legal proceedings and disputes related to remediation and/or alleged environmental impacts in Bethpage, including with federal and state entities, local municipalities and water districts, insurance carriers and individual and class action plaintiffs. These matters could result in fines, penalties, sanctions, compensatory or other damages (including natural resource damages), determinations on allocation, allowability and coverage, and non-monetary relief and actions.

In addition, government and private parties could seek to hold us responsible for liabilities or obligations related to former operations that have been divested or spun-off (including our former shipbuilding business) and/or for which other parties have agreed to be responsible and/or to indemnify us, directly or indirectly. The indemnity related rights we have may not be sufficient to protect us against such liabilities.

The impact of these factors is difficult to predict, but one or more of them could harm our reputation and business and have a material adverse effect on our financial position, results of operations and/or cash flows.

- ***Our business is subject to disruption caused by natural disasters that could adversely affect our profitability and our overall financial position.***

We have significant operations located in regions that may be exposed to hurricanes, earthquakes, other damaging storms, forest fires and other natural disasters. Our subcontractors and suppliers are also subject to natural disasters that could affect their ability to deliver or perform under a contract, including as a result of disruptions to their workforce and critical industrial infrastructure needed for normal business operations. Although preventative measures may help to mitigate damage, the damage and disruption resulting from natural disasters may be significant.

If insurance or other risk transfer mechanisms are unavailable or insufficient to recover all costs or if we experience a significant disruption to our business due to a natural disaster, it could have a material adverse effect on our financial position, results of operations and/or cash flows.

- ***Our insurance coverage, customer indemnifications or other liability protections may be unavailable or inadequate to cover all of our significant risks or our insurers may deny coverage of or be unable to pay for material losses we incur, which could adversely affect our profitability and overall financial position.***

We endeavor to obtain insurance agreements from financially solid, highly rated counterparties in established markets to cover significant risks and liabilities (including, for example, natural disasters, space launches, hazardous operations and products liability). Not every risk or liability can be insured, and for risks that are insurable, the policy limits and terms of coverage reasonably obtainable in the market may not be sufficient to cover all actual losses or liabilities incurred. Even if insurance coverage is available, we may not be able to obtain it at a price or on terms acceptable to us. Disputes with insurance carriers, including over policy terms, reservation of rights, the applicability of coverage (including exclusions), compliance with provisions (including notice) and/or the insolvency of one or more of our insurers may significantly affect the amount or timing of recovery, and may impact our ability to obtain insurance coverage at reasonable rates in the future.

In some circumstances we may be entitled to certain legal protections or indemnifications from our customers through contractual provisions, laws, regulations or otherwise. However, these protections are not always available, are typically subject to certain terms or limitations, including the availability of funds, and may not be sufficient to cover all losses or liabilities incurred.

If insurance coverage, customer indemnifications and/or other legal protections are not available or are not sufficient to cover our risks or losses, it could have a material adverse effect on our financial position, results of operations and/or cash flows.

- ***We provide products and services related to hazardous and high risk operations, which subjects us to various environmental, regulatory, financial, reputational and other risks.***

We provide products and services related to hazardous and high risk operations. Among other such operations, our products and services are used in nuclear-related activities (including nuclear-powered platforms) and used in support of nuclear-related operations of third parties. In addition, certain of our products are provided with space launch services. With our acquisition of legacy Orbital ATK, we have expanded our portfolio to include energetic materials, including products that involve highly explosive or flammable elements. All of these activities subject us to various extraordinary risks, including potential liabilities relating to nuclear or launch-related incidents or unintended initiation of energetic materials, including risk of personal injury and property damage; to the harmful effects on the environment and human health that may result from nuclear-related activities, operations or incidents, as well as the storage, handling and disposal of radioactive materials; and to failed launches of spacecraft. We may be subject to reputational harm and potential liabilities arising out of a nuclear or launch incident, among others, whether or not the cause was within our control. Under some circumstances, the U.S. government and prime contractors may provide for certain indemnification and other protection under certain of our government related contracts, including pursuant to, or in connection with, Public Law 85-804, the Price-Anderson Nuclear Industries Indemnity Act and the Terrorism Risk Insurance Reauthorization Act, for certain risks.

Certain of our Innovation Systems products, including products from its Defense Systems business, such as small, medium and large caliber ammunition, and its Flight Systems business, such as solid rocket motors and liquid propulsion engines, involve the use, manufacture and/or handling of a variety of explosive and flammable materials. From time to time, these activities have resulted in incidents, such as an explosion at the Lake City Army Ammunition Plant in 2017, that have caused workplace injuries and fatalities, the temporary shut down or other disruption of manufacturing processes, production delays, environmental harm and expense, fines and liability to third parties. We have safety and loss prevention programs which provide for detailed pre-construction reviews of process changes and new operations, along with routine safety audits of operations involving explosive materials, to mitigate such incidents, as well as insurance coverage. We and our customers may experience similar or more serious incidents in the future which could result in various liabilities and production delays.

In addition, our customers may otherwise use our products and services in connection with hazardous activities, or in ways that can be unusually hazardous or risky, creating potential liabilities to our customers and/or our company as the provider of such products and services. In the event of an incident, if our customers fail to use our products properly or if our products or services do not operate as intended, we could be subject to reputational harm and potential liabilities.

If there was a nuclear incident or other nuclear-related damages, an incident related to launch activities, an incident related to the use of energetics or an incident or other damages related to or caused by the use of our products and services in connection with hazardous activities or risks, and if insurance coverage or indemnification or other

protection was not fully available to cover our losses and liabilities, it could adversely affect our reputation and have a material adverse effect on our financial position, results of operations and/or cash flows.

- ***Pension and other postretirement benefit (OPB) obligations and related expenses recorded in our financial statements may fluctuate significantly depending upon investment performance of plan assets, changes in actuarial assumptions, and legislative or other regulatory actions.***

A substantial portion of our current and retired employee population is covered by pension and OPB plans. Defined benefit pension and OPB obligations and related expenses as recorded in our financial statements are dependent upon the investment performance of plan assets and various assumptions, including discount rates applied to future payment obligations, mortality assumptions, estimated long-term rates of return on plan assets, rates of future cost growth and trends for future costs. In addition, funding requirements for benefit obligations of our pension and OPB plans, including Pension Benefit Guaranty Corporation premiums for certain of our defined benefit plans, and our health and welfare plans are subject to legislative and other government regulatory actions.

In accordance with government regulations, pension plan cost recoveries under our U.S. government contracts may occur in different periods from when those pension costs are recognized for financial statement purposes or when pension funding is made. These timing differences could have a material adverse effect on our cash flows. The cost accounting rules have been revised in order to partially harmonize the measurement and period of assignment of defined benefit pension plan costs allocable to U.S. government contracts and minimum required contributions under the Employee Retirement Income Security Act of 1974 (ERISA), as amended by the Pension Protection Act (PPA) of 2006. These rules better align, but do not eliminate, mismatches between ERISA funding requirements and CAS pension costs for U.S. government CAS covered contracts.

Investment performance of plan assets and changes in assumptions associated with our pension and OPB plans could have a material adverse effect on our financial position, results of operations and/or cash flows.

- ***Anticipated benefits of the Orbital ATK Acquisition may not be realized.***

On June 6, 2018, the company completed the acquisition of Orbital ATK, Inc., which is now our new Innovation Systems sector. We believe this acquisition will enable us to broaden our capabilities and offerings, enhance our ability to provide innovative solutions to meet our customers' emerging requirements, create value for shareholders and provide expanded opportunities for our combined employees. However, in the course of integrating our business with the legacy Orbital ATK business, we may discover additional information about the legacy Orbital ATK business (including its financial controls and potential risks, opportunities and liabilities) that alters our assessment of the anticipated benefits, costs and risks of the acquisition. Additionally, our customers may not value our combined businesses and capabilities as much as we anticipate, in which case we may not realize the benefits of our combined business to the extent we currently anticipate or at all.

Our ability to realize the anticipated benefits of the acquisition will depend, to a significant extent, on our ability to integrate the legacy Orbital ATK business with ours. The integration of an independent business with our business is a complex, costly and time-consuming process. Costs may include, among other things, those associated with facilities and systems consolidation, operational impacts, severance and other potential employment-related costs, as well as fees paid to financial, legal and other advisors. We are devoting significant management attention and resources effectively to integrate the legacy Orbital ATK business and operations with our business, including integration of internal controls processes and procedures, and to realize the anticipated benefits. The integration process may disrupt our business and, if implemented ineffectively, may not result in the realization of the expected benefits of the acquisition, including enhanced product offerings. The consummation of the acquisition has triggered change in control and other similar provisions in certain agreements to which legacy Orbital ATK is a party and otherwise affected contractual relationships, which could have an adverse impact on the combined business if we are unable to address such issues successfully. The failure to meet the challenges involved in integrating the legacy Orbital ATK business and to realize the anticipated benefits of the acquisition could cause an interruption of, or a loss of momentum in, our activities.

The foregoing risks could have a material adverse effect on our future financial position, results of operations and/or cash flows.

- ***We may be unable fully to exploit or adequately to protect intellectual property rights, which could materially affect our ability to compete, our reputation and our financial position, results of operations and/or cash flows.***

To perform on our contracts and to win new business, we depend on our ability to develop, protect and exploit our intellectual property and also to access the intellectual property of others under reasonable terms. We may not be

able adequately to exploit, protect or access intellectual property and the conduct of our customers, competitors and suppliers may make it more difficult for us to do so.

We own many forms of intellectual property, including U.S. and foreign patents, trademarks, copyrights and trade secrets and we license or otherwise obtain access to various intellectual property rights of third parties. The U.S. government and certain foreign governments hold licenses or other rights to certain intellectual property that we develop in performance of government contracts, and may seek to use or authorize others to use such intellectual property, including in competition with us. Governments have increased certain efforts to assert or obtain more extensive rights in intellectual property, which could reduce our ability to develop, protect and exploit certain of our intellectual property rights and to compete. Governments have also declined at times to make intellectual property of others available to us under acceptable terms.

We also rely significantly upon proprietary technology, information, processes and know-how. We typically seek to protect this information, including by entering into confidentiality agreements with our employees and other parties such as consultants and subcontractors. These agreements and other measures may not provide adequate protection for our trade secrets and other proprietary information. In the event of an infringement of such intellectual property rights, a breach of a confidentiality agreement, a misuse or theft of our intellectual property or divulgence of proprietary information, we may not have adequate legal remedies. In addition, our trade secrets or other proprietary information may otherwise become known or be independently developed by competitors.

In some instances, our ability to seek, win or perform contracts may require us to access and use third party intellectual property. This may require that the government or our customer is willing and able to provide rights to such third party intellectual property, or that we are able to negotiate directly to obtain necessary rights on reasonable terms.

Our intellectual property is subject to challenge, invalidation, misappropriation or circumvention by third parties. Our access to and use of intellectual property licensed or otherwise obtained from third parties is also subject to challenges. Litigation to determine the scope of intellectual property rights, even if ultimately successful, could be costly and could divert management's attention away from other aspects of our business. Moreover, the laws concerning intellectual property rights vary among countries and the protection provided to our intellectual property by foreign laws and courts may not be the same as the remedies available under U.S. law.

If we are unable adequately to exploit our intellectual property rights, to protect our intellectual property rights against infringement or third party claims, or to obtain rights to intellectual property of others, it could have a material adverse effect on our reputation, ability to compete for and perform on contracts, financial position, results of operations and/or cash flows.

•Our future success depends, in part, on our ability to develop new products and new technologies and maintain technologies, facilities and equipment to win new competitions and meet the needs of our customers.

Many of the markets in which we operate are characterized by rapidly changing technologies. The product, program and service needs of our customers change and evolve regularly. Our success in the competitive defense industry depends upon our ability to identify emerging technological trends, develop technologically advanced, innovative and cost-effective products and services and market these products and services to our customers in the U.S. and internationally. In addition, our ability to develop innovative and technologically advanced products depends, in part, on continued funding for, and investment in, research and development projects. Our success also depends on our continued access to assured suppliers of important technologies and components and our ability to provide the people, technologies, facilities, equipment and financial capacity needed to deliver those products and services with maximum efficiency. If we are unable to develop new products and technologies, or if we fail to achieve market acceptance more rapidly than our competitors, we may be unable to maintain our competitive position and our future success could be materially adversely affected. If we fail to maintain our competitive position, we could lose a significant amount of future business to our competitors, which could have a material adverse effect on our ability to generate favorable financial results and maintain market share.

▪ Changes in future business conditions could cause business investments and/or recorded goodwill and other long-lived assets to become impaired, resulting in substantial losses and write-downs that would reduce our operating income.

Goodwill accounts for approximately 50 percent of our total assets. Although we currently have excess fair value of our reporting units over their respective carrying values, market-based inputs to the calculations in our goodwill impairment test, such as weighted average cost of capital and terminal value (based on market comparisons) could change significantly from our current assumptions. Additionally, we acquired a significant amount of purchased

intangible and other long-lived assets in the Merger, whose recovery is dependent, in part, on future business conditions. We continue to monitor the recoverability of the carrying value of our goodwill and other long-lived assets. Significant write-offs of goodwill or other long-lived assets could have a material adverse effect on our financial condition and/or results of operations.

▪ ***Unanticipated changes in our tax provisions or exposure to additional tax liabilities could affect our profitability and cash flow.***

We are subject to income and other taxes in the U.S. and foreign jurisdictions. Changes in applicable U.S. or foreign tax laws and regulations, or their interpretation and application, including the possibility of retroactive effect, could affect our tax expense and profitability as they did in 2017 upon passage of the Tax Cuts and Jobs Act. In addition, the final determination of any tax audits or related litigation could be materially different from our historical income tax provisions and accruals.

The distribution (Distribution) by Alliant Techsystems Inc. (ATK) of the shares of Vista Outdoor Inc. (Vista) and ATK's acquisition of Orbital Sciences Corporation (Orbital) to create then Orbital ATK (the Orbital-ATK Merger) were intended to qualify as tax-free to ATK, ATK's stockholders, Vista and Orbital for U.S. income tax purposes. However, there can be no assurance that the IRS or the courts will agree with the conclusion of the parties and their counsel regarding the tax treatment of the Distribution and Orbital-ATK Merger. If the Distribution or certain related transactions were taxable, ATK's shareholders immediately prior to the Distribution could be required to recognize income on their receipt of Vista Outdoor stock in the Distribution, ATK could be considered to have made a taxable sale of certain of its assets to Vista Outdoor and Vista could be subject to income taxes.

Under the tax matters agreement between Orbital ATK and Vista (the Tax Matters Agreement), in certain circumstances, and subject to certain limitations, Vista is required to indemnify Orbital ATK against taxes on the Distribution that arise as a result of actions or failures to act by Vista, or as a result of Section 355(e) of the Internal Revenue Code applying due to acquisitions of Vista stock after the Distribution. In other cases, however, we might recognize a taxable gain on the Distribution without being entitled to an indemnification payment under the Tax Matters Agreement. If such tax is imposed on Vista, then we may, depending on the circumstances, be required to indemnify Vista for that tax.

Changes in our tax provision or an increase in our tax liabilities, whether due to changes in applicable laws and regulations, the interpretation or application thereof, or a final determination of tax audits or litigation, could have a material adverse effect on our financial position, results of operations and/or cash flows.

Item 1B. Unresolved Staff Comments

None.

FORWARD-LOOKING STATEMENTS AND PROJECTIONS

This Annual Report on Form 10-K and the information we are incorporating by reference contain statements that constitute "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. Words such as "will," "expect," "anticipate," "intend," "may," "could," "should," "plan," "project," "forecast," "believe," "estimate," "outlook," "trends," "goals" and similar expressions generally identify these forward-looking statements. Forward-looking statements include, among other things, statements relating to our future financial condition, results of operations and/or cash flows.

Forward-looking statements are based upon assumptions, expectations, plans and projections that we believe to be reasonable when made, but which may change over time. These statements are not guarantees of future performance and inherently involve a wide range of risks and uncertainties that are difficult to predict. Specific risks that could cause actual results to differ materially from those expressed or implied in these forward-looking statements include, but are not limited to, those identified under "Risk Factors" and other important factors disclosed in this report and from time to time in our other filings with the SEC. They include:

- our dependence on the U.S. government for a substantial portion of our business
- significant delays or reductions in appropriations for our programs and U.S. government funding more broadly
- investigations, claims, disputes, enforcement actions and/or litigation
- the use of estimates when accounting for our contracts and the effect of contract cost growth and/or changes in estimated contract revenues and costs

- our exposure to additional risks as a result of our international business, including risks related to geopolitical and economic factors, laws and regulations
- the improper conduct of employees, agents, subcontractors, suppliers, business partners or joint ventures in which we participate and the impact on our reputation, our ability to do business, and our financial position, results of operations and/or cash flows
- cyber and other security threats or disruptions faced by us, our customers or our suppliers and other partners
- the performance and financial viability of our subcontractors and suppliers and the availability and pricing of raw materials, chemicals and components
- changes in procurement and other laws, regulations and practices applicable to our industry, findings by the U.S. government as to our compliance with such laws and regulations, and changes in our customers' business practices globally
- increased competition within our markets and bid protests
- the ability to maintain a qualified workforce
- our ability to meet performance obligations under our contracts, including obligations that are technologically complex, require certain manufacturing expertise or are dependent on factors not wholly within our control
- environmental matters, including unforeseen environmental costs and government and third party claims
- natural disasters
- the adequacy and availability of our insurance coverage, customer indemnifications or other liability protections
- products and services we provide related to hazardous and high risk operations, including the production and use of such products, which subject us to various environmental, regulatory, financial, reputational and other risks
- the future investment performance of plan assets, changes in actuarial assumptions associated with our pension and other postretirement benefit plans and legislative or other regulatory actions impacting our pension, postretirement and health and welfare plans
- our ability successfully to integrate the Orbital ATK business and realize fully the anticipated benefits of the acquisition, without adverse consequences
- our ability to exploit or protect intellectual property rights
- our ability to develop new products and technologies and maintain technologies, facilities, and equipment to win new competitions and meet the needs of our customers
- changes in business conditions that could impact business investments and/or recorded goodwill or the value of other long-lived assets
- unanticipated changes in our tax provisions or exposure to additional tax liabilities, including qualification of the Alliant Techsystems Inc. spin-off of Vista Outdoor Inc. as a tax-free transaction

You are urged to consider the limitations on, and risks associated with, forward-looking statements and not unduly rely on the accuracy of forward-looking statements. These forward-looking statements speak only as of the date this report is first filed or, in the case of any document incorporated by reference, the date of that document. We undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable law.

Item 2. Properties

At December 31, 2018, we had approximately 53 million square feet of floor space at 548 separate locations, primarily in the U.S., for manufacturing, warehousing, research and testing, administration and various other uses.

At December 31, 2018, we leased to third parties approximately 317,000 square feet of our owned and leased facilities.

At December 31, 2018, we had major operations at the following locations:

Aerospace Systems

Azusa, Carson, El Segundo, Manhattan Beach, Mojave, Oxnard, Palmdale, Redondo Beach and San Diego, CA; Melbourne and St. Augustine, FL; Devens, MA; Moss Point, MS; and Oklahoma City, OK.

Innovation Systems

Chandler, Gilbert, Mesa and Tempe, AZ; Los Angeles and San Diego, CA; Beltsville, Cumberland and Elkton, MD; Eden Prairie, Elk River and Plymouth, MN; Independence, MO; Iuka, MS; Beavercreek, OH; Fort Worth, TX; Brigham City, Clearfield, Magna and Tremonton, UT; Dulles, Radford and Sterling, VA; and Rocket Center, WV.

Mission Systems

Huntsville, AL; McClellan, Redondo Beach, San Diego, Sunnyvale and Woodland Hills, CA; Aurora and Colorado Springs, CO; Apopka, FL; Rolling Meadows, IL; Annapolis, Annapolis Junction, Elkridge, Halethorpe, Linthicum and Sykesville, MD; Bethpage and Williamsville, NY; Beavercreek and Cincinnati, OH; Salt Lake City, UT; and Chantilly, Charlottesville, Fairfax, McLean and Richmond, VA. Locations outside the U.S. include Germany, Italy and the United Kingdom.

Technology Services

Sierra Vista, AZ; Warner Robins, GA; Lake Charles, LA; Baltimore, MD; and Herndon, VA. Locations outside the U.S. include Australia and France.

Corporate

Falls Church and Lebanon, VA and Irving, TX.

The following is a summary of our floor space at December 31, 2018:

<i>Square feet (in thousands)</i>	Owned	Leased	U.S. Government Owned/Leased	Total
Aerospace Systems	6,780	7,146	3,209	17,135
Innovation Systems	6,161	6,165	5,394	17,720
Mission Systems	8,584	5,735	—	14,319
Technology Services	434	2,576	—	3,010
Corporate	614	485	—	1,099
Total	22,573	22,107	8,603	53,283

We maintain our properties in good operating condition and believe the productive capacity of our properties is adequate to meet current contractual requirements and those for the foreseeable future.

Item 3. Legal Proceedings

We have provided information about certain legal proceedings in which we are involved in Notes 11 and 12 to the consolidated financial statements.

We are a party to various investigations, lawsuits, arbitration, claims, enforcement actions and other legal proceedings, including government investigations and claims, that arise in the ordinary course of our business. These types of matters could result in administrative, civil or criminal fines, penalties or other sanctions (which terms include judgments or convictions and consent or other voluntary decrees or agreements); compensatory, treble or other damages; non-monetary relief or actions; or other liabilities. Government regulations provide that certain allegations against a contractor may lead to suspension or debarment from future government contracts or suspension of export privileges for the company or one or more of its components. The nature of legal proceedings is such that we cannot assure the outcome of any particular matter. For additional information on pending matters, please see Notes 11 and 12 to the consolidated financial statements, and for further information on the risks we face from existing and future investigations, lawsuits, arbitration, claims, enforcement actions and other legal proceedings, please see "Risk Factors."

Item 4. Mine Safety Disclosures

No information is required in response to this item.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

COMMON STOCK

We have 800,000,000 shares authorized at a \$1 par value per share, of which 170,607,336 shares and 174,085,619 shares were issued and outstanding as of December 31, 2018 and 2017, respectively.

PREFERRED STOCK

We have 10,000,000 shares authorized at a \$1 par value per share, of which no shares were issued and outstanding as of December 31, 2018 and 2017.

MARKET INFORMATION

Our common stock is listed on the New York Stock Exchange and trades under the symbol NOC.

HOLDERS

The approximate number of common stockholders was 22,385 as of January 28, 2019.

PURCHASES OF EQUITY SECURITIES BY THE ISSUER AND AFFILIATED PURCHASERS

The table below summarizes our repurchases of common stock during the three months ended December 31, 2018:

Period	Total Number of Shares Purchased	Average Price Paid per Share ⁽¹⁾	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares that May Yet Be Purchased under the Plans or Programs (\$ in millions) ⁽²⁾
September 29, 2018 - October 26, 2018	163,268	\$ 302.39	163,268	\$ 2,084
October 27, 2018 - November 23, 2018 ⁽³⁾	2,964,720	269.84	2,964,720	1,284
November 24, 2018 - December 31, 2018	—	—	—	4,284
Total	3,127,988	\$ 271.54	3,127,988	\$ 4,284

⁽¹⁾ Includes commissions paid.

⁽²⁾ The value remaining on December 31, 2018 includes an additional \$3.0 billion share repurchase authorization approved by the company's board of directors on December 4, 2018.

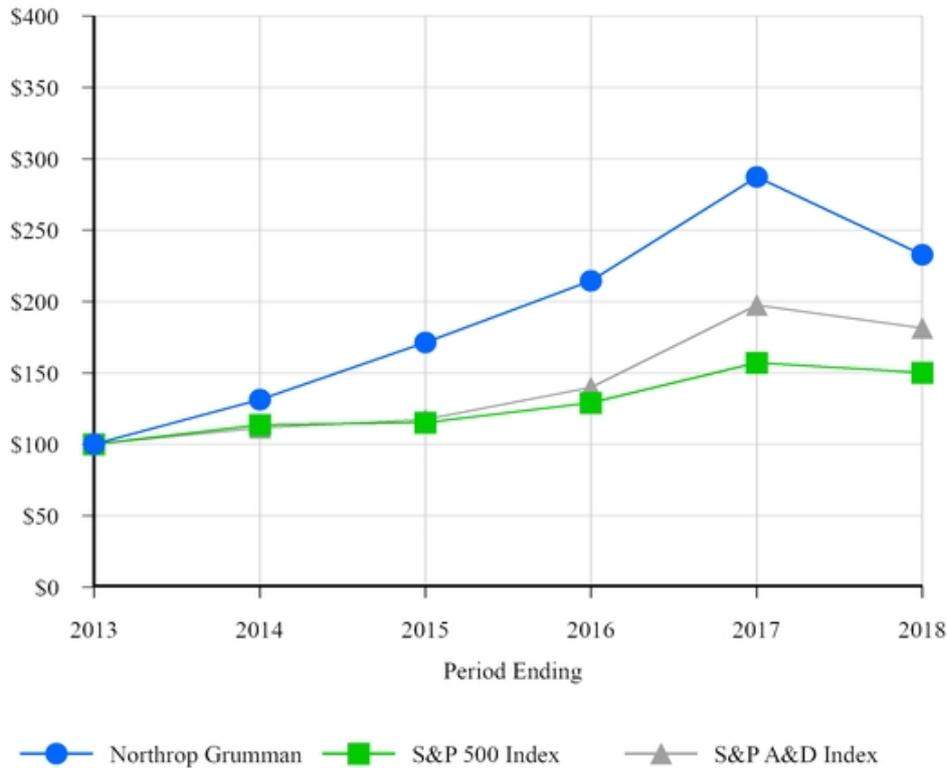
⁽³⁾ The company entered into an accelerated share repurchase agreement with Goldman Sachs & Co. LLC to repurchase \$1.0 billion of the company's common stock and received an initial delivery of shares representing approximately 80 percent of the share repurchase agreement.

Share repurchases take place from time to time, subject to market conditions and management's discretion, in the open market or in privately negotiated transactions. The company retires its common stock upon repurchase and, in the periods presented, has not made any purchases of common stock other than in connection with these publicly announced repurchase programs.

See Note 3 to the consolidated financial statements for further information on our share repurchase programs.

STOCK PERFORMANCE GRAPH

Comparison of Cumulative Five Year Total Return
 Among Northrop Grumman, the S&P 500 Index and the S&P Aerospace & Defense (A&D) Index



- Assumes \$100 invested at the close of business on December 31, 2013, in Northrop Grumman Corporation common stock, Standard & Poor’s (S&P) 500 Index and the S&P Aerospace & Defense Index.
- The cumulative total return assumes reinvestment of dividends.
- The S&P Aerospace & Defense Index is comprised of Arconic, Inc., The Boeing Company, General Dynamics Corporation, Harris Corporation, Huntington Ingalls Industries Inc., L3 Technologies, Inc., Lockheed Martin Corporation, Northrop Grumman Corporation, Raytheon Company, Textron, Inc., TransDigm Group and United Technologies Corporation.
- The total return is weighted according to market capitalization of each company at the beginning of each year.
- This graph is not deemed to be “filed” with the U.S. Securities and Exchange Commission (SEC) or subject to the liabilities of Section 18 of the Securities Exchange Act of 1934 (the Exchange Act), and should not be deemed to be incorporated by reference into any of our prior or subsequent filings under the Securities Act of 1933 or the Exchange Act.

Item 6. Selected Financial Data

The data presented in the following table is derived from the audited consolidated financial statements and other information.

SELECTED FINANCIAL DATA

Selected financial data below reflects the retrospective effects from the January 1, 2018 adoption of Accounting Standards Codification (ASC) Topic 606, *Revenue from Contracts with Customers*, and Accounting Standards Update (ASU) No. 2017-07, *Compensation Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost* and the fourth quarter 2018 change in accounting method related to the recognition of actuarial gains and losses for our pension and OPB plans (see Notes 1, 13, 16, 17 and 18 to the consolidated financial statements for further information on these changes).

\$ in millions, except per share amounts	Year Ended December 31				
	2018 ⁽⁵⁾	2017	2016	2015 ⁽³⁾	2014 ⁽³⁾
Sales	\$ 30,095	\$ 26,004	\$ 24,706	\$ 23,526	\$ 23,979
Operating income	3,780	3,218	3,277	2,984	3,069
Net earnings (loss)	3,229	2,869	2,043	2,119	(233)
Basic earnings per share	\$ 18.59	\$ 16.45	\$ 11.42	\$ 11.19	\$ (1.12)
Diluted earnings per share	18.49	16.34	11.32	11.06	(1.12)
Cash dividends declared per common share	4.70	3.90	3.50	3.10	2.71
Year-End Financial Position					
Total assets	\$ 37,653	\$ 35,128	\$ 25,815	\$ 24,424	\$ 26,545
Notes payable to banks and long-term debt	14,400	15,266	7,070	6,496	5,901
Other long-term obligations ⁽¹⁾	7,309	6,505	7,667	7,059	7,520
Financial Metrics					
Net cash provided by operating activities	\$ 3,827	\$ 2,613	\$ 2,813	\$ 2,162	\$ 2,593
Free cash flow ⁽²⁾	2,578	1,685	1,893	1,691	2,032
Other Information					
Company-sponsored research and development expenses	\$ 764	\$ 639	\$ 705	\$ 712	\$ 569
Total backlog ⁽⁴⁾	53,500	42,629	45,339	35,923	38,199
Square footage at year-end (in thousands)	53,283	35,379	34,112	34,392	34,264
Number of employees at year-end	85,000	70,000	67,000	65,000	64,300

⁽¹⁾ Other long-term obligations include pension and OPB plan liabilities, unrecognized tax benefits, deferred compensation, environmental liabilities, deferred tax liabilities and other long-term obligations.

⁽²⁾ Free cash flow is a non-GAAP measure defined as net cash provided by operating activities less capital expenditures, and may not be defined and calculated by other companies in the same manner. We use free cash flow as a key factor in our planning for, and consideration of, acquisitions, the payment of dividends and share repurchases. This non-GAAP measure may be useful to investors and other users of our financial statements as a supplemental measure of our cash performance, but should not be considered in isolation, as a measure of residual cash flow available for discretionary purposes, or as an alternative to operating cash flows presented in accordance with accounting principles generally accepted in the United States of America ("GAAP" or "FAS"). See "Liquidity and Capital Resources" – "Free Cash Flow" in Management's Discussion and Analysis of Financial Conditions and Results of Operations (MD&A) for more information on this measure, including a reconciliation of free cash flow to net cash provided by operating activities.

⁽³⁾ Years prior to 2016 do not reflect the effects from our January 1, 2018 adoption of ASC Topic 606.

⁽⁴⁾ We applied the ASC Topic 606 transition practical expedient related to remaining performance obligations for reporting periods presented before the date of initial application. As such, years prior to 2017 have not been restated for the adoption of ASC Topic 606. For comparative purposes, we have recast our backlog as of December 31, 2017 to reflect the impact of ASC Topic 606.

⁽⁵⁾ Selected financial data includes the operating results of Innovation Systems subsequent to the Merger date.

Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations**OVERVIEW**

As previously announced, effective January 1, 2018, we adopted ASC Topic 606, *Revenue from Contracts with Customers*, and ASU No. 2017-07, *Compensation Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost*, using the full retrospective method.

Additionally, during the fourth quarter of 2018, we changed our GAAP accounting method related to the recognition of actuarial gains and losses for the company’s pension and other postretirement benefit (OPB) plans (the “Accounting change”). Prior to the Accounting change, actuarial gains and losses were recognized as a component of Accumulated other comprehensive (loss) income upon annual remeasurement and were amortized into earnings in future periods on a plan-by-plan basis when they exceeded the accounting corridor, a defined range within which amortization of net gains and losses is not required. Under the new method, actuarial gains and losses are immediately recognized in net periodic benefit cost through Mark-to-market pension and OPB (“MTM”) (expense) benefit upon annual remeasurement in the fourth quarter, or on an interim basis as triggering events warrant remeasurement.

Our 2017 and 2016 results below have been recast to reflect the impact of the adoption of ASC Topic 606 and ASU 2017-07 and the Accounting change as described in Notes 1, 13, 16, 17 and 18 to the consolidated financial statements.

Acquisition of Orbital ATK

On June 6, 2018 (the “Merger Date”), the company completed its previously announced acquisition of Orbital ATK, Inc. (“Orbital ATK”) (the “Merger”), by acquiring all of the outstanding shares of Orbital ATK for a purchase price of \$7.7 billion in cash. On the Merger date, Orbital ATK became a wholly-owned subsidiary of the company and its name was changed to Northrop Grumman Innovation Systems, Inc. We established Innovation Systems as a new, fourth business sector, whose main products include launch vehicles and related propulsion systems; missile products and defense electronics; precision weapons, armament systems and ammunition; satellites and associated space components and services; and advanced aerospace structures. The acquisition was financed with proceeds from the company’s debt financing completed in October 2017 and cash on hand. We believe this acquisition will enable us to broaden our capabilities and offerings, provide additional innovative solutions to meet our customers’ emerging requirements, create value for shareholders and provide expanded opportunities for our combined employees. See Note 2 to the consolidated financial statements for further information regarding the acquisition of Orbital ATK.

Global Security and Economic Environment

The U.S. and its allies continue to face a global security environment of heightened tensions and instability, threats from state and non-state actors as well as terrorist organizations, emerging nuclear tensions, diverse regional security concerns and political instability. Global threats persist across all domains, from undersea to space to cyber. The market for defense products, services and solutions globally is driven by these complex and evolving security challenges, considered in the broader context of political and socioeconomic priorities.

The global geopolitical and economic environments also continue to be impacted by uncertainty. Geopolitical relationships are changing and global economic growth is expected to remain in the low single digits in 2019, reflecting the impact of and uncertainty surrounding geopolitical tensions globally and financial market volatility. The global economy may also be affected by Britain’s anticipated exit from the European Union, the full impact of which is not known at this time. Additionally, economic tensions and changes in international trade policies, including higher tariffs on imported goods and materials and renegotiation of free trade agreements, could impact the global market for defense products, services and solutions.

U.S. Political and Economic Environment

The U.S. continues to face an uncertain political environment and substantial fiscal and economic challenges, which affect funding for discretionary and non-discretionary budgets. The Budget Control Act of 2011 (BCA) mandated spending caps for all federal discretionary spending across a ten-year period (FY 2012 through FY 2021), including specific limits for defense and non-defense spending. In prior years, these spending caps have been revised by separate bills for specific fiscal years.

Most recently, on February 9, 2018, Congress passed the Bipartisan Budget Act (BBA) of 2018, which raised the statutory budget caps for defense spending, including for Overseas Contingency Operations (OCO), by \$80 billion for FY 2018 and by \$85 billion for FY 2019. The BBA also raised non-defense spending by \$63 billion for FY 2018 and \$68 billion for FY 2019 and suspended the debt ceiling until March 1, 2019. The original spending caps

established by the BCA will return for FY 2020 and FY 2021 without another statutory change. Similarly, the suspension of the debt ceiling is expected to end on March 1, 2019 absent further action.

On March 23, 2018, the President signed the Omnibus Appropriations Act for FY 2018, which provided \$1.3 trillion in discretionary funding for federal agencies. In total for FY 2018, Congress appropriated approximately \$700 billion for national security, including approximately \$630 billion for base discretionary funding and approximately \$70 billion in OCO funding.

On September 28, 2018, full-year appropriations for FY 2019 were enacted representing over half of discretionary federal spending. For FY 2019, Congress appropriated approximately \$716 billion for national security, including approximately \$647 billion for base discretionary funding and approximately \$69 billion in OCO funding. A continuing resolution was approved to provide further funding for other agencies (including NASA and other civil agencies) through December 7, 2018, which was subsequently extended through December 21, 2018. On December 22, 2018, U.S. government agencies that had not yet received full-year appropriations and did not otherwise have funding entered into a temporary shutdown. On January 25, 2019, a third continuing resolution was enacted, which funds these agencies through February 15, 2019.

The federal budget and debt ceiling are expected to continue to be the subject of considerable debate, which could have significant impacts on defense spending broadly and the company's programs in particular.

For further information on the risks we face from the current political and economic environment, see "Risk Factors."

Operating Performance Assessment and Reporting

We manage and assess our business based on our performance on contracts and programs (typically larger contracts or two or more closely-related contracts). We recognize sales from our portfolio of long-term contracts as control is transferred to the customer, primarily over time on a cost-to-cost basis (cost incurred relative to costs estimated at completion). As a result, sales tend to fluctuate in concert with costs incurred across our large portfolio of contracts. Due to Federal Acquisition Regulation (FAR) rules that govern our U.S. government business and related Cost Accounting Standards (CAS), most types of costs are allocable to U.S. government contracts. As such, we do not focus on individual cost groupings (such as manufacturing, engineering and design labor, subcontractor, material, overhead and general and administrative (G&A) costs), as much as we do on total contract cost, which is the key driver of our sales and operating income.

In evaluating our operating performance, we look primarily at changes in sales and operating income. Where applicable, significant fluctuations in operating performance attributable to individual contracts or programs, or changes in a specific cost element across multiple contracts, are described in our analysis. Based on this approach and the nature of our operations, the discussion of results of operations below first focuses on our four segments before distinguishing between products and services. Changes in sales are generally described in terms of volume, while changes in margin rates are generally described in terms of performance and/or contract mix. For purposes of this discussion, volume generally refers to increases or decreases in sales or cost from production/service activity levels and performance generally refers to non-volume related changes in profitability. Contract mix generally refers to changes in the ratio of contract type and/or lifecycle (e.g., cost-type, fixed-price, development, production, and/or sustainment).

CONSOLIDATED OPERATING RESULTS

For purposes of the operating results discussion below, we assess our financial and operating performance using certain financial measures that are not calculated in accordance with GAAP. These non-GAAP financial measures exclude MTM (expense) benefit and related tax impacts, and are described as MTM-adjusted net earnings and MTM-adjusted diluted earnings per share. These non-GAAP measures may be useful to investors and other users of our financial statements as supplemental measures in evaluating the company's underlying financial performance by presenting the company's operating results before the non-operational impact of pension and OPB actuarial gains and losses. These measures are also consistent with how management views the underlying performance of the business as the impact of MTM accounting is not considered in management's assessment of the company's operating performance or in its determination of incentive compensation awards. We reconcile these non-GAAP financial measures to their most directly comparable GAAP financial measures below. These non-GAAP measures may not be defined and calculated by other companies in the same manner and should not be considered in isolation or as an alternative to operating results presented in accordance with GAAP.

Selected financial highlights are presented in the table below:

<i>\$ in millions, except per share amounts</i>	Year Ended December 31			% Change in	
	2018	2017	2016	2018	2017
Sales	\$ 30,095	\$ 26,004	\$ 24,706	16 %	5 %
Operating costs and expenses	26,315	22,786	21,429	15 %	6 %
<i>Operating costs and expenses as a % of sales</i>	87.4%	87.6%	86.7%		
Operating income	3,780	3,218	3,277	17 %	(2)%
<i>Operating margin rate</i>	12.6%	12.4%	13.3%		
Mark-to-market pension and OPB (expense) benefit	(655)	536	(950)	NM	NM
Federal and foreign income tax expense	513	1,360	638	(62)%	113 %
<i>Effective income tax rate</i>	13.7%	32.2%	23.8%		
Net earnings	3,229	2,869	2,043	13 %	40 %
Diluted earnings per share	18.49	16.34	11.32	13 %	44 %

Sales

2018 – Sales increased \$4.1 billion, or 16 percent, as compared with 2017, due to the addition of \$3.3 billion of sales from Innovation Systems and higher sales at Aerospace Systems and Mission Systems, partially offset by lower sales at Technology Services.

2017 – Sales increased \$1.3 billion, or 5 percent, as compared with 2016, primarily due to higher sales at Aerospace Systems and Mission Systems.

See “Segment Operating Results” below for further information by segment and “Product and Service Analysis” for product and service detail. See Note 15 to the consolidated financial statements for information regarding the company’s sales by customer type, contract type and geographic region for each of our segments.

Operating Income and Margin Rate

2018 – Operating income increased \$562 million, or 17 percent, as compared with 2017, primarily due to a \$544 million increase in segment operating income, which includes the addition of \$343 million of operating income from Innovation Systems, and a \$42 million decrease in unallocated corporate expense, partially offset by a \$25 million decrease in our net FAS (service)/CAS pension adjustment, all of which are further discussed in “Segment Operating Results.” Lower operating costs and expenses as a percentage of sales increased our operating margin rate to 12.6 percent from 12.4 percent in the prior year period and was principally driven by a higher segment operating margin rate, as described in “Segment Operating Results,” and the previously noted decrease in unallocated corporate expense, partially offset by the decrease in our net FAS (service)/CAS pension adjustment.

G&A as a percentage of sales decreased to 10.0 percent in 2018 from 10.4 percent in 2017, principally due to higher sales volume.

2017 – Operating income for 2017 decreased \$59 million, or 2 percent, as compared with 2016, primarily due to a \$280 million increase in unallocated corporate expense, partially offset by a \$181 million increase in our net FAS (service)/CAS pension adjustment and a \$39 million increase in segment operating income, all of which are further discussed in “Segment Operating Results.” Higher operating costs and expenses as a percentage of sales reduced our operating margin rate to 12.4 percent from 13.3 percent in the prior year period and principally was driven by the previously noted increase in unallocated corporate expense and a lower segment operating margin rate, as described in “Segment Operating Results,” partially offset by the increase in our net FAS (service)/CAS pension adjustment.

G&A as a percentage of sales decreased to 10.4 percent in 2017 from 10.7 percent in 2016, principally due to higher sales volume.

For further information regarding product and service operating costs and expenses, see “Product and Service Analysis” below.

Mark-to-Market Pension and OPB Adjustment

The primary components of pre-tax MTM (expense) benefit are presented in the table below:

\$ in millions	Year Ended December 31		
	2018	2017	2016
Actuarial gains (losses) on projected benefit obligation	\$ 2,772	\$ (1,570)	\$ (988)
Actuarial (losses) gains on plan assets	(3,426)	2,119	25
Other	(1)	(13)	13
MTM (expense) benefit	\$ (655)	\$ 536	\$ (950)

2018 – MTM expense of \$655 million in 2018 was primarily driven by actual net plan asset losses of approximately 3.5 percent, partially offset by actuarial gains principally resulting from a 63 basis point increase in the discount rate. In 2017, we recognized a MTM benefit of \$536 million as described below.

2017 – MTM benefit of \$536 million in 2017 was primarily driven by actual net plan asset returns of approximately 16.4 percent, partially offset by actuarial losses principally resulting from a 51 basis point decrease in the discount rate. MTM expense of \$950 million in 2016 was primarily driven by actuarial losses largely resulting from a 34 basis point decrease in the discount rate.

Federal and Foreign Income Taxes

2018 – Our effective tax rate for 2018 was lower than 2017 primarily due to the Tax Cuts and Jobs Act (the “2017 Tax Act”), as discussed in Note 7 to the consolidated financial statements.

2017 – Our effective tax rate for 2017 was higher than 2016 primarily due to the 2017 Tax Act, as discussed in Note 7 to the consolidated financial statements.

Net Earnings

The table below reconciles net earnings to MTM-adjusted net earnings:

\$ in millions	Year Ended December 31			% Change in	
	2018	2017	2016	2018	2017
Net earnings	\$ 3,229	\$ 2,869	\$ 2,043	13%	40%
MTM expense (benefit)	655	(536)	950	NM	NM
MTM-related deferred state tax (benefit) expense ⁽¹⁾	(29)	24	(43)	NM	NM
Federal tax (benefit) expense of items above ⁽²⁾	(131)	108	(317)	NM	NM
MTM adjustment, net of tax	495	(404)	590	NM	NM
MTM-adjusted net earnings	\$ 3,724	\$ 2,465	\$ 2,633	51%	(6)%

⁽¹⁾ Deferred state taxes are recorded in unallocated corporate expense within operating income.

⁽²⁾ Based on a 21% federal statutory tax rate for the years ended December 31, 2018 and 2017 and a 35% federal statutory tax rate for the year ended December 31, 2016.

2018 – Net earnings for 2018 increased \$360 million, or 13 percent, as compared with 2017, and includes an \$899 million reduction related to impacts associated with our MTM adjustment, net of tax. Excluding these impacts, MTM-adjusted net earnings increased by \$1.3 billion, or 51 percent, primarily due to the lower effective tax rate described above, \$544 million of higher segment operating income, and a \$350 million increase in our net FAS (non-service) pension benefit. These increases were partially offset by \$202 million of higher interest expense.

2017 – Net earnings for 2017 increased \$826 million, or 40 percent, as compared with 2016, and includes a \$1 billion increase related to impacts associated with our MTM adjustment, net of tax. Excluding these items, MTM-adjusted net earnings decreased by \$168 million, or 6 percent, primarily due to the higher effective tax rate noted above and \$59 million of higher interest expense resulting from our debt issuance in October 2017, as described in Note 10 to the consolidated financial statements. These decreases were partially offset by a \$92 million increase in Other, net as a result of gains on the sale of two investments and higher interest income on short-term investments as well as an \$88 million increase in our net FAS (non-service) pension benefit.

Diluted Earnings Per Share

The table below reconciles diluted earnings per share to MTM-adjusted diluted earnings per share:

	Year Ended December 31			% Change in	
	2018	2017	2016	2018	2017
Diluted earnings per share	\$ 18.49	\$ 16.34	\$ 11.32	13%	44 %
MTM expense (benefit) per share	3.76	(3.06)	5.27	NM	NM
MTM-related deferred state tax (benefit) expense per share ⁽¹⁾	(0.17)	0.14	(0.24)	NM	NM
Federal tax (benefit) expense of items above per share ⁽²⁾	(0.75)	0.62	(1.76)	NM	NM
MTM adjustment per share, net of tax	2.84	(2.30)	3.27	NM	NM
MTM-adjusted diluted earnings per share	\$ 21.33	\$ 14.04	\$ 14.59	52%	(4)%

⁽¹⁾ Deferred state taxes are recorded in unallocated corporate expense within operating income.

⁽²⁾ Based on a 21% federal statutory tax rate for the years ended December 31, 2018 and 2017 and a 35% federal statutory tax rate for the year ended December 31, 2016.

2018 – Diluted earnings per share for 2018 increased \$2.15, or 13 percent, as compared with 2017, and includes a \$5.14 reduction related to impacts associated with our MTM adjustment, net of tax. Excluding these impacts, MTM-adjusted diluted earnings per share increased \$7.29, or 52 percent, primarily due to the 51 percent increase in MTM-adjusted net earnings discussed above.

2017 – Diluted earnings per share for 2017 increased \$5.02, or 44 percent, as compared with 2016, and includes a \$5.57 increase related to impacts associated with our MTM adjustment, net of tax. Excluding these items, MTM-adjusted diluted earnings per share decreased \$0.55, or 4 percent, primarily due to the 6 percent decline in MTM-adjusted net earnings discussed above, partially offset by a 3 percent reduction in weighted-average shares outstanding resulting principally from shares repurchased during 2016.

SEGMENT OPERATING RESULTS**Basis of Presentation**

The company is aligned in four operating sectors, which also comprise our reportable segments: Aerospace Systems, Innovation Systems, Mission Systems and Technology Services. As described above, on the effective date of the Merger, we established Innovation Systems as a new, fourth business sector. The segment operating results below include sales and operating income for Innovation Systems subsequent to the Merger date. For a more complete description of each segment's products and services, see "Business."

We present our sectors in the following business areas, which are reported in a manner reflecting core capabilities:

Aerospace Systems	Innovation Systems	Mission Systems	Technology Services
Autonomous Systems	Defense Systems	Advanced Capabilities	Advanced Defense Services
Manned Aircraft	Flight Systems	Cyber and ISR	Global Logistics and Modernization
Space	Space Systems	Sensors and Processing	System Modernization and Services

This section discusses segment sales, operating income and operating margin rates. A reconciliation of segment operating income to total operating income is provided below.

Segment Operating Income and Margin Rate

Segment operating income, as reconciled in the Reconciliation of Segment Operating Income to Total Operating Income section below, is a non-GAAP measure that reflects total earnings from our four segments, including allocated pension expense recognized under CAS, and excluding unallocated corporate items and FAS pension expense. This non-GAAP measure may be useful to investors and other users of our financial statements as a supplemental measure in evaluating the financial performance and operational trends of our sectors. This non-GAAP measure may not be defined and calculated by other companies in the same manner and should not be considered in isolation or as an alternative to operating results presented in accordance with GAAP.

\$ in millions	Year Ended December 31			% Change in	
	2018	2017	2016	2018	2017
Segment operating income	\$ 3,447	\$ 2,903	\$ 2,864	19%	1%
Segment operating margin rate	11.5%	11.2%	11.6%		

2018 – Segment operating income for 2018 increased \$544 million, or 19 percent, as compared with 2017, and includes the addition of \$343 million of operating income from Innovation Systems and higher operating income at Aerospace Systems and Mission Systems. The higher operating income includes \$69 million of favorable EAC adjustments on multiple restricted programs at Aerospace Systems. Segment operating margin rate increased to 11.5 percent from 11.2 percent in 2017 principally due to higher segment margin rates at each of the legacy Northrop Grumman sectors.

2017 – Segment operating income for 2017 increased \$39 million, or 1 percent, as compared with 2016, primarily due to higher operating income at Aerospace Systems, partially offset by lower operating income at Mission Systems and Technology Services. The higher operating income includes a \$56 million favorable EAC adjustment at Aerospace Systems on a restricted program largely related to performance incentives and \$54 million recognized in connection with a claim related to certain costs incurred in prior years (the “2017 Cost Claim”). Segment operating margin rate decreased to 11.2 percent from 11.6 percent in 2016 principally due to lower segment margin rates at Mission Systems and Aerospace Systems.

Reconciliation of Segment Operating Income to Total Operating Income - The table below reconciles segment operating income to total operating income by including the impact of the net FAS (service)/CAS pension adjustment, as well as unallocated corporate expenses (certain corporate-level expenses, which are not considered allowable or allocable under applicable CAS or FAR, and costs not considered part of management’s evaluation of segment operating performance). See Note 15 to the consolidated financial statements for further information on the net FAS (service)/CAS pension adjustment and unallocated corporate expense.

\$ in millions	Year Ended December 31			% Change in	
	2018	2017	2016	2018	2017
Segment operating income	\$ 3,447	\$ 2,903	\$ 2,864	19 %	1 %
CAS pension expense	1,017	1,026	847	(1)%	21 %
Less: FAS (service) pension expense	(404)	(388)	(390)	4 %	(1)%
Net FAS (service)/CAS pension adjustment	613	638	457	(4)%	40 %
Intangible asset amortization and PP&E step-up depreciation ⁽¹⁾	(220)	—	—	NM	NM
MTM-related deferred state tax benefit (expense) ⁽²⁾	29	(24)	43	NM	NM
Other unallocated corporate expense ⁽³⁾	(86)	(295)	(82)	(71)%	260 %
Unallocated corporate expense	(277)	(319)	(39)	(13)%	718 %
Other	(3)	(4)	(5)	(25)%	(20)%
Total operating income	\$ 3,780	\$ 3,218	\$ 3,277	17 %	(2)%

⁽¹⁾ Includes amortization of purchased intangible assets and the additional depreciation expense related to the step-up in fair value of property, plant and equipment (PP&E) acquired through business combinations, which are included in unallocated corporate expense as they are not considered part of management’s evaluation of segment operating performance.

⁽²⁾ Represents the deferred state tax impact of MTM (expense) benefit, which is recorded in unallocated corporate expense consistent with other changes in deferred state taxes.

⁽³⁾ Includes \$24 million, \$34 million and \$35 million of deferred state tax expense for the years ended December 31, 2018, 2017 and 2016, respectively, resulting from the reversal of previously recognized amortization of net actuarial losses in connection with the Accounting change.

Net FAS (service)/CAS Pension Adjustment

2018 – The decrease in our net FAS (service)/CAS pension adjustment, as compared with 2017, is primarily due to lower CAS expense for legacy Northrop Grumman resulting from higher assets returns in 2017 and a change in the legacy Northrop Grumman mortality assumption as of December 31, 2017, which more than offset the additional net FAS (service)/CAS pension adjustment from the addition of Innovation Systems.

2017 – The increase in our net FAS (service)/CAS pension adjustment, as compared with 2016, is primarily due to higher CAS expense resulting from the continued phase-in of CAS harmonization and the impact of actual demographic experience, partially offset by a change in our mortality assumption as of December 31, 2016.

Unallocated Corporate Expense

2018 – Unallocated corporate expense for 2018 decreased \$42 million, as compared with 2017, primarily due to a \$223 million benefit recognized for the finalization of certain prior year corporate cost claims resulting in a reduction of overhead reserves and an increase in our estimated recovery of certain environmental remediation costs and a \$53 million increase in MTM-related deferred state tax benefit, partially offset by \$220 million of intangible asset amortization and PP&E step-up depreciation.

2017 – Unallocated corporate expense for 2017 increased \$280 million, as compared with 2016, primarily due to a \$67 million increase in MTM-related deferred state tax expense, \$47 million of costs associated with the Orbital ATK acquisition and \$41 million of deferred state tax expense resulting from state tax adjustments associated with the filing of our prior year federal tax return and the company's \$500 million discretionary pension contribution in December 2017. In addition, the prior year period included a \$35 million benefit recognized for state tax refunds claimed on our prior year tax returns and a \$25 million benefit recognized for estimated prior year overhead claim recoveries.

Net Estimate-At-Completion (EAC) Adjustments - We record changes in estimated contract earnings at completion (net EAC adjustments) using the cumulative catch-up method of accounting. Net EAC adjustments can have a significant effect on reported sales and operating income and the aggregate amounts are presented in the table below:

\$ in millions	Year Ended December 31		
	2018	2017	2016
Favorable EAC adjustments	\$ 1,019	\$ 717	\$ 771
Unfavorable EAC adjustments	(442)	(357)	(328)
Net EAC adjustments	\$ 577	\$ 360	\$ 443

Net EAC adjustments by segment are presented in the table below:

\$ in millions	Year Ended December 31		
	2018	2017	2016
Aerospace Systems	\$ 309	\$ 250	\$ 208
Innovation Systems ⁽¹⁾	34	—	—
Mission Systems	175	104	217
Technology Services	76	19	47
Eliminations	(17)	(13)	(29)
Net EAC adjustments	\$ 577	\$ 360	\$ 443

⁽¹⁾ Amounts reflect EAC adjustments after the percent complete on Innovation Systems contracts was reset to zero as of the Merger date.

For purposes of the discussion in the remainder of this Segment Operating Results section, references to operating income and operating margin rate reflect segment operating income and segment operating margin rate, respectively.

AEROSPACE SYSTEMS

\$ in millions	Year Ended December 31			% Change in	
	2018	2017	2016	2018	2017
Sales	\$ 13,096	\$ 12,131	\$ 10,853	8%	12%
Operating income	1,411	1,289	1,198	9%	8%
Operating margin rate	10.8%	10.6%	11.0%		

2018 – Aerospace Systems sales for 2018 increased \$965 million, or 8 percent, as compared with 2017, due to higher volume in each of our three business areas, principally on Manned Aircraft programs. Manned Aircraft sales were driven by higher restricted and F-35 volume. Autonomous Systems sales reflect higher volume on several programs, including Triton, partially offset by lower Global Hawk volume. Space sales reflect higher restricted and Ground Based Strategic Deterrent Technology Maturation Risk Reduction volume, partially offset by lower intercompany and James Webb Space Telescope (JWST) volume.

Operating income for 2018 increased \$122 million, or 9 percent, primarily due to higher sales and a higher operating margin rate. Operating margin rate increased to 10.8 percent from 10.6 percent principally due to improved performance, including the previously noted \$69 million of favorable EAC adjustments on multiple restricted programs in 2018, partially offset by the \$56 million favorable EAC adjustment recorded in 2017.

2017 – Aerospace Systems sales for 2017 increased \$1.3 billion, or 12 percent, as compared with 2016, primarily due to higher volume on Manned Aircraft programs. Manned Aircraft sales were driven by higher restricted sales. Autonomous Systems sales increased principally due to higher volume for several programs, including Triton, partially offset by lower NATO Alliance Ground Surveillance (AGS) volume. Space sales increased primarily due to higher restricted sales, partially offset by lower volume on the JWST and Advanced Extremely High Frequency (AEHF) programs.

Operating income for 2017 increased \$91 million, or 8 percent, primarily due to higher sales, partially offset by a lower operating margin rate. Operating margin rate decreased to 10.6 percent from 11.0 percent principally due to changes in contract mix on Manned Aircraft programs and a gain of \$45 million recognized in the prior year associated with the sale of a property, partially offset by the previously discussed \$56 million favorable EAC adjustment largely related to performance incentives.

INNOVATION SYSTEMS

\$ in millions	Year Ended December 31			% Change in	
	2018	2017	2016	2018	2017
Sales	\$ 3,276	—	—	—	—
Operating income	343	—	—	—	—
Operating margin rate	10.5%	—	—		

The sales and operating income above reflect the operating results of Innovation Systems subsequent to the Merger date. In our comparative discussion below, we reference pro forma sales prepared in accordance with Article 11 of Regulation S-X and computed as if the Merger had been completed as of January 1, 2017. Refer to Note 2 to the consolidated financial statements for additional supplemental consolidated pro forma financial information. This pro forma financial information should not be considered indicative of the results that would have actually occurred if the Merger had been consummated on January 1, 2017, nor are they indicative of future results.

2018 – Innovation Systems sales for 2018 were \$5.6 billion and for 2017 were \$4.8 billion, each on a pro forma basis. The \$0.8 billion, or 17 percent, increase reflects higher volume in each business area. Defense Systems sales reflect increased international volume on armament systems programs and increased volume on the Anti-Radiation Guided Missile program and small caliber ammunition programs. Flight Systems sales were primarily driven by higher Ground-based Midcourse Defense, A350 and F-35 volume. Space Systems sales increased primarily due to higher government satellite volume.

MISSION SYSTEMS

\$ in millions	Year Ended December 31			% Change in	
	2018	2017	2016	2018	2017
Sales	\$ 11,709	\$ 11,470	\$ 11,161	2%	3%
Operating income	1,520	1,442	1,468	5%	(2)%
Operating margin rate	13.0%	12.6%	13.2%		

2018 – Mission Systems sales for 2018 increased \$239 million, or 2 percent, as compared with 2017, primarily due to higher Sensors and Processing volume, partially offset by lower Cyber and ISR and Advanced Capabilities volume. Sensors and Processing sales increased principally due to higher volume on restricted programs, communications programs, F-35 and electro-optical/infrared (EO/IR) self-protection programs. Cyber and ISR sales decreased primarily due to ramp-down on a restricted ISR program. Advanced Capabilities sales reflect lower volume on the Joint National Integration Center Research and Development (JRDC) program and follow on activity, partially offset by higher volume on several programs, including the Integrated Air and Missile Defense Battle Command System program.

Operating income for 2018 increased \$78 million, or 5 percent, due to a higher operating margin rate and higher sales. Operating margin rate increased to 13.0 percent from 12.6 percent primarily due to improved performance on Cyber and ISR and Sensors and Processing programs, partially offset by a \$32 million benefit recognized in the prior year in connection with the 2017 Cost Claim described above.

2017 – Mission Systems sales for 2017 increased \$309 million, or 3 percent, as compared with 2016 primarily due to higher Sensors and Processing volume, partially offset by lower Cyber and ISR volume. Sensors and Processing sales increased principally due to higher volume on F-35 sensors, EO/IR self-protection programs, communications programs and the SABR program. These increases were partially offset by lower volume on international ground-based radar programs. Cyber and ISR sales decreased primarily due to lower volume on restricted ISR programs.

Operating income for 2017 decreased \$26 million, or 2 percent, primarily due to a lower operating margin rate, partially offset by higher sales and \$32 million recognized in connection with the 2017 Cost Claim described above. Operating margin rate decreased to 12.6 percent from 13.2 percent primarily due to lower margin rates on Sensors and Processing and Cyber and ISR programs principally resulting from lower performance and changes in contract mix. This decrease was partially offset by improved margin rates at Advanced Capabilities primarily due to the prior year including a \$49 million forward loss provision on an Advanced Capabilities program.

TECHNOLOGY SERVICES

\$ in millions	Year Ended December 31			% Change in	
	2018	2017	2016	2018	2017
Sales	\$ 4,297	\$ 4,687	\$ 4,765	(8)%	(2)%
Operating income	443	449	456	(1)%	(2)%
Operating margin rate	10.3%	9.6%	9.6%		

2018 – Technology Services sales for 2018 decreased \$390 million, or 8 percent, as compared with 2017, due to lower volume on Advanced Defense Services and System Modernization and Services programs, partially offset by higher volume on Global Logistics and Modernization programs. Advanced Defense Services and System Modernization and Services sales decreased primarily due to the completion of several programs, including JRDC, partially offset by higher volume on the Saudi Arabian Ministry of National Guard Training Support program (through our interest in a joint venture for which we consolidate the financial results). Global Logistics and Modernization sales increased primarily due to higher volume for several programs, including the Special Electronic Mission Aircraft program, partially offset by lower volume from the completion of the KC-10 program.

Operating income for 2018 decreased \$6 million, or 1 percent, primarily due to lower sales, partially offset by a higher operating margin rate. Operating margin rate increased to 10.3 percent from 9.6 percent primarily due to the close-out of a state IT outsourcing program.

2017 – Technology Services sales for 2017 decreased \$78 million, or 2 percent, as compared with 2016, primarily due to lower volume on System Modernization and Services programs, partially offset by higher volume on Global Logistics and Modernization programs. System Modernization and Services sales decreased principally due to the completion of several programs in 2016 and 2017. Global Logistics and Modernization sales increased primarily due

to higher intercompany volume and increased sales on the UKAWACS and Hunter programs, partially offset by lower volume on the KC-10 program as our contract nears completion.

Operating income for 2017 decreased \$7 million, or 2 percent, primarily due to lower sales as described above. Operating margin rate was comparable to the prior year.

PRODUCT AND SERVICE ANALYSIS

The following table presents product and service sales and operating costs and expenses by segment:

\$ in millions	Year Ended December 31					
	2018		2017		2016	
Segment Information:	Sales	Operating Costs and Expenses	Sales	Operating Costs and Expenses	Sales	Operating Costs and Expenses
Aerospace Systems						
Product	\$ 11,087	\$ 9,889	\$ 10,064	\$ 8,988	\$ 8,947	\$ 7,945
Service	2,009	1,796	2,067	1,854	1,906	1,710
Innovation Systems						
Product	2,894	2,582	—	—	—	—
Service	382	351	—	—	—	—
Mission Systems						
Product	7,329	6,335	7,012	6,088	6,726	5,810
Service	4,380	3,854	4,458	3,940	4,435	3,883
Technology Services						
Product	485	450	391	360	327	299
Service	3,812	3,404	4,296	3,878	4,438	4,010
Segment Totals						
Total Product	\$ 21,795	\$ 19,256	\$ 17,467	\$ 15,436	\$ 16,000	\$ 14,054
Total Service	10,583	9,405	10,821	9,672	10,779	9,603
Intersegment eliminations	(2,283)	(2,013)	(2,284)	(2,007)	(2,073)	(1,815)
Total Segment ⁽¹⁾	\$ 30,095	\$ 26,648	\$ 26,004	\$ 23,101	\$ 24,706	\$ 21,842

⁽¹⁾ A reconciliation of segment operating income to total operating income is included in "Segment Operating Results."

Product Sales and Costs

2018 – Product sales for 2018 increased \$4.3 billion, or 25 percent, as compared with 2017. The increase was primarily due to the addition of \$2.9 billion of product sales from Innovation Systems and higher restricted and F-35 volume at Aerospace Systems.

Product costs for 2018 increased \$3.8 billion, or 25 percent, as compared with 2017, consistent with the higher product sales described above.

2017 – Product sales for 2017 increased \$1.5 billion, or 9 percent, as compared with 2016. The increase was primarily due to higher product sales at Aerospace Systems and Mission Systems. Higher Aerospace Systems product sales were primarily driven by increased restricted volume, partially offset by lower volume on the JWST and NATO AGS programs. The increase at Mission Systems was principally due to higher product volume on F-35 sensors, EO/IR self-protection programs and the SABR program.

Product costs for 2017 increased \$1.4 billion, or 10 percent, as compared with 2016, consistent with the higher product sales described above and reflects lower product margin rates at Aerospace Systems, principally due to changes in contract mix, and Mission Systems.

Service Sales and Costs

2018 – Service sales for 2018 decreased \$238 million, or 2 percent, as compared with 2017. The decrease was primarily driven by lower service sales at Technology Services principally due to the completion of several programs, partially offset by the addition of \$382 million of service sales from Innovation Systems.

Service costs for 2018 decreased \$267 million, or 3 percent, as compared with 2017, consistent with the lower service sales described above and reflects a higher service margin rate at Technology Services due to the close-out of a state IT outsourcing program.

2017 – Service sales for 2017 were comparable with 2016. Higher service sales at Aerospace Systems on several Autonomous Systems and Manned Aircraft programs were offset by lower service volume principally on the KC-10 program at Technology Services.

Service costs for 2017 increased \$69 million, or 1 percent, as compared with 2016. The increase principally reflects a lower service margin rate at Mission Systems.

BACKLOG

Backlog represents the future sales we expect to recognize on firm orders received by the company and is equivalent to the company's remaining performance obligations at the end of each period. It comprises both funded backlog (firm orders for which funding is authorized and appropriated) and unfunded backlog. Unexercised contract options and indefinite delivery indefinite quantity (IDIQ) contracts are not included in backlog until the time the option or IDIQ task order is exercised or awarded. Backlog is converted into sales as costs are incurred or deliveries are made.

As discussed in Note 1 to the consolidated financial statements, we adopted ASC Topic 606 on January 1, 2018 using the full retrospective method and applied the transition practical expedient related to backlog for reporting periods presented before the date of initial application. However, for comparative purposes, we have recast our backlog as of December 31, 2017 to reflect the impact of adoption of ASC Topic 606.

Backlog consisted of the following at December 31, 2018 and 2017:

<i>\$ in millions</i>	2018			2017	% Change in 2018
	Funded	Unfunded	Total Backlog	Total Backlog	
Aerospace Systems	\$ 11,448	\$ 14,992	\$ 26,440	\$ 25,560	3 %
Innovation Systems	5,928	2,279	8,207	—	—
Mission Systems	9,676	5,732	15,408	13,277	16 %
Technology Services	2,883	562	3,445	3,792	(9) %
Total backlog	\$ 29,935	\$ 23,565	\$ 53,500	\$ 42,629	26 %

Approximately \$26.6 billion of the \$53.5 billion total backlog at December 31, 2018 is expected to be converted into sales in 2019.

LIQUIDITY AND CAPITAL RESOURCES

We endeavor to ensure the most efficient conversion of operating income into cash for deployment in our business and to maximize shareholder value through cash deployment activities. In addition to our cash position, we use various financial measures to assist in capital deployment decision-making, including cash provided by operating activities and free cash flow, a non-GAAP measure described in more detail below.

As of December 31, 2018, we had cash and cash equivalents of \$1.6 billion; approximately \$250 million was held outside of the U.S. by foreign subsidiaries. Cash and cash equivalents and cash generated from operating activities, supplemented by borrowings under credit facilities, commercial paper and/or in the capital markets, if needed, are expected to be sufficient to fund our operations for at least the next 12 months. Capital expenditure commitments were \$784 million at December 31, 2018, and are expected to be paid with cash on hand.

Operating Cash Flow

The table below summarizes key components of cash flow provided by operating activities:

\$ in millions	Year Ended December 31		
	2018	2017	2016
Net earnings	\$ 3,229	\$ 2,869	\$ 2,043
Non-cash items ⁽¹⁾	1,775	1,018	1,439
Changes in assets and liabilities:			
Trade working capital	(65)	(285)	(169)
Retiree benefits, excluding MTM (expense) benefit	(1,083)	(946)	(375)
Other, net	(29)	(43)	(125)
Net cash provided by operating activities	\$ 3,827	\$ 2,613	\$ 2,813

⁽¹⁾ Includes depreciation and amortization, MTM (expense) benefit, stock based compensation expense and deferred income taxes.

2018 – Net cash provided by operating activities for 2018 increased by \$1.2 billion, or 46 percent, as compared with 2017, principally due to higher net earnings, which include the addition of Innovation Systems, and improved trade working capital performance.

2017 – Net cash provided by operating activities for 2017 decreased by \$200 million, or 7 percent, as compared with 2016, principally due to a \$500 million voluntary pre-tax pension contribution (\$325 million after-tax) made in December 2017.

Free Cash Flow

Free cash flow, as reconciled in the table below, is a non-GAAP measure defined as net cash provided by operating activities less capital expenditures, and may not be defined and calculated by other companies in the same manner. We use free cash flow as a key factor in our planning for, and consideration of, acquisitions, the payment of dividends and share repurchases. This non-GAAP measure may be useful to investors and other users of our financial statements as a supplemental measure of our cash performance, but should not be considered in isolation, as a measure of residual cash flow available for discretionary purposes, or as an alternative to operating cash flows presented in accordance with GAAP.

The table below reconciles net cash provided by operating activities to free cash flow:

\$ in millions	Year Ended December 31			% Change in	
	2018	2017	2016	2018	2017
Net cash provided by operating activities	\$ 3,827	\$ 2,613	\$ 2,813	46%	(7)%
Less: capital expenditures	(1,249)	(928)	(920)	35%	1 %
Free cash flow	\$ 2,578	\$ 1,685	\$ 1,893	53%	(11)%

2018 – Free cash flow for 2018 increased \$893 million, or 53 percent, as compared with 2017. The increase was principally driven by the increase in net cash provided by operating activities described above, partially offset by the inclusion of Innovation Systems' capital expenditures and higher capital expenditures at Aerospace Systems.

2017 – Free cash flow for 2017 decreased \$208 million, or 11 percent, as compared with 2016. The decrease was principally driven by the \$500 million voluntary pre-tax pension contribution discussed above.

Investing Cash Flow

2018 – Net cash used in investing activities for 2018 increased to \$8.9 billion from \$889 million in 2017. The increase was principally due to \$7.7 billion paid for the acquisition of Orbital ATK, net of cash acquired.

2017 – Net cash used in investing activities for 2017 increased \$84 million, or 10 percent, as compared with 2016. The increase was primarily due to proceeds from the 2016 sales of a property at Aerospace Systems and a commercial cyber security business at Mission Systems, partially offset by proceeds from the sale of two investments in 2017.

Financing Cash Flow

2018 – Net cash used in financing activities during 2018 was \$4.6 billion, compared to net cash provided by financing activities of \$7.0 billion in 2017. The change is principally due to \$2.3 billion in debt repayments, \$870

million higher share repurchases and \$320 million in payments to credit facilities in 2018, compared with \$8.2 billion net proceeds from the issuance of long-term debt in 2017.

2017 – Net cash provided by financing activities during 2017 was \$7.0 billion compared to net cash used in financing activities of \$1.8 billion in 2016. The change is principally due to \$7.5 billion higher net proceeds from the issuance of long-term debt and \$1.2 billion lower share repurchases in 2017.

Share Repurchases – See Note 3 to the consolidated financial statements for further information on our share repurchase programs.

Commercial Paper, Credit Facilities and Unsecured Senior Notes – See Note 10 to the consolidated financial statements for further information on our commercial paper, credit facilities and unsecured senior notes.

Financial Arrangements – See Note 12 to the consolidated financial statements for further information on our use of standby letters of credit and guarantees.

Other Sources of Capital – We believe we can obtain additional capital, if necessary for long-term liquidity, from such sources as the public or private capital markets, the sale of assets, sale and leaseback of operating assets, and leasing rather than purchasing new assets. We have an effective shelf registration statement on file with the SEC, which allows us to access capital in a timely manner.

Contractual Obligations

At December 31, 2018, we had contractual commitments to repay debt with interest, make payments under operating leases, settle obligations related to agreements to purchase goods and services and make payments on various other liabilities. Payments due under these obligations and commitments, and the estimated timing of those payments, are as follows:

<i>\$ in millions</i>	Total	2019	2020- 2021	2022- 2023	2024 and beyond
Long-term debt	\$ 14,475	\$ 517	\$ 1,868	\$ 2,558	\$ 9,532
Interest payments on long-term debt	7,181	550	1,008	903	4,720
Operating leases	2,080	312	491	338	939
Purchase obligations ⁽¹⁾	12,962	7,167	3,862	917	1,016
Other long-term liabilities ⁽²⁾	1,418	499	376	146	397
Total contractual obligations	\$ 38,116	\$ 9,045	\$ 7,605	\$ 4,862	\$ 16,604

⁽¹⁾ A “purchase obligation” is defined as an agreement to purchase goods or services that is enforceable and legally binding on us and that specifies all significant terms, including: fixed or minimum quantities to be purchased; fixed, minimum, or variable price provisions; and the approximate timing of the transaction. These amounts are primarily comprised of open purchase order commitments to suppliers and subcontractors pertaining to funded contracts.

⁽²⁾ Other long-term liabilities, including their current portions, primarily consist of total accrued environmental reserves, deferred compensation and other miscellaneous liabilities, of which \$159 million is related to environmental reserves recorded in Other current liabilities. It excludes obligations for uncertain tax positions of \$772 million, as the timing of such payments, if any, cannot be reasonably estimated.

The table above excludes estimated minimum funding requirements for the company’s pension and OPB plans, as set forth by the Employee Retirement Income Security Act, as amended. For further information about future minimum contributions for these plans, see Note 13 to the consolidated financial statements. Further details regarding long-term debt and operating leases can be found in Notes 10 and 12, respectively, to the consolidated financial statements.

CRITICAL ACCOUNTING POLICIES, ESTIMATES AND JUDGMENTS

Our consolidated financial statements are based on GAAP, which requires us to make estimates and assumptions about future events that affect the amounts reported in our consolidated financial statements. We employ judgment in making our estimates in consideration of historical experience, currently available information and various other assumptions that we believe to be reasonable under the circumstances. Actual results could differ from our estimates and assumptions, and any such differences could be material to our consolidated financial statements. We believe the following accounting policies are critical to the understanding of our consolidated financial statements and require the use of significant management judgment in their application. For a summary of our significant accounting policies, see Note 1 to the consolidated financial statements.

Revenue Recognition

Due to the long-term nature of our contracts, we generally recognize revenue over time using the cost-to-cost method, which requires us to make reasonably dependable estimates regarding the revenue and cost associated with the design, manufacture and delivery of our products and services.

Contract sales may include estimates of variable consideration, including cost or performance incentives (such as award and incentive fees), contract claims and requests for equitable adjustment (REAs). Variable consideration is included in total estimated sales to the extent it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved. We estimate variable consideration as the most likely amount to which we expect to be entitled.

Our cost estimation process is based on the professional knowledge of our engineering, program management and financial professionals, and draws on their significant experience and judgment. We prepare EACs for our contracts and calculate an estimated contract profit based on total estimated contract sales and cost. Since our contracts typically span a period of several years, estimation of revenue, cost, and progress toward completion requires the use of judgment. Factors considered in these estimates include our historical performance, the availability, productivity and cost of labor, the nature and complexity of work to be performed, the effect of change orders, availability and cost of materials, components and subcontracts, the effect of any delays in performance and the level of indirect cost allocations.

We generally review and reassess our sales, cost and profit estimates for each significant contract at least annually or more frequently as determined by the occurrence of events, changes in circumstances and evaluations of contract performance to reflect the latest reliable information available. Changes in estimates of contract sales and cost are frequent. The company performs on a broad portfolio of long-term contracts, including the development of complex and customized military platforms and systems, as well as advanced electronic equipment and software, that often include technology at the forefront of science. Changes in estimates occur for a variety of reasons, including changes in contract scope, the resolution of risk at lower or higher cost than anticipated, unanticipated risks affecting contract costs, performance issues with our subcontractors or suppliers, changes in indirect cost allocations, such as overhead and G&A costs, and changes in estimated award and incentive fees. Identified risks typically include technical, schedule and/or performance risk based on our evaluation of the contract effort. Similarly, the changes in estimates may include changes in, or resolution of, identified opportunities for operating margin improvement.

For the impacts of changes in estimates on our consolidated statements of earnings and comprehensive income, see “Segment Operating Results” and Note 1 to the consolidated financial statements.

Retirement Benefits

Overview – The determination of projected benefit obligations, the fair value of plan assets for our pension and OPB plans and pension and OPB expense requires the use of estimates and actuarial assumptions. We perform an annual review of our actuarial assumptions in consultation with our actuaries. As we determine changes in the assumptions are warranted, or as a result of plan amendments, future pension and OPB expense and our projected benefit obligation could increase or decrease. The principal estimates and assumptions that have a significant effect on our consolidated financial position and annual results of operations are the discount rate, cash balance crediting rate, expected long-term rate of return on plan assets, estimated fair market value of plan assets, and the mortality rate of those covered by our pension and OPB plans. The effects of actual results differing from our assumptions and the effects of changing assumptions (i.e. actuarial gains or losses) are recognized immediately through earnings upon annual remeasurement in the fourth quarter, or on an interim basis as triggering events warrant remeasurement.

Discount Rate – The discount rate represents the interest rate that is used to determine the present value of future cash flows currently expected to be required to settle our pension and OPB obligations. The discount rate is generally based on the yield of high-quality corporate fixed-income investments. At the end of each year, we determine the discount rate using a theoretical bond portfolio model of bonds rated AA or better to match the notional cash outflows related to projected benefit payments for each of our significant benefit plans. Taking into consideration the factors noted above, our weighted-average composite pension discount rate was 4.31 percent at December 31, 2018, and 3.68 percent at December 31, 2017.

The effects of a hypothetical change in the discount rate may be nonlinear and asymmetrical for future years as the discount rate changes. Holding all other assumptions constant, an increase or decrease of 25 basis points in the December 31, 2018 discount rate assumption would have the following estimated effects on 2018 pension and OPB obligations, which would be reflected in the 2018 MTM expense (benefit), and 2019 expected pension and OPB expense:

<i>\$ in millions</i>	25 Basis Point Decrease in Rate	25 Basis Point Increase in Rate
2019 pension and OPB (benefit) expense	\$ (22)	\$ 20
2018 pension and OPB obligation and MTM expense (benefit)	1,069	(1,016)

Cash Balance Crediting Rate – A portion of the company’s pension obligation and resulting pension expense is based on a cash balance formula, where participants’ hypothetical account balances are accumulated over time with pay-based credits and interest. Interest is credited monthly using the current 30-Year Treasury bond rate. The interest crediting rate is part of the cash balance formula and independent of actual pension investment earnings. The cash balance crediting rate tends to move in concert with the discount rate but has an offsetting effect on pension benefit obligations and the related MTM (benefit) expense. The cash balance crediting rate assumption has therefore been set to its current level of 3.0 percent as of December 31, 2018, growing to 3.25 percent by 2024. Holding all other assumptions constant, an increase or decrease of 25 basis points in the December 31, 2018 cash balance crediting rate assumption would have the following estimated effects on the 2018 pension benefit obligation, which would be reflected in the 2018 MTM (benefit) expense, and 2019 expected pension expense:

<i>\$ in millions</i>	25 Basis Point Decrease in Rate	25 Basis Point Increase in Rate
2019 pension (benefit) expense	\$ (11)	\$ 12
2018 pension obligation and MTM (benefit) expense	(125)	130

Expected Long-Term Rate of Return on Plan Assets – The expected long-term rate of return on plan assets (EROA) assumption reflects the average rate of net earnings we expect on current and future benefit plan investments. EROA is a long-term assumption, which we review annually and adjust to reflect changes in our long-term view of expected market returns and/or significant changes in our plan asset investment policy. Due to the inherent uncertainty of this assumption, we consider multiple data points at the measurement date including the plan’s target asset allocation, historical asset returns and third party projection models of expected long-term returns for each of the plans’ strategic asset classes. In addition to the data points themselves, we consider trends in the data points, including changes from the prior measurement date. The EROA assumptions we use for pension benefits are consistent with those used for OPB plans; however, we reduce the EROA for OPB plans to allow for the impact of tax on investment earnings, as certain Voluntary Employee Beneficiary Association trusts are taxable.

During 2018, the Investment Committee of the company’s benefit plans reviewed and approved the plans’ major asset class allocations. The current asset allocation is approximately 45% equities, 30% fixed-income and 25% alternatives, which reflects a shift of approximately 5% from fixed-income to alternatives. At this time, the Investment Committee is not contemplating any significant changes to that mix. For further information on plan asset investments, see Note 13 to the consolidated financial statements.

While historical market returns are not necessarily predictive of future market returns, given our long history of plan performance supported by the stability in our investment mix, investment managers, and active asset management, we believe our actual historical performance is a reasonable metric to consider when developing our EROA. Our average annual rate of return from 1976 to 2018 was approximately 10.9 percent and our 20-year rolling average rate of return was approximately 7.1 percent, each determined on an arithmetic basis and net of expenses. Our 2018 actual net plan asset losses were approximately 3.5 percent.

Consistent with our past practice, we obtained long-term capital market forecasting models from several third parties and, using our target asset allocation, developed an expected rate of return on plan assets from each model. We considered not only the specific returns projected by those third party models, but also changes in the models year-to-year when developing our EROA.

For determining 2018 FAS expense, we assumed an expected long-term rate of return on pension plan assets of 8.0 percent and an expected long-term rate of return on OPB plan assets of 7.65 percent. For 2019 FAS expense, we have assumed an expected long-term rate of return on pension plan assets of 8.0 percent and 7.67 percent on OPB plans. Holding all other assumptions constant, an increase or decrease of 25 basis points in our December 31, 2018 EROA assumption would have the following estimated effects on 2019 expected pension and OPB expense:

<i>\$ in millions</i>	25 Basis Point Decrease	25 Basis Point Increase
2019 pension and OPB expense (benefit)	\$ 69	\$ (69)

In addition, holding all other assumptions constant, an increase or decrease of 100 basis points in actual versus expected return on plan assets would have the following estimated effects on our 2019 MTM expense (benefit):

<i>\$ in millions</i>	100 Basis Point Decrease	100 Basis Point Increase
2019 MTM expense (benefit)	275	(275)

Estimated Fair Market Value of Plan Assets – For certain plan assets where the fair market value is not readily determinable, such as real estate, private equity, hedge funds and opportunistic investments, estimates of fair value are determined using the best information available. Estimated fair values on these plan assets are based on redemption values and net asset values, as well as valuation methodologies that include third party appraisals, comparable transactions, discounted cash flow valuation models and public market data.

Mortality Rate – Mortality assumptions are used to estimate life expectancies of plan participants. In October 2014, the Society of Actuaries (SOA) issued updated mortality tables and a mortality improvement scale, which reflected longer life expectancies than previously projected. The SOA has issued annual updates to their mortality improvement scale each year since then as additional data has become available. These updates generally contained lower mortality improvement projections than the original projections from 2014. After considering the additional information released by the SOA in October 2018, and after reviewing our own historical mortality experience, we continued our practice of adopting the latest SOA projection scale, but with a long-term improvement rate of 0.75% versus 1.0% assumed by the SOA. Accordingly, we updated the mortality assumptions used in calculating our pension and OPB obligations recognized at December 31, 2018, and the amounts estimated for our 2019 pension and OPB expense.

For further information regarding our pension and OPB plans, see “Risk Factors” and Note 1 and 13 to the consolidated financial statements.

Litigation, Commitments and Contingencies

We are subject to a range of claims, disputes, enforcement actions, investigations, lawsuits, overhead cost claims, environmental matters, income tax matters and administrative proceedings that arise in the ordinary course of business. Estimating liabilities and costs associated with these matters requires judgment based upon the professional knowledge and experience of management. We determine whether to record a reserve and, if so, what amount based on consideration of the facts and circumstances of each matter as then known to us. Determinations regarding whether to record a reserve and, if so, of what amount, reflect management’s assessment regarding what is likely to occur; they do not necessarily reflect what management believes should occur. The ultimate resolution of any such exposure to us may vary materially from earlier estimates as further facts and circumstances develop or become known to us.

Environmental Matters – We are subject to environmental laws and regulations in the jurisdictions in which we do or have done business. Factors that could result in changes to the assessment of probability, range of reasonably estimated costs and environmental accruals include: modification of planned remedial actions; changes in the estimated time required to conduct remedial actions; discovery of more or less extensive (or different) contamination than anticipated; information regarding the potential causes and effects of contamination; results of efforts to involve other responsible parties; financial capabilities of other responsible parties; changes in laws and regulations, their interpretation or application; contractual obligations affecting remediation or responsibilities; and improvements in remediation technology.

For further information on litigation, commitments and contingencies, see “Risk Factors” and Note 1, Note 11 and Note 12 to the consolidated financial statements.

Goodwill and Other Purchased Intangible Assets

Overview – We allocate the purchase price of acquired businesses to the underlying tangible and intangible assets acquired and liabilities assumed based upon their respective fair values, with the excess recorded as goodwill. Such fair value assessments require judgments and estimates that can be affected by contract performance and other factors over time, which may cause final amounts to differ materially from original estimates. Adjustments to the fair value of purchased assets and liabilities after the initial measurement period are recognized in net earnings.

We recognize purchased intangible assets in connection with our business acquisitions at fair value on the acquisition date. The most significant purchased intangible assets recognized from our acquisitions are generally customer-related intangible assets, including customer contracts and commercial customer relationships. We determine the fair value of those customer-related intangible assets based on estimates and judgments, including the amount and timing of expected future cash flows, long-term growth rates and discount rates. In some cases, we use discounted cash flow analyses, which are based on estimates of future sales, earnings and cash flows after considering such factors as general market conditions, customer budgets, existing firm and future orders, changes in working capital, long term business plans and recent operating performance.

Impairment Testing – We test for impairment of goodwill annually at each of our reporting units, which comprise our operating segments. The results of our annual goodwill impairment tests as of December 31, 2018 and 2017, respectively, indicated that the estimated fair value of each reporting unit exceeded its respective carrying value. There were no impairment charges recorded in the years ended December 31, 2018, 2017 and 2016.

In addition to performing an annual goodwill impairment test, we may perform an interim impairment test if events occur or circumstances change that suggest goodwill in any of our reporting units may be impaired. Such indicators may include, but are not limited to, the loss of significant business, significant reductions in federal government appropriations or other significant adverse changes in industry or market conditions.

When testing goodwill for impairment, we compare the fair values of each of our reporting units to their respective carrying values. To determine the fair value of our reporting units, we primarily use the income approach based on the cash flows that the reporting unit expects to generate in the future, consistent with our operating plans. This income valuation method requires management to project sales, operating expenses, working capital, capital spending and cash flows for the reporting units over a multi-year period, as well as to determine the weighted-average cost of capital (WACC) used as a discount rate and terminal value assumptions. The WACC takes into account the relative weights of each component of our consolidated capital structure (equity and debt) and represents the expected cost of new capital adjusted as appropriate to consider lower risk profiles associated with longer-term contracts and barriers to market entry. The terminal value assumptions are applied to the final year of the discounted cash flow model. We use industry multiples (including relevant control premiums) of operating earnings to corroborate the fair values of our reporting units determined under the market valuation method of the income approach.

We test for impairment of our purchased intangible assets when events or changes in circumstances indicate that the carrying amount of these assets may not be recoverable. Our assessment is based on our projection of the undiscounted future operating cash flows of the related asset group. If such projections indicate that future undiscounted cash flows are not sufficient to recover the carrying amount, we recognize a non-cash impairment charge to reduce the carrying amount to fair value. There were no impairment charges recorded in the years ended December 31, 2018, 2017 and 2016.

Impairment assessment inherently involves management judgments as to assumptions about expected future cash flows and the impact of market conditions on those assumptions. Due to the many variables inherent in the estimation of a business' fair value and the relative size of our recorded goodwill and other purchased intangible assets, differences in assumptions may have a material effect on the results of our impairment analysis.

OTHER MATTERS

Off-Balance Sheet Arrangements

As of December 31, 2018, we had no significant off-balance sheet arrangements other than operating leases, which largely will be recorded on our balance sheet effective January 1, 2019 in connection with our adoption of the new lease standard. For additional information on our operating leases, see Notes 1 and 12 to the consolidated financial statements.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

EQUITY RISK

We are exposed to market risk with respect to our portfolio of marketable securities with a fair value of \$335 million at December 31, 2018. These securities are exposed to market volatilities, changes in price and interest rates.

INTEREST RATE RISK

We are exposed to interest rate risk on variable-rate, short-term borrowings under our credit facilities, for which there was £85 million (the equivalent of approximately \$108 million as of December 31, 2018) outstanding at December 31, 2018 and on our outstanding short-term commercial paper borrowings, for which there was \$198 million outstanding at December 31, 2018. At December 31, 2018, we have \$14.4 billion of long-term debt, primarily consisting of fixed-rate debt, with a fair value of approximately \$14.3 billion. The terms of our fixed-rate debt obligations do not generally allow investors to demand payment of these obligations prior to maturity. Therefore, we do not have significant exposure to interest rate risk for our fixed-rate debt; however, we do have exposure to fair value risk if we repurchase or exchange long-term debt prior to maturity.

FOREIGN CURRENCY RISK

In certain circumstances, we are exposed to foreign currency risk. We enter into foreign currency forward contracts to manage a portion of the exchange rate risk related to receipts from customers and payments to suppliers denominated in foreign currencies. We do not hold or issue derivative financial instruments for trading purposes. At December 31, 2018, foreign currency forward contracts with a notional amount of \$114 million were outstanding. At December 31, 2018, a 10 percent unfavorable foreign exchange rate movement would not have a material impact on our consolidated financial position, annual results of operations and/or cash flows.

INFLATION RISK

We have generally been able to anticipate increases in costs when pricing our contracts. Bids for longer-term firm fixed-price contracts typically include assumptions for labor and other cost escalations in amounts that historically have been sufficient to cover cost increases over the period of performance.

COMMODITY PRICE RISK

In certain circumstances, we are exposed to commodity price risk on purchases of inventory such as copper and zinc. We enter into forward contracts and purchase orders for the current expected production requirements for small-caliber ammunition supply contracts. We do not hold or issue derivative financial instruments for trading purposes. At December 31, 2018, we had commodity forward contracts outstanding that hedge forecasted commodity purchases of 10 million pounds of copper and 4 million pounds of zinc. At December 31, 2018, a 10 percent unfavorable change in commodity prices would not have a material impact on our consolidated financial position, annual results of operations and/or cash flows.

Item 8. Financial Statements and Supplementary Data

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of
Northrop Grumman Corporation
Falls Church, Virginia

Opinion on the Financial Statements

We have audited the accompanying consolidated statements of financial position of Northrop Grumman Corporation and subsidiaries (the “Company”) as of December 31, 2018 and 2017, and the related consolidated statements of earnings and comprehensive income, changes in shareholders’ equity, and cash flows for each of the three years in the period ended December 31, 2018, and the related notes (collectively referred to as the “financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company’s internal control over financial reporting as of December 31, 2018, based on the criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated January 30, 2019 expressed an unqualified opinion on the Company’s internal control over financial reporting, which excludes Northrop Grumman Innovation Systems.

Change in Accounting Principles

As discussed in Note 1 to the consolidated financial statements, the Company elected during 2018 to change its method of accounting for recognizing pension and other postretirement benefit plans actuarial gains and losses. Also discussed in Note 1 to the consolidated financial statements, the Company changed the manner in which it accounts for revenue from contracts with customers due to the adoption of the new revenue standard during 2018. The Company adopted both changes using the full retrospective approach.

Basis for Opinion

These financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ Deloitte & Touche LLP
McLean, Virginia
January 30, 2019

We have served as the Company’s auditor since 1975.

CONSOLIDATED STATEMENTS OF EARNINGS AND COMPREHENSIVE INCOME

<i>\$ in millions, except per share amounts</i>	Year Ended December 31		
	2018	2017	2016
Sales			
Product	\$ 20,469	\$ 16,364	\$ 15,080
Service	9,626	9,640	9,626
Total sales	30,095	26,004	24,706
Operating costs and expenses			
Product	15,785	12,527	11,197
Service	7,519	7,547	7,600
General and administrative expenses	3,011	2,712	2,632
Operating income	3,780	3,218	3,277
Other (expense) income			
Interest expense	(562)	(360)	(301)
Net FAS (non-service) pension benefit	1,049	699	611
Mark-to-market pension and OPB (expense) benefit	(655)	536	(950)
Other, net	130	136	44
Earnings before income taxes	3,742	4,229	2,681
Federal and foreign income tax expense	513	1,360	638
Net earnings	\$ 3,229	\$ 2,869	\$ 2,043
Basic earnings per share	\$ 18.59	\$ 16.45	\$ 11.42
Weighted-average common shares outstanding, in millions	173.7	174.4	178.9
Diluted earnings per share	\$ 18.49	\$ 16.34	\$ 11.32
Weighted-average diluted shares outstanding, in millions	174.6	175.6	180.5
Net earnings (from above)	\$ 3,229	\$ 2,869	\$ 2,043
Other comprehensive loss			
Change in unamortized prior service credit, net of tax expense of \$19 in 2018, \$35 in 2017 and \$20 in 2016	(60)	(44)	(62)
Change in cumulative translation adjustment	(8)	(4)	(50)
Other, net	(6)	2	(1)
Other comprehensive loss, net of tax	(74)	(46)	(113)
Comprehensive income	\$ 3,155	\$ 2,823	\$ 1,930

The accompanying notes are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENTS OF FINANCIAL POSITION

<i>\$ in millions, except par value</i>	December 31	
	2018	2017
Assets		
Cash and cash equivalents	\$ 1,579	\$ 11,225
Accounts receivable, net	1,448	1,054
Unbilled receivables, net	5,026	3,465
Inventoried costs, net	654	398
Prepaid expenses and other current assets	973	445
Total current assets	9,680	16,587
Property, plant and equipment, net of accumulated depreciation of \$5,369 for 2018 and \$5,066 for 2017	6,372	4,225
Goodwill	18,672	12,455
Intangible assets, net	1,372	52
Deferred tax assets	94	447
Other non-current assets	1,463	1,362
Total assets	\$ 37,653	\$ 35,128
Liabilities		
Trade accounts payable	\$ 2,182	\$ 1,661
Accrued employee compensation	1,676	1,382
Advance payments and amounts in excess of costs incurred	1,917	1,761
Other current liabilities	2,499	2,288
Total current liabilities	8,274	7,092
Long-term debt, net of current portion of \$517 for 2018 and \$867 for 2017	13,883	14,399
Pension and OPB plan liabilities	5,755	5,511
Deferred tax liabilities	108	—
Other non-current liabilities	1,446	994
Total liabilities	29,466	27,996
Commitments and contingencies (Note 12)		
Shareholders' equity		
Preferred stock, \$1 par value; 10,000,000 shares authorized; no shares issued and outstanding	—	—
Common stock, \$1 par value; 800,000,000 shares authorized; issued and outstanding: 2018—170,607,336 and 2017—174,085,619	171	174
Paid-in capital	—	44
Retained earnings	8,068	6,913
Accumulated other comprehensive (loss) income	(52)	1
Total shareholders' equity	8,187	7,132
Total liabilities and shareholders' equity	\$ 37,653	\$ 35,128

The accompanying notes are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENTS OF CASH FLOWS

\$ in millions	Year Ended December 31		
	2018	2017	2016
Operating activities			
Net earnings	\$ 3,229	\$ 2,869	\$ 2,043
Adjustments to reconcile to net cash provided by operating activities:			
Depreciation and amortization	800	475	456
Mark-to-market pension and OPB expense (benefit)	655	(536)	950
Stock-based compensation	86	94	93
Deferred income taxes	234	985	(60)
Changes in assets and liabilities:			
Accounts receivable, net	202	(209)	46
Unbilled receivables, net	(297)	(422)	(211)
Inventoried costs, net	(37)	25	(53)
Prepaid expenses and other assets	(56)	(92)	(117)
Accounts payable and other liabilities	381	570	18
Income taxes payable, net	(258)	(157)	148
Retiree benefits	(1,083)	(946)	(375)
Other, net	(29)	(43)	(125)
Net cash provided by operating activities	3,827	2,613	2,813
Investing activities			
Acquisition of Orbital ATK, net of cash acquired	(7,657)	—	—
Capital expenditures	(1,249)	(928)	(920)
Other, net	28	39	115
Net cash used in investing activities	(8,878)	(889)	(805)
Financing activities			
Payments of long-term debt	(2,276)	—	(321)
Net proceeds from issuance of long-term debt	—	8,245	749
Net (payments to) proceeds from credit facilities	(320)	(13)	135
Net borrowings on commercial paper	198	—	—
Common stock repurchases	(1,263)	(393)	(1,547)
Cash dividends paid	(821)	(689)	(640)
Payments of employee taxes withheld from share-based awards	(85)	(92)	(153)
Other, net	(28)	(98)	(9)
Net cash (used in) provided by financing activities	(4,595)	6,960	(1,786)
(Decrease) increase in cash and cash equivalents	(9,646)	8,684	222
Cash and cash equivalents, beginning of year	11,225	2,541	2,319
Cash and cash equivalents, end of year	\$ 1,579	\$ 11,225	\$ 2,541

The accompanying notes are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY

<i>\$ in millions, except per share amounts</i>	Year Ended December 31		
	2018	2017	2016
Common stock			
Beginning of year	\$ 174	\$ 175	\$ 181
Common stock repurchased	(4)	(2)	(7)
Shares issued for employee stock awards and options	1	1	1
End of year	171	174	175
Paid-in capital			
Beginning of year	44	—	—
Common stock repurchased	(34)	—	—
Stock compensation	(10)	44	—
End of year	—	44	—
Retained earnings			
Beginning of year	6,913	5,141	5,329
Impact from adoption of ASU 2018-02 and ASU 2016-01 (See Note 1)	(21)	—	—
Common stock repurchased	(1,225)	(371)	(1,548)
Net earnings	3,229	2,869	2,043
Dividends declared	(822)	(687)	(633)
Stock compensation	(6)	(39)	(50)
End of year	8,068	6,913	5,141
Accumulated other comprehensive (loss) income			
Beginning of year	1	47	160
Impact from adoption of ASU 2018-02 and ASU 2016-01 (See Note 1)	21	—	—
Other comprehensive income (loss), net of tax	(74)	(46)	(113)
End of year	(52)	1	47
Total shareholders' equity	\$ 8,187	\$ 7,132	\$ 5,363
Cash dividends declared per share	\$ 4.70	\$ 3.90	\$ 3.50

The accompanying notes are an integral part of these consolidated financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS**1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES****Nature of Operations**

Northrop Grumman Corporation (herein referred to as “Northrop Grumman,” the “company,” “we,” “us,” or “our”) is a leading global security company. We offer a broad portfolio of capabilities and technologies that enable us to deliver innovative platforms, systems and solutions for applications that range from undersea to outer space and into cyberspace. We provide capabilities in autonomous systems; cyber; command, control, communications and computers, intelligence, surveillance and reconnaissance (C4ISR); space; strike; and logistics and modernization. We participate in many high-priority defense and government programs in the United States (U.S.) and abroad. We conduct most of our business with the U.S. government, principally the Department of Defense (DoD) and intelligence community. We also conduct business with foreign, state and local governments, as well as commercial customers.

On June 6, 2018 (the “Merger date”), the company completed its previously announced acquisition of Orbital ATK, Inc. (“Orbital ATK”) (the “Merger”). On the Merger date, Orbital ATK became a wholly-owned subsidiary of the company and its name was changed to Northrop Grumman Innovation Systems, Inc., which we established as a new, fourth business sector (“Innovation Systems”). The operating results of Innovation Systems subsequent to the Merger date have been included in the company’s consolidated results of operations. See Note 2 for further information regarding the Merger.

Principles of Consolidation

The consolidated financial statements include the accounts of Northrop Grumman and its subsidiaries and joint ventures or other investments for which we consolidate the financial results. Material intercompany accounts, transactions and profits are eliminated in consolidation. Investments in equity securities and joint ventures where the company has significant influence, but not control, are accounted for using the equity method.

Basis of Presentation

The prior period financial information in the company’s consolidated financial statements reflects the retrospective effects from the company’s January 1, 2018 adoption of Accounting Standards Codification (ASC) Topic 606, *Revenue from Contracts with Customers*, and Accounting Standards Update (ASU) No. 2017-07, *Compensation Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost*, and our fourth quarter 2018 change in accounting method related to the recognition of actuarial gains and losses for pension and other postretirement benefit (OPB) plans as discussed below.

Accounting Estimates

The company’s consolidated financial statements are prepared in conformity with accounting principles generally accepted in the United States of America (“GAAP” or “FAS”). The preparation thereof requires management to make estimates and judgments that affect the reported amounts of assets and liabilities and the disclosure of contingencies at the date of the financial statements, as well as the reported amounts of sales and expenses during the reporting period. Estimates have been prepared using the most current and best available information; however, actual results could differ materially from those estimates.

Revenue Recognition

The majority of our sales are derived from long-term contracts with the U.S. government for the production of goods, the provision of services, or a combination of both. The company classifies sales as product or service based on the predominant attributes of each contract.

Under Accounting Standards Codification (ASC) Topic 606, *Revenue from Contracts with Customers*, the company recognizes revenue for each separately identifiable performance obligation in a contract representing a promise to transfer a distinct good or service to a customer. In most cases, goods and services provided under the company’s contracts are accounted for as single performance obligations due to the complex and integrated nature of our products and services. These contracts generally require significant integration of a group of goods and/or services to deliver a combined output. In some contracts, the company provides multiple distinct goods or services to a customer, most commonly when a contract covers multiple phases of the product lifecycle (development, production, maintenance and/or support). In those cases, the company accounts for the distinct contract deliverables as separate performance obligations and allocates the transaction price to each performance obligation based on its relative standalone selling price, which is generally estimated using the cost plus a reasonable margin approach of ASC Topic 606. Warranties are provided on certain contracts, but do not typically provide for services beyond standard assurances and are therefore not within the scope of ASC Topic 606. Likewise, our accounting for costs to

obtain or fulfill a contract was not significantly impacted by the adoption of ASC Topic 606 as these costs are not material.

A contract modification exists when the parties to a contract approve a change in the scope or price of a contract. Contracts are often modified for changes in contract specifications or requirements. Most of the company's contract modifications are for goods or services that are not distinct in the context of the contract and are therefore accounted for as part of the original performance obligation through a cumulative estimate-at-completion (EAC) adjustment.

The company recognizes revenue as control is transferred to the customer, either over time or at a point in time. In general, our U.S. government contracts contain termination for convenience and/or other clauses that generally entitle the customer to goods produced and/or in-process. Similarly, our non-U.S. government contracts generally contain contractual termination clauses or entitle the company to payment for work performed to date for goods and services that do not have an alternative use. As control is effectively transferred while we perform on our contracts and we are typically entitled to cost plus a reasonable margin for work in process if the contract is terminated for convenience, we generally recognize revenue over time using the cost-to-cost method (cost incurred relative to total cost estimated at completion) as the company believes this represents the most appropriate measurement towards satisfaction of its performance obligations. Revenue for contracts in which the control of goods produced does not transfer until delivery to the customer is recognized at a point in time (i.e., typically upon delivery).

Contract Estimates

Use of the cost-to-cost method requires us to make reasonably dependable estimates regarding the revenue and cost associated with the design, manufacture and delivery of our products and services. The company estimates profit on these contracts as the difference between total estimated sales and total estimated cost at completion and recognizes that profit as costs are incurred. Significant judgment is used to estimate total revenue and cost at completion.

Contract sales may include estimates of variable consideration, including cost or performance incentives (such as award and incentive fees), contract claims and requests for equitable adjustment (REAs). Variable consideration is included in total estimated sales to the extent it is probable that a significant reversal in the amount of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved. We estimate variable consideration as the most likely amount to which we expect to be entitled.

We recognize changes in estimated contract sales or costs and the resulting changes in contract profit on a cumulative basis. Cumulative EAC adjustments represent the cumulative effect of the changes on current and prior periods; sales and operating margins in future periods are recognized as if the revised estimates had been used since contract inception. If it is determined that a loss is expected to result on an individual performance obligation, the entire amount of the estimable future loss, including an allocation of general and administrative (G&A) costs, is charged against income in the period the loss is identified. Each loss provision is first offset against costs included in Unbilled accounts receivable or Inventoried costs; remaining amounts are reflected in Other current liabilities.

Significant EAC adjustments on a single contract could have a material effect on the company's consolidated financial statements. When such adjustments occur, we generally disclose the nature, underlying conditions and financial impact of the adjustments. During the second quarter of 2018, the company recognized \$69 million of favorable EAC adjustments on multiple restricted programs at Aerospace Systems. During the third quarter of 2017, the company recorded a \$56 million favorable EAC adjustment on a restricted program at Aerospace Systems.

The following table presents the effect of aggregate net EAC adjustments:

<i>\$ in millions, except per share data</i>	Year Ended December 31		
	2018	2017	2016
Operating income	\$ 577	\$ 360	\$ 443
Net earnings ⁽¹⁾	456	234	288
Diluted earnings per share ⁽¹⁾	2.61	1.33	1.60

⁽¹⁾ Based on statutory tax rates in effect for each year presented.

Revenue recognized from performance obligations satisfied in previous reporting periods was \$631 million, \$374 million and \$463 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Backlog

Backlog represents the future sales we expect to recognize on firm orders received by the company and is equivalent to the company's remaining performance obligations at the end of each period. It comprises both funded backlog (firm orders for which funding is authorized and appropriated) and unfunded backlog. Unexercised contract options

and indefinite delivery indefinite quantity (IDIQ) contracts are not included in backlog until the time an option or IDIQ task order is exercised or awarded. Company backlog as of December 31, 2018 was \$53.5 billion. We expect to recognize approximately 50 percent and 75 percent of our December 31, 2018 backlog as revenue over the next 12 and 24 months, respectively, with the remainder to be recognized thereafter.

Contract Assets and Liabilities

For each of the company's contracts, the timing of revenue recognition, customer billings, and cash collections results in a net contract asset or liability at the end of each reporting period. Fixed-price contracts are typically billed to the customer either using progress payments, whereby amounts are billed monthly as costs are incurred or work is completed, or performance based payments, which are based upon the achievement of specific, measurable events or accomplishments defined and valued at contract inception. Cost-type contracts are typically billed to the customer on a monthly or semi-monthly basis.

Contract assets consist of unbilled receivables, primarily related to long-term contracts where revenue recognized under the cost-to-cost method exceeds amounts billed to customers. Unbilled receivables are classified as current assets and, in accordance with industry practice, include amounts that may be billed and collected beyond one year due to the long-cycle nature of many of our contracts. Accumulated contract costs in unbilled receivables include costs such as direct production costs, factory and engineering overhead, production tooling costs, and allowable G&A. Unbilled receivables also include certain estimates of variable consideration described above. These contract assets are not considered a significant financing component of the company's contracts as the payment terms are intended to protect the customer in the event the company does not perform on its obligations under the contract.

Contract liabilities include advance payments and billings in excess of revenue recognized. Certain customers make advance payments prior to the company's satisfaction of its obligations on the contract. These amounts are recorded as contract liabilities until such obligations are satisfied, either over time as costs are incurred or at a point in time when deliveries are made. Contract liabilities are not a significant financing component as they are generally utilized to pay for contract costs within a one-year period or are used to ensure the customer meets contractual requirements.

Net contract assets (liabilities) are as follows:

<i>\$ in millions</i>	December 31, 2018	December 31, 2017	\$ Change	% Change
Unbilled receivables, net	\$ 5,026	\$ 3,465	\$ 1,561	45%
Advance payments and amounts in excess of costs incurred	(1,917)	(1,761)	(156)	9%
Net contract assets (liabilities)	\$ 3,109	\$ 1,704	\$ 1,405	82%

The change in the balances of the company's contract assets and liabilities primarily results from timing differences between revenue recognition and customer billings and/or payments. The increase in net contract assets during the year ended December 31, 2018 is principally due to the addition of \$1.0 billion of net contract assets from Innovation Systems and a reduction of amounts in excess of costs incurred at Mission Systems.

The amount of revenue recognized for the years ended December 31, 2018, 2017 and 2016 that was included in the contract liability balance at the beginning of each year was \$1.3 billion, \$1.2 billion and \$1.3 billion, respectively.

Disaggregation of Revenue

See Note 15 for information regarding the company's sales by customer type, contract type and geographic region for each of our segments. We believe those categories best depict how the nature, amount, timing and uncertainty of our revenue and cash flows are affected by economic factors.

General and Administrative Expenses

In accordance with the regulations that govern cost accounting requirements for government contracts, most general management and corporate expenses incurred at the segment and corporate locations are considered allowable and allocable costs. Allowable and allocable G&A costs, including independent research and development (IR&D) and bid and proposal (B&P) costs, are allocated on a systematic basis to contracts in progress and are included as a component of total estimated contract costs.

Research and Development

Company-sponsored research and development activities primarily include efforts related to government programs. Company-sponsored IR&D expenses totaled \$764 million, \$639 million and \$705 million in 2018, 2017 and 2016,

respectively, which represented 2.5 percent, 2.5 percent and 2.9 percent of total sales, respectively. Customer-funded research and development activities are charged directly to the related contracts.

Income Taxes

Provisions for federal and foreign income taxes are calculated on reported earnings before income taxes based on current tax law and include the cumulative effect of any changes in tax rates from those used previously in determining deferred tax assets and liabilities. Such provisions differ from the amounts currently payable because certain items of income and expense are recognized in different periods for financial reporting purposes than for income tax purposes. The company recognizes federal and foreign interest accrued related to unrecognized tax benefits in income tax expense. Federal tax penalties are recognized as a component of income tax expense.

In accordance with the regulations that govern cost accounting requirements for government contracts, current state and local income and franchise taxes are generally considered allowable and allocable costs and, consistent with industry practice, are recorded in operating costs and expenses. The company recognizes changes in deferred state taxes and unrecognized state tax benefits in unallocated corporate expenses.

Uncertain tax positions reflect the company's expected treatment of tax positions taken in a filed tax return, or planned to be taken in a future tax return or claim, which have not been reflected in measuring income tax expense for financial reporting purposes. Until these positions are sustained by the taxing authorities or the statute of limitations concerning such issues lapses, the company does not generally recognize the tax benefits resulting from such positions and reports the tax effects as a liability for uncertain tax positions in its consolidated statements of financial position.

Cash and Cash Equivalents

Cash and cash equivalents are comprised of cash in banks and highly liquid instruments with original maturities of three months or less, primarily consisting of bank time deposits and investments in institutional money market funds. Cash in bank accounts often exceeds federally insured limits.

Fair Value of Financial Instruments

The company measures the fair value of its financial instruments using observable and unobservable inputs. Observable inputs reflect market data obtained from independent sources, while unobservable inputs reflect internal market assumptions.

These two types of inputs create the following fair value hierarchy:

Level 1 - Quoted prices for identical instruments in active markets.

Level 2 - Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; and model-derived valuations whose inputs are observable or whose significant value drivers are observable.

Level 3 - Significant inputs to the valuation model are unobservable.

Marketable securities accounted for as trading are recorded at fair value on a recurring basis. Changes in unrealized gains and losses on trading securities are included in Other, net in the consolidated statements of earnings and comprehensive income. Investments in held-to-maturity instruments with original maturities greater than three months are recorded at amortized cost.

Derivative financial instruments are recognized as assets or liabilities in the financial statements and measured at fair value on a recurring basis. Changes in the fair value of derivative financial instruments that are designated as fair value hedges are recorded in net earnings, while the changes in the fair value of derivative financial instruments that are designated as cash flow hedges are recorded as a component of other comprehensive income until settlement. For derivative financial instruments not designated as hedging instruments, gains or losses resulting from changes in the fair value are reported in Other, net in the consolidated statements of earnings and comprehensive income.

The company may use derivative financial instruments to manage its exposure to interest rate risk for its long-term fixed-rate debt portfolio, foreign currency exchange risk related to receipts from customers and payments to suppliers denominated in foreign currencies and commodity price risk on purchases of inventory such as copper and zinc. The company does not use derivative financial instruments for trading or speculative purposes, nor does it use leveraged financial instruments. Credit risk related to derivative financial instruments is considered minimal and is managed through the use of multiple counterparties with high credit standards and periodic settlements of positions, as well as by entering into master netting agreements with most of our counterparties.

Inventoried Costs

Inventoried costs generally comprise costs associated with unsatisfied performance obligations on contracts accounted for using point in time revenue recognition, costs incurred in excess of existing contract requirements or funding that are probable of recovery and other accrued contract costs that are expected to be recoverable when allocated to specific contracts. Product inventory primarily consists of raw materials and is stated at the lower of cost or net realizable value, generally using the average method.

Accumulated contract costs in inventoried costs include costs such as direct production costs, factory and engineering overhead, production tooling costs, and allowable G&A. Inventoried costs are classified as current assets and, in accordance with industry practice, include amounts related to contracts having production cycles longer than one year.

Cash Surrender Value of Life Insurance Policies

The company maintains whole life insurance policies on a group of executives, which are recorded at their cash surrender value as determined by the insurance carrier. The company also has split-dollar life insurance policies on former officers and executives from acquired businesses, which are recorded at the lesser of their cash surrender value or premiums paid. These policies are utilized as a partial funding source for deferred compensation and other non-qualified employee retirement plans. As of December 31, 2018 and 2017, the carrying values associated with these policies were \$316 million and \$340 million, respectively, and are recorded in Other non-current assets in the consolidated statements of financial position.

Property, Plant and Equipment

Property, plant and equipment are depreciated over the estimated useful lives of individual assets. Most assets are depreciated using declining-balance methods, with the remainder using the straight-line method. Depreciation expense is generally recorded in the same segment where the related assets are held. However, the additional depreciation expense related to the step-up in fair value of property, plant and equipment acquired through business combinations is recorded in unallocated corporate expense within operating income as such depreciation is not considered part of management's evaluation of segment operating performance. Major classes of property, plant and equipment and their useful lives are as follows:

<i>Useful life in years, \$ in millions</i>	Useful Life	December 31	
		2018	2017
Land and land improvements	Up to 40 ⁽¹⁾	\$ 636	\$ 420
Buildings and improvements	Up to 40	2,139	1,834
Machinery and other equipment	Up to 20	6,618	5,105
Capitalized software costs	3-5	603	537
Leasehold improvements	Length of Lease ⁽²⁾	1,745	1,395
Property, plant and equipment, at cost		11,741	9,291
Accumulated depreciation		(5,369)	(5,066)
Property, plant and equipment, net		\$ 6,372	\$ 4,225

⁽¹⁾ Land is not a depreciable asset.

⁽²⁾ Leasehold improvements are depreciated over the shorter of the useful life of the asset or the length of the lease.

Goodwill and Other Purchased Intangible Assets

The company tests goodwill for impairment at least annually as of December 31, or when an indicator of potential impairment exists. When performing the goodwill impairment test, the company uses a discounted cash flow approach corroborated by comparative market multiples, where appropriate, to determine the fair value of its reporting units.

Goodwill and other purchased intangible asset balances are included in the identifiable assets of their assigned business segment. Beginning in 2018, the company includes the amortization of other purchased intangible assets in unallocated corporate expense within operating income as such amortization is no longer considered part of management's evaluation of segment operating performance. The company's customer-related intangible assets are generally amortized over their respective useful lives based on the pattern in which the future economic benefits of the intangible assets are expected to be consumed. Other intangible assets are generally amortized on a straight-line basis over their estimated useful lives.

Leases

The company uses its incremental borrowing rate in the assessment of lease classification as capital or operating and defines the initial lease term to include renewal options determined to be reasonably assured. The majority of our leases are operating leases.

Many of the company's real property lease agreements contain incentives for tenant improvements, rent holidays, or rent escalation clauses. For tenant improvement incentives, the company records a deferred rent liability and amortizes the deferred rent over the term of the lease as a reduction to rent expense. For rent holidays and rent escalation clauses during the lease term, the company records rental expense on a straight-line basis over the term of the lease. For purposes of recognizing lease incentives, the company uses the date of initial possession as the commencement date, which is generally when the company is given the right of access to the space and begins to make improvements in preparation for intended use.

Litigation, Commitments and Contingencies

We accrue for litigation, commitments and contingencies when management, after considering the facts and circumstances of each matter as then known to management, has determined it is probable a liability will be found to have been incurred and the amount of the loss can be reasonably estimated. When only a range of amounts is reasonably estimable and no amount within the range is more likely than another, the low end of the range is recorded. Legal fees are expensed as incurred. Due to the inherent uncertainties surrounding gain contingencies, we generally do not recognize potential gains until realized.

Environmental Costs

We accrue for environmental liabilities when management determines that, based on the facts and circumstances known to the company, it is probable the company will incur costs to address environmental impacts and the costs are reasonably estimable. When only a range of amounts is reasonably estimable and no amount within the range is more probable than another, we record the low end of the range. The company typically projects environmental costs for up to 30 years, records environmental liabilities on an undiscounted basis, and excludes asset retirement obligations and certain legal costs. At sites involving multiple parties, we accrue environmental liabilities based upon our expected share of liability, taking into account the financial viability of other liable parties. As a portion of environmental remediation liabilities are expected to be recoverable through overhead charges on government contracts, such amounts are deferred in prepaid expenses and other current assets (current portion) and other non-current assets until charged to contracts. The portion of environmental costs not expected to be recoverable is expensed.

Retirement Benefits

The company sponsors various defined benefit pension plans and defined contribution retirement plans covering substantially all of its employees. In most cases, our defined contribution plans provide for a company match of employee contributions. The company also provides postretirement benefits other than pensions to eligible retirees and qualifying dependents, consisting principally of health care and life insurance benefits.

The liabilities, unamortized prior service credits and annual income or expense of the company's defined benefit pension and OPB plans are determined using methodologies that involve several actuarial assumptions.

Because U.S. government regulations require that the costs of pension and OPB plans be charged to our contracts in accordance with the Federal Acquisition Regulation (FAR) and the related U.S. Government Cost Accounting Standards (CAS) that govern such plans, we calculate retiree benefit plan costs under both CAS and FAS methods. While both FAS and CAS recognize a normal service cost component in measuring periodic pension cost, there are differences in the way the components of annual pension costs are calculated under each method. Measuring plan obligations under FAS and CAS includes different assumptions and models, such as in estimating returns on plan assets, calculating interest expense and the periods over which gains/losses related to pension assets and actuarial changes are recognized. As a result, annual retiree benefit plan expense amounts for FAS are different from the amounts for CAS in any given reporting period even though the ultimate cost of providing benefits over the life of the plans is the same under either method. CAS retiree benefit plan costs are charged to contracts and are included in segment operating income, and the difference between the service cost component of FAS expense and total CAS expense is recorded in operating income at the consolidated company level. Not all net periodic pension expense is recognized in net earnings in the year incurred because it is allocated as production costs and a portion remains in inventory at the end of a reporting period.

Change in Accounting Method

During the fourth quarter of 2018, we changed our GAAP accounting method related to the recognition of actuarial gains and losses for the company's pension and OPB plans (the "Accounting change"). Prior to the Accounting

change, actuarial gains and losses were recognized as a component of Accumulated other comprehensive (loss) income upon annual remeasurement and were amortized into earnings in future periods on a plan-by-plan basis when they exceeded the accounting corridor, a defined range within which amortization of net gains and losses is not required.

Under the new method, actuarial gains and losses are immediately recognized in net periodic benefit cost through Mark-to-market pension and OPB (“MTM”) (expense) benefit upon annual remeasurement in the fourth quarter, or on an interim basis as triggering events warrant remeasurement. Prior service credits will continue to be recognized as a component of Accumulated other comprehensive (loss) income and amortized into earnings in future periods. While the historical accounting principle was acceptable, we believe the Accounting change is preferable as it better aligns with fair value principles by recognizing the effects of economic and interest rate changes in our pension and OPB assets and liabilities in the year in which the gains and losses are incurred rather than amortizing them over time. The Accounting change has been applied retrospectively to all prior years presented. As of January 1, 2016, the cumulative effect of this change resulted in a \$5.5 billion decrease to retained earnings and a corresponding \$5.5 billion increase to accumulated other comprehensive (loss) income, both net of tax of \$3.5 billion.

See Notes 13, 16, 17 and 18 for further information regarding the impact of the Accounting change on our current and prior period consolidated financial statements.

Stock Compensation

The company’s stock compensation plans are classified as equity plans and compensation expense is generally recognized over the vesting period of stock awards (typically three years), net of estimated forfeitures. The company issues stock awards in the form of restricted performance stock rights and restricted stock rights. The fair value of stock awards is determined based on the closing market price of the company’s common stock on the grant date. At each reporting date, the number of shares used to calculate compensation expense and diluted earnings per share is adjusted to reflect the number ultimately expected to vest.

Accumulated Other Comprehensive (Loss) Income

The components of accumulated other comprehensive (loss) income are as follows:

\$ in millions	December 31	
	2018	2017
Unamortized prior service credit, net of tax expense of \$32 for 2018 and \$76 for 2017	\$ 98	\$ 133
Cumulative translation adjustment	(144)	(136)
Other, net	(6)	4
Total accumulated other comprehensive (loss) income	\$ (52)	\$ 1

Unamortized prior service credit as of December 31, 2018 reflects a reclassification from accumulated other comprehensive (loss) income to retained earnings of \$25 million of stranded tax effects resulting from the 2017 Tax Act. This reclassification, which was calculated after consideration of the Accounting change, resulted from the company’s early adoption of ASU 2018-02 on January 1, 2018. See “Accounting Standards Updates” below for more information.

Reclassifications from accumulated other comprehensive (loss) income to net earnings related to the amortization of prior service credit were \$60 million, \$44 million and \$62 million, net of taxes, for the years ended December 31, 2018, 2017 and 2016, respectively. The reclassifications are included in the computation of net periodic benefit cost. See Note 13 for further information.

Reclassifications from accumulated other comprehensive (loss) income to net earnings, relating to cumulative translation adjustments, marketable securities (prior to the January 1, 2018 adoption of ASU 2016-01) and cash flow hedges were not material for the years ended December 31, 2018, 2017 and 2016.

Related Party Transactions

For all periods presented, the company had no material related party transactions.

Accounting Standards Updates

On February 14, 2018, the Financial Accounting Standards Board (FASB) issued ASU No. 2018-02, *Income Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income*. ASU 2018-02 allows companies to reclassify stranded tax effects resulting from the 2017 Tax Act from accumulated other comprehensive (loss) income to retained earnings. As described above, the company elected to early adopt ASU 2018-02 on January 1, 2018, which resulted in a reclassification of \$25 million

of stranded tax effects, related to our unamortized prior service credits, from accumulated other comprehensive (loss) income to retained earnings. Adoption of ASU 2018-02 did not have a material impact on the company's results of operations and/or cash flows.

On March 10, 2017, the FASB issued ASU No. 2017-07, *Compensation Retirement Benefits (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost*. ASU 2017-07 requires employers that sponsor defined benefit pension and/or OPB plans to report the service cost component of net benefit cost in the same line item as other compensation costs arising from services rendered by the pertinent employees during the period. Employers are required to present the other components of net benefit costs in the income statement separately from the service cost component and outside a subtotal of income from operations. Additionally, only the service cost component of net periodic pension cost is eligible for asset capitalization. We adopted ASU 2017-07 on January 1, 2018 using the retrospective method. Adoption of ASU 2017-07 did not have a material impact on our consolidated statements of financial position and/or cash flows. See Note 18 for further information regarding the impact of adopting ASU 2017-17 on our consolidated statements of earnings and comprehensive income.

On February 25, 2016, the FASB issued ASU No. 2016-02, *Leases (Topic 842)*. ASU 2016-02 supersedes existing lease guidance, including ASC 840 - *Leases*. Among other things, ASU 2016-02 requires recognition of a right-of-use asset and liability for future lease payments for contracts that meet the definition of a lease and requires disclosure of certain information about leasing arrangements. ASU 2016-02 will be effective January 1, 2019, although early adoption is permitted. On July 30, 2018, the FASB issued ASU No. 2018-11, *Leases (Topic 842): Targeted Improvements*, which, among other things, allows companies to elect an optional transition method to apply the new lease standard through a cumulative-effect adjustment in the period of adoption. We adopted the standard on January 1, 2019 using the optional transition method. The company has made substantial progress in executing our implementation plan. We have revised our controls and processes to address the lease standard and have completed the implementation and data input for our lease accounting software tool. We are electing the package of practical expedients, which, among other things, allows us to carry forward our prior lease classifications under ASC 840. However, we are not electing to adopt the hindsight practical expedient and are therefore maintaining the lease terms we previously determined under ASC 840. Adoption of the standard is expected to have an impact of approximately \$1.4 billion on our consolidated statement of financial position for the addition of lease assets and liabilities related to operating leases. ASU 2016-02 also requires expanded disclosure regarding the amounts, timing and uncertainties of cash flows related to a company's lease portfolio. We are evaluating these disclosure requirements and are incorporating the collection of relevant data into our processes in preparation for disclosure in 2019. We do not expect ASU 2016-02 to have a material impact on our annual results of operations and/or cash flows.

On January 5, 2016, the FASB issued ASU No. 2016-01, *Financial Instruments (Topic 825): Recognition and Measurement of Financial Assets and Financial Liabilities*. ASU 2016-01 requires equity investments that are not accounted for under the equity method of accounting or that do not result in consolidation of the investee to be measured at fair value with changes recognized in net earnings. ASU 2016-01 also eliminates the available-for-sale classification for equity investments that recognized changes in fair value as a component of other comprehensive income. We adopted ASU 2016-01 on January 1, 2018 using the modified retrospective method, which resulted in a \$4 million (net of tax) cumulative-effect adjustment from accumulated other comprehensive (loss) income to retained earnings. Adoption of ASU 2016-01 did not have a material impact on our results of operations and/or cash flows.

On May 28, 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers (Topic 606)*. Topic 606 supersedes previous revenue recognition guidance, including ASC 605-35, *Revenue Recognition - Construction-Type and Production-Type Contracts*, and outlines a single set of comprehensive principles for recognizing revenue under U.S. GAAP. Among other things, it requires companies to identify contractual performance obligations and determine whether revenue should be recognized at a point in time or over time. The primary impact of the adoption of ASC Topic 606 was that, in most cases, the accounting for those contracts where we previously recognized revenue as units were delivered changed under ASC Topic 606 such that we now recognize revenue as over time as costs are incurred. In addition, for certain of our contracts, there is a change in the number of performance obligations under ASC Topic 606, which has altered the timing of revenue and margin recognition.

We adopted ASC Topic 606 on January 1, 2018 using the full retrospective method. We applied the transition practical expedient related to remaining performance obligations for reporting periods presented before the date of initial application. No other practical expedients were applied. The cumulative effect of adopting ASC Topic 606

was a \$148 million increase to retained earnings at January 1, 2016. See Note 18 for further information regarding the impact of adopting ASC Topic 606 on our consolidated financial statements.

Other accounting standards updates adopted and/or issued, but not effective until after December 31, 2018, are not expected to have a material effect on the company's consolidated financial position, annual results of operations and/or cash flows.

2. ACQUISITION OF ORBITAL ATK

On June 6, 2018, the company completed its previously announced acquisition of Orbital ATK, by acquiring all of the outstanding shares of Orbital ATK for a purchase price of \$7.7 billion in cash. On the Merger date, Orbital ATK became a wholly-owned subsidiary of the company and its name was changed to Northrop Grumman Innovation Systems, Inc. We established Innovation Systems as a new, fourth business sector, whose main products include launch vehicles and related propulsion systems; missile products and defense electronics; precision weapons, armament systems and ammunition; satellites and associated space components and services; and advanced aerospace structures. The acquisition was financed with proceeds from the company's debt financing completed in October 2017 and cash on hand. We believe this acquisition will enable us to broaden our capabilities and offerings, provide additional innovative solutions to meet our customers' emerging requirements, create value for shareholders and provide expanded opportunities for our combined employees.

The operating results of Innovation Systems subsequent to the Merger date are included in the company's consolidated results of operations. Innovation Systems recognized sales of \$3.3 billion, operating income of \$343 million and net earnings of \$273 million for the period from the Merger date to December 31, 2018.

The company recognized \$29 million of acquisition-related costs that were expensed as incurred during the year ended December 31, 2018. These costs are included in Product and Service cost in the consolidated statements of earnings and comprehensive income.

Preliminary Purchase Price Allocation

The acquisition was accounted for as a purchase business combination. As such, the company recorded the assets acquired and liabilities assumed at fair value, with the excess of the purchase price over the fair value of assets acquired and liabilities assumed recorded as goodwill. Determining the fair value of assets acquired and liabilities assumed requires significant judgment, including the amount and timing of expected future cash flows, long-term growth rates and discount rates. In some cases, the company used discounted cash flow analyses, which were based on our best estimate of future sales, earnings and cash flows after considering such factors as general market conditions, customer budgets, existing firm and future orders, changes in working capital, long term business plans and recent operating performance. Use of different estimates and judgments could yield materially different results.

During the second quarter of 2018, the company completed a preliminary analysis to determine the fair values of the assets acquired and liabilities assumed and the amounts recorded reflected management's initial assessment of fair value as of the Merger date. Based on additional information obtained to date, the company refined its initial assessment of fair value and recognized the following significant adjustments to our preliminary purchase price allocation: Intangible assets increased \$220 million, Other current liabilities increased \$114 million, Pension and OPB plan liabilities increased \$56 million and Goodwill decreased \$73 million. These adjustments did not result in a material impact on the financial results of prior periods.

The company expects to finalize its purchase price allocation within one year of the Merger date. We are continuing to analyze and assess relevant information in the following areas to determine the fair value of assets acquired and liabilities assumed as of the Merger Date: income tax and certain legal and contract-related matters. The final fair value determination could result in material adjustments to the values presented in the preliminary purchase price allocation table below.

The Merger date fair value of the consideration transferred totaled \$7.7 billion in cash, which was comprised of the following:

<i>\$ in millions, except per share amounts</i>	Purchase price	
Shares of Orbital ATK common stock outstanding as of the Merger date		57,562,152
Cash consideration per share of Orbital ATK common stock	\$	134.50
Total purchase price	\$	7,742

The following preliminary purchase price allocation table presents the company's refined estimate of the fair values of assets acquired and liabilities assumed at the Merger date:

<i>\$ in millions</i>	As of June 6, 2018
Cash and cash equivalents	\$ 85
Accounts receivable	596
Unbilled receivables	1,264
Inventoried costs	220
Other current assets	214
Property, plant and equipment	1,509
Goodwill	6,222
Intangible assets	1,525
Other non-current assets	151
Total assets acquired	11,786
Trade accounts payable	(397)
Accrued employee compensation	(158)
Advance payments and amounts in excess of costs incurred	(222)
Below market contracts ⁽¹⁾	(151)
Other current liabilities	(412)
Long-term debt	(1,687)
Pension and OPB plan liabilities	(613)
Deferred tax liabilities	(248)
Other non-current liabilities	(156)
Total liabilities assumed	(4,044)
Total purchase price	\$ 7,742

⁽¹⁾ Included in Other current liabilities in the consolidated statements of financial position.

Below market contracts represent liabilities on certain acquired programs where the expected costs at completion exceed the expected sales under contract. We measured these liabilities based on the estimated price to transfer the obligations to a market participant at the Merger date plus a reasonable profit margin. These liabilities will be reduced as the company incurs costs to complete its performance obligations on the underlying programs. This reduction will be included in sales and is estimated as follows: \$64 million in 2019, \$45 million in 2020, and \$2 million in 2021.

The following table presents a summary of purchased intangible assets and their related estimated useful lives:

	Fair Value (in millions)	Estimated Useful Life in Years
Customer contracts	\$ 1,245	9
Commercial customer relationships	280	13
Total customer-related intangible assets	\$ 1,525	

The preliminary purchase price allocation resulted in the recognition of \$6.2 billion of goodwill, a majority of which was allocated to the Innovation Systems sector (refer to Note 8). The goodwill recognized is attributable to expected revenue synergies generated by the integration of Aerospace Systems, Mission Systems and Technology Services products and technologies with those of legacy Orbital ATK, synergies resulting from the consolidation or elimination of certain costs, and intangible assets that do not qualify for separate recognition, such as the assembled workforce of Orbital ATK. None of the goodwill is expected to be deductible for tax purposes.

Unaudited Supplemental Pro Forma Information

The following table presents unaudited pro forma financial information prepared in accordance with Article 11 of Regulation S-X and computed as if Orbital ATK had been included in our results as of January 1, 2017:

<i>\$ in millions, except per share amounts</i>	Year Ended December 31	
	2018	2017
Sales	\$ 32,319	\$ 30,634
Net earnings	3,417	2,938
Diluted earnings per share	19.57	16.73

The unaudited supplemental pro forma financial data has been calculated after applying our accounting policies and adjusting the historical results of Orbital ATK with pro forma adjustments, net of tax, that assume the acquisition occurred on January 1, 2017. Significant pro forma adjustments include the following:

1. The impact of the adoption of ASC Topic 606 on Orbital ATK's historical sales of \$21 million and cost of sales of \$21 million, for the year ended December 31, 2017.
2. The elimination of intercompany sales and costs of sales between the company and Orbital ATK of \$80 million and \$155 million for the years ended December 31, 2018 and 2017, respectively.
3. The elimination of nonrecurring transaction costs incurred by the company and Orbital ATK in connection with the Merger of \$71 million and \$57 million for the years ended December 31, 2018 and 2017, respectively.
4. The recognition of additional depreciation expense, net of removal of historical depreciation expense, of \$8 million and \$40 million for the years ended December 31, 2018 and 2017, respectively, related to the step-up in fair value of acquired property, plant and equipment.
5. Additional interest expense related to the debt issued to finance the Merger, including amortization of the debt issuance costs associated with the newly issued debt, of \$208 million for the year ended December 31, 2017. Interest expense and amortization of debt issuance costs have been included in the company's historical financial statements since the date of issuance (October 12, 2017).
6. The recognition of additional amortization expense, net of removal of historical amortization expense, of \$90 million and \$290 million for the years ended December 31, 2018 and 2017, respectively, related to the fair value of acquired intangible assets.
7. The elimination of Orbital ATK's historical amortization of net actuarial losses and prior service credits and impact of the revised pension and OPB net periodic benefit cost as determined under the company's plan assumptions of \$51 million and \$110 million for the years ended December 31, 2018 and 2017, respectively.
8. The income tax effect on the pro forma adjustments, which was calculated using the federal statutory tax rate in effect in each respective period, of \$(5) million and \$130 million for the years ended December 31, 2018 and 2017, respectively.

The unaudited pro forma financial information does not reflect the potential realization of revenue synergies or cost savings, nor does it reflect other costs relating to the integration of the two companies. This unaudited pro forma financial information should not be considered indicative of the results that would have actually occurred if the acquisition had been consummated on January 1, 2017, nor are they indicative of future results.

3. EARNINGS PER SHARE, SHARE REPURCHASES AND DIVIDENDS ON COMMON STOCK

Basic Earnings Per Share

We calculate basic earnings per share by dividing net earnings by the weighted-average number of shares of common stock outstanding during each period.

Diluted Earnings Per Share

Diluted earnings per share include the dilutive effect of awards granted to employees under stock-based compensation plans. The dilutive effect of these securities totaled 0.9 million, 1.2 million and 1.6 million shares for the years ended December 31, 2018, 2017 and 2016, respectively.

Share Repurchases

On December 4, 2014, the company's board of directors authorized a share repurchase program of up to \$3.0 billion of the company's common stock (the "2014 Repurchase Program"). Repurchases under the 2014 Repurchase Program commenced in March 2015 and were completed in March 2016.

On September 16, 2015, the company's board of directors authorized a share repurchase program of up to \$4.0 billion of the company's common stock (the "2015 Repurchase Program"). Repurchases under the 2015 Repurchase Program commenced in March 2016.

On December 4, 2018, the company's board of directors authorized a new share repurchase program of up to an additional \$3.0 billion in share repurchases of the company's common stock (the "2018 Repurchase Program"). By its terms, repurchases under the 2018 Repurchase Program will commence upon completion of the 2015 Repurchase Program and will expire when we have used all authorized funds for repurchases.

During the fourth quarter of 2018, the company entered into an accelerated share repurchase (ASR) agreement with Goldman Sachs & Co. LLC (Goldman Sachs) to repurchase \$1.0 billion of the company's common stock as part of the 2015 Repurchase Program. Under the agreement, we made a payment of \$1.0 billion to Goldman Sachs and received an initial delivery of 3.0 million shares valued at \$800 million that were immediately canceled by the company. The remaining balance of \$200 million, included as a reduction to Retained earnings on the consolidated statement of financial position, settled on January 4, 2019 with a final delivery of 0.9 million shares from Goldman Sachs. The final average purchase price was \$260.32 per share.

As of December 31, 2018, repurchases under the 2015 Repurchase Program totaled \$2.7 billion; \$1.3 billion remained under this share repurchase authorization. \$200 million of this share repurchase authorization was used to settle the ASR on January 4, 2019. By its terms, the 2015 Repurchase Program is set to expire when we have used all authorized funds for repurchases.

Share repurchases take place from time to time, subject to market conditions and management's discretion, in the open market or in privately negotiated transactions. The company retires its common stock upon repurchase and, in the periods presented, has not made any purchases of common stock other than in connection with these publicly announced repurchase programs.

The table below summarizes the company's share repurchases to date under the authorizations described above:

Repurchase Program Authorization Date	Amount Authorized (in millions)	Total Shares Retired (in millions)	Average Price Per Share ⁽¹⁾	Date Completed	Shares Repurchased (in millions)		
					Year Ended December 31		
					2018	2017	2016
December 4, 2014	\$ 3,000	18.0	\$ 166.70	March 2016	—	—	1.4
September 16, 2015	\$ 4,000	11.3	\$ 241.66		3.8	1.6	5.9
December 4, 2018	\$ 3,000	—	\$ —		—	—	—
					3.8	1.6	7.3

⁽¹⁾ Includes commissions paid.

Dividends on Common Stock

In May 2018, the company increased the quarterly common stock dividend 9 percent to \$1.20 per share from the previous amount of \$1.10 per share.

In January 2018, the company increased the quarterly common stock dividend 10 percent to \$1.10 per share from the previous amount of \$1.00 per share.

In May 2017, the company increased the quarterly common stock dividend 11 percent to \$1.00 per share from the previous amount of \$0.90 per share.

In May 2016, the company increased the quarterly common stock dividend 13 percent to \$0.90 per share from the previous amount of \$0.80 per share.

4. ACCOUNTS RECEIVABLE, NET

Accounts receivable, net represent amounts billed and due from customers. Substantially all accounts receivable at December 31, 2018 are expected to be collected in 2019. The company does not believe it has significant exposure

to credit risk as accounts receivable are primarily due from the U.S. government either as the ultimate customer or in connection with foreign military sales. Accounts receivable consisted of the following:

<i>\$ in millions</i>	December 31	
	2018	2017
Due from U.S. government ⁽¹⁾	\$ 1,164	\$ 825
Due from international and other customers	318	268
Accounts receivable, gross	1,482	1,093
Allowance for doubtful accounts	(34)	(39)
Accounts receivable, net	\$ 1,448	\$ 1,054

⁽¹⁾ Includes receivables due from the U.S. government associated with foreign military sales (FMS). For FMS, we contract with and are paid by the U.S. government.

5. UNBILLED RECEIVABLES, NET

Unbilled receivables, net represent revenue recognized under the cost-to-cost method that exceeds amounts billed to customers. Substantially all unbilled receivables at December 31, 2018 are expected to be billed and collected in 2019. Progress and performance-based payments are reflected as an offset to the related unbilled receivable balances.

Unbilled receivables consisted of the following:

<i>\$ in millions</i>	December 31	
	2018	2017
Due from U.S. government ⁽¹⁾		
Unbilled receivables	\$ 16,823	\$ 12,513
Progress and performance-based payments received	(12,539)	(9,447)
Total due from U.S. government	4,284	3,066
Due from international and other customers		
Unbilled receivables	3,811	3,424
Progress and performance-based payments received	(3,030)	(2,986)
Total due from international and other customers	781	438
Unbilled receivables, net of progress and performance-based payments received	5,065	3,504
Allowance for doubtful accounts	(39)	(39)
Unbilled receivables, net	\$ 5,026	\$ 3,465

⁽¹⁾ Includes unbilled receivables due from the U.S. government associated with FMS sales. For FMS, we contract with and are paid by the U.S. government.

6. INVENTORIED COSTS, NET

Inventoried costs are primarily from contracts where the U.S. government is the primary customer, therefore the company does not believe it has significant exposure to recoverability risk related to these amounts.

Inventoried costs, net consisted of the following:

<i>\$ in millions</i>	December 31	
	2018	2017
Production costs of contracts in process	\$ 402	\$ 312
G&A expenses	16	30
	418	342
Progress and performance-based payments received	(41)	(41)
	377	301
Product inventory and raw material	277	97
Inventoried costs, net	\$ 654	\$ 398

7. INCOME TAXES

In December 2017, the 2017 Tax Act was enacted. The 2017 Tax Act includes a number of changes to previous U.S. tax laws that impact the company, most notably a reduction of the U.S. corporate income tax rate from 35 percent to 21 percent for tax years beginning after December 31, 2017. The 2017 Tax Act also provides for a one-time transition tax on certain foreign earnings and the acceleration of depreciation for certain assets placed into service after September 27, 2017 as well as prospective changes which began in 2018, including repeal of the domestic manufacturing deduction, capitalization of research and development expenditures, additional limitations on executive compensation and limitations on the deductibility of interest.

The company recognized the income tax effects of the 2017 Tax Act in its financial statements in accordance with Staff Accounting Bulletin (SAB) No. 118, which provides SEC staff guidance for the application of ASC Topic 740, *Income Taxes*. The company finalized its accounting for the income tax effects of the 2017 Tax Act in the third quarter of 2018.

The following tables present the impact of the 2017 Tax Act relating to SAB 118 amounts as an increase (decrease) reflected in the noted line items in the Consolidated Statements of Earnings and Comprehensive Income and Consolidated Statements of Financial Position:

<i>\$ in millions</i>	Year Ended December 31			
	2018		2017	
	2018	2017	2018	2017
	Income Tax Expense		Income Tax Rate	
Reduction of U.S. Corporate Income Tax Rate	\$ —	\$ 265	—%	6.3%
Transition Tax on Foreign Earnings	5	13	0.1	0.3
Acceleration of Depreciation	—	5	—	0.1
Other	—	2	—	0.1
Total	\$ 5	\$ 285	0.1%	6.8%

<i>\$ in millions</i>	Year Ended December 31			
	2018		2017	
	2018	2017	2018	2017
	Deferred Tax Assets		Other Current Liabilities	
Reduction of U.S. Corporate Income Tax Rate	\$ —	\$ (265)	\$ —	\$ —
Transition Tax on Foreign Earnings	(5)	(13)	—	—
Acceleration of Depreciation	17	(80)	17	(75)
Other	—	—	—	2
Total	\$ 12	\$ (358)	\$ 17	\$ (73)

Income Tax Expense

Federal and foreign income tax expense consisted of the following:

\$ in millions	Year Ended December 31		
	2018	2017	2016
Federal income tax expense:			
Current	\$ 292	\$ 449	\$ 661
Deferred	213	907	(36)
Total federal income tax expense	505	1,356	625
Foreign income tax expense:			
Current	7	8	14
Deferred	1	(4)	(1)
Total foreign income tax expense	8	4	13
Total federal and foreign income tax expense	\$ 513	\$ 1,360	\$ 638

Earnings from foreign operations before income taxes are not material for all periods presented.

Income tax expense differs from the amount computed by multiplying earnings before income taxes by the statutory federal income tax rate due to the following:

\$ in millions	Year Ended December 31					
	2018		2017		2016	
Income tax expense at statutory rate	\$ 786	21.0 %	\$ 1,480	35.0 %	\$ 938	35.0 %
Stock compensation - excess tax benefits	(27)	(0.7)	(48)	(1.1)	(85)	(3.2)
Research credit	(186)	(5.0)	(130)	(3.1)	(61)	(2.2)
Manufacturing deduction	—	—	(97)	(2.3)	(58)	(2.2)
Settlements with taxing authorities	—	—	(42)	(1.0)	(40)	(1.5)
Repatriation of non-U.S. earnings	—	—	—	—	(33)	(1.2)
Impacts related to the 2017 Tax Act	(84)	(2.2)	285	6.8	—	—
MTM benefit tax rate differential ⁽¹⁾	—	—	(72)	(1.7)	—	—
Other, net	24	0.6	(16)	(0.4)	(23)	(0.9)
Total federal and foreign income taxes	\$ 513	13.7 %	\$ 1,360	32.2 %	\$ 638	23.8 %

⁽¹⁾ Impact of applying the 2017 Tax Act enacted statutory tax rate of 21 percent versus 35 percent.

2018 – The effective tax rate for 2018 was 13.7 percent, as compared with 32.2 percent in 2017, principally due to the reduction of the U.S. corporate income tax rate from 35 percent to 21 percent as a result of the 2017 Tax Act and a \$56 million increase in research credits. In addition, the company's effective tax rate for 2017 includes \$285 million of tax expense recorded in connection with the 2017 Tax Act, largely due to the write-down of net deferred tax assets, offset by \$97 million of tax benefits associated with manufacturing deductions and a \$72 million tax benefit from the impact of applying the 2017 Tax Act enacted statutory tax rate of 21 percent versus 35 percent to the 2017 MTM benefit.

2017 – The effective tax rate for 2017 was 32.2 percent, as compared with 23.8 percent in 2016. The higher rate is principally due to \$285 million of tax expense recorded in connection with the 2017 Tax Act, largely due to the write-down of net deferred tax assets, partially offset by a \$69 million increase in research credits and a \$39 million benefit recognized for additional manufacturing deductions principally related to prior years. The effective tax rates for the years ended December 31, 2017 and 2016 each include separate approximately \$40 million benefits recognized in connection with the resolution of Internal Revenue Service (IRS) examinations of the company's prior year tax returns.

Income tax payments, net of refunds received, were \$270 million, \$517 million and \$691 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Uncertain Tax Positions

In connection with the Merger, the company has initially recognized an increase in unrecognized tax benefits of approximately \$160 million for matters associated with legacy Orbital ATK, principally related to federal and state research credits. In addition, during 2018, we increased our unrecognized tax benefits related to our methods of accounting associated with the 2017 Tax Act by approximately \$100 million and it is reasonably possible that within the next twelve months those unrecognized tax benefits may increase by up to an additional \$70 million.

We file income tax returns in the U.S. federal jurisdiction and in various state and foreign jurisdictions. The Northrop Grumman 2014-2015 federal tax returns and refund claims related to its 2007-2016 federal tax returns are currently under IRS examination. In addition, legacy Orbital ATK federal tax returns for the year ended March 31, 2015 and nine-month transition period ended December 31, 2015 are currently under IRS examination.

Tax returns for open tax years related to state and foreign jurisdictions remain subject to examination, but the amounts currently subject to examination are not material.

The change in unrecognized tax benefits during 2018, 2017 and 2016, excluding interest, is as follows:

<i>\$ in millions</i>	December 31		
	2018	2017	2016
Unrecognized tax benefits at beginning of the year	\$ 283	\$ 135	\$ 223
Additions based on tax positions related to the current year	293	102	35
Additions for tax positions of prior years	207	110	2
Reductions for tax positions of prior years	(23)	(44)	(40)
Settlements with taxing authorities	(7)	(20)	(84)
Other, net	(5)	—	(1)
Net change in unrecognized tax benefits	465	148	(88)
Unrecognized tax benefits at end of the year	\$ 748	\$ 283	\$ 135

These liabilities, along with \$24 million of accrued interest and penalties, are included in other current and non-current liabilities in the consolidated statements of financial position. If the income tax benefits from these tax positions are ultimately realized, \$430 million of federal and foreign tax benefits would reduce the company's effective tax rate.

Net interest expense within the company's federal, foreign and state income tax provisions was not material for all years presented.

Deferred Income Taxes

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and tax purposes. Net deferred tax assets and liabilities are classified as non-current in the consolidated statements of financial position.

The tax effects of significant temporary differences and carryforwards that gave rise to year-end deferred federal, state and foreign tax balances, as presented in the consolidated statements of financial position, are as follows:

<i>\$ in millions</i>	December 31	
	2018	2017
Deferred Tax Assets		
Retiree benefits	\$ 1,541	\$ 1,477
Accrued employee compensation	308	263
Provisions for accrued liabilities	139	193
Inventory	650	447
Stock-based compensation	42	46
Tax credits	174	9
Other	59	30
Gross deferred tax assets	2,913	2,465
Less valuation allowance	(142)	(26)
Net deferred tax assets	2,771	2,439
Deferred Tax Liabilities		
Goodwill	511	508
Purchased intangibles	346	9
Property, plant and equipment, net	518	256
Contract accounting differences	1,381	1,182
Other	29	37
Deferred tax liabilities	2,785	1,992
Total net deferred tax (liabilities) assets	\$ (14)	\$ 447

Realization of deferred tax assets is primarily dependent on generating sufficient taxable income in future periods. The company believes it is more-likely-than-not our net deferred tax assets will be realized.

At December 31, 2018, the company has available tax credits and unused net operating losses of \$255 million and \$330 million, respectively, that may be applied against future taxable income. The majority of tax credits and net operating losses expire in 2019 through 2039, however, some may be carried forward indefinitely. Due to the uncertainty of the realization of the tax credits and net operating losses, the company has recorded valuation allowances of \$110 million and \$27 million as of December 31, 2018, respectively.

Undistributed Foreign Earnings

As of December 31, 2018, the company has accumulated undistributed earnings generated by our foreign subsidiaries and most have been taxed in the U.S. as a result of the 2017 Tax Act. The 2017 Tax Act allows for a dividend received deduction for repatriation of earnings. We intend to indefinitely reinvest these earnings, as well as future earnings from our foreign subsidiaries, to fund our international operations and foreign credit facility. In addition, we expect future U.S. cash generation will be sufficient to meet future U.S. cash needs.

8. GOODWILL AND OTHER PURCHASED INTANGIBLE ASSETS**Goodwill**

As discussed in Note 2, Innovation Systems was established as a new, fourth business sector of the company. The Merger resulted in the recognition of \$6.2 billion of goodwill, a majority of which was allocated to the Innovation Systems sector. A portion of this goodwill was allocated to the company's other sectors based on expected revenue synergies generated by the integration of their products and technologies with those of Innovation Systems. The amount of goodwill recognized is subject to change, pending the final determination of the fair value of assets acquired and liabilities assumed in connection with the Merger (see Note 2).

Changes in the carrying amounts of goodwill for the years ended December 31, 2017 and 2018, were as follows:

<i>\$ in millions</i>	Aerospace Systems	Innovation Systems	Mission Systems	Technology Services	Total
Balance as of December 31, 2016	\$ 3,742	\$ —	\$ 6,694	\$ 2,014	\$ 12,450
Other ⁽¹⁾	—	—	2	3	5
Balance as of December 31, 2017	\$ 3,742	\$ —	\$ 6,696	\$ 2,017	\$ 12,455
Acquisition of Orbital ATK	418	5,256	469	79	6,222
Other ⁽¹⁾	—	—	(2)	(3)	(5)
Balance as of December 31, 2018	\$ 4,160	\$ 5,256	\$ 7,163	\$ 2,093	\$ 18,672

⁽¹⁾ Other consists primarily of adjustments for foreign currency translation.

Accumulated goodwill impairment losses at December 31, 2018 and 2017, totaled \$570 million at Aerospace Systems.

Other Purchased Intangible Assets

Net customer-related and other intangible assets, including the fair value of purchased intangible assets acquired in the Merger, are as follows:

<i>\$ in millions</i>	December 31	
	2018	2017
Gross customer-related and other intangible assets	\$ 3,356	\$ 1,833
Less accumulated amortization	(1,984)	(1,781)
Net customer-related and other intangible assets	\$ 1,372	\$ 52

Amortization expense for 2018, 2017 and 2016, was \$203 million, \$14 million and \$16 million, respectively. The company's other purchased intangible assets are being amortized over an aggregate weighted-average period of 12 years. As of December 31, 2018, the expected future amortization of purchased intangibles for each of the next five years is as follows:

<i>\$ in millions</i>	
2019	\$ 331
2020	262
2021	204
2022	197
2023	78

9. FAIR VALUE OF FINANCIAL INSTRUMENTS

The company holds a portfolio of marketable securities consisting of securities to partially fund non-qualified employee benefit plans. A portion of these securities are held in common/collective trust funds and are measured at fair value using net asset value (NAV) per share as a practical expedient; and therefore are not required to be categorized in the fair value hierarchy table below. Marketable securities are included in Other non-current assets in the consolidated statements of financial position.

The company's derivative portfolio consists primarily of commodity forward contracts and foreign currency forward contracts. As a result of the Merger, the company assumed commodity forward contracts, which Innovation Systems periodically uses to hedge forecasted purchases of certain commodities. The contracts generally establish a fixed price for the underlying commodity and are designated and qualify as effective cash flow hedges of such commodity purchases. Commodity derivatives are valued based on prices of future exchanges and recently reported transactions in the marketplace. For foreign currency forward contracts, where model-derived valuations are appropriate, the company utilizes the income approach to determine the fair value and uses the applicable London Interbank Offered Rate (LIBOR) swap rates.

The following table presents the financial assets and liabilities the company records at fair value on a recurring basis identified by the level of inputs used to determine fair value. See Note 1 for the definitions of these levels.

\$ in millions	December 31, 2018			December 31, 2017		
	Level 1	Level 2	Total	Level 1	Level 2	Total
Financial Assets (Liabilities)						
Marketable securities	\$ 319	\$ 1	\$ 320	\$ 352	\$ 1	\$ 353
Marketable securities valued using NAV	—	—	15	—	—	—
Total marketable securities	319	1	335	352	1	353
Derivatives	—	(10)	(10)	—	—	—

At December 31, 2018, the company had commodity forward contracts outstanding that hedge forecasted commodity purchases of 10 million pounds of copper and 4 million pounds of zinc. Gains or losses on the commodity forward contracts are recognized in product and service cost as the performance obligations on related contracts are satisfied.

The notional value of the company's foreign currency forward contracts at December 31, 2018 and 2017 was \$114 million and \$89 million, respectively. At December 31, 2018, no portion of the notional value was designated as a cash flow hedge. The portion of the notional value designated as a cash flow hedge at December 31, 2017 was \$8 million.

The derivative fair values and related unrealized gains/losses at December 31, 2018 and 2017 were not material.

There were no transfers of financial instruments between the three levels of the fair value hierarchy during the years ended December 31, 2018 and 2017.

The carrying value of cash and cash equivalents and commercial paper approximates fair value.

10. DEBT

Unsecured Senior Notes

In October 2017, the company issued \$8.25 billion of unsecured senior notes to finance the Orbital ATK Acquisition and to pay related fees and expenses as follows:

- \$1.0 billion of 2.08 percent Senior Notes due 2020 (the "2020 Notes"),
- \$1.5 billion of 2.55 percent Senior Notes due 2022 (the "2022 Notes"),
- \$1.5 billion of 2.93 percent Senior Notes due 2025 (the "2025 Notes"),
- \$2.0 billion of 3.25 percent Senior Notes due 2028 (the "2028 Notes") and
- \$2.25 billion of 4.03 percent Senior Notes due 2047 (the "2047 Notes").

In December 2016, the company issued \$750 million of unsecured senior notes due February 1, 2027, with a fixed interest rate of 3.20 percent. We used the net proceeds from this offering for a debt repayment of \$200 million in the fourth quarter of 2016 and for general corporate purposes.

Commercial Paper

In May 2018, the company commenced a commercial paper program that serves as a source of short-term financing. In September 2018, the company amended its commercial paper program to increase its capacity to issue unsecured commercial paper notes from \$750 million up to \$2.0 billion. The commercial paper notes outstanding have original maturities of three months or less from the date of issuance. At December 31, 2018, there were \$198 million of outstanding short-term commercial paper borrowings at a weighted-average interest rate of 2.77 percent. The outstanding balance of commercial paper borrowings is recorded in Other current liabilities in the consolidated statements of financial position.

Credit Facilities

In August 2018, the company entered into a new five-year senior unsecured credit facility in an aggregate principal amount of \$2.0 billion (the "2018 Credit Agreement"). The 2018 Credit Agreement replaced the company's prior five-year revolving credit facility in an aggregate amount of \$1.6 billion entered into on July 8, 2015. The revolving credit facility established under the 2018 Credit Agreement is intended to support the company's commercial paper program and other general corporate purposes. At December 31, 2018, there was no balance outstanding under this facility; however, the outstanding balance of commercial paper borrowings reduces the amount available for borrowing under the 2018 Credit Agreement.

In December 2016, a subsidiary of the company entered into a two-year credit facility, with two additional one-year option periods, in an aggregate principal amount of £120 million (the equivalent of approximately \$152 million as of December 31, 2018) (the “2016 Credit Agreement”). The company exercised the second option to extend the maturity to December 2020. The 2016 Credit Agreement is guaranteed by the company. At December 31, 2018, there was £85 million (the equivalent of approximately \$108 million as of December 31, 2018) outstanding under this facility, which bears interest at a rate of LIBOR plus 1.10 percent. All of the borrowings outstanding under this facility mature less than one year from the date of issuance, but may be renewed under the terms of the facility. Based on our intent and ability to refinance the obligations on a long-term basis, substantially all of the borrowings are classified as non-current.

Our credit agreements contain generally customary terms and conditions, including covenants restricting the company’s ability to sell all or substantially all of its assets, merge or consolidate with another entity or undertake other fundamental changes and incur liens. The company also cannot permit the ratio of its debt to capitalization (as set forth in the credit agreements) to exceed 65 percent. At December 31, 2018, the company was in compliance with all covenants under its credit agreements.

Long-term debt consists of the following:

<i>\$ in millions</i>		December 31	
		2018	2017
Fixed-rate notes and debentures, maturing in	Interest rate		
2018	1.75%	\$ —	\$ 850
2019	5.05%	500	500
2020	2.08%	1,000	1,000
2021	3.50%	700	700
2022	2.55%	1,500	1,500
2023	3.25%	1,050	1,050
2025	2.93%	1,500	1,500
2026	7.75% - 7.88%	527	527
2027	3.20%	750	750
2028	3.25%	2,000	2,000
2031	7.75%	466	466
2040	5.05%	300	300
2043	4.75%	950	950
2045	3.85%	600	600
2047	4.03%	2,250	2,250
Credit facilities	1.89%	108	134
Other	Various	272	271
Debt issuance costs		(73)	(82)
Total long-term debt		14,400	15,266
Less: current portion ⁽¹⁾		517	867
Long-term debt, net of current portion		\$ 13,883	\$ 14,399

⁽¹⁾ The current portion of long-term debt is recorded in Other current liabilities in the consolidated statements of financial position.

In connection with the Merger, the company assumed \$1.7 billion of long-term debt, all of which was repaid as of December 31, 2018.

The estimated fair value of long-term debt was \$14.3 billion and \$16.0 billion as of December 31, 2018 and 2017, respectively. We calculated the fair value of long-term debt using Level 2 inputs, based on interest rates available for debt with terms and maturities similar to the company’s existing debt arrangements.

Indentures underlying long-term debt issued by the company or its subsidiaries contain various restrictions with respect to the issuer, including one or more restrictions relating to limitations on liens, sale-leaseback arrangements and funded debt of subsidiaries. The majority of these fixed rate notes and debentures are subject to redemption at the company’s discretion at any time prior to maturity in whole or in part at the principal amount plus any make-whole premium and accrued and unpaid interest. Interest on these fixed rate notes and debentures are payable semi-annually in arrears.

Total interest payments, net of interest received, were \$456 million, \$273 million, and \$299 million for the years ended December 31, 2018, 2017 and 2016, respectively.

Maturities of long-term debt as of December 31, 2018, are as follows:

\$ in millions

Year Ending December 31	
2019	\$ 517
2020	1,127
2021	741
2022	1,505
2023	1,053
Thereafter	9,532
Total principal payments	14,475
Unamortized premium on long-term debt, net of discount	(2)
Debt issuance costs	(73)
Total long-term debt	\$ 14,400

11. INVESTIGATIONS, CLAIMS AND LITIGATION

Litigation

On May 4, 2012, the company commenced an action, *Northrop Grumman Systems Corp. v. United States*, in the U.S. Court of Federal Claims. This lawsuit relates to an approximately \$875 million firm fixed-price contract awarded to the company in 2007 by the U.S. Postal Service (USPS) for the construction and delivery of flats sequencing systems (FSS) as part of the postal automation program. The FSS have been delivered. The company's lawsuit is based on various theories of liability. The complaint seeks approximately \$63 million for unpaid portions of the contract price, and approximately \$115 million based on the company's assertions that, through various acts and omissions over the life of the contract, the USPS adversely affected the cost and schedule of performance and materially altered the company's obligations under the contract. The United States responded to the company's complaint with an answer, denying most of the company's claims, and counterclaims seeking approximately \$410 million, less certain amounts outstanding under the contract. The principal counterclaim alleges that the company delayed its performance and caused damages to the USPS because USPS did not realize certain costs savings as early as it had expected. On April 2, 2013, the U.S. Department of Justice informed the company of a False Claims Act complaint relating to the FSS contract that was filed under seal by a relator in June 2011 in the U.S. District Court for the Eastern District of Virginia. On June 3, 2013, the United States filed a Notice informing the Court that the United States had decided not to intervene in this case. The relator alleged that the company violated the False Claims Act in a number of ways with respect to the FSS contract, alleged damage to the USPS in an amount of at least approximately \$179 million annually, alleged that he was improperly discharged in retaliation, and sought an unspecified partial refund of the contract purchase price, penalties, attorney's fees and other costs of suit. The relator later voluntarily dismissed his retaliation claim and reasserted it in a separate arbitration, which he also ultimately voluntarily dismissed. On September 5, 2014, the court granted the company's motion for summary judgment and ordered the relator's False Claims Act case be dismissed with prejudice. On December 19, 2014, the company filed a motion for partial summary judgment asking the court to dismiss the principal counterclaim referenced above. On June 29, 2015, the Court heard argument and denied that motion without prejudice to filing a later motion to dismiss. On February 16, 2018, both the company and the United States filed motions to dismiss many of the claims and counterclaims in whole or in part. The United States also filed a motion seeking to amend its answer and counterclaim, including to reduce its counterclaim to approximately \$193 million, which the court granted on June 11, 2018. On October 17, 2018, the court granted in part and denied in part the parties' motions to dismiss. On December 17, 2018, the court issued a Scheduling Order, proposed by the parties, providing for the parties to engage in mediation through March 1, 2019, and for pretrial activities then to resume, if and as necessary, with trial to commence on or about September 23, 2019. Although the ultimate outcome of these matters ("the FSS matters," collectively), including any possible loss, cannot be predicted or reasonably estimated at this time, the company intends vigorously to pursue and defend the FSS matters.

On August 8, 2013, the company received a court-appointed expert's report in litigation pending in the Second Federal Court of the Federal District in Brazil brought by the Brazilian Post and Telegraph Corporation (ECT), a Brazilian state-owned entity, against Solystic SAS (Solystic), a French subsidiary of the company, and two of its consortium partners. In this suit, commenced on December 17, 2004, and relatively inactive for some period of time, ECT alleges the consortium breached its contract with ECT and seeks damages of approximately R\$111 million (the equivalent of approximately \$29 million as of December 31, 2018), plus interest, inflation adjustments and attorneys' fees, as authorized by Brazilian law, which amounts could be significant over time. The original suit

sought R\$89 million (the equivalent of approximately \$23 million as of December 31, 2018) in damages. In October 2013, ECT asserted an additional damage claim of R\$22 million (the equivalent of approximately \$6 million as of December 31, 2018). In its counterclaim, Solystic alleges ECT breached the contract by wrongfully refusing to accept the equipment Solystic had designed and built and seeks damages of approximately €31 million (the equivalent of approximately \$35 million as of December 31, 2018), plus interest, inflation adjustments and attorneys' fees, as authorized by Brazilian law. The Brazilian court retained an expert to consider certain issues pending before it. On August 8, 2013 and September 10, 2014, the company received reports from the expert, which contain some recommended findings relating to liability and the damages calculations put forth by ECT. Some of the expert's recommended findings were favorable to the company and others were favorable to ECT. In November 2014, the parties submitted comments on the expert's most recent report. On June 16, 2015, the court published a decision denying the parties' request to present oral testimony. In a decision dated November 13, 2018, the trial court ruled in ECT's favor and awarded damages of R\$41 million (the equivalent of approximately \$11 million as of December 31, 2018) against Solystic and its consortium partners, with that amount to be adjusted for inflation and interest from November 2004 through any appeal, in accordance with the Manual of Calculations of the Federal Justice, as well as attorneys' fees. Once the court officially publishes the decision, the parties will have 10 days to file a motion for clarification with the trial court or 30 days to file an appeal with the intermediate court of appeals.

The company previously identified and disclosed to the U.S. government various issues relating primarily to time-charging practices of some employees working on a particular program with remote deployments. In the fourth quarter of 2018, the Department of Justice concluded its investigations as to the company and settled the matter with the company. As part of the settlement, the company paid a total of \$30 million, largely in restitution and repayment, and agreed to continue to cooperate with the government's ongoing investigation.

We are engaged in remediation activities relating to environmental conditions allegedly resulting from historic operations at the former United States Navy and Grumman facilities in Bethpage, New York. For over 20 years, we have worked closely with the United States Navy, the United States Environmental Protection Agency, the New York State Department of Environmental Conservation, the New York State Department of Health and other federal, state and local governmental authorities, to address legacy environmental conditions in Bethpage. We have incurred, and expect to continue to incur, as included in Note 12, substantial remediation costs related to these environmental conditions. The remediation standards or requirements to which we are subject may change and costs may increase materially. The State of New York has notified us that it intends to seek to impose additional remedial requirements and, among other things, is evaluating natural resource damages. In addition, we are and may become a party to various legal proceedings and disputes related to remediation and/or alleged environmental impacts in Bethpage, including with federal and state entities, local municipalities and water districts, insurance carriers and class action and individual plaintiffs alleging personal injury and property damage. These Bethpage matters could result in additional costs, fines, penalties, sanctions, compensatory or other damages (including natural resource damages), determinations on allocation, allowability and coverage, and non-monetary relief. We cannot at this time predict or reasonably estimate the potential cumulative outcomes or ranges of possible liability of these aggregate Bethpage matters.

On August 12, 2016, a putative class action complaint, naming Orbital ATK and two of its then-officers as defendants, Steven Knurr, et al. v. Orbital ATK, Inc., No. 16-cv-01031 (TSE-MSN), was filed in the United States District Court for the Eastern District of Virginia. The complaint asserts claims on behalf of purchasers of Orbital ATK securities for violations of Sections 10(b) and 20(a) of the Exchange Act and Rule 10b-5, allegedly arising out of false and misleading statements and the failure to disclose that: (i) Orbital ATK lacked effective control over financial reporting; and (ii) as a result, it failed to record an anticipated loss on a long-term contract with the U.S. Army to manufacture and supply small caliber ammunition at the U.S. Army's Lake City Army Ammunition Plant. On April 24, 2017 and October 10, 2017, the plaintiffs filed amended complaints naming additional defendants and asserting claims for alleged violations of additional sections of the Exchange Act and alleged false and misleading statements in Orbital ATK's Form S-4 filed in connection with the Orbital-ATK Merger. The complaint seeks damages, reasonable costs and expenses at trial, including counsel and expert fees, and such other relief as deemed appropriate by the Court. On August 8, 2018, plaintiffs sought leave to file an additional amended complaint; defendants filed an opposition. The parties engaged in mediation on November 6, 2018. On December 27, 2018, the parties reached a preliminary agreement to resolve the litigation for \$108 million, subject to agreement on additional terms and to court approval. On January 15, 2019, the court issued an order setting a schedule for final settlement approval proceedings. Consistent with that order, on January 30, 2019, the parties submitted a joint motion for preliminary settlement approval, with supporting documents. The schedule suggests a final approval settlement hearing in the second quarter of 2019. The company is also negotiating with and pursuing coverage litigation against various of its insurance carriers. The company intends vigorously to defend itself in connection with these matters.

We currently expect related contingencies will continue to be included in the company's measurement period adjustments of the fair value of assets acquired and liabilities assumed in the Merger (see Note 2).

The SEC is investigating Orbital ATK's historical accounting practices relating to the restatement of Orbital's unaudited condensed consolidated financial statements for the quarterly periods ended July 5, 2015 and October 4, 2015 described in the Transition Report on Form 10-K for the nine-month period ending December 31, 2015 previously filed on March 15, 2016. The SEC is also investigating matters relating to a voluntary disclosure Orbital ATK made concerning the restatement described in Orbital ATK's Form 10-K/A for the nine-month period ending December 31, 2015 filed on February 24, 2017. The ultimate outcome of these matters, including any possible loss, cannot be predicted or reasonably estimated at this time and the company intends to continue to cooperate with the SEC.

The company is a party to various other investigations, lawsuits, arbitration, claims, enforcement actions and other legal proceedings, including government investigations and claims, that arise in the ordinary course of our business. The nature of legal proceedings is such that we cannot assure the outcome of any particular matter. However, based on information available to the company to date, the company does not believe that the outcome of any of these other matters pending against the company is likely to have a material adverse effect on the company's consolidated financial position as of December 31, 2018, or its annual results of operations and/or cash flows.

12. COMMITMENTS AND CONTINGENCIES

U.S. Government Cost Claims

From time to time, the company is advised of claims by the U.S. government concerning certain potential disallowed costs, plus, at times, penalties and interest. When such findings are presented, the company and U.S. government representatives engage in discussions to enable the company to evaluate the merits of these claims, as well as to assess the amounts being claimed. Where appropriate, provisions are made to reflect the company's estimated exposure for such potential disallowed costs. Such provisions are reviewed periodically using the most recent information available. The company believes it has adequately reserved for disputed amounts that are probable and reasonably estimable, and that the outcome of any such matters would not have a material adverse effect on its consolidated financial position as of December 31, 2018, or its annual results of operations and/or cash flows.

Environmental Matters

The table below summarizes management's estimate of the range of reasonably possible future costs for environmental remediation, the amount accrued within that range, and the deferred costs expected to be recoverable through overhead charges on U.S. government contracts as of December 31, 2018 and 2017:

<i>\$ in millions</i>	Range of Reasonably Possible Future Costs ⁽¹⁾	Accrued Costs ⁽²⁾	Deferred Costs ⁽³⁾
December 31, 2018	\$447 - \$835	\$ 461	\$ 343
December 31, 2017	405 - 792	410	207

⁽¹⁾ Estimated remediation costs are not discounted to present value. The range of reasonably possible future costs does not take into consideration amounts expected to be recoverable through overhead charges on U.S. government contracts.

⁽²⁾ As of December 31, 2018, \$159 million is recorded in Other current liabilities and \$302 million is recorded in Other non-current liabilities.

⁽³⁾ As of December 31, 2018, \$127 million is deferred in Prepaid expenses and other current assets and \$216 million is deferred in Other non-current assets. These amounts reflect a \$103 million increase during 2018 in our estimated recovery of certain environmental remediation costs and are evaluated for recoverability on a routine basis.

As a result of the Merger, we assumed certain environmental remediation liabilities that are included in the accrued costs above, along with the related deferred costs expected to be recoverable on U.S. government contracts.

Although management cannot predict whether new information gained as our environmental remediation projects progress, or as changes in facts and circumstances occur, will materially affect the estimated liability accrued, except with respect to Bethpage, we do not anticipate that future remediation expenditures associated with our currently identified projects will have a material adverse effect on the company's consolidated financial position as of December 31, 2018, or its annual results of operations and/or cash flows. With respect to Bethpage, as described in Note 11, we cannot at this time estimate the range of reasonably possible additional future costs that could result from potential changes to remediation standards or requirements to which we are subject.

Financial Arrangements

In the ordinary course of business, the company uses standby letters of credit and guarantees issued by commercial banks and surety bonds issued principally by insurance companies to guarantee the performance on certain obligations. At December 31, 2018, there were \$542 million of stand-by letters of credit and guarantees and \$201 million of surety bonds outstanding.

Indemnifications

The company has provided indemnification for certain environmental, income tax and other potential liabilities in connection with certain of its divestitures. The settlement of these liabilities is not expected to have a material adverse effect on the company's consolidated financial position as of December 31, 2018, or its annual results of operations and/or cash flows.

Operating Leases

Rental expense for operating leases was \$375 million, \$300 million and \$298 million in 2018, 2017 and 2016, respectively. These amounts are net of immaterial amounts of sublease rental income. Minimum rental commitments under long-term non-cancelable operating leases as of December 31, 2018 are payable as follows:

\$ in millions

Year Ending December 31		
2019	\$	312
2020		270
2021		221
2022		186
2023		152
Thereafter		939
Total minimum lease payments	\$	2,080

13. RETIREMENT BENEFITS**Plan Descriptions**

U.S. Defined Benefit Pension Plans – The company sponsors several defined benefit pension plans in the U.S. Pension benefits for most participants are based on their years of service, age and compensation. It is our policy to fund at least the minimum amount required for all qualified plans, using actuarial cost methods and assumptions acceptable under U.S. government regulations, by making payments into benefit trusts separate from the company.

U.S. Defined Contribution Plans – The company also sponsors defined contribution plans covering the majority of its employees, including certain employees covered under collective bargaining agreements. Company contributions vary depending on date of hire, with a majority of employees being eligible for employer matching of employee contributions. Based on date of hire, certain employees are eligible to receive a company non-elective contribution or an enhanced matching contribution in lieu of a defined benefit pension plan benefit. The company's contributions to these defined contribution plans for the years ended December 31, 2018, 2017 and 2016, were \$403 million, \$344 million and \$311 million, respectively.

Non-U.S. Benefit Plans – The company sponsors several benefit plans for non-U.S. employees. These plans are designed to provide benefits appropriate to local practice and in accordance with local regulations. Some of these plans are funded using benefit trusts separate from the company.

Medical and Life Benefits – The company provides a portion of the costs for certain health care and life insurance benefits for a substantial number of its active and retired employees. In addition to a company and employee cost-sharing feature, the health plans also have provisions for deductibles, co-payments, coinsurance percentages, out-of-pocket limits, conformance to a schedule of reasonable fees, the use of managed care providers and coordination of benefits with other plans. The plans also provide for a Medicare carve-out. The company reserves the right to amend or terminate the plans at any time.

Certain covered employees and dependents are eligible to participate in plans upon retirement if they meet specified age and years of service requirements. The company provides subsidies to reimburse certain retirees for a portion of the cost of individual Medicare-supplemental coverage purchased directly by the retiree through a private insurance exchange. The company has capped the amount of its contributions to substantially all of its remaining

postretirement medical and life benefit plans. In addition, after January 1, 2005 (or earlier at some businesses), newly hired employees are not eligible for subsidized postretirement medical and life benefits.

Summary Plan Results

As discussed in Note 1, during the fourth quarter of 2018, we changed our accounting method related to the recognition of actuarial gains and losses for our pension and OPB plans. Under the new method, actuarial gains and losses are immediately recognized in net periodic benefit cost upon annual remeasurement in the fourth quarter, or on an interim basis as triggering events warrant remeasurement. These changes have been applied retrospectively to all prior years presented below. See Notes 1, 16, 17 and 18 for further information regarding the impact of the change in accounting principle on our consolidated financial statements.

The cost to the company of its retirement benefit plans is shown in the following table:

<i>\$ in millions</i>	Year Ended December 31					
	Pension Benefits			Medical and Life Benefits		
	2018	2017	2016	2018	2017	2016
Components of net periodic benefit cost						
Service cost	\$ 404	\$ 388	\$ 390	\$ 21	\$ 20	\$ 29
Interest cost	1,226	1,250	1,302	76	85	95
Expected return on plan assets	(2,217)	(1,885)	(1,853)	(101)	(89)	(86)
Amortization of prior service credit	(58)	(57)	(60)	(21)	(22)	(22)
Mark-to-market expense (benefit)	699	(445)	1,041	(44)	(91)	(91)
Other	—	(7)	—	—	—	—
Net periodic benefit cost	\$ 54	\$ (756)	\$ 820	\$ (69)	\$ (97)	\$ (75)

Changes in Presentation

As discussed in Note 1, we adopted ASU 2017-07 on January 1, 2018 using the retrospective method, which changed the financial statement presentation of service costs and the other components of net periodic benefit cost. The service cost component continues to be included in operating income; however, the other components are now presented in Net FAS (non-service) pension benefit and MTM (expense) benefit in the consolidated statements of earnings and comprehensive income. In addition, interest on service cost, which has historically been included in service cost, is now presented in interest cost. Further, to conform our presentation of service costs for all plans, administrative expenses previously included in service cost for certain plans are now consistently presented in the MTM (expense) benefit component. As a result, the company reclassified interest on service cost of \$16 million and \$18 million and plan administrative expenses of \$20 million and \$38 million from service cost to the interest cost and MTM (expense) benefit components, respectively, for its pension plans for the years ended December 31, 2017 and 2016, respectively, to conform to the current year presentation. For the company's medical and life benefit plans, plan administrative expenses of \$2 million were reclassified from service cost to the MTM (expense) benefit component for the year ended December 31, 2017 and interest on service costs of \$1 million were reclassified from service cost to the interest cost component for the year ended December 31, 2016 to conform to the current year presentation. This change in presentation had no impact on net periodic benefit cost.

The table below summarizes the components of changes in unamortized prior service credit for the years ended December 31, 2016, 2017 and 2018:

<i>\$ in millions</i>	Pension Benefits		Medical and Life	Total
			Benefits	
Changes in unamortized prior service credit				
Amortization of prior service credit	\$	60	\$ 22	\$ 82
Tax expense		(11)	(9)	(20)
Change in unamortized prior service credit – 2016		49	13	62
Amortization of prior service credit		57	22	79
Tax expense		(26)	(9)	(35)
Change in unamortized prior service credit – 2017		31	13	44
Amortization of prior service credit		58	21	79
Tax expense		(14)	(5)	(19)
Change in unamortized prior service credit – 2018	\$	44	\$ 16	\$ 60

We expect to recognize \$59 million and \$3 million of prior year service credit related to our pension benefit and medical and life benefit plans, respectively, in net periodic benefit cost in 2019.

The following table sets forth the funded status and amounts recognized in the consolidated statements of financial position for the company's defined benefit retirement plans. Pension benefits data includes the qualified plans, foreign plans and U.S. unfunded non-qualified plans for benefits provided to directors, officers and certain employees. The company uses a December 31 measurement date for its plans.

<i>\$ in millions</i>	Pension Benefits		Medical and Life Benefits	
	2018	2017	2018	2017
Plan Assets				
Fair value of plan assets at beginning of year	\$ 27,226	\$ 24,384	\$ 1,338	\$ 1,208
Net (loss) gain on plan assets	(1,043)	3,885	(65)	208
Employer contributions	370	596	38	45
Participant contributions	9	11	25	24
Benefits paid	(1,685)	(1,617)	(148)	(144)
Acquired plan assets	2,293	—	58	—
Other	(20)	(33)	1	(3)
Fair value of plan assets at end of year	27,150	27,226	1,247	1,338
Projected Benefit Obligation				
Projected benefit obligation at beginning of year	31,967	30,409	2,110	2,100
Service cost	404	388	21	20
Interest cost	1,226	1,250	76	85
Participant contributions	9	11	25	24
Actuarial loss (gain)	(2,561)	1,544	(211)	26
Benefits paid	(1,685)	(1,617)	(148)	(144)
Acquired benefit obligation	2,895	—	50	—
Other	(24)	(18)	7	(1)
Projected benefit obligation at end of year	32,231	31,967	1,930	2,110
Funded status	\$ (5,081)	\$ (4,741)	\$ (683)	\$ (772)
Classification of amounts recognized in the consolidated statements of financial position				
Non-current assets	\$ 77	\$ 82	\$ 124	\$ 112
Current liability	(164)	(154)	(46)	(42)
Non-current liability	(4,994)	(4,669)	(761)	(842)

The accumulated benefit obligation for all defined benefit pension plans was \$31.9 billion and \$31.6 billion at December 31, 2018 and 2017, respectively. Amounts for pension plans with accumulated benefit obligations in excess of fair value of plan assets are as follows:

<i>\$ in millions</i>	December 31	
	2018	2017
Projected benefit obligation	\$ 30,259	\$ 29,804
Accumulated benefit obligation	29,961	29,454
Fair value of plan assets	25,101	24,981

Plan Assumptions

On a weighted-average basis, the following assumptions were used to determine benefit obligations and net periodic benefit cost:

	Pension Benefits		Medical and Life Benefits	
	2018	2017	2018	2017
Assumptions used to determine benefit obligation at December 31				
Discount rate	4.31%	3.68%	4.30%	3.66%
Initial cash balance crediting rate assumed for the next year	3.00%	2.75%		
Rate to which the cash balance crediting rate is assumed to increase (the ultimate rate)	3.25%	3.00%		
Year that the cash balance crediting rate reaches the ultimate rate	2024	2023		
Rate of compensation increase	3.00%	3.00%		
Initial health care cost trend rate assumed for the next year			6.20%	6.50%
Rate to which the health care cost trend rate is assumed to decline (the ultimate trend rate)			5.00%	5.00%
Year that the health care cost trend rate reaches the ultimate trend rate			2023	2023
Assumptions used to determine benefit cost for the year ended December 31				
Discount rate	3.68%	4.19%	3.66%	4.13%
Initial cash balance crediting rate assumed for the next year	2.75%	3.10%		
Rate to which the cash balance crediting rate is assumed to increase (the ultimate rate)	3.00%	3.60%		
Year that the cash balance crediting rate reaches the ultimate rate	2023	2022		
Expected long-term return on plan assets	8.00%	8.00%	7.65%	7.70%
Rate of compensation increase	3.00%	3.00%		
Initial health care cost trend rate assumed for the next year			6.50%	6.50%
Rate to which the health care cost trend rate is assumed to decline (the ultimate trend rate)			5.00%	5.00%
Year that the health care cost trend rate reaches the ultimate trend rate			2023	2020

Plan Assets and Investment Policy

Plan assets are invested in various asset classes that are expected to produce a sufficient level of diversification and investment return over the long term. Through consultation with our investment management team and outside investment advisers, management develops expected long-term returns for each of the plans' strategic asset classes. In addition to our historical investment performance, we consider several factors, including current market data such as yields/price-earnings ratios, historical market returns over long periods and periodic surveys of investment managers' expectations. Using policy target allocation percentages and the asset class expected returns, we calculate a weighted-average expected long-term rate of return. Liability studies are conducted on a regular basis to provide guidance in setting investment goals with an objective to balance risk. Risk targets are established and monitored against acceptable ranges.

Our investment policies and procedures are designed to ensure the plans' investments are in compliance with the Employee Retirement Income Security Act (ERISA). Guidelines are established defining permitted investments within each asset class. Derivatives are used for transitioning assets, asset class rebalancing, managing currency risk and for management of fixed-income and alternative investments.

For the majority of the plans' assets, the investment policies require that the asset allocation be maintained within the following ranges as of December 31, 2018:

	Asset Allocation Ranges
Cash and cash equivalents	0% - 12%
Global Public Equities	35% - 55%
Fixed-income securities	20% - 40%
Alternative investments	13% - 33%

The table below provides the fair values of the company's pension and Voluntary Employee Beneficiary Association (VEBA) trust plan assets at December 31, 2018 and 2017, by asset category. The table also identifies the level of inputs used to determine the fair value of assets in each category. See Note 1 for the definitions of these levels. Certain investments that are measured at fair value using NAV per share (or its equivalent) as a practical expedient are not required to be categorized in the fair value hierarchy table. The total fair value of these investments is included in the table below to permit reconciliation of the fair value hierarchy to amounts presented in the funded status table above. As of December 31, 2018 and 2017, there were no investments expected to be sold at a value materially different than NAV.

<i>\$ in millions</i>	Level 1		Level 2		Level 3		Total	
	2018	2017	2018	2017	2018	2017	2018	2017
Asset category								
Cash and cash equivalents	\$ 209	\$ 55	\$ 2,655	\$ 4,086			\$ 2,864	\$ 4,141
U.S. equities	2,859	3,365				\$ 1	2,859	3,366
International equities	2,711	2,453			\$ 1	1	2,712	2,454
Fixed-income securities								
U.S. Treasuries	26	—	1,501	1,282			1,527	1,282
U.S. Government Agency			322	345			322	345
Non-U.S. Government			206	135			206	135
Corporate debt	34	—	4,141	4,406			4,175	4,406
Asset backed			297	255			297	255
High yield debt	11	—	153	866			164	866
Bank loans			20	248			20	248
Other Assets	15	15	51	3	2	2	68	20
Investments valued using NAV as a practical expedient								
U.S. equities							1,170	1,053
International equities							4,017	4,315
Fixed-income funds							1,386	129
Hedge funds							351	166
Opportunistic investments							1,367	873
Private equities							2,510	2,091
Real estate funds							2,382	2,419
Fair value of plan assets at the end of the year	\$ 5,865	\$ 5,888	\$ 9,346	\$ 11,626	\$ 3	\$ 4	\$ 28,397	\$ 28,564

There were no transfers of plan assets between the three levels of the fair value hierarchy during the years ended December 31, 2018 and 2017.

Generally, investments are valued based on information in financial publications of general circulation, statistical and valuation services, records of security exchanges, appraisal by qualified persons, transactions and bona fide offers. Cash and cash equivalents are predominantly held in money market or short-term investment funds. U.S. and international equities consist primarily of common stocks and institutional common trust funds. Investments in certain equity securities, which include domestic and international securities and registered investment companies, and exchange-traded funds with fixed income strategies are valued at the last reported sales or quoted price on the

last business day of the reporting period. Fair values for certain fixed-income securities, which are not exchange-traded, are valued using third-party pricing services.

Other assets include derivative assets with a fair value of \$76 million and \$34 million, derivative liabilities with a fair value of \$52 million and \$19 million, and net notional amounts of \$3.2 billion and \$3.3 billion, as of December 31, 2018 and 2017, respectively. Derivative instruments may include exchange traded futures contracts, interest rate swaps, options on futures and swaps, currency contracts, total return swaps and credit default swaps. Notional amounts do not quantify risk or represent assets or liabilities of the pension and VEBA trusts, but are used in the calculation of cash settlement under the contracts. The volume of derivative activity is commensurate with the amounts disclosed at year-end. Certain derivative financial instruments within the pension trust are subject to master netting agreements with certain counterparties.

Investments in certain equity and fixed-income funds, which include common/collective trust funds, and alternative investments, including hedge funds, opportunistic investments, private equity funds and real estate funds, are valued based on the NAV derived by the investment managers, as a practical expedient, and are described further below.

U.S. and International equities: Generally, redemption periods are daily or monthly with a notice requirement less than 30 days. As of December 31, 2018 and 2017, there were no unfunded commitments.

Fixed-income funds: Redemption periods are daily, monthly or quarterly with various notice requirements but generally are less than 30 days. As of December 31, 2018 and 2017, there were no unfunded commitments.

Hedge funds: The redemption period of hedge funds is generally monthly or quarterly with various notice requirements from 30 to 95 days. As of December 31, 2018 and 2017, there were no unfunded commitments.

Opportunistic investments: Opportunistic investments are primarily held in partnerships with a 5-10 year life. As of December 31, 2018 and 2017, unfunded commitments were \$1.1 billion and \$768 million, respectively.

Private equities: The term of each fund is typically 10 or more years and the fund's investors do not have an option to redeem their interest in the fund. As of December 31, 2018 and 2017, unfunded commitments were \$1.8 billion and \$1.4 billion, respectively.

Real estate funds: Consists of closed-end real estate funds and infrastructure funds with terms that are typically 10 or more years. This class also contains open-end funds that generally allow investors to redeem their interests in the fund. As of December 31, 2018 and 2017, unfunded commitments were \$73 million and \$71 million, respectively.

For the years ended December 31, 2018 and 2017, the defined benefit pension and VEBA trusts did not hold any Northrop Grumman common stock.

Benefit Payments

The following table reflects estimated future benefit payments for the next ten years, based upon the same assumptions used to measure the benefit obligation, and includes expected future employee service, as of December 31, 2018:

<i>\$ in millions</i>	Pension Plans		Medical and Life Plans		Total
Year Ending December 31					
2019	\$	1,781	\$	153	\$ 1,934
2020		1,834		155	1,989
2021		1,880		142	2,022
2022		1,928		141	2,069
2023		1,970		139	2,109
2024 through 2028		10,384		651	11,035

In 2019, the company expects to contribute the required minimum funding of approximately \$91 million to its pension plans and approximately \$50 million to its medical and life benefit plans. During the year ended December 31, 2018, the company made voluntary pension contributions of \$280 million.

14. STOCK COMPENSATION PLANS AND OTHER COMPENSATION ARRANGEMENTS

Stock Compensation Plans

At December 31, 2018, the company had stock-based compensation awards outstanding under the following shareholder-approved plans: the 2011 Long-Term Incentive Stock Plan (2011 Plan), applicable to employees, and the 1993 Stock Plan for Non-Employee Directors (1993 SPND).

Employee Plans – In May 2015, the company’s shareholders approved amendments to the 2011 Plan. These amendments provided that shares issued under the plan would be counted against the aggregate share limit on a one-for-one basis. As amended, 5.1 million shares plus 2.4 million of newly authorized shares were available for issuance under the 2011 Plan; as of December 31, 2018, 5.9 million shares remain available for issuance.

The 2011 Plan provides for the following equity awards: stock options, stock appreciation rights (SARs) and stock awards. Under the 2011 Plan, no SARs have been granted and there are no outstanding stock options. Stock awards include restricted performance stock rights (RPSR) and restricted stock rights (RSR). RPSRs generally vest and are paid following the completion of a three-year performance period, based primarily on achievement of financial objectives determined by the Board. RSRs generally vest 100% after three years. Each includes dividend equivalents, which are paid upon payment of the RPSR or RSR. The terms of equity awards granted under the 2011 Plan provide for accelerated vesting, and in some instances forfeiture, of all or a portion of an award upon termination of employment.

Non-Employee Director Plans – Awards to non-employee directors are made pursuant to the Northrop Grumman Corporation Equity Grant Program for Non-Employee Directors under the 2011 Plan (the Director Program), which was amended and restated effective January 1, 2016. Prior to January 1, 2016, the Director Program and the 1993 SPND provided for quarterly award and vesting of an annual equity retainer in the form of deferred stock units (Automatic Stock Units) to be paid upon the conclusion of a director’s board service, or earlier, as specified by the director, if the director had five or more years of service.

Under the amended Director Program, each non-employee director is awarded an annual equity grant in the form of Automatic Stock Units, which vest on the one-year anniversary of the grant date. Directors may elect to have all or any portion of their Automatic Stock Units paid on (A) the earlier of (i) the beginning of a specified calendar year after the vesting date or (ii) their separation from service as a member of the Board, or (B) on the vesting date.

Directors also may elect to defer to a later year all or a portion of their remaining cash retainer or committee retainer fees into a stock unit account as Elective Stock Units or in alternative investment options. Elective Stock Units are awarded on a quarterly basis. Directors may elect to have all or a portion of their Elective Stock Units paid on the earlier of (i) the beginning of a specified calendar year or (ii) their separation from service as a member of the Board. Stock units awarded under the Director Program are paid out in an equivalent number of shares of Northrop Grumman common stock. Directors are credited with dividend equivalents in connection with the accumulated stock units until the shares of common stock relating to such stock units are issued.

Compensation Expense

Stock-based compensation expense for the years ended December 31, 2018, 2017 and 2016 was \$86 million, \$94 million and \$93 million, respectively. The related tax benefits for stock-based compensation for the years ended December 31, 2018, 2017 and 2016 were \$27 million, \$48 million and \$85 million, respectively.

At December 31, 2018, there was \$108 million of unrecognized compensation expense related to unvested stock awards granted under the company’s stock-based compensation plans. These amounts are expected to be charged to expense over a weighted-average period of 1.3 years.

Stock Awards

Compensation expense for stock awards is measured at the grant date based on the fair value of the award and is recognized over the vesting period (generally three years). The fair value of stock awards and performance stock awards is determined based on the closing market price of the company’s common stock on the grant date. The fair value of market-based stock awards is determined at the grant date using a Monte Carlo simulation model. For purposes of measuring compensation expense for performance awards, the number of shares ultimately expected to vest is estimated at each reporting date based on management’s expectations regarding the relevant performance criteria.

Stock award activity for the years ended December 31, 2016, 2017 and 2018, is presented in the table below. Vested awards do not include any adjustments to reflect the final performance measure for issued shares.

	Stock Awards (in thousands)	Weighted- Average Grant Date Fair Value Per Share	Weighted- Average Remaining Contractual Term (in years)
Outstanding at January 1, 2016	1,586	\$ 122	1.2
Granted	483	186	
Vested	(872)	97	
Forfeited	(49)	143	
Outstanding at December 31, 2016	1,148	\$ 167	1.3
Granted	397	233	
Vested	(521)	152	
Forfeited	(86)	198	
Outstanding at December 31, 2017	938	\$ 192	1.0
Granted	376	321	
Vested	(455)	181	
Forfeited	(63)	250	
Outstanding at December 31, 2018	796	\$ 244	0.8

The majority of our stock awards are granted annually during the first quarter.

The grant date fair value of shares issued in settlement of fully vested stock awards was \$93 million, \$96 million and \$97 million during the years ended December 31, 2018, 2017 and 2016, respectively.

Cash Awards

The company grants certain employees cash units (CUs) and cash performance units (CPUs). Depending on actual performance against financial objectives, recipients of CPUs earn between 0 and 200 percent of the original grant. The following table presents the minimum and maximum aggregate payout amounts related to those cash awards granted for the periods presented:

<i>\$ in millions</i>	Year Ended December 31		
	2018	2017	2016
Minimum aggregate payout amount	\$ 36	\$ 38	\$ 39
Maximum aggregate payout amount	205	201	199

The majority of our cash awards are granted annually during the first quarter. CUs typically vest and settle in cash on the third anniversary of the grant date, while CPUs generally vest and pay out in cash based primarily on the achievement of financial metrics over a three-year period. At December 31, 2018, there was \$137 million of unrecognized compensation expense related to cash awards.

15. SEGMENT INFORMATION

The company is aligned in four operating sectors, which also comprise our reportable segments: Aerospace Systems, Innovation Systems, Mission Systems and Technology Services.

The following table presents sales and operating income by segment:

<i>\$ in millions</i>	Year Ended December 31		
	2018	2017	2016
Sales			
Aerospace Systems	\$ 13,096	\$ 12,131	\$ 10,853
Innovation Systems	3,276	—	—
Mission Systems	11,709	11,470	11,161
Technology Services	4,297	4,687	4,765
Intersegment eliminations	(2,283)	(2,284)	(2,073)
Total sales	30,095	26,004	24,706
Operating income			
Aerospace Systems	1,411	1,289	1,198
Innovation Systems	343	—	—
Mission Systems	1,520	1,442	1,468
Technology Services	443	449	456
Intersegment eliminations	(270)	(277)	(258)
Total segment operating income	3,447	2,903	2,864
Net FAS (service)/CAS pension adjustment	613	638	457
Unallocated corporate expense	(277)	(319)	(39)
Other	(3)	(4)	(5)
Total operating income	\$ 3,780	\$ 3,218	\$ 3,277

Net FAS (Service)/CAS Pension Adjustment

For financial statement purposes, we account for our employee pension plans in accordance with FAS. However, the cost of these plans is charged to our contracts in accordance with the FAR and the related CAS. The net FAS (service)/CAS pension adjustment reflects the difference between CAS pension expense included as cost in segment operating income and the service cost component of FAS expense included in total operating income.

Unallocated Corporate Expense

Unallocated corporate expense includes the portion of corporate costs not considered allowable or allocable under applicable CAS or FAR, and therefore not allocated to the segments, such as a portion of management and administration, legal, environmental, compensation, retiree benefits and other corporate unallowable costs. Unallocated corporate expense also includes costs not considered part of management's evaluation of segment operating performance, such as amortization of purchased intangible assets and the additional depreciation expense related to the step-up in fair value of property, plant and equipment acquired through business combinations.

Disaggregation of Revenue

Sales by Customer Type

\$ in millions	Year Ended December 31					
	2018		2017		2016	
	\$	% ⁽³⁾	\$	% ⁽³⁾	\$	% ⁽³⁾
Aerospace Systems						
U.S. Government ⁽¹⁾	\$ 11,380	87%	\$ 10,521	87%	\$ 9,277	86%
International ⁽²⁾	1,371	10%	1,160	10%	1,192	11%
Other Customers	148	1%	155	1%	144	1%
Intersegment sales	197	2%	295	2%	240	2%
Aerospace Systems sales	13,096	100%	12,131	100%	10,853	100%
Innovation Systems						
U.S. Government ⁽¹⁾	2,241	68%	—	—	—	—
International ⁽²⁾	615	19%	—	—	—	—
Other Customers	293	9%	—	—	—	—
Intersegment sales	127	4%	—	—	—	—
Innovation Systems sales	3,276	100%	—	—	—	—
Mission Systems						
U.S. Government ⁽¹⁾	8,803	75%	8,876	77%	8,737	78%
International ⁽²⁾	1,647	14%	1,540	14%	1,416	13%
Other Customers	114	1%	100	1%	133	1%
Intersegment sales	1,145	10%	954	8%	875	8%
Mission Systems sales	11,709	100%	11,470	100%	11,161	100%
Technology Services						
U.S. Government ⁽¹⁾	2,372	55%	2,572	55%	2,722	57%
International ⁽²⁾	801	19%	752	16%	687	15%
Other Customers	310	7%	328	7%	398	8%
Intersegment sales	814	19%	1,035	22%	958	20%
Technology Services sales	4,297	100%	4,687	100%	4,765	100%
Total						
U.S. Government ⁽¹⁾	24,796	82%	21,969	85%	20,736	84%
International ⁽²⁾	4,434	15%	3,452	13%	3,295	13%
Other Customers	865	3%	583	2%	675	3%
Total Sales	\$ 30,095	100%	\$ 26,004	100%	\$ 24,706	100%

⁽¹⁾ Sales to the U.S. government include sales from contracts for which we are the prime contractor, as well as those for which we are a subcontractor and the ultimate customer is the U.S. government. Each of the company's segments derives substantial revenue from the U.S. government.

⁽²⁾ International sales include sales from contracts for which we are the prime contractor, as well as those for which we are a subcontractor and the ultimate customer is an international customer. These sales include foreign military sales contracted through the U.S. government.

⁽³⁾ Percentages calculated based on total segment sales.

Sales by Contract Type

	Year Ended December 31					
	2018		2017		2016	
	\$	% ⁽¹⁾	\$	% ⁽¹⁾	\$	% ⁽¹⁾
<i>\$ in millions</i>						
Aerospace Systems						
Cost-type	\$ 7,634	59%	\$ 7,193	61%	\$ 6,484	61%
Fixed-price	5,265	41%	4,643	39%	4,129	39%
Intersegment sales	197		295		240	
Aerospace System sales	13,096		12,131		10,853	
Innovation Systems						
Cost-type	843	27%	—	—	—	—
Fixed-price	2,306	73%	—	—	—	—
Intersegment sales	127		—		—	
Innovation System sales	3,276		—		—	
Mission Systems						
Cost-type	4,939	47%	5,311	51%	5,200	51%
Fixed-price	5,625	53%	5,205	49%	5,086	49%
Intersegment sales	1,145		954		875	
Mission System sales	11,709		11,470		11,161	
Technology Services						
Cost-type	1,588	46%	1,693	46%	1,770	46%
Fixed-price	1,895	54%	1,959	54%	2,037	54%
Intersegment sales	814		1,035		958	
Technology Services sales	4,297		4,687		4,765	
Total						
Cost-type	15,004	50%	14,197	55%	13,454	54%
Fixed-price	15,091	50%	11,807	45%	11,252	46%
Total Sales	\$ 30,095		\$ 26,004		\$ 24,706	

⁽¹⁾ Percentages calculated based on external customer sales.

Sales by Geographic Region

	Year Ended December 31					
	2018		2017		2016	
	\$	% ⁽²⁾	\$	% ⁽²⁾	\$	% ⁽²⁾
<i>\$ in millions</i>						
Aerospace Systems						
United States	\$ 11,528	89%	\$ 10,676	90%	\$ 9,421	89%
Asia/Pacific	705	6%	649	6%	579	5%
All other ⁽¹⁾	666	5%	511	4%	613	6%
Intersegment sales	197		295		240	
Aerospace Systems sales	13,096		12,131		10,853	
Innovation Systems						
United States	2,534	80%	—	—	—	—
Asia/Pacific	151	5%	—	—	—	—
All other ⁽¹⁾	464	15%	—	—	—	—
Intersegment sales	127		—		—	
Innovation Systems sales	3,276		—		—	
Mission Systems						
United States	8,917	85%	8,976	86%	8,870	86%
Asia/Pacific	659	6%	671	6%	514	5%
All other ⁽¹⁾	988	9%	869	8%	902	9%
Intersegment sales	1,145		954		875	
Mission Systems sales	11,709		11,470		11,161	
Technology Services						
United States	2,682	77%	2,900	79%	3,120	82%
Asia/Pacific	151	4%	141	4%	119	3%
All other ⁽¹⁾	650	19%	611	17%	568	15%
Intersegment sales	814		1,035		958	
Technology Services sales	4,297		4,687		4,765	
Total						
United States	25,661	85%	22,552	87%	21,411	87%
Asia/Pacific	1,666	6%	1,461	5%	1,212	5%
All other ⁽¹⁾	2,768	9%	1,991	8%	2,083	8%
Total Sales	\$ 30,095		\$ 26,004		\$ 24,706	

⁽¹⁾ All other is principally comprised of Europe and the Middle East.

⁽²⁾ Percentages calculated based on external customer sales.

Intersegment Sales and Operating Income

Sales between segments are recorded at values that include intercompany operating income for the performing segment based on that segment's estimated average operating margin rate for external sales. Such intercompany operating income is eliminated in consolidation, so that the company's total sales and total operating income reflect only those transactions with external customers. See Note 1 for additional information.

The following table presents intersegment sales and operating income before eliminations:

\$ in millions	Year Ended December 31					
	2018		2017		2016	
	Sales	Operating Income	Sales	Operating Income	Sales	Operating Income
Intersegment sales and operating income						
Aerospace Systems	\$ 197	\$ 23	\$ 295	\$ 33	\$ 240	\$ 28
Innovation Systems	127	1	—	—	—	—
Mission Systems	1,145	165	954	141	875	136
Technology Services	814	81	1,035	103	958	94
Total	\$ 2,283	\$ 270	\$ 2,284	\$ 277	\$ 2,073	\$ 258

Assets

Substantially all of the company's operating assets are located in the U.S. The following table presents assets by segment:

\$ in millions	December 31	
	2018	2017
Assets		
Aerospace Systems	\$ 9,750	\$ 8,497
Innovation Systems	10,368	—
Mission Systems	11,047	10,389
Technology Services	2,957	3,014
Segment assets	34,122	21,900
Corporate assets ⁽¹⁾	3,531	13,228
Total assets	\$ 37,653	\$ 35,128

⁽¹⁾ Corporate assets principally consist of cash and cash equivalents, property, plant and equipment and marketable securities.

Capital Expenditures and Depreciation and Amortization

The following table presents capital expenditures and depreciation and amortization by segment:

\$ in millions	Year Ended December 31					
	2018			2017		
	2018	2017	2016	2018	2017	2016
	Capital Expenditures			Depreciation and Amortization ⁽¹⁾		
Aerospace Systems	\$ 781	\$ 665	\$ 451	\$ 243	\$ 234	\$ 216
Innovation Systems	141	—	—	84	—	—
Mission Systems	206	164	372	134	131	140
Technology Services	18	15	6	45	40	37
Corporate	103	84	91	294	70	63
Total	\$ 1,249	\$ 928	\$ 920	\$ 800	\$ 475	\$ 456

⁽¹⁾ Beginning in 2018, corporate amounts include the amortization of other purchased intangible assets and the additional depreciation expense related to the step-up in fair value of property, plant and equipment acquired through business combinations as they are not considered part of management's evaluation of segment operating performance.

16. UNAUDITED SELECTED QUARTERLY DATA

Unaudited quarterly financial results are set forth in the following tables. It is legacy Northrop Grumman's long-standing practice to establish actual interim closing dates using a "fiscal" calendar in which we close our books on a Friday near each quarter-end date, in order to normalize the potentially disruptive effects of quarterly closings on business processes. Similarly, Innovation Systems uses a "fiscal" calendar by closing its books on a Sunday near these quarter-end dates and will continue this practice until its business processes are aligned with legacy Northrop Grumman's. This practice is only used at interim periods within a reporting year.

2018*In millions, except per share amounts*

	1st Qtr	2nd Qtr ⁽¹⁾	3rd Qtr ⁽¹⁾	4th Qtr ⁽¹⁾
Sales	\$ 6,735	\$ 7,119	\$ 8,085	\$ 8,156
Operating income	848	817	1,172	943
Net earnings	840	789	1,244	356
Basic earnings per share	4.82	4.52	7.15	2.07
Diluted earnings per share	4.79	4.50	7.11	2.06
Weighted-average common shares outstanding	174.3	174.5	174.1	171.8
Weighted-average diluted shares outstanding	175.4	175.4	174.9	172.6

2018 - Impact of Accounting Change⁽²⁾*In millions, except per share amounts*

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Sales	\$ —	\$ —	\$ —	\$ —
Operating income	(6)	(6)	(6)	23
Net earnings	101	100	100	(394)
Basic earnings per share	0.58	0.57	0.58	(2.29)
Diluted earnings per share	0.58	0.57	0.57	(2.28)

2017*In millions, except per share amounts*

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Sales	\$ 6,410	\$ 6,473	\$ 6,569	\$ 6,552
Operating income	853	864	829	672
Net earnings	770	677	750	672
Basic earnings per share	4.41	3.88	4.31	3.86
Diluted earnings per share	4.37	3.86	4.28	3.83
Weighted-average common shares outstanding	174.8	174.5	174.2	174.2
Weighted-average diluted shares outstanding	176.1	175.5	175.3	175.5

2017 - Impact of Accounting Change⁽²⁾*In millions, except per share amounts*

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr
Sales	\$ —	\$ —	\$ —	\$ —
Operating income	(9)	(9)	(8)	(32)
Net earnings	120	122	107	525
Basic earnings per share	0.69	0.70	0.62	3.01
Diluted earnings per share	0.68	0.70	0.61	2.99

⁽¹⁾ Selected financial data includes the operating results of Innovation Systems subsequent to the Merger date.

⁽²⁾ Table reflects the effects of the Accounting change described in Note 1 on our unaudited selected quarterly financial data.

17. 2018 IMPACT OF ACCOUNTING METHOD CHANGE

The following tables summarize the effects of the Accounting change described in Note 1 on our consolidated statement of earnings and comprehensive income, statement of cash flows and statement of changes in shareholders' equity for the year ended December 31, 2018 and consolidated statement of financial position as of December 31, 2018:

CONSOLIDATED STATEMENT OF EARNINGS AND COMPREHENSIVE INCOME

<i>\$ in millions, except per share amounts</i>	Year Ended December 31, 2018		
	As Computed Under Previous Method	Effect of Accounting Change	As Reported Under New Method
Operating income	\$ 3,775	\$ 5	\$ 3,780
Other (expense) income			
Interest expense	(562)	—	(562)
Net FAS (non-service) pension benefit	514	535	1,049
Mark-to-market pension and OPB expense	—	(655)	(655)
Other, net	132	(2)	130
Earnings before income taxes	3,859	(117)	3,742
Federal and foreign income tax expense	537	(24)	513
Net earnings	\$ 3,322	\$ (93)	\$ 3,229
Basic earnings per share	\$ 19.12	\$ (0.53)	\$ 18.59
Diluted earnings per share	\$ 19.03	\$ (0.54)	\$ 18.49

CONSOLIDATED STATEMENT OF FINANCIAL POSITION

<i>\$ in millions</i>	December 31, 2018		
	As Computed Under Previous Method	Effect of Accounting Change	As Reported Under New Method
Retained earnings	\$ 13,965	\$ (5,897)	\$ 8,068
Accumulated other comprehensive (loss) income	(5,949)	5,897	(52)

CONSOLIDATED STATEMENT OF CASH FLOWS

<i>\$ in millions</i>	December 31, 2018		
	As Computed Under Previous Method	Effect of Accounting Change	As Reported Under New Method
Operating activities			
Net earnings	\$ 3,322	\$ (93)	\$ 3,229
Adjustments to reconcile to net cash provided by operating activities:			
Depreciation and amortization	800	—	800
Mark-to-market pension and OPB expense	—	655	655
Stock-based compensation	86	—	86
Deferred income taxes	263	(29)	234
Changes in assets and liabilities:			
Accounts receivable, net	202	—	202
Unbilled receivables, net	(297)	—	(297)
Inventoried costs, net	(37)	—	(37)
Prepaid expenses and other assets	(56)	—	(56)
Accounts payable and other liabilities	381	—	381
Income taxes payable, net	(258)	—	(258)
Retiree benefits ⁽¹⁾	(550)	(533)	(1,083)
Other, net	(29)	—	(29)
Net cash provided by operating activities	\$ 3,827	\$ —	\$ 3,827

⁽¹⁾ Includes company contributions to our pension and OPB plans as well as net periodic benefit costs, excluding MTM pension and OPB expense, which is presented as a separate non-cash item above.

CONSOLIDATED STATEMENT OF CHANGES IN SHAREHOLDERS' EQUITY

<i>\$ in millions</i>	Year ended December 31, 2018		
	As Computed Under Previous Method	Effect of Accounting Change	As Reported Under New Method
Retained earnings			
Beginning of year	\$ 11,632	\$ (4,719)	\$ 6,913
Impact from adoption of ASU 2018-02 and ASU 2016-01	1,064	(1,085)	(21)
Common stock repurchased	(1,225)	—	(1,225)
Net earnings	3,322	(93)	3,229
Dividends declared	(822)	—	(822)
Stock compensation	(6)	—	(6)
End of year	13,965	(5,897)	8,068
Accumulated other comprehensive (loss) income			
Beginning of year	(4,718)	4,719	1
Impact from adoption of ASU 2018-02 and ASU 2016-01	(1,064)	1,085	21
Other comprehensive loss, net of tax	(167)	93	(74)
End of year	\$ (5,949)	\$ 5,897	\$ (52)

18. RECAST 2017 AND 2016 FINANCIAL INFORMATION

Our prior period consolidated financial statements were recast for the retrospective adoption of ASC Topic 606 and ASU 2017-07 and the Accounting change described in Note 1. The following tables summarize the effects of these changes on our consolidated statements of earnings and comprehensive income, statements of cash flows and statements of changes in shareholders' equity for the years ended December 31, 2017 and 2016 and consolidated statement of financial position as of December 31, 2017.

CONSOLIDATED STATEMENT OF EARNINGS AND COMPREHENSIVE INCOME

	Year Ended December 31, 2017				
	As Previously Reported	Impact of:			As Adjusted
<i>\$ in millions, except per share amounts</i>		ASC Topic 606	ASU 2017-07	Accounting Change	
Sales					
Product	\$ 16,038	\$ 326	\$ —	\$ —	\$ 16,364
Service	9,765	(125)	—	—	9,640
Total sales	25,803	201	—	—	26,004
Operating costs and expenses					
Product	12,271	239	(18)	35	12,527
Service	7,578	(42)	(12)	23	7,547
General and administrative expenses	2,655	57	—	—	2,712
Operating income	3,299	(53)	30	(58)	3,218
Other (expense) income					
Interest expense	(360)	—	—	—	(360)
Net FAS (non-service) pension (expense) income	—	—	(44)	743	699
Mark-to-market pension and OPB benefit	—	—	—	536	536
Other, net	110	—	14	12	136
Earnings before income taxes	3,049	(53)	—	1,233	4,229
Federal and foreign income tax expense (benefit)	1,034	(33)	—	359	1,360
Net earnings	\$ 2,015	\$ (20)	\$ —	\$ 874	\$ 2,869
Basic earnings per share					
	\$ 11.55	\$ (0.11)	\$ —	\$ 5.01	\$ 16.45
Weighted-average common shares outstanding, in millions	174.4	—	—	—	174.4
Diluted earnings per share					
	\$ 11.47	\$ (0.11)	\$ —	\$ 4.98	\$ 16.34
Weighted-average diluted shares outstanding, in millions	175.6	—	—	—	175.6
Net earnings (from above)					
	\$ 2,015	\$ (20)	\$ —	\$ 874	\$ 2,869
Other comprehensive income (loss)					
Change in unamortized benefit plan costs, net of tax expense of \$35	830	—	—	(874)	(44)
Change in cumulative translation adjustment	(4)	—	—	—	(4)
Other, net	2	—	—	—	2
Other comprehensive income (loss), net of tax	828	—	—	(874)	(46)
Comprehensive income	\$ 2,843	\$ (20)	\$ —	\$ —	\$ 2,823

Year Ended December 31, 2016

<i>\$ in millions, except per share amounts</i>	Impact of:				As Adjusted
	As Previously Reported	ASC Topic 606	ASU 2017-07	Accounting Change	
Sales					
Product	\$ 14,738	\$ 342	\$ —	\$ —	\$ 15,080
Service	9,770	(144)	—	—	9,626
Total sales	24,508	198	—	—	24,706
Operating costs and expenses					
Product	11,002	286	(86)	(5)	11,197
Service	7,729	(68)	(58)	(3)	7,600
General and administrative expenses	2,584	48	—	—	2,632
Operating income	3,193	(68)	144	8	3,277
Other (expense) income					
Interest expense	(301)	—	—	—	(301)
Net FAS (non-service) pension (expense) income	—	—	(141)	752	611
Mark-to-market pension and OPB expense	—	—	—	(950)	(950)
Other, net	31	—	(3)	16	44
Earnings before income taxes	2,923	(68)	—	(174)	2,681
Federal and foreign income tax expense (benefit)	723	(24)	—	(61)	638
Net earnings	\$ 2,200	\$ (44)	\$ —	\$ (113)	\$ 2,043
Basic earnings per share					
Basic earnings per share	\$ 12.30	\$ (0.25)	\$ —	\$ (0.63)	\$ 11.42
Weighted-average common shares outstanding, in millions	178.9	—	—	—	178.9
Diluted earnings per share					
Diluted earnings per share	\$ 12.19	\$ (0.24)	\$ —	\$ (0.63)	\$ 11.32
Weighted-average diluted shares outstanding, in millions	180.5	—	—	—	180.5
Net earnings (from above)					
Net earnings	\$ 2,200	\$ (44)	\$ —	\$ (113)	\$ 2,043
Other comprehensive loss					
Change in unamortized benefit plan costs, net of tax expense of \$20	(175)	—	—	113	(62)
Change in cumulative translation adjustment	(50)	—	—	—	(50)
Other, net	(1)	—	—	—	(1)
Other comprehensive loss, net of tax	(226)	—	—	113	(113)
Comprehensive income	\$ 1,974	\$ (44)	\$ —	\$ —	\$ 1,930

CONSOLIDATED STATEMENT OF FINANCIAL POSITION

\$ in millions	December 31, 2017			
	As Previously Reported	Impact of:		As Adjusted
		ASC Topic 606	Accounting Change	
Assets				
Cash and cash equivalents	\$ 11,225	\$ —	\$ —	\$ 11,225
Accounts receivable, net	829	225	—	1,054
Unbilled receivables, net	3,147	318	—	3,465
Inventoried costs, net	780	(382)	—	398
Prepaid expenses and other current assets	368	77	—	445
Total current assets	16,349	238	—	16,587
Property, plant and equipment, net of accumulated depreciation of \$5,066 for 2017	4,225	—	—	4,225
Goodwill	12,455	—	—	12,455
Intangible assets, net	52	—	—	52
Deferred tax assets	475	(28)	—	447
Other non-current assets	1,361	1	—	1,362
Total assets	\$ 34,917	\$ 211	\$ —	\$ 35,128
Liabilities				
Trade accounts payable	\$ 1,661	\$ —	\$ —	\$ 1,661
Accrued employee compensation	1,382	—	—	1,382
Advance payments and amounts in excess of costs incurred	1,617	144	—	1,761
Other current liabilities	2,305	(17)	—	2,288
Total current liabilities	6,965	127	—	7,092
Long-term debt, net of current portion of \$867 for 2017	14,399	—	—	14,399
Pension and OPB plan liabilities	5,511	—	—	5,511
Other non-current liabilities	994	—	—	994
Total liabilities	27,869	127	—	27,996
Commitments and contingencies (Note 12)				
Shareholders' equity				
Preferred stock, \$1 par value; 10,000,000 shares authorized; no shares issued and outstanding	—	—	—	—
Common stock, \$1 par value; 800,000,000 shares authorized; issued and outstanding: 2017—174,085,619	174	—	—	174
Paid-in capital	44	—	—	44
Retained earnings	11,548	84	(4,719)	6,913
Accumulated other comprehensive (loss) income	(4,718)	—	4,719	1
Total shareholders' equity	7,048	84	—	7,132
Total liabilities and shareholders' equity	\$ 34,917	\$ 211	\$ —	\$ 35,128

CONSOLIDATED STATEMENT OF CASH FLOWS

The adoption of ASC Topic 606 and ASU 2017-07 and our Accounting change did not have an impact on our investing or financing cash flows for the years ended December 31, 2017 and 2016.

<i>\$ in millions</i>	Year Ended December 31, 2017			
	As Previously Reported	Impact of:		As Adjusted
		ASC Topic 606	Accounting Change	
Operating activities				
Net earnings	\$ 2,015	\$ (20)	\$ 874	\$ 2,869
Adjustments to reconcile to net cash provided by operating activities:				
Depreciation and amortization	475	—	—	475
Mark-to-market pension and OPB benefit	—	—	(536)	(536)
Stock-based compensation	94	—	—	94
Deferred income taxes	603	(35)	417	985
Changes in assets and liabilities:				
Accounts receivable, net	(187)	(22)	—	(209)
Unbilled receivables, net	(490)	68	—	(422)
Inventoried costs, net	36	(11)	—	25
Prepaid expenses and other assets	(81)	(11)	—	(92)
Accounts payable and other liabilities	539	31	—	570
Income taxes payable, net	(157)	—	—	(157)
Retiree benefits ⁽¹⁾	(191)	—	(755)	(946)
Other, net	(43)	—	—	(43)
Net cash provided by operating activities	\$ 2,613	\$ —	\$ —	\$ 2,613

<i>\$ in millions</i>	Year Ended December 31, 2016			
	As Previously Reported	Impact of:		As Adjusted
		ASC Topic 606	Accounting Change	
Operating activities				
Net earnings	\$ 2,200	\$ (44)	\$ (113)	\$ 2,043
Adjustments to reconcile to net cash provided by operating activities:				
Depreciation and amortization	456	—	—	456
Mark-to-market pension and OPB expense	—	—	950	950
Stock-based compensation	93	—	—	93
Deferred income taxes	36	(27)	(69)	(60)
Changes in assets and liabilities:				
Accounts receivable, net	55	(9)	—	46
Unbilled receivables, net	(516)	305	—	(211)
Inventoried costs, net	(15)	(38)	—	(53)
Prepaid expenses and other assets	(110)	(7)	—	(117)
Accounts payable and other liabilities	198	(180)	—	18
Income taxes payable, net	148	—	—	148
Retiree benefits ⁽¹⁾	393	—	(768)	(375)
Other, net	(125)	—	—	(125)
Net cash provided by operating activities	\$ 2,813	\$ —	\$ —	\$ 2,813

⁽¹⁾ Includes company contributions to our pension and OPB plans as well as net periodic benefit costs, excluding MTM pension and OPB expense, which is presented as a separate non-cash item above.

CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY

The adoption of ASC Topic 606 and ASU 2017-07 and our Accounting change did not have an impact on the changes in common stock and paid-in capital for the years ended December 31, 2017 and 2016.

<i>\$ in millions, except per share amounts</i>	Year Ended December 31, 2017			
	As Previously Reported	Impact of:		As Adjusted
		ASC Topic 606	Accounting Change	
Retained earnings				
Beginning of year	\$ 10,630	\$ 104	\$ (5,593)	\$ 5,141
Common stock repurchased	(371)	—	—	(371)
Net earnings	2,015	(20)	874	2,869
Dividends declared	(687)	—	—	(687)
Stock compensation	(39)	—	—	(39)
End of year	11,548	84	(4,719)	6,913
Accumulated other comprehensive (loss) income				
Beginning of year	(5,546)	—	5,593	47
Other comprehensive income (loss), net of tax	828	—	(874)	(46)
End of year	(4,718)	—	4,719	1
Total shareholders' equity	\$ 7,048	\$ 84	\$ —	\$ 7,132

<i>\$ in millions, except per share amounts</i>	Year Ended December 31, 2016			
	As Previously Reported	Impact of:		As Adjusted
		ASC Topic 606	Accounting Change	
Retained earnings				
Beginning of year	\$ 10,661	\$ 148	\$ (5,480)	\$ 5,329
Common stock repurchased	(1,548)	—	—	(1,548)
Net earnings	2,200	(44)	(113)	2,043
Dividends declared	(633)	—	—	(633)
Stock compensation	(50)	—	—	(50)
End of year	10,630	104	(5,593)	5,141
Accumulated other comprehensive (loss) income				
Beginning of year	(5,320)	—	5,480	160
Other comprehensive income (loss), net of tax	(226)	—	113	(113)
End of year	(5,546)	—	5,593	47
Total shareholders' equity	\$ 5,259	\$ 104	\$ —	\$ 5,363

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None.

Item 9A. Controls and Procedures

DISCLOSURE CONTROLS AND PROCEDURES

Our principal executive officer (Chief Executive Officer and President) and principal financial officer (Corporate Vice President and Chief Financial Officer) have evaluated the company's disclosure controls and procedures (as defined in Rule 13a-15(e) and Rule 15d-15(e) of the Securities Exchange Act of 1934 (the Exchange Act)) as of December 31, 2018, and have concluded that these controls and procedures are effective to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms. These disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed in the reports that we file or submit is accumulated and communicated to management, including the principal executive officer and the principal financial officer, as appropriate to allow timely decisions regarding required disclosure.

CHANGES IN INTERNAL CONTROL OVER FINANCIAL REPORTING

As previously discussed, we completed our acquisition of Orbital ATK during the second quarter of 2018 (see Note 2 to the consolidated financial statements). We are in the process of integrating certain controls and related procedures for legacy Orbital ATK with those of legacy Northrop Grumman. Other than integrating such controls, during the three months ended December 31, 2018, no change occurred in our internal controls over financial reporting that materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

The management of Northrop Grumman Corporation (the company) prepared and is responsible for the consolidated financial statements and all related financial information contained in this Annual Report. This responsibility includes establishing and maintaining effective internal control over financial reporting. The company's internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America.

To comply with the requirements of Section 404 of the Sarbanes–Oxley Act of 2002, the company designed and implemented a structured and comprehensive assessment process to evaluate its internal control over financial reporting across the enterprise. The assessment of the effectiveness of the company's internal control over financial reporting is based on criteria established in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Because of its inherent limitations, a system of internal control over financial reporting can provide only reasonable assurance and may not prevent or detect misstatements. Management regularly monitors its internal control over financial reporting, and actions are taken to correct deficiencies as they are identified. In accordance with SEC rules, management elected to exclude Orbital ATK, acquired on June 6, 2018, from its assessment of the effectiveness of the company's internal control over financial reporting as of December 31, 2018. Orbital ATK, which subsequently became Northrop Grumman Innovation Systems, represents approximately 10 percent of the company's consolidated total assets, excluding the preliminary value of goodwill and purchased intangible assets, as of December 31, 2018 and 10 percent and 10 percent of the company's consolidated sales and operating income, respectively, for the year ended December 31, 2018. Based on its assessment, management has concluded that the company's internal control over financial reporting was effective as of December 31, 2018.

Deloitte & Touche LLP issued an attestation report dated January 30, 2019, concerning the company's internal control over financial reporting, which is contained in this Annual Report. The company's consolidated financial statements as of and for the year ended December 31, 2018, have been audited by the independent registered public accounting firm of Deloitte & Touche LLP in accordance with the standards of the Public Company Accounting Oversight Board (United States).

/s/ Kathy J. Warden
Chief Executive Officer and President

/s/ Kenneth L. Bedingfield
Corporate Vice President and Chief Financial Officer
January 30, 2019

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of
Northrop Grumman Corporation
Falls Church, Virginia

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Northrop Grumman Corporation and subsidiaries (the "Company") as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on the criteria established in *Internal Control - Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2018 of the Company and our report dated January 30, 2019 expressed an unqualified opinion on those financial statements and included an explanatory paragraph concerning the Company's election during 2018 to change its method of accounting for recognizing pension and other postretirement benefit plans actuarial gains and losses as well as the change in the manner in which it accounts for revenue from contracts with customers due to the adoption of the new revenue standard during 2018.

As described in Management's Report on Internal Control over Financial Reporting, management excluded from its assessment the internal control over financial reporting at Orbital ATK, Inc., which was acquired by the Company on June 6, 2018 and subsequently became Northrop Grumman Innovation Systems, and whose financial statements represent approximately 10 percent of the Company's consolidated total assets, excluding the preliminary value of goodwill and purchased intangible assets, as of December 31, 2018, and 10 percent and 10 percent of the Company's consolidated sales and operating income, respectively, for the year ended December 31, 2018. Accordingly, our audit did not include the internal control over financial reporting at Northrop Grumman Innovation Systems.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become

inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche LLP
McLean, Virginia
January 30, 2019

PART III

Item 10. Directors, Executive Officers and Corporate Governance

DIRECTORS

Information about our Directors will be incorporated herein by reference to the Proxy Statement for the 2019 Annual Meeting of Stockholders, to be filed with the Securities and Exchange Commission (SEC) within 120 days after the end of the company's fiscal year.

EXECUTIVE OFFICERS

Our executive officers as of January 30, 2019, are listed below, along with their ages on that date, positions and offices held with the company, and principal occupations and employment, focused primarily on the past five years.

<u>Name</u>	<u>Age</u>	<u>Office Held</u>	<u>Since</u>	<u>Recent Business Experience</u>
Kathy J. Warden	47	Chief Executive Officer and President	2019	President and Chief Operating Officer (2018); Corporate Vice President and President, Mission Systems Sector (2016-2017); Corporate Vice President and President, Former Information Systems Sector (2013-2015)
Wesley G. Bush	57	Chairman	2019	Chairman and Chief Executive Officer (2018); Chairman, Chief Executive Officer and President (2011-2017)
Ann M. Addison	57	Corporate Vice President and Chief Human Resources Officer	2019	Corporate Vice President (2018); Executive Vice President and Chief Human Resources Officer, Leidos (2016-2018); Vice President, Human Resources, Lockheed Martin (2010-2016)
Patrick M. Antkowiak	58	Corporate Vice President and Chief Strategy and Technology Officer	2019	Corporate Vice President and Chief Technology Officer (2014-2019); Vice President and General Manager, Advanced Concepts and Technologies Division, Former Electronic Systems Sector (2010-2014)
Kenneth L. Bedingfield	46	Corporate Vice President and Chief Financial Officer	2015	Vice President, Finance (2014-2015); Vice President, Business Management and Chief Financial Officer, Aerospace Systems Sector (2013-2014)
Mark A. Caylor	54	Corporate Vice President and President, Mission Systems Sector	2018	Corporate Vice President and President, Enterprise Services and Chief Strategy Officer (2014-2017); Corporate Vice President and President, Enterprise Shared Services (2013-2014)
Sheila C. Cheston	60	Corporate Vice President and General Counsel	2010	
Michael A. Hardesty	47	Corporate Vice President, Controller, and Chief Accounting Officer	2013	
Christopher T. Jones	54	Corporate Vice President and President, Technology Services Sector	2016	Corporate Vice President and President, Former Technical Services Sector (2013-2015)

Name	Age	Office Held	Since	Recent Business Experience
Lesley A. Kalan	45	Corporate Vice President, Government Relations	2018	Vice President, Legislative Affairs (2010-2017)
Blake E. Larson	59	Corporate Vice President and President, Innovation Systems Sector	2018	Chief Operating Officer, Orbital ATK, Inc. (2015-2018); Senior Vice President and President, Aerospace Group, Alliant Techsystems, Inc. (2010-2015)
Janis G. Pamiljans	58	Corporate Vice President and President, Aerospace Systems Sector	2017	Vice President and General Manager, Strategic Systems Division, Aerospace Systems Sector (2015-2017); Vice President and General Manager, Unmanned Systems (now Autonomous Systems), Aerospace Systems Sector (2012-2014)
Denise M. Peppard	62	Corporate Vice President	2019	Corporate Vice President and Chief Human Resources Officer (2011-2018)
David T. Perry	54	Corporate Vice President and Chief Global Business Officer	2019	Corporate Vice President and Chief Global Business Development Officer (2012-2019)
Shawn N. Purvis	45	Corporate Vice President and President of Enterprise Services	2018	Vice President and Chief Information Officer (2016-2017); Vice President and General Manager, Cyber Division, Former Information Systems Sector (2014-2016); Vice President and Business Manager, Integrated Intelligence Systems Business Unit, Former Information Systems Sector (2012-2014)
Lucy C. Ryan	45	Corporate Vice President, Communications	2019	Vice President, Enterprise Communications (2018); Director of Communications, General Dynamics (2010-2018)

AUDIT COMMITTEE FINANCIAL EXPERT

The information as to the Audit Committee and the Audit Committee Financial Expert will be incorporated herein by reference to the Proxy Statement for the 2019 Annual Meeting of Shareholders.

CODE OF ETHICS

We have adopted Standards of Business Conduct for all of our employees, including the principal executive officer, principal financial officer and principal accounting officer. The Standards of Business Conduct can be found on our internet website at www.northropgrumman.com under “Investor Relations – Corporate Governance – Overview.” A copy of the Standards of Business Conduct is available to any stockholder who requests it by writing to: Northrop Grumman Corporation, c/o Office of the Secretary, 2980 Fairview Park Drive, Falls Church, VA 22042. We disclose amendments to provisions of our Standards of Business Conduct by posting amendments on our website. Waivers of the provisions of our Standards of Business Conduct that apply to our directors and executive officers are disclosed in a Current Report on Form 8-K.

The website and information contained on it or incorporated in it are not intended to be incorporated in this report on Form 10-K or other filings with the SEC.

OTHER DISCLOSURES

Other disclosures required by this Item will be incorporated herein by reference to the Proxy Statement for the 2019 Annual Meeting of Shareholders.

Item 11. Executive Compensation

Information concerning Executive Compensation, including information concerning Compensation Committee Interlocks and Insider Participation and the Compensation Committee Report, will be incorporated herein by reference to the Proxy Statement for the 2019 Annual Meeting of Shareholders.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

The information as to Securities Authorized for Issuance Under Equity Compensation Plans and Security Ownership of Certain Beneficial Owners and Management will be incorporated herein by reference to the Proxy Statement for the 2019 Annual Meeting of Shareholders.

For a description of securities authorized under our equity compensation plans, see Note 14 to the consolidated financial statements.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information as to Certain Relationships and Related Transactions and Director Independence will be incorporated herein by reference to the Proxy Statement for the 2019 Annual Meeting of Shareholders.

Item 14. Principal Accountant Fees and Services

The information as to Principal Accountant Fees and Services will be incorporated herein by reference to the Proxy Statement for the 2019 Annual Meeting of Shareholders.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) 1. Report of Independent Registered Public Accounting Firm

Financial Statements

[Consolidated Statements of Earnings and Comprehensive Income](#)

[Consolidated Statements of Financial Position](#)

[Consolidated Statements of Cash Flows](#)

[Consolidated Statements of Changes in Shareholders' Equity](#)

[Notes to Consolidated Financial Statements](#)

2. Financial Statement Schedules

All schedules have been omitted because they are not applicable, not required, or the information has been otherwise supplied in the consolidated financial statements or notes to the consolidated financial statements.

3. Exhibits

- 2(a) [Agreement and Plan of Merger among Titan II, Inc. \(formerly Northrop Grumman Corporation\), Northrop Grumman Corporation \(formerly New P, Inc.\) and Titan Merger Sub Inc., dated March 30, 2011 \(incorporated by reference to Exhibit 10.1 to Form 8-K filed April 4, 2011, File No. 001-16411\)](#)
- 2(b) [Separation and Distribution Agreement dated as of March 29, 2011, among Titan II, Inc. \(formerly Northrop Grumman Corporation\), Northrop Grumman Corporation \(formerly New P, Inc.\), Huntington Ingalls Industries, Inc., Northrop Grumman Shipbuilding, Inc. and Northrop Grumman Systems Corporation \(incorporated by reference to Exhibit 10.2 to Form 8-K filed April 4, 2011, File No. 001-16411\)](#)
- 2(c) [Agreement and Plan of Merger dated as of September 17, 2017, among Northrop Grumman Corporation, Neptune Merger, Inc. and Orbital ATK, Inc. \(incorporated by reference to Exhibit 2.1 to Form 8-K filed September 18, 2017\)](#)
- 2(d) [Transaction Agreement dated as of April 28, 2014, among Alliant Techsystems Inc., Vista Spinco Inc., Vista Merger Sub Inc. and Orbital Sciences Corporation \(incorporated by reference to Exhibit 2.1 to Alliant Techsystems Inc. \(now known as Northrop Grumman Innovation Systems, Inc.\) Form 8-K filed May 2, 2014\)](#)
- 3(a) [Amended and Restated Certificate of Incorporation of Northrop Grumman Corporation dated May 29, 2012 \(incorporated by reference to Exhibit 3.1 to Form 10-Q for the quarter ended June 30, 2012, filed July 25, 2012, File No. 001-16411\)](#)
- 3(b) [Amended and Restated Bylaws of Northrop Grumman Corporation dated December 4, 2018 \(incorporated by reference to Exhibit 3.1 to Form 8-K filed December 10, 2018\)](#)
- 4(a) [Registration Rights Agreement dated as of January 23, 2001, by and among Northrop Grumman Corporation \(now Northrop Grumman Systems Corporation\), NNG, Inc. \(now Northrop Grumman Corporation\) and Unitrin, Inc. \(incorporated by reference to Exhibit\(d\)\(6\) to Amendment No. 4 to Schedule TO filed January 31, 2001, File No. 001-3229\)](#)
- 4(b) [Indenture dated as of October 15, 1994, between Northrop Grumman Corporation \(now Northrop Grumman Systems Corporation\) and The Chase Manhattan Bank \(National Association\), Trustee \(incorporated by reference to Exhibit 4.1 to Form 8-K filed October 25, 1994, File No. 001-3229\)](#)
- 4(c) [First Supplemental Indenture dated as of March 30, 2011 by and among Northrop Grumman Systems Corporation, The Bank of New York Mellon \(successor trustee to JPMorgan Chase Bank and The Chase Manhattan Bank, N.A.\), Titan II, Inc. \(formerly known as Northrop Grumman Corporation\), and Titan Holdings II, L.P., to Indenture dated as of October 15, 1994, between Northrop Grumman Corporation \(now Northrop Grumman Systems Corporation\) and The Chase Manhattan Bank, N.A., Trustee \(incorporated by reference to Exhibit 4.1 to Form 10-Q for the quarter ended March 31, 2011, filed April 27, 2011, File No. 001-16411\)](#)

- 4(d) [Second Supplemental Indenture dated as of March 30, 2011 by and among Northrop Grumman Systems Corporation, The Bank of New York Mellon \(successor trustee to JPMorgan Chase Bank and The Chase Manhattan Bank, N.A.\), Titan Holdings II, L.P., and Northrop Grumman Corporation \(formerly known as New P, Inc.\), to Indenture dated as of October 15, 1994, between Northrop Grumman Corporation \(now Northrop Grumman Systems Corporation\) and The Chase Manhattan Bank, N.A., Trustee \(incorporated by reference to Exhibit 4.2 to Form 10-Q for the quarter ended March 31, 2011, filed April 27, 2011, File No. 001-16411\)](#)
- 4(e) [Form of Officers' Certificate \(without exhibits\) establishing the terms of Northrop Grumman Corporation's \(now Northrop Grumman Systems Corporation's\) 7.875% Debentures due 2026 \(incorporated by reference to Exhibit 4.3 to Form S-4 Registration Statement No. 333-02653 filed April 19, 1996\)](#)
- 4(f) [Form of Northrop Grumman Corporation's \(now Northrop Grumman Systems Corporation's\) 7.875% Debentures due 2026 \(incorporated by reference to Exhibit 4.6 to Form S-4 Registration Statement No. 333-02653 filed April 19, 1996\)](#)
- 4(g) [Form of Officers' Certificate establishing the terms of Northrop Grumman Corporation's \(now Northrop Grumman Systems Corporation's\) 7.75% Debentures due 2031 \(incorporated by reference to Exhibit 10.9 to Form 8-K filed April 17, 2001, File No. 001-16411\)](#)
- 4(h) [Senior Indenture dated as of December 15, 1991, between Litton Industries, Inc. \(predecessor-in-interest to Northrop Grumman Systems Corporation\) and The Bank of New York, as trustee, under which its 7.75% and 6.98% debentures due 2026 and 2036 were issued, and specimens of such debentures \(incorporated by reference to Exhibit 4.1 to the Form 10-Q of Litton Industries, Inc. for the quarter ended April 30, 1996, filed June 11, 1996, File No. 001-3998\)](#)
- 4(i) [Supplemental Indenture with respect to Senior Indenture dated December 15, 1991, dated as of April 3, 2001, among Litton Industries, Inc. \(predecessor-in-interest to Northrop Grumman Systems Corporation\), Northrop Grumman Corporation, Northrop Grumman Systems Corporation and The Bank of New York, as trustee \(incorporated by reference to Exhibit 4.7 to Form 10-Q for the quarter ended March 31, 2001, filed May 10, 2001, File No. 001-16411\)](#)
- 4(j) [Supplemental Indenture with respect to Senior Indenture dated December 15, 1991, dated as of December 20, 2002, among Litton Industries, Inc. \(predecessor-in-interest to Northrop Grumman Systems Corporation\), Northrop Grumman Corporation, Northrop Grumman Systems Corporation and The Bank of New York, as trustee \(incorporated by reference to Exhibit 4\(t\) to Form 10-K for the year ended December 31, 2002, filed March 24, 2003, File No. 001-16411\)](#)
- 4(k) [Third Supplemental Indenture dated as of March 30, 2011 by and among Northrop Grumman Systems Corporation \(successor-in-interest to Litton Industries, Inc.\), The Bank of New York Mellon \(formerly known as The Bank of New York\), as trustee, Titan II, Inc. \(formerly known as Northrop Grumman Corporation\), and Titan Holdings II, L.P., to Senior Indenture dated December 15, 1991, between Litton Industries, Inc. and The Bank of New York, as trustee \(incorporated by reference to Exhibit 4.5 to Form 10-Q for the quarter ended March 31, 2011, filed April 27, 2011, File No. 001-16411\)](#)
- 4(l) [Fourth Supplemental Indenture dated as of March 30, 2011 by and among Northrop Grumman Systems Corporation \(successor-in-interest to Litton Industries, Inc.\), The Bank of New York Mellon \(formerly known as The Bank of New York\) as trustee, Titan Holdings II, L.P., and Northrop Grumman Corporation \(formerly known as New P, Inc.\), to Senior Indenture dated December 15, 1991, between Litton Industries, Inc. and The Bank of New York, as trustee \(incorporated by reference to Exhibit 4.6 to Form 10-Q for the quarter ended March 31, 2011, filed April 27, 2011, File No. 001-16411\)](#)
- 4(m) Indenture between TRW Inc. (predecessor-in-interest to Northrop Grumman Systems Corporation) and Mellon Bank, N.A., as trustee, dated as of May 1, 1986 (incorporated by reference to Exhibit 2 to the Form 8-A Registration Statement of TRW Inc. dated July 3, 1986, File No. 001-02384)
- 4(n) First Supplemental Indenture between TRW Inc. (predecessor-in-interest to Northrop Grumman Systems Corporation) and Mellon Bank, N.A., as trustee, dated as of August 24, 1989 (incorporated by reference to Exhibit 4(b) to Form S-3 Registration Statement No. 33-30350 of TRW Inc.)

- 4(o) [Fifth Supplemental Indenture between TRW Inc. \(predecessor-in-interest to Northrop Grumman Systems Corporation\) and The Chase Manhattan Bank, as successor trustee, dated as of June 2, 1999 \(incorporated by reference to Exhibit 4\(f\) to Form S-4 Registration Statement No. 333-83227 of TRW Inc. filed July 20, 1999\)](#)
- 4(p) [Ninth Supplemental Indenture dated as of December 31, 2009 among Northrop Grumman Space & Mission Systems Corp. \(predecessor-in-interest to Northrop Grumman Systems Corporation\); The Bank of New York Mellon, as successor trustee; Northrop Grumman Corporation; and Northrop Grumman Systems Corporation \(incorporated by reference to Exhibit 4\(p\) to Form 10-K for the year ended December 31, 2009, filed February 9, 2010, File No. 001-16411\)](#)
- 4(q) [Tenth Supplemental Indenture dated as of March 30, 2011, by and among Northrop Grumman Systems Corporation \(successor-in-interest to Northrop Grumman Space & Mission Systems Corp. and TRW, Inc.\), The Bank of New York Mellon, as successor trustee to JPMorgan Chase Bank and to Mellon Bank, N.A., Titan II Inc. \(formerly known as Northrop Grumman Corporation\), and Titan Holdings II, L.P., to Indenture between TRW Inc. and Mellon Bank, N.A., as trustee, dated as of May 1, 1986 \(incorporated by reference to Exhibit 4.7 to Form 10-Q for the quarter ended March 31, 2011, filed April 27, 2011, File No. 001-16411\)](#)
- 4(r) [Eleventh Supplemental Indenture dated as of March 30, 2011, by and among Northrop Grumman Systems Corporation \(successor-in-interest to Northrop Grumman Space & Mission Systems Corp. and TRW, Inc.\), The Bank of New York Mellon, as successor trustee to JPMorgan Chase Bank and to Mellon Bank, N.A., Titan Holdings II, L.P., and Northrop Grumman Corporation \(formerly known as New P, Inc.\) to Indenture between TRW Inc. and Mellon Bank, N.A., as trustee, dated as of May 1, 1986 \(incorporated by reference to Exhibit 4.8 to Form 10-Q for the quarter ended March 31, 2011, filed April 27, 2011, File No. 001-16411\)](#)
- 4(s) [Indenture dated as of November 21, 2001, between Northrop Grumman Corporation and JPMorgan Chase Bank, as trustee \(incorporated by reference to Exhibit 4.1 to Form 8-K filed November 21, 2001, File No. 001-16411\)](#)
- 4(t) [First Supplemental Indenture dated as of July 30, 2009, between Northrop Grumman Corporation and The Bank of New York Mellon, as successor trustee, to Indenture dated as of November 21, 2001 \(incorporated by reference to Exhibit 4\(a\) to Form 8-K filed July 30, 2009, File No. 001-16411\)](#)
- 4(u) [Form of Northrop Grumman Corporation's 5.05% Senior Note due 2019 \(incorporated by reference to Exhibit B to Exhibit 4\(a\) to Form 8-K filed July 30, 2009, File No. 001-16411\)](#)
- 4(v) [Second Supplemental Indenture dated as of November 8, 2010, between Northrop Grumman Corporation and The Bank of New York Mellon, as successor trustee, to Indenture dated as of November 21, 2001 \(incorporated by reference to Exhibit 4\(a\) to Form 8-K filed November 8, 2010, File No. 001-16411\)](#)
- 4(w) [Form of Northrop Grumman Corporation's 3.500% Senior Note due 2021 \(incorporated by reference to Exhibit B to Exhibit 4\(a\) to Form 8-K filed November 8, 2010, File No. 001-16411\)](#)
- 4(x) [Form of Northrop Grumman Corporation's 5.050% Senior Note due 2040 \(incorporated by reference to Exhibit C to Exhibit 4\(a\) to Form 8-K filed November 8, 2010, File No. 001-16411\)](#)
- 4(y) [Third Supplemental Indenture dated as of March 30, 2011, by and among Titan II, Inc. \(formerly known as Northrop Grumman Corporation\), The Bank of New York Mellon, as successor trustee to JPMorgan Chase Bank, and Titan Holdings II, L.P., to Indenture dated as of November 21, 2001 between Northrop Grumman Corporation and JPMorgan Chase Bank, as trustee \(incorporated by reference to Exhibit 4.9 to Form 10-Q for the quarter ended March 31, 2011, filed April 27, 2011, File No. 001-16411\)](#)
- 4(z) [Fourth Supplemental Indenture dated as of March 30, 2011, by and among Titan Holdings II, L.P., The Bank of New York Mellon, as successor trustee to JPMorgan Chase Bank, and Northrop Grumman Corporation \(formerly known as New P, Inc.\), to Indenture dated as of November 21, 2001 between Northrop Grumman Corporation and JPMorgan Chase Bank, as trustee \(incorporated by reference to Exhibit 4.10 to Form 10-Q for the quarter ended March 31, 2011, filed April 27, 2011, File No. 001-16411\)](#)

- 4(aa) [Fifth Supplemental Indenture, dated as of May 31, 2013, between Northrop Grumman Corporation and The Bank of New York Mellon, as successor to JPMorgan Chase Bank, Trustee, to Indenture dated as of November 21, 2001 \(incorporated by reference to Exhibit 4\(a\) to Form 8-K filed May 31, 2013, File No. 001-16411\)](#)
- 4(bb) [Form of 3.250% Senior Note due 2023 \(incorporated by reference to Exhibit B to Exhibit 4\(a\) to Form 8-K filed May 31, 2013, File No. 001-16411\)](#)
- 4(cc) [Form of 4.750% Senior Note due 2043 \(incorporated by reference to Exhibit C to Exhibit 4\(a\) to Form 8-K filed May 31, 2013, File No. 001-16411\)](#)
- 4(dd) [Sixth Supplemental Indenture, dated as of February 6, 2015, between Northrop Grumman Corporation and The Bank of New York Mellon, as successor to JPMorgan Chase Bank, Trustee, to Indenture dated as of November 21, 2001 \(incorporated by reference to Exhibit 4.1 to Form 8-K filed February 6, 2015\)](#)
- 4(ee) [Form of 3.850% Senior Note due 2045 \(incorporated by reference to Exhibit A to Exhibit 4.1 to Form 8-K filed February 6, 2015\)](#)
- 4(ff) [Seventh Supplemental Indenture, dated as of December 1, 2016, between Northrop Grumman Corporation and The Bank of New York Mellon, as successor to JPMorgan Chase Bank, Trustee, to Indenture dated as of November 21, 2001 \(incorporated by reference to Exhibit 4.1 to Form 8-K filed December 1, 2016\)](#)
- 4(gg) [Form of 3.200% Senior Note due 2027 \(incorporated by reference to Exhibit A to Exhibit 4.1 to Form 8-K filed December 1, 2016\)](#)
- 4(hh) [Eighth Supplemental Indenture, dated as of October 13, 2017, between Northrop Grumman Corporation and The Bank of New York Mellon, as successor to JPMorgan Chase Bank, Trustee, to Indenture dated as of November 21, 2001 \(incorporated by reference to Exhibit 4.1 to Form 8-K filed October 13, 2017\)](#)
- 4(ii) [Form of 2.080% Senior Note due 2020 \(incorporated by reference to Exhibit A to Exhibit 4.1 to Form 8-K filed October 13, 2017\)](#)
- 4(jj) [Form of 2.550% Senior Note due 2022 \(incorporated by reference to Exhibit B to Exhibit 4.1 to Form 8-K filed October 13, 2017\)](#)
- 4(kk) [Form of 2.930% Senior Note due 2025 \(incorporated by reference to Exhibit C to Exhibit 4.1 to Form 8-K filed October 13, 2017\)](#)
- 4(ll) [Form of 3.250% Senior Note due 2028 \(incorporated by reference to Exhibit D to Exhibit 4.1 to Form 8-K filed October 13, 2017\)](#)
- 4(mm) [Form of 4.030% Senior Note due 2047 \(incorporated by reference to Exhibit E to Exhibit 4.1 to Form 8-K filed October 13, 2017\)](#)
- 10(a) [Credit Agreement, dated as of August 17, 2018, among Northrop Grumman Corporation, as Borrower; Northrop Grumman Systems Corporation, as Guarantor; the lenders party thereto and JPMorgan Chase Bank, N.A., as Administrative Agent \(incorporated by reference to Exhibit 10.1 to Form 8-K filed August 17, 2018\)](#)
- 10(b) [Form of Guarantee dated as of April 3, 2001, by Northrop Grumman Corporation of the indenture indebtedness issued by Litton Industries, Inc. \(predecessor-in-interest to Northrop Grumman Systems Corporation\) \(incorporated by reference to Exhibit 10.10 to Form 8-K filed April 17, 2001, File No. 001-16411\)](#)
- 10(c) [Form of Guarantee dated as of April 3, 2001, by Northrop Grumman Corporation of Northrop Grumman Systems Corporation indenture indebtedness \(incorporated by reference to Exhibit 10.11 to Form 8-K and filed April 17, 2001, File No. 001-16411\)](#)

- 10(d) [Form of Guarantee dated as of March 27, 2003, by Northrop Grumman Corporation, as Guarantor, in favor of JP Morgan Chase Bank, as trustee, of certain debt securities issued by the former Northrop Grumman Space & Mission Systems Corp. \(predecessor-in-interest to Northrop Grumman Systems Corporation\), \(incorporated by reference to Exhibit 4.2 to Form 10-Q for the quarter ended March 31, 2003, filed May 14, 2003, File No. 001-16411\)](#)
- +10(e) [Northrop Grumman Corporation 1993 Stock Plan for Non-Employee Directors \(as Amended and Restated January 1, 2010\), \(incorporated by reference to Exhibit 10.1 to Form 10-Q for the quarter ended June 30, 2009, filed July 23, 2009, File No. 001-16411\)](#)
- +10(f) [Northrop Grumman Corporation Non-Employee Directors Equity Participation Plan \(Amended and Restated January 1, 2008\), \(incorporated by reference to Exhibit 10\(q\) to Form 10-K for the year ended December 31, 2007, filed February 20, 2008, File No. 001-16411\)](#)
- +10(g) [Amended and Restated 2011 Long-Term Incentive Stock Plan \(as amended and restated effective as of May 20, 2015\) \(incorporated by reference to Appendix B to the Company's Proxy Statement on Schedule 14A for the 2015 Annual Meeting of Shareholders filed April 6, 2015\)](#)
- (i) [Northrop Grumman Corporation Equity Grant Program for Non-Employee Directors under the Northrop Grumman 2011 Long-Term Incentive Stock Plan, Amended and Restated Effective as of January 1, 2016 \(incorporated by reference to Exhibit 10.1 to Form 10-Q for the quarter ended September 30, 2015, filed October 28, 2015\)](#)
- (ii) [Grant Certificate Specifying the Terms and Conditions Applicable to 2016 Restricted Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.1 to Form 10-Q for the quarter ended March 31, 2016 filed April 27, 2016\)](#)
- (iii) [Grant Certificate Specifying the Terms and Conditions Applicable to 2016 Restricted Performance Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.2 to Form 10-Q for the quarter ended March 31, 2016 filed April 27, 2016\)](#)
- (iv) [Grant Certificate Specifying the Terms and Conditions Applicable to 2016 Restricted Performance Stock Rights Granted to Janis G. Pamiljans Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10\(h\)\(iv\) to Form 10-K for the year ended December 31, 2017, filed January 29, 2018\)](#)
- (v) [Grant Certificate Specifying the Terms and Conditions Applicable to 2016 Restricted Stock Rights Granted to Janis G. Pamiljans Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10\(h\)\(v\) to Form 10-K for the year ended December 31, 2017, filed January 29, 2018\)](#)
- (vi) [Grant Certificate Specifying the Terms and Conditions Applicable to Special 2016 Restricted Stock Rights Granted to Janis G. Pamiljans Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10\(h\)\(vi\) to Form 10-K for the year ended December 31, 2017, filed January 29, 2018\)](#)
- (vii) [Grant Certificate Specifying the Terms and Conditions Applicable to 2017 Restricted Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.1 to Form 10-Q for the quarter ended March 31, 2017, filed April 26, 2017\)](#)
- (viii) [Grant Certificate Specifying the Terms and Conditions Applicable to 2017 Restricted Performance Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.2 to Form 10-Q for the quarter ended March 31, 2017, filed April 26, 2017\)](#)
- (ix) [Grant Certificate Specifying the Terms and Conditions Applicable to 2017 Restricted Stock Rights Granted to Janis G. Pamiljans Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.2 to Form 10-Q for the quarter ended June 30, 2017, filed July 26, 2017\)](#)

- (x) [Grant Certificate Specifying the Terms and Conditions Applicable to 2018 Restricted Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.1 to Form 10-Q for the quarter ended March 31, 2018, filed April 25, 2018\)](#)
 - (xi) [Grant Certificate Specifying the Terms and Conditions Applicable to 2018 Restricted Performance Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.2 to Form 10-Q for the quarter ended March 31, 2018, filed April 25, 2018\)](#)
 - (xii) [Grant Certificate Specifying the Terms and Conditions Applicable to Special 2018 Restricted Stock Rights Granted to Blake Larson Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.2 to Form 10-Q for the quarter ended June 30, 2018, filed July 25, 2018\)](#)
 - (xiii) [Modified Terms and Conditions Applicable to 2017 Restricted Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.3 to Form 8-K filed September 21, 2018\)](#)
 - (xiv) [Modified Terms and Conditions Applicable to 2017 Restricted Performance Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.4 to Form 8-K filed September 21, 2018\)](#)
 - (xv) [Modified Terms and Conditions Applicable to 2018 Restricted Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.1 to Form 8-K filed September 21, 2018\)](#)
 - (xvi) [Modified Terms and Conditions Applicable to 2018 Restricted Performance Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.2 to Form 8-K filed September 21, 2018\)](#)
 - *(xvii) [Grant Certificate Specifying the Terms and Conditions Applicable to 2018 Restricted Stock Rights Granted to Mark Caylor Under the 2011 Long-Term Incentive Stock Plan](#)
- +10(h) [Northrop Grumman 2011 Long-Term Incentive Stock Plan \(As Amended Through December 4, 2014\) \(incorporated by reference to Exhibit 10\(h\) to Form 10-K for the year ended December 31, 2014, filed February 2, 2015\)](#)
- (i) [Summary of Non-Employee Director Award Terms Under the 2011 Long-Term Incentive Stock Plan effective December 21, 2011 \(incorporated by reference to Exhibit 10\(j\)\(ii\) to Form 10-K for the year ended December 31, 2011, filed February 8, 2012, File No. 001-16411\)](#)
 - (ii) [Northrop Grumman Corporation Equity Grant Program for Non-Employee Directors under the Northrop Grumman 2011 Long-Term Incentive Stock Plan, Amended and Restated Effective January 1, 2015 \(incorporated by reference to Exhibit 10\(h\)\(ii\) to Form 10-K for the year ended December 31, 2014, filed February 2, 2015\)](#)
 - (iii) [Grant Certificate Specifying the Terms and Conditions Applicable to 2015 Restricted Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.1 to Form 8-K filed February 20, 2015\)](#)
 - (iv) [Grant Certificate Specifying the Terms and Conditions Applicable to 2015 Restricted Performance Stock Rights Granted Under the 2011 Long-Term Incentive Stock Plan \(incorporated by reference to Exhibit 10.2 to Form 8-K filed February 20, 2015\)](#)
- +10(i) [Northrop Grumman Supplemental Plan 2 \(Amended and Restated Effective as of January 1, 2014\) \(incorporated by reference to Exhibit 10\(l\) to Form 10-K for the year ended December 31, 2013, Filed February 3, 2014\)](#)

- (i) [Appendix B to the Northrop Grumman Supplemental Plan 2: ERISA Supplemental Program 2 \(Amended and Restated Effective as of January 1, 2014\) \(incorporated by reference to Exhibit 10\(l\)\(i\) to Form 10-K for the year ended December 31, 2013, filed February 3, 2014\)](#)
 - (ii) [Appendix G to the Northrop Grumman Supplemental Plan 2: Officers Supplemental Executive Retirement Program \(Amended and Restated Effective as of January 1, 2012\) \(incorporated by reference to Exhibit 10\(k\)\(iv\) to Form 10-K for the year ended December 31, 2011, filed February 8, 2012, File No. 001-16411\)](#)
 - (iii) [Appendix I to the Northrop Grumman Supplemental Plan 2: Officers Supplemental Executive Retirement Program II \(Amended and Restated January 1, 2014\) \(incorporated by reference to Exhibit 10\(k\)\(iv\) to Form 10-K for the year ended December 31, 2015, filed February 1, 2016\)](#)
 - (iv) [First Amendment to the Northrop Grumman Supplemental Plan 2, dated December 20, 2017 \(Effective as of December 31, 2017\) \(incorporated by reference to Exhibit 10\(j\)\(v\) to Form 10-K for the year ended December 31, 2017, filed January 29, 2018\)](#)
- +10(j) [Northrop Grumman Supplementary Retirement Income Plan \(formerly TRW Supplementary Retirement Income Plan\) \(Amended and Restated Effective January 1, 2014\) \(incorporated by reference to Exhibit 10\(m\) to Form 10-K for the year ended December 31, 2013, filed February 3, 2014\)](#)
- +*10(k) [Severance Plan for Elected and Appointed Officers of Northrop Grumman Corporation \(Amended and Restated Effective January 1, 2019\)](#)
- +10(l) [Non-Employee Director Compensation Term Sheet, effective May 17, 2017 \(incorporated by reference to Exhibit 10.1 to Form 10-Q for the quarter ended June 30, 2017, filed July 26, 2017\)](#)
- +10(m) [Non-Employee Director Compensation Term Sheet, effective May 16, 2018 \(incorporated by reference to Exhibit 10.1 to Form 10-Q for the quarter ended June 30, 2018, filed July 25, 2018\)](#)
- +10(n) [Form of Indemnification Agreement between Northrop Grumman Corporation and its directors and executive officers \(incorporated by reference to Exhibit 10.3 to Form 10-Q for the quarter ended March 31, 2012, filed April 25, 2012, File No. 001-16411\)](#)
- +10(o) [Northrop Grumman Deferred Compensation Plan \(Amended and Restated Effective as of April 1, 2016\) \(incorporated by reference to Exhibit 10.3 to Form 10-Q for the quarter ended March 31, 2016, filed April 27, 2016\)](#)
- +10(p) [The 2002 Incentive Compensation Plan of Northrop Grumman Corporation, As Amended and Restated effective January 1, 2009 \(incorporated by reference to Exhibit 10.6 to Form 10-Q for the quarter ended March 31, 2009, filed April 22, 2009, File No. 001-16411\)](#)
- +10(q) [Northrop Grumman 2006 Annual Incentive Plan and Incentive Compensation Plan \(for Non-Section 162\(m\) Officers\), as amended and restated effective January 1, 2009 \(incorporated by reference to Exhibit 10.7 to Form 10-Q for the quarter ended March 31, 2009, filed April 22, 2009, File No. 001-16411\)](#)
- +*10(r) [Northrop Grumman Innovation Systems Nonqualified Deferred Compensation Plan, as amended and restated January 1, 2019](#)
- +10(s) [Trust Agreement for Alliant Techsystems Inc. Nonqualified Deferred Compensation Plan effective January 1, 2003 \(incorporated by reference to Exhibit 10.9.2 to Alliant Techsystems, Inc. \(now known as Northrop Grumman Innovation Systems, Inc.\) Form 10-K for the year ended March 31, 2003 filed June 18, 2003, File No. 001-10582\)](#)
- (i) [First Amendment to the Trust Agreement for Alliant Techsystems Inc. Nonqualified Deferred Compensation Plan, dated January 28, 2013 \(incorporated by reference to Exhibit 10.12 to Form 10-Q for the quarter ended June 30, 2018, filed July 25, 2018\)](#)

- +10(t) [Orbital ATK, Inc. Executive Officer Incentive Plan \(as of May 4, 2016\) \(incorporated by reference to Exhibit 10.1 to Orbital ATK, Inc. \(now known as Northrop Grumman Innovation Systems, Inc.\) Form 8-K filed May 5, 2016\)](#)
- +*10(u) [Northrop Grumman Savings Excess Plan \(Amended and Restated Effective as of January 1, 2019\)](#)
- +*10(v) [Northrop Grumman Officers Retirement Account Contribution Plan \(Amended and Restated Effective as of January 1, 2019\)](#)
- +*10(w) [Northrop Grumman Corporation Special Officer Retiree Medical Plan \(Amended and Restated Effective October 1, 2018\)](#)
- +*10(x) [Northrop Grumman Innovation Systems Defined Benefit Supplemental Executive Retirement Plan, as amended and restated effective January 1, 2019](#)
- +*10(y) [Northrop Grumman Innovation Systems Defined Contribution Supplemental Executive Retirement Plan, as amended and restated effective January 1, 2019](#)
- +10(z) [Executive Basic Life Insurance Policy \(Certificate No. 46\) dated July 1, 2013 \(incorporated by reference to Exhibit 10\(w\) to Form 10-K for the year ended December 31, 2017, filed January 29, 2018\)](#)
- (i) [Amendment to Executive Life Insurance Policy effective July 1, 2016 \(incorporated by reference to Exhibit 10\(w\)\(i\) to Form 10-K for the year ended December 31, 2017, filed January 29, 2018\)](#)
- +10(aa) [Executive Accidental Death, Dismemberment and Plegia Insurance Policy Terms applicable to Executive Officers dated January 1, 2009 \(incorporated by reference to Exhibit 10.3 to Form 10-Q for the quarter ended March 31, 2009, filed April 22, 2009, File No. 001-16411\)](#)
- (i) [Amendment to Executive Accidental Death, Dismemberment and Plegia Insurance Policy Terms dated April 9, 2009 \(incorporated by reference to Exhibit 10\(x\)\(i\) to Form 10-K for the year ended December 31, 2017, filed January 29, 2018\)](#)
- +10(bb) [Executive Long-Term Disability Insurance Policy as amended by Amendment No. 7 dated December 29, 2016 and effective as of January 1, 2017 \(incorporated by reference to Exhibit 10\(y\) to Form 10-K for the year ended December 31, 2017, filed January 29, 2018\)](#)
- +10(cc) [Executive Supplemental Individual Disability Insurance Plan dated June 30, 2014 \(incorporated by reference to Exhibit 10\(z\) to Form 10-K for the year ended December 31, 2017, filed January 29, 2018\)](#)
- +*10(dd) [Group Personal Excess Liability Policy dated October 20, 2016 and effective as of January 1, 2018](#)
- +10(ee) [Letter dated December 16, 2009 from Northrop Grumman Corporation to Wesley G. Bush regarding compensation effective January 1, 2010 \(incorporated by reference to Exhibit 10.2 to Form 8-K filed December 21, 2009, File No. 001-16411\)](#)
- +10(ff) [Relocation Agreement between Northrop Grumman Systems Corporation and Janis G. Pamiljans dated March 8, 2017 \(incorporated by reference to Exhibit 10\(gg\) to Form 10-K for the year ended December 31, 2017, filed January 29, 2018\)](#)
- +10(gg) [Letter dated January 10, 2018 from Northrop Grumman Corporation to Blake Larson regarding compensation effective June 6, 2018 \(incorporated by reference to Exhibit 10.3 to Form 10-Q for quarter ended June 30, 2018, filed July 25, 2018\)](#)
- *18 [Preferability Letter of Independent Registered Public Accounting Firm dated January 30, 2019](#)
- *21 [Subsidiaries](#)

- *23 [Consent of Independent Registered Public Accounting Firm](#)
- *24 [Power of Attorney](#)
- *31.1 [Certification of Kathy J. Warden pursuant to Section 302 of the Sarbanes-Oxley Act of 2002](#)
- *31.2 [Certification of Kenneth L. Bedingfield pursuant to Section 302 of the Sarbanes-Oxley Act of 2002](#)
- **32.1 [Certification of Kathy J. Warden pursuant to Section 906 of the Sarbanes-Oxley Act of 2002](#)
- **32.2 [Certification of Kenneth L. Bedingfield pursuant to Section 906 of the Sarbanes-Oxley Act of 2002](#)
- *101 Northrop Grumman Corporation Annual Report on Form 10-K for the fiscal year ended December 31, 2018, formatted in XBRL (Extensible Business Reporting Language); (i) the Consolidated Statements of Earnings and Comprehensive Income, (ii) Consolidated Statements of Financial Position, (iii) Consolidated Statements of Cash Flows, (iv) Consolidated Statements of Changes in Shareholders' Equity, and (v) Notes to Consolidated Financial Statements
- + Management contract or compensatory plan or arrangement
- * Filed with this Report
- ** Furnished with this Report

Item 16. Form 10-K Summary

None.

Group Personal Excess Liability Policy

CHUBB®

Coverage Summary

Chubb Group of Insurance Companies
PO BOX 1600,
Whitehouse Station, NJ 08889-1600

Name and address of Insured *Policy Number: (19) 7993-14-03*
 NORTHROP GRUMMAN CORPORATION
 GROUP PERSONAL EXCESS PROGRAM
 2980 FAIRVIEW PARK DRIVE
 FALLS CHURCH, VIRGINIA 22042

Issued by the stock insurance company
indicated below, herein called the company.
FEDERAL INSURANCE COMPANY
Incorporated under the laws of INDIANA

Producer No.: 0017806
Sponsoring Organization and Address
 Northrop Grumman Corporation
 2980 Fairview Park Drive
 Falls Church, VA 22042

Policy Period

From: JANUARY 01, 2018 To: JANUARY 01, 2019
 12:01 A.M. Standard Time at the Named Insured's mailing address.

Premium

Amount
 \$146,454.00

Limit Of Liability

SEE ENDT Each Occurrence
 SEE ENDT Excess Uninsured / Underinsured
 Motorists Protection Each Occurrence

Required Primary Underlying Insurance

Personal Liability (Homeowners) for personal injury and property damage in the minimum amount of \$100,000 each occurrence.
 Registered vehicles in the minimum amount of \$250,000 / \$500,000 bodily injury and \$100,000 property damage; or \$300,000 single limit each occurrence.

Group Personal Excess Liability Policy continued

Form 10-02-0690 (Rev. 8-07) Declarations Page 1

Required Primary Underlying Insurance

(continued)

Unregistered vehicles in the minimum amount of \$300,000 bodily injury and property damage each occurrence.

Registered vehicles with less than four wheels and motorhomes in the minimum amount \$250,000 / \$500,000 bodily injury and \$100,000 property damage; or \$300,000 single limit each occurrence.

Watercraft less than 26 feet and 50 engine rated horsepower or less for bodily and property damage in the minimum amount of \$300,000 each occurrence.

Watercraft 26 feet or longer or more than 50 engine rated horsepower for bodily injury and property damage in the minimum amount of \$500,000 each occurrence.

Uninsured motorists/underinsured motorists protection in the minimum amount of \$250,000 / \$500,000 bodily injury and \$100,000 property damage; or \$300,000 single limit occurrence.

FAILURE TO COMPLY WITH THE REQUIRED PRIMARY UNDERLYING INSURANCE WILL RESULT IN A GAP IN COVERAGE.

Group Personal Excess Liability Policy

CHUBB

Coverage Summary

Effective Date JANUARY 01, 2018

Policy Number 7993-14-03

Authorization

In Witness Whereof, the company issuing this policy has caused this policy to be signed by its authorized officers and signed by a duly authorized representative of the company.

FEDERAL INSURANCE COMPANY

President  Secretary  Date 



JANUAY 08, 2018

Authorized Representative

Producer's Name & Address

MARSH USA, INC (PHILADELPHIA) 1717 ARCH STREET
PHILADELPHIA, PA 19103-0000

Chubb. Insured™

Policy Number:(19) 7993-14-03

Insured:NORTHROP GRUMMAN CORPORATION

GROUP PERSONAL EXCESS PROGRAM

Policy Period From: JANUARY 01, 2018 to JANUARY 01, 2019

The following is a schedule of forms issued with the policy at inception:

Form Name	Form Number	
PRIVACY NOTICE - GROUP MASTER POLICY	10-02-1058	(10/16)
IMPORTANT NOTICE - OFAC	99-10-0796	(09/04)
COVERAGE SUMMARY/DECLARATIONS	10-02-0690	(08/07)
GROUP PERSONAL EXCESS - CONTRACT/POLICY TERMS	10-02-0691	(08/07)
NAMED INSURED ENDORSEMENT	10-02-0692	(08/96)
UNDERLYING LIMITS ENDORSEMENT	10-02-0692	(08/96)
ANNUAL PREMIUM ADJUSTMENT CLAUSE	10-02-0692	(08/96)

***GROUP PERSONAL EXCESS
LIABILITY
POLICY***

GROUP PERSONAL EXCESS LIABILITY POLICY



INTRODUCTION

This is your Chubb Group Personal Excess Liability Policy. Together with your Coverage Summary, it explains your coverages and other conditions of your insurance in detail.

This policy is a contract between you and us. **READ YOUR POLICY CAREFULLY** and keep it in a safe place.

Agreement

We agree to provide the insurance described in this policy in return for the premium paid by you or the Sponsoring Organization and your compliance with the policy conditions.

Definitions

In this policy, we use words in their plain English meaning. Words with special meanings are defined in the part of the policy where they are used. The few defined terms used throughout the policy are defined here:

You means the individual who is a member of the Defined Group shown as the Insured named in the Coverage Summary.

We and us mean the insurance company named in the Coverage Summary.

Family member means your spouse or domestic partner or other relative who lives with you, or any other person under 25 in your care or your relative's care who lives with you.

Domestic partner means a person in a legal or personal relationship with you, who lives with you and shares a common domestic life with you, and meeting all of the benefits eligibility criteria as defined by the Sponsoring Organization.

Sponsoring Organization means the entity, corporation, partnership or sole proprietorship sponsoring and defining the criteria for qualification as an Insured.

Policy means your entire Group Personal Excess Liability Policy, including the Coverage Summary.

Coverage Summary means the most recent Coverage Summary we issued to you, including any endorsements.

Occurrence means an accident or offense to which this insurance applies and which begins within the policy period. Continuous or repeated exposure to substantially the same general conditions unless excluded is considered to be one occurrence.

Business means any employment, trade, occupation, profession, or farm operation including the raising or care of animals.

Defined Group means those individuals meeting the criteria for qualification as an Insured as defined by the Sponsoring Organization and accepted by us.

Follow form means we cover damages to the extent they are both covered under the Required Primary Underlying Insurance and, not excluded under this policy. Also, the amount of coverage, defense coverages, cancellation and "other insurance" provisions of this policy supersede and replace the similar provisions contained in such other policies. When this policy is called upon to pay losses in excess of required primary underlying policies exhausted by payment of claims, **we** do not provide broader coverage than provided by such policies. When no primary underlying coverage exists, the extent of coverage provided on a follow form basis will be determined as if the required primary underlying insurance had been purchased from us.

Covered person means:

- you or a family member;
- any person using a vehicle or watercraft covered under this policy with permission from you or a family member with respect to their legal responsibility arising out of its use;

- any other person who is a covered person under your Required Primary Underlying Insurance;
- any person or organization with respect to their legal responsibility for covered acts or omissions of you or a family member; or
- any combination of the above.

Damages mean the sum that is paid or is payable to satisfy a claim settled by us or resolved by judicial procedure or by a compromise we agree to in writing.

Personal injury means the following injuries, and resulting death:

- bodily injury;
- shock, mental anguish, or mental injury;
- false arrest, false imprisonment, or wrongful detention;
- wrongful entry or eviction;
- malicious prosecution or humiliation; and
- libel, slander, defamation of character, or invasion of privacy.

Bodily injury means physical bodily harm, including sickness or disease that results from it, and required care, loss of services and resulting death.

Property damage means physical injury to or destruction of tangible property and the resulting loss of its use. Tangible property includes the cost of recreating or replacing stocks, bonds, deeds, mortgages, bank deposits, and similar instruments, but does not include the value represented by such instruments. Tangible property does not include the cost of recreating or replacing any software, data or other information that is in electronic form.

Registered vehicle means any motorized land vehicle not described in "unregistered vehicle."

Unregistered vehicle means:

- any motorized land vehicle not designed for or required to be registered for use on public roads;
- any motorized land vehicle which is in dead storage at your residence;
- any motorized land vehicle used solely on and to service your residence premises;
- any motorized land vehicle used to assist the disabled that is not designed for or required to be registered for use on public roads; or
- golf carts.

GROUP PERSONAL EXCESS LIABILITY COVERAGE

This part of your Group Personal Excess Liability Policy provides you or a family member with liability coverage in excess of your underlying insurance anywhere in the world unless stated otherwise or an exclusion applies.

Payment for a Loss

Amount of coverage

The amount of coverage for liability is shown in the Coverage Summary. We will pay on your behalf up to that amount for covered damages from any one occurrence, regardless of how many claims, homes, vehicles, watercraft, or people are involved in the occurrence.

Any costs we pay for legal expenses (see **Defense coverages**) are in addition to the amount of coverage.

Underlying Insurance

We will pay only for covered damages in excess of all underlying insurance covering those damages, even if the underlying coverage is for more than the minimum amount

"Underlying insurance" includes all liability coverage that applies to the covered damages, except for other insurance purchased in excess of this policy.

Required primary underlying Insurance

Regardless of whatever other primary underlying insurance may be available in the event of a claim or loss, it is a condition of your policy that you and your family members must maintain in full effect primary underlying liability insurance of the types and in at least the amounts set forth below unless a different amount is shown in your coverage Summary, covering your personal liability and to the extent you or a family member have such liability exposures, all vehicles and watercraft you or your family members own, or rent for longer than 60 days, or have furnished for longer than 60 days, as follows:

Personal liability (homeowners) for personal injury and property damage in the minimum amount of \$300,000 each occurrence.

Registered vehicles in the minimum amount of:

- \$250,000/\$500,000 bodily injury and \$100,000 property damage;
- \$300,000/\$300,000 bodily injury and \$100,000 property damage; or
- \$300,000 single limit each occurrence.

Unregistered vehicles in the minimum amount of \$300,000 bodily injury and property damage each occurrence. Registered vehicles with less than four wheels and motorhomes in the minimum amount of:

- \$250,000/\$500,000 bodily injury and \$100,000 property damage;
- \$300,000/\$300,000 bodily injury and \$100,000 property damage; or
- \$300,000 single limit each occurrence.

Watercraft less than 26 feet and 50 engine rated horsepower or less for bodily injury and property damage in the minimum amount of \$300,000 each occurrence.

Watercraft 26 feet or longer or more than 50 engine rated horsepower for bodily injury and property damage in the minimum amount of \$500,000 each occurrence.

Uninsured motorists/underinsured motorist protection in the minimum amounts of:

- \$250,000/\$500,000 bodily injury and \$100,000 property damage;
- \$300,000/\$300,000 bodily injury and \$100,000 property damage; or
- \$300,000 single limit each occurrence.

With respect to you and your family members residing outside of the United States, the required primary underlying insurance limits of liability shall be the same limits of liability as shown above, unless you and your family members reside in a country where the minimum required primary underlying insurance limits of liability are not available. In these countries, you and your family members must maintain in full effect primary underlying liability insurance limits equal to the maximum limits of liability available in that country for all coverages up to the minimum required primary underlying limits shown in the Coverage Summary under Required Primary Underlying Insurance.

Failure by you or your family members to comply with this condition, or failure of any of your primary underlying insurers due to insolvency or bankruptcy, shall not invalidate this policy. In the event of any such failure, we shall only be liable in

excess of the foregoing minimum amounts and to no greater extent with respect to coverages, amounts and defense costs than we would have been had this failure not occurred.

You must also give notice of losses and otherwise cooperate and comply with the terms and conditions of such primary underlying insurance.

Excess Liability Coverage

We cover damages a covered person is legally obligated to pay for personal injury or property damage, caused by an occurrence:

- in excess of damages covered by the underlying insurance; or
- from the first dollar of damage where no underlying insurance is required under this policy and no underlying insurance exists; or
- from the first dollar of damage where underlying insurance is required under this policy but no coverage is provided by the underlying insurance for a particular occurrence

unless stated otherwise or an exclusion applies. Exclusions to this coverage are described in **Exclusions**.

Excess uninsured motorists/underinsured motorist protection

This coverage is in effect only if excess uninsured motorists/underinsured motorists protection is shown in the Coverage Summary.

We cover damages for bodily injury and property damage a covered person is legally entitled to receive from the owner or operator of an uninsured motorized/underinsured motorized land vehicle. We cover these damages in excess of the underlying insurance or the Required Primary Underlying Insurance, whichever is greater, if they are caused by an occurrence during the policy period, unless otherwise stated.

Amount of coverage. The maximum amount of excess uninsured motorists/underinsured motorists protection available for any one occurrence is the excess uninsured motorists/underinsured motorists protection amount shown in the Coverage Summary regardless of the number of vehicles covered by the Required Primary Underlying Insurance. We will not pay more than this amount in any one occurrence for covered damages regardless of how many claims, vehicles or people are involved in the occurrence.

This coverage will follow form.

Uninsured motorists/underinsured motorists protection arbitration

If we and a covered person disagree whether that person is legally entitled to recover damages from the owner or operator of an uninsured motor vehicle/underinsured motor vehicle, or do not agree as to the amount of damages, either party may make a written demand for arbitration. In this event, each party will select an arbitrator. The two arbitrators will select a third. If they cannot agree on a third arbitrator within 45 days, either may request that the arbitration be submitted to the American Arbitration Association. When the covered person's recovery exceeds the minimum limit specified in the applicable jurisdiction's financial responsibility law, each party will pay the expenses it incurs, and bear the expenses of the third arbitrator equally. Otherwise, we will bear all the expenses of the arbitration.

Unless both parties agree otherwise, arbitration will take place in the county and state in which the covered person lives. Local rules of law as to procedure and evidence will apply. A decision agreed to by two arbitrators will be binding unless the recovery amount for bodily injury exceeds the minimum limit specified by the applicable jurisdiction's financial responsibility law. If the amount exceeds that limit, either party may demand the right to a trial. This demand must be made within 60 days of the arbitrator's decision. If this demand is not made, the amount of damages agreed to by the arbitrators will be binding.

Defense coverages

We will defend a covered person against any suit seeking covered damages for personal injury or property damage that is either:

- not covered by any underlying insurance; or

- covered by an underlying policy. This will apply to each Defense Coverage as it has been exhausted by payment of claims.

We provide this defense at our expense, with counsel of our choice, even if the suit is groundless, false, or fraudulent. We may investigate, negotiate, and settle any such claim or suit at our discretion.

As part of our investigation, defense, negotiation, or settlement, we will pay:

- all premiums on appeal bonds required in any suit we defend;
- all premiums on bonds to release attachments for any amount up to the amount of coverage (but we are not obligated to apply for or furnish any bond);
- all expenses incurred by us;
- all costs taxed against a covered person;
- all interest accruing after a judgment is entered in a suit we defend on only that part of the judgment we are responsible for paying. We will not pay interest accruing after we have paid the judgment up to the amount of coverage;
- all prejudgment interest awarded against a covered person on that part of the judgment we pay or offer to pay. We will not pay any prejudgment interest based on that period of time after we make an offer to pay the amount of coverage;
- all earnings lost by each covered person at our request, up to \$25,000;
- other reasonable expenses incurred by a covered person at our request: and
- the cost of bail bonds required of a covered person because of a covered loss.

In jurisdictions where we may be prevented by local law from carrying out these Defense Coverages, we will pay only those defense expenses that we agree in writing to pay and that are incurred by you.

Extra Coverages

In addition to covering damages and defense costs, we also provide other related coverages. These coverages are in addition to the amount of coverage for damages and defense costs unless stated otherwise.

Shadow defense coverage

If we are defending you or a family member in a suit seeking covered damages, we will pay reasonable expenses you or a family member incur up to \$10,000 or the amount shown in the Coverage Summary for a law firm of your choice to review and monitor the defense. However any recommendation by your personal attorney is not binding on us. We will pay these costs provided that you obtain prior approval from us before incurring any fees or expenses.

Identity fraud

We will pay for your or a family member's identity fraud expenses, up to a maximum of \$25,000, for each identity fraud occurrence.

"Identity fraud" means the act of knowingly transferring or using, without lawful authority, your or a family member's means of identity which constitutes a violation of federal law or a crime under any applicable state or local law.

"Identity fraud occurrence" means any act or series of acts of identity fraud by a person or group commencing in the policy period.

"Identity fraud expenses" means:

- the costs for notarizing affidavits or similar documents for law enforcement agencies, financial institutions or similar credit grantors, and credit agencies;
- the costs for sending certified mail to law enforcement agencies, financial institutions or similar credit grantors, and credit agencies;

- the loan application fees for reapplying for loan(s) due to the rejection of the original application because the lender received incorrect credit information;
- the telephone expenses for calls to businesses, law enforcement agencies, financial institutions or similar credit grantors, and credit agencies;
- earnings lost by you or a family member as a result of time off from work to complete fraud affidavits, meet with law enforcement agencies, credit agencies, merchants, or legal counsel;
- the reasonable attorney fees incurred with prior notice to us for:
- the defense of you or a family member against any suit(s) by businesses or their collection agencies;
- the removal of any criminal or civil judgements wrongly entered against you or a family member;
- any challenge to the information in your or a family member's consumer credit report; and
- the reasonable fees incurred with prior notice to us by an identity fraud mitigation entity to:
- provide services for the activities described above;
- restore accounts or credit standing with financial institutions or similar credit grantors and credit agencies; and
- monitor for up to one year the effectiveness of the fraud mitigation and to detect additional identity fraud activity after the first identify fraud occurrence.

However, such monitoring must begin no later than one year after you or a family member first report an identity fraud occurrence to us.

However, "identity fraud expenses" does not include expenses incurred due to any fraudulent, dishonest or criminal act by a covered person or any person acting with a covered person, or by any authorized representative of a covered person, whether acting alone or in collusion with others.

"Identity fraud mitigation entity" means a company that principally provides professional, specialized services to counter identity fraud for individuals or groups of individuals, or a financial institution that provides similar services.

In addition to the duties described in Policy Terms, Liability Conditions, Your duties after a loss, you shall notify an applicable law enforcement agency.

Kidnap expenses

We will pay up to a maximum of \$100,000 for kidnap expenses you or a family member incurs solely and directly as a result of a kidnap and ransom occurrence. In addition, we also will pay up to \$25,000 to any person for information not otherwise available leading to the arrest and conviction of any person(s) who kidnaps you, a family member or a covered relative. The following are not eligible to receive this reward payment

- you or a family member; or
- a covered relative who witnessed the occurrence.

"Kidnap and ransom occurrence" means the actual or alleged wrongful taking of:

- you;
- one or more family members; or
- one or more covered relatives while visiting or legally traveling with you or a family member; from anywhere in the world except those places listed on the United States State Department Bureau of Consular Affairs Travel Warnings list at the time of the occurrence. The occurrence must include a demand for ransom payment which would be paid by you or a family member in exchange for the release of the kidnapped person(s).

"Kidnap expenses" means the reasonable costs for:

- a professional negotiator;
- a professional security consultant;
- professional security guard services;
- a professional public relations consultant;
- travel, meals, lodging and phone expenses incurred by you or a family member;

- advertising, communications and recording equipment;
- related medical, cosmetic, psychiatric and dental expenses incurred by a kidnapped person within 12 months from that person's release;
- attorneys fees;
- a professional forensic analyst;
- earnings lost by you or a family member, up to \$25,000.

However, "kidnap expenses" does not include expenses incurred due to any kidnap and ransom occurrence caused by:

- you or a family member;
- a covered relative;
- any guardian, or former guardian of you, a family member or covered relative;
- any estranged spouse or domestic partner, or former spouse or domestic partner of you or a family member;
- any person unrelated to you or a family member who lives with you or a family member or has ever lived with you or a family member for 6 or more months, other than a domestic employee, residential staff, or a person employed by you or a family member for farm work; or
- a civil authority,

or any person acting on behalf of any of the above, whether acting alone or in collusion with others.

"Covered relative" means the following relatives of you, or a spouse or domestic partner who lives with you, or any family member:

- children, their children or other descendants of theirs;
- parents, grandparents or other ancestors of theirs; or
- siblings, their children or other descendants of theirs;

who do not live with you, including spouses or domestic partners of all of the above. Parents, grandparents and other ancestors include adoptive parents, stepparents and stepgrandparents.

Reputational Injury. If we are defending you or a family member in a suit seeking covered damages, we will pay reasonable and necessary fees or expenses that you or a family member incur for services provided by a reputation management firm to minimize potential injury to the reputation of you or a family member solely as a result of personal injury or property damage, caused by an occurrence if:

- the reputational injury is reported to us as soon as reasonably possible but not later than 30 days after the personal injury or property damage occurrence; and
- you obtain approval of the reputation management firm from us before incurring any fees or expenses, unless stated otherwise or an exclusion applies. There is no deductible for this coverage.

A Reputation management firm means a professional public relations consulting firm, a professional security consulting firm or a professional media management consulting firm.

The maximum amount of coverage for Reputational injury available for any one occurrence is \$25,000 or the amount shown in the Coverage Summary. We will not pay more than this amount in any one occurrence for covered damages regardless of how many claims or people are involved in the occurrence.

The maximum annual amount of coverage for Reputational injury shown in the Coverage Summary is the most we will pay for the sum of all covered damages you or a family member incur during the policy period regardless of the number of claims, people, or occurrences.

This coverage does not apply to loss caused by a wrongful employment act covered by Employment Practices Liability Insurance.

Exclusions

These exclusions apply to your Group Personal Excess Liability Coverage, unless stated otherwise.

Aircraft. We do not cover any damages arising out of the ownership, maintenance, use, loading, unloading, or towing of any aircraft, except aircraft chartered with crew by you. We do not cover any property damages to aircraft rented to, owned by, or in the care, custody or control of a covered person.

Hovercraft. We do not cover any damages arising out of the ownership, maintenance, use, loading, unloading or towing of any hovercraft. We do not cover any property damages to hovercraft rented to, owned by, or in the care, custody or control of a covered person.

Motorized land vehicle racing or track usage. We do not cover any damages arising out of the ownership, maintenance or use of any motorized land vehicle:

- during any instruction, practice, preparation for, or participation in, any competitive, prearranged or organized racing, speed contest, rally, gymkhana, sports event, stunting activity, or timed event of any kind; or
- on a racetrack, test track or other course of any kind.

Watercraft and aircraft racing or track usage. We do not cover any damages arising out of the ownership, maintenance or use of any watercraft or aircraft during any instruction, practice, preparation for, or participation in, any competitive, prearranged or organized racing, speed contest, rally, sports event, stunting activity or timed event of any kind. This exclusion does not apply to you or a family member for sailboat racing even if the sailboat is equipped with an auxiliary motor.

Motorized land vehicle-related jobs. We do not cover any damages arising out of the ownership, maintenance, or use of a motorized land vehicle by any person who is employed or otherwise engaged in the business of selling, repairing, servicing, storing, parking, testing, or delivering motorized land vehicles. This exclusion does not apply to you, a family member, or your employee or an employee of a family member for damages arising out of the ownership, maintenance or use of a motorized land vehicle owned by, rented to, or furnished to you or a family member.

Watercraft-related jobs. We do not cover any damages arising out of the ownership, maintenance, or use of a watercraft by any person who is engaged by or employed by, or is operating a marina, boat repair yard, shipyard, yacht club, boat sales agency, boat service station, or other similar organization. This exclusion does not apply to damages arising out of the ownership, maintenance, or use of a watercraft by you, a family member, or your or a family member's captain or full time paid crew member maintaining or using this watercraft with permission from you or a family member.

Motorized land vehicle and watercraft loading. We do not cover any person or organization, other than you or a family member or your or a family member's employees, with respect to the loading or unloading of motorized land vehicles or watercraft.

Workers' compensation or disability. We do not cover any damages a covered person is legally:

- required to provide; or
- voluntarily provides under any:
 - workers' compensation;
 - disability benefits;
 - unemployment compensation; or
 - other similar laws.

But we do provide coverage in excess over any other insurance for damages you or a family member is **legally** required to pay for bodily injury to a domestic employee of a residence covered under the Required Primary Underlying Insurance which are not compensable under workers' compensation, unless another exclusion applies.

Director's liability. We do not cover any damages for any covered person's actions or failure to act as **an** officer or member of a board of directors of any corporation or organization. However, we do cover such damages if you are or a family member is an officer or member of a board of directors of a:

- homeowner, condominium or cooperative association; or
- not-for-profit corporation or organization for which he or she is not compensated; unless another exclusion applies.

Damage to covered person's property. We do not cover any person for property damage to property **owned by** any covered person.

Damage to property in your care. We do not cover any person for property damage to property rented to, occupied by, used by, or in the care of any covered person, to the extent that the covered person is required

by contract to provide insurance. But we do cover such damages for loss caused by fire, smoke, or explosion unless another exclusion applies.

Wrongful employment act. We do not cover any damages arising out of a wrongful employment act- **A** wrongful employment act means any employment discrimination, sexual harassment, or wrongful termination of any residential staff actually or allegedly committed or attempted by a covered person while acting in the capacity as an employer, that violates applicable employment law of any federal, state, or local statute, regulation, ordinance, or common law of the United States of America its territories or possessions, or Puerto Rico.

"Employment discrimination" as it relates solely to a wrongful employment act means a violation of applicable employment discrimination law protecting any residential staff based on his or her race, color, religion, creed, age, sex, disability, national origin or other status according to any federal, state, or local statute, regulation, ordinance, or common law of the United States of America its territories or possessions, or Puerto Rico.

"Sexual harassment" as it relates solely to a wrongful employment act means unwelcome sexual **advances**, requests for sexual favors, or other conduct of a sexual nature that

- is made a condition of employment of any residential staff;
- is used as a basis for employment decisions;
- interferes with performance of any residential staff's duties; or
- creates an intimidating, hostile, or offensive working environment.

"Wrongful termination" as it relates solely to a wrongful employment act means

- the actual or constructive termination of employment of any residential staff by you or a family **member** in violation of applicable employment law; or
- breach of duty and care when you or a family member terminates an employment relationship with **any residential** staff.

"Residential staff" as it relates solely to a wrongful employment act means your or a family member's employee who is:

- employed by you or a family member, or through a firm under an agreement with you or a family member, ID perform duties related only to a covered person's domestic, personal, or business pursuits covered under this **part** of your policy;
- compensated for labor or services directed by you or a family member; and
- employed regularly to work 15 or more hours per week.

Residential staff includes a temporary worker. Residential staff does not include an independent contract or or any covered person.

"Temporary worker" as it relates solely to a wrongful employment act means your or a family member's employee who is:

- employed by you or a family member, or through a firm under an agreement with you or a family **member**, to perform duties related only to a covered person's domestic, personal, or business pursuits covered under this part of your policy;
- compensated for labor or services directed by you or a family member; and
- employed to work 15 or more hours per week to substitute for any residential staff on leave or to meet seasonal or short term workload demands for 30 consecutive days or longer during a 6 month period.

Temporary worker does not include an independent contractor or any covered person.

Discrimination. We do not cover any damages arising out of discrimination due to age, race, color, sex, creed, national origin, or any other discrimination.

Intentional acts. We do not cover any damages arising out of a willful, malicious, fraudulent or dishonest act or any act intended by any covered person to cause personal injury or property damage, even if the injury or damage is of a different degree or type than actually intended or expected. But we do cover such damages if the act was intended to protect people or property unless another exclusion applies. An intentional act is one whose consequences could have been foreseen by a reasonable person.

Molestation, misconduct or abuse. We do not cover any damages arising out of any actual, alleged or threatened:

- sexual molestation;
- sexual misconduct or harassment; or
- abuse.

Nonpermissive use. We do not cover any person who uses a motorized land vehicle or watercraft without permission from you or a family member.

Business pursuits. We do not cover any damages arising out of a covered person's business pursuits, investment or other for-profit activities, for the account of a covered person or others, or business property except on a follow form basis .

But we do cover damages arising out of volunteer work for an organized charitable, religious or community group, an incidental business away from home, incidental business at home, incidental business property, incidental farming, or residence premises conditional business liability unless another exclusion applies. We also cover damages arising out of your or a family member's ownership, maintenance, or use of a private passenger motor vehicle in business activities other than selling, repairing, servicing, storing, parking, testing, or delivering motorized land vehicles.

Unless stated otherwise in your Coverage Summary:

"Incidental business away from home" is a self-employed sales activity, or a self-employed business activity normally undertaken by person under the age of 18 such as newspaper delivery, babysitting, caddying, and lawn care. Either of these activities must:

- not yield gross revenues in excess of \$15,000 in any year;
- have no employees subject to worker's compensation or other similar disability laws;
- conform to local, state, and federal laws.

"Incidental business at home" is a business activity, other than farming, conducted on your residence premises which must:

- not yield gross revenues in excess of \$15,000, in any year, except for the business activity of managing one's own personal investments;
- have no employees subject to worker's compensation or other similar disability laws;
- conform to local, state, and federal laws.

"Incidental business property" is limited to the rental or holding for rental, to be used as a residence, of a condominium or cooperative unit owned by you or a family member, an apartment unit rented to you or a family member, a one or two family dwelling owned by you or a family member, or a three or four family dwelling owned and occupied by you or a family member. We provide this coverage only for premises covered under the Required Primary Underlying Insurance unless the rental or holding for rental is for:

- a residence of yours or a family member's that is occasionally rented and that is used exclusively as a residence; or
- part of a residence of yours or a family member's by one or two roomers or boarders; or
- part of a residence of yours or a family member's as an office, school, studio, or private garage.

"Incidental farming" is a farming activity which meets all of the following requirements:

- is incidental to your or a family member's use of the premises as a residence;
- does not involve employment of others for more than 1,500 hours of farm work during the policy period;

- does not produce more than \$25,000 in gross annual revenue from agricultural operations;
- and with respect to the raising or care of animals:
 - does not produce more than \$50,000 in gross annual revenues;
 - does not involve more than 25 sales transactions during the policy period;
 - does not involve the sale of more than 50 animals during the policy period.

"Residence premises conditional business liability" is limited to business or professional activities when legally conducted by you or a family member at your residence. We provide coverage only for personal injury or property damage arising out of the physical condition of that residence if:

- you or a family member do not have any employees involved in your business or professional activities who are subject to workers' compensation or other similar disability laws; or, if you or a family member are a doctor or dentist, you do not have more than two employees subject to such laws;
- you or a family member do not earn annual gross revenues in excess of \$5,000, if you or a family member are a home day care provider.'

We do not cover damages or consequences resulting from business or professional care or services performed or not performed.

The following additional exclusion applies only to "incidental farming" as described under the exclusion, Business pursuits.

Contamination. We do not cover any actual or alleged damages arising out of the discharge, dispersal, seepage, migration or release or escape of pollutants. Nor do we cover any cost or expense arising out of any request, demand or order to:

- extract pollutants from land or water;
- remove, restore or replace polluted or contaminated land or water; or
- test for, monitor, clean up, remove, contain, treat, detoxify or neutralize pollutants, or in any way respond to or assess the effects of pollutants.

However, this exclusion does not apply if the discharge, dispersal, seepage, migration, release or escape is sudden and accidental. A "pollutant" is any solid, liquid, gaseous or thermal irritant or contaminant, including smoke (except smoke from a hostile fire), vapor, soot, fumes, acids, alkalis, chemicals and waste. A "contaminant" is an impurity resulting from the mixture of or contact of a substance with a foreign substance. "Waste" includes materials to be disposed of, recycled, reconditioned or reclaimed.

Financial guarantees. We do not cover any damages for any covered person's financial guarantee of the financial performance of any covered person, other individual or organization.

Professional services. We do not cover any damages for any covered person's performing or failure to perform professional services, or for professional services for which any covered person is legally responsible or licensed.

Acts of war. We do not cover any damages caused directly or indirectly by war, undeclared war, civil war, insurrection, rebellion, revolution, warlike acts by military forces or personnel, the destruction or seizure of property for a military purpose, or the consequences of any of these actions.

Contractual liability. We do not cover any assessments charged against a covered person as a member of a homeowners, condominium or cooperative association. We also do not cover any damages arising from contracts or agreements made in connection with any covered person's business. Nor do we cover any liability for unwritten contracts, or contracts in which the liability of others is assumed after a covered loss.

Covered person's or dependent's personal injury. We do not cover any damages for personal injury for any covered person or their dependents where the ultimate beneficiary is the offending party or defendant. We also do not cover any damages for personal injury for which you can be held legally liable, in any way, to a

family member, your spouse or domestic partner or for which a family member, your spouse or domestic partner can be held legally liable, in any way, to you.

However, we do cover damages for bodily injury arising out of the use of a motorized land vehicle for which you can be held legally liable to a family member, your spouse or domestic partner or for which a family member, your spouse or domestic partner can be held legally liable to you to the extent that coverage is provided under this policy. This coverage applies only to the extent such damages are covered by primary underlying insurance and exceed the limits of insurance required for that motorized land vehicle under the Required Primary Underlying Insurance provisions of this policy.

Liability for dependent care. We do not cover any damages for personal injury for which a covered person's only legal liability is by virtue of a contract or other responsibility for a dependent's care.

Illness. We do not cover personal injury or property damage resulting from any illness, sickness or disease transmitted intentionally or unintentionally by a covered person to anyone, or any consequence resulting from that illness, sickness or disease. We also do not cover any damages for personal injury resulting from the fear of contracting any illness, sickness or disease, or any consequence resulting from the fear of contracting any illness, sickness or disease.

Fungi and mold. We do not cover any actual or alleged damages or medical expenses arising out of mold, the fear of mold or any consequences resulting from mold or the fear of mold. "Mold" means fungi, mold, mold spores, mycotoxins, and the scents and other byproducts of any of these.

Nuclear or radiation hazard. We do not cover any damages caused directly or indirectly by nuclear reaction, radiation, or radioactive contamination, regardless of how it was caused.

POLICY TERMS

This part of your Group Personal Excess Liability Policy explains the conditions that apply to your policy.

General Conditions

These conditions apply to your policy in general, and to each coverage provided in the policy.

Policy period

The effective dates of your policy are shown in the Coverage Summary. Those dates begin at 12:01 a.m. standard time at the mailing address shown.

All coverages on this policy apply only to occurrences that take place while this policy is in effect.

Transfer of rights

If we make a payment under this policy, we will assume any recovery rights a covered person has in connection with that loss, to the extent we have paid for the loss.

All of your rights of recovery will become our rights to the extent of any payment we make under this policy. A covered person will do everything necessary to secure such rights; and do nothing after a loss to prejudice such rights. However, you may waive any rights of recovery from another person or organization for a covered loss in writing before the loss occurs.

Concealment or fraud

We do not provide coverage if you or any covered person has intentionally concealed or misrepresented any material fact relating to this policy before or after a loss.

Application of coverage

Coverage applies separately to each covered person. However, this provision does not increase the amount of coverage for any one occurrence.

Assignment

You cannot transfer your interest in this policy to anyone else unless we agree in writing to the transfer.

Policy changes

This policy can be changed only by a written amendment we issue.

Bankruptcy or Insolvency

We will meet all our obligations under this policy regardless of whether you, your estate, **or** anyone else or their estate becomes bankrupt or insolvent.

In case of death

In the event of your death, coverage will be provided until the end of the policy period or policy anniversary date, whichever occurs first for any surviving member of your household who is a covered person at the time of death. We will also cover your legal representative or any person having proper temporary custody of your property.

Liberalization

We may extend or broaden the coverage provided by this policy. If we do this during the policy period or within 60 days before it begins, without increasing the premium, then the extended or broadened coverage will apply to occurrences after the effective date of the extended or broadened coverage.

Conforming to state law

If any provision of this policy conflicts with any applicable laws of the state you live in, this policy is amended to conform to those laws.

Conforming to trade sanction laws

This policy does not apply to the extent that trade or economic sanctions or other laws or regulations prohibit us from providing insurance.

Liability Conditions

These conditions apply to all liability coverages in this policy.

Other Insurance

This insurance is excess over any other insurance except for those policies that

- are written specifically to cover excess over the amount of coverage that applies in this policy; and
- schedule this policy as underlying insurance.

Your duties after a loss

In case of an accident or occurrence, the covered person shall perform the following duties that apply:

Notification. You must notify us or your agent or broker as soon as possible.

Assistance. You must provide us with all available information. This includes any suit papers or other documents which help us in the event that we defend you.

Cooperation. You must cooperate with us fully in any legal defense. This may include **any** association by us with the covered person in defense of a claim reasonably likely to involve us.

Examination. A person making a claim under this policy must submit as often as we reasonably require:

- to physical exams by physicians we select, which we will pay for; and
- to examination under oath and subscribe the same; and authorize us to obtain:
 - medical reports; and
 - other pertinent records.

Appeals

If a covered person, or any primary insurer, does not appeal a judgment for covered damages, we may choose to do so. We will then become responsible for all expenses, taxable costs, and interest arising out of the appeal. However, the amount of coverage for damages will not be increased.

Special Conditions

In the event of conflict with any other conditions of your policy, these conditions supersede.

Legal action against us

You agree not to bring action against us unless you have first complied with all conditions of this policy.

You also agree not to bring any action against us until the amount of damages you are legally obligated to pay has been finally determined after an actual trial or appeal, if any, or by a written agreement between you, us and the claimant. No person or organization has any right under this policy to bring us into any action to determine the liability of a covered person.

Notice of cancellation and coverage termination conditions

The Sponsoring Organization may cancel this policy by returning it to us or notifying us in writing at any time subject to the following:

- the Sponsoring Organization must notify us in advance of the requested cancellation date; and
- the Sponsoring Organization must provide proof of notification to each member of the Defined Group covered under this policy.

We may cancel this policy or any part of it subject to the following conditions. Our right to cancel applies to each coverage or limit in this policy. In the event we cancel this policy, we are under no obligation to provide you with an opportunity to purchase equivalent coverage.

- **Within 60 days.** When this policy or any part of it has been in effect for less than 60 days, we may cancel with 30 days notice for any reason.
- **Non-payment of premium.** We may cancel this policy or any part of it with 10 days notice if the Sponsoring Organization or you fail to pay the premium by the due date, regardless of whether the premium is payable to us, to our agent, or under any financial credit.
- **Misrepresentation.** We may cancel this policy or any part of it with 30 days notice if the coverage was obtained through misrepresentation, fraudulent statements, or omissions or concealment of a fact that is relevant to the acceptance of the risk or to the hazard we assumed.
- **Increase in hazard.** We may cancel this policy or any part of it with 30 days notice if there has been a substantial change in the risk which increases the chance of loss after insurance coverage has been issued or renewed, including but not limited to an increase in exposure due to rules, legislation, or court decision.
- **Procedure.** To cancel this policy or any part of it, we must notify you in writing. This notice will be mailed to the Sponsoring Organization at the mailing address shown in the Coverage Summary and we will obtain a certificate of mailing. This notice will include the date the cancellation is to take effect.

Termination. Should an individual for any reason no longer qualify as a member of the Defined Group, coverage will cease sixty (60) days from the date that individual no longer qualifies as a member of the Defined Group, or the policy expiration or cancellation date, whichever comes first.

Refund. In the event of cancellation by the Sponsoring Organization or us, we will refund any unearned premium on the effective date of cancellation, or as soon as possible afterwards to the Sponsoring Organization. The unearned premium will be computed short rate for the unexpired term of the policy.

ENDORSEMENT

Policy Period JANUARY 01, 2018 to JANUARY 01, 2019

Effective Date JANUARY 01, 2018

Policy Number (19) 7993-14-03

Insured NORTHROP GRUMMAN CORPORATION
 GROUP PERSONAL EXCESS PROGRAM

Name of Company FEDERAL INSURANCE COMPANY

Date Issued JANUARY 08, 2018

All Vice Presidents, Non Officers designated by the company and Designated Retirees of Northrop Grumman Corporation

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

Authorized Representative

ENDORSEMENT

Policy Period JANUARY 01, 2018 to JANUARY 01, 2019

Effective Date JANUARY 01, 2018

Policy Number (19) 7993-14-03

Insured

NORTHROP GRUMMAN CORPORATION
GROUP PERSONAL EXCESS PROGRAM

Name of Company FEDERAL INSURANCE COMPANY

Date Issued JANUARY 08, 2018

UNDERLYING LIMITS ENDORSEMENT

IT IS HEREBY UNDERSTOOD AND AGREED THAT THE REQUIRED **PRIMARY**
UNDERLYING LIABILITY INSURANCE LIMITS ARE AMENDED TO:

Personal Liability (Homeowners) for personal injury and property damage in the minimum amount of \$100,000 each occurrence.

Registered vehicles in the minimum amount of:

\$250,000/\$500,000 bodily injury and \$100,000 property damage;
\$300,000/\$300,000 bodily injury and \$100,000 property damage; or
\$300,000 single limit each occurrence.

Unregistered vehicles in the minimum amount of \$300,000 bodily injury and property **damage** each occurrence.

Registered vehicles with less than four wheels and motorhomes in the minimum amount of:

\$250,000/\$500,000 bodily injury and \$100,000 property damage;
\$300,000/\$300,000 bodily injury and \$100,000 property **damage**; or
\$300,000 single limit each occurrence.

Watercraft less than 26 feet and 50 engine rated horsepower or less for bodily injury and property damage in the minimum amount of \$300,000 each occurrence.

Watercraft 26 feet or longer or more than 50 engine rated horsepower for bodily injury and property damage in the minimum amount of \$500,000 each occurrence.

Uninsured motorists /underinsured motorist protection in the minimum amount of:

\$250,000/\$500,000 bodily injury and \$100,000 property damage;
\$300,000/\$300,000 bodily injury and \$100,000 property damage; or
\$300,000 single limit each occurrence.

FAILURE TO COMPLY WITH THE REQUIRED PRIMARY UNDERLYING INSURANCE WILL RESULT IN A GAP IN COVERAGE.---

ALL OTHER TERMS AND CONDITIONS REMAIN UNCHANGED.

Authorized Representative

**CHUBB GROUP
U.S. PRIVACY NOTICE**

FACTS	WHAT DOES THE CHUBB GROUP DO WITH YOUR PERSONAL INFORMATION?	
Why?	Insurance companies choose how they share your personal information. Federal and state law gives consumers the right to limit some but not all sharing. Federal and state law also requires us to tell you how we collect, share, and protect your personal information. Please read this notice carefully to understand what we do.	
What?	<p>The types of personal information we collect and share depend on the product or service you have with us. This information can include:</p> <ul style="list-style-type: none"> • Social Security number and payment history • insurance claim history and medical information • account transactions and credit scores <p>When you are no longer our customer, we continue to share information about you as described in this notice.</p>	
How?	All insurance companies need to share customers' personal information to run their everyday business. In the section below, we list the reasons insurance companies can share their customers' personal information; the reasons the Chubb Group chooses to share; and whether you can limit this sharing.	
Reasons we can share your personal information	Does Chubb share?	Can you limit this sharing?
For our everyday business purposes - such as to process your transactions, maintain your account(s), respond to court orders and legal investigations, or report to credit bureaus	Yes	No
For our marketing purposes - to offer our products and services to you	Yes	No
For joint marketing with other financial companies	Yes	No
For our affiliates' everyday business purposes - information about your transactions and experiences	Yes	No
For our affiliates' everyday business purposes - information about your creditworthiness	No	We don't share
For our affiliates to market to you	No	We don't share
For nonaffiliates to market to you	No	We don't share
Questions?	Call 1-800-258-2930 or go to https://www2.Chubb.com/us.en/privacy.aspx	

Who is providing this notice?	The Chubb Group. A list of these companies is located at the end of this document.
What we do	
How does Chubb Group protect my personal information?	<p>To protect your personal information from unauthorized access and use, we use security measures that comply with federal law. These measures include computer safeguards and secured files and buildings.</p> <p>We restrict access to personal information to our employees, affiliates' employees, or others who need to know that information to service the account or to conduct our normal business operations.</p>
How does Chubb Group collect my personal information?	<p>We collect your personal information, for example, when you</p> <ul style="list-style-type: none"> • apply for insurance or pay insurance premiums • file an insurance claim or provide account information • give us your contact information <p>We also collect your personal information from others, such as credit bureaus, affiliates, or other companies.</p>
Why can't I limit all sharing?	<p>Federal law gives you the right to limit only</p> <ul style="list-style-type: none"> • sharing for affiliates' everyday business purposes - information about your creditworthiness • affiliates from using your information to market to you • sharing for nonaffiliates to market to you <p>State laws and individual companies may give you additional rights to limit sharing. See below for more on your rights under state law.</p>
Definitions	
Affiliates	<p>Companies related by common ownership or control. They can be financial and nonfinancial companies.</p> <ul style="list-style-type: none"> • Our affiliates include those with a Chubb name and other companies, such as Westchester Fire Insurance Company and Great Northern Insurance Company.
Nonaffiliates	<p>Companies not related by common ownership or control. They can be financial and nonfinancial companies.</p> <ul style="list-style-type: none"> • Chubb does not share with nonaffiliates so they can market to you.
Joint Marketing	<p>A formal agreement between nonaffiliated financial companies that together market financial products or services to you.</p> <ul style="list-style-type: none"> • Our joint marketing partners include categories of companies such as banks.

Other important information

For Insurance Customers in AZ, CA, CT, GA, IL, MA, ME, MN, MT, NV, NC, NJ, OH, OR, and VA only: Under state law, under certain circumstances, you have the right see the personal information about you that we have on file. To see your information, write Chubb Group Attention: Privacy Inquiries, 202 Hall's Mill Road, P.O. Box 1600, Whitehouse Station, NJ 08889-1600. Chubb may charge a reasonable fee to cover the costs of providing this information. If you think any of the information is not accurate you may write us. We will let you know what actions we take. If you do not agree with our actions, you may send us a statement. If you want a full description of privacy rights that we will protect in accordance with the law in your home state, please contact us and we will provide it. We may disclose information to certain third parties, such as law enforcement officers, without your permission.

For Nevada residents only: We may contact our existing customers by telephone to offer additional insurance products that we believe may be of interest to you. Under state law, you have the right to opt out of these calls by adding your name to our internal do-not-call list. To opt out of these calls, or for more information about your opt out rights, please contact our customer service department. You can reach us by calling 1-800-258-2930, emailing us at privacyinquiries@Chubb.com or writing to Chubb Group, Attention: Privacy Inquiries, 202 Hall's Mill Road, P.O. Box 1600, Whitehouse Station, NJ 08889-1600. You are being provided this notice under Nevada state law. In addition to contacting Chubb, Nevada residents can contact the Nevada Attorney General for more information about your opt out rights by calling 775-684-1100, emailing bcpinfo@ag.state.nv.us, or by writing to: Office of the Attorney General, Nevada Department of Justice, Bureau of Consumer Protection: 100 North Carson Street, Carson City, NV 89701.

For Vermont residents only: Under state law, we will not share information about your creditworthiness within our corporate family except with your authorization or consent, but we may share information about our transactions or experiences with you within our corporate family without your consent.

Chubb Group Companies Providing This Notice

This notice is being provided by the following Chubb Group companies to their customers located in the United States: ACE American Insurance Company, ACE Capital Title Reinsurance Company, ACE Fire Underwriters Insurance Company, ACE Insurance Company of the Midwest, ACE Life Insurance Company, ACE Property and Casualty Insurance Company, Agri General Insurance Company, Atlantic Employers Insurance Company, Bankers Standard Fire and Marine Company, Bankers Standard Insurance Company, Century Indemnity Company, Chubb Custom Insurance Company, Chubb Indemnity Insurance Company, Chubb Insurance Company of New Jersey, Chubb Lloyds Insurance Company of Texas, Chubb National Insurance Company, Executive Risk Indemnity Inc. • Executive Risk Specialty Insurance Company, Federal Insurance Company, Great Northern Insurance Company, Illinois Union Insurance Company, Indemnity Insurance Company of North America. Insurance Company of North America. Pacific Employers Insurance Company, Pacific Indemnity Company, Penn Millers Insurance Company, Texas Pacific Indemnity Company, Vigilant Insurance Company, Westchester Fire Insurance Company and Westchester Surplus Lines Insurance Company.



IMPORTANT NOTICE TO POLICYHOLDERS

This Important Notice is not your policy. Please read your policy carefully to determine your rights, duties, and what is and what is not covered. Only the provisions of your policy determine the scope of your Insurance protection.

THIS IMPORTANT NOTICE PROVIDES INFORMATION CONCERNING POSSIBLE IMPACT ON YOUR INSURANCE COVERAGE DUE TO COMPLIANCE WITH APPLICABLE TRADE SANCTION LAWS.

PLEASE READ THIS NOTICE CAREFULLY.

Various trade or economic sanctions and other laws or regulations prohibit us from providing insurance in certain circumstances. For example, the United States Treasury Department's Office of Foreign Asset Control (OFAC) administers and enforces economic and trade sanctions and places restrictions on transactions with foreign agents, front organizations, terrorists, terrorists organizations, and narcotic traffickers. OFAC acts pursuant to Executive Orders of the President of the United States and specific legislation, to impose controls on transactions and freeze foreign assets under United States jurisdiction. (To learn more about OFAC, please refer to the United States Treasury's web site at <http://www.treas.gov/ofac>.)

To the extent that you or any other insured, or any person or entity claiming the benefits of this insurance has violated any applicable sanction laws, this insurance will not apply.

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NORTHROP GRUMMAN CORPORATION
TERMS AND CONDITIONS APPLICABLE TO
2018 RESTRICTED STOCK RIGHTS
GRANTED UNDER THE 2011 LONG-TERM INCENTIVE STOCK PLAN

These Terms and Conditions (“Terms”) apply to certain “Restricted Stock Rights” (“RSRs”) granted by Northrop Grumman Corporation (the “Company”) in 2018 under its 2011 Long-Term Incentive Stock Plan. The date of grant of your RSR award (the “Grant Date”) and the number of RSRs applicable to your award are set forth in the letter from the Company announcing your RSR award (your “Grant Letter”) and are also reflected in the electronic stock plan award recordkeeping system (“Stock Plan System”) maintained by the Company or its designee. These Terms apply only with respect to this 2018 RSR award identified in your Grant Letter. You are referred to as the “Grantee” with respect to your award. Capitalized terms are generally defined in Section 12 below if not otherwise defined herein.

Each RSR represents a right to receive one share of the Company’s Common Stock, or cash of equivalent value as provided herein, subject to vesting as provided herein. The number of RSRs subject to your award is subject to adjustment as provided herein. The RSR award is subject to all of the terms and conditions set forth in these Terms, and is further subject to all of the terms and conditions of the Plan, as it may be amended from time to time, and any rules adopted by the Committee, as such rules are in effect from time to time. If you do not formally accept your RSR award, including these Terms, in accordance with the instructions and time limit set forth in your Grant Letter, you will be deemed to have forfeited your RSR award.

1. Vesting; Issuance of Shares.

Subject to Sections 2, 3, 4 and 6 below, one hundred percent (100%) of the number of RSRs (and any Dividend Equivalents (as defined below)) subject to your award (subject to adjustment as provided in Section 6.1) shall vest upon the third anniversary of the Grant Date, provided that if the third anniversary of the Grant Date falls on a weekend or holiday, then the award shall vest on the next business day.

1.1 *Payment of RSRs.* Except as otherwise provided below, the Company shall pay an RSR subject to the award that vests (“Vested RSR”) (and related Dividend Equivalents) within 60 days following the vesting of the RSRs on the third anniversary of the Grant Date. The Company shall pay such Vested RSRs in either an equivalent number of shares of Common Stock, or, in the discretion of the Committee, in cash or in a combination of shares of Common Stock and cash. In the event of a cash payment, the amount of the payment for each Vested RSR to be paid in cash will equal the Fair Market Value (as defined below) of a share of Common Stock as of the date that such RSR became vested.

1.2 *Dividend Equivalents.* The Grantee shall be entitled to payment for Dividend Equivalents (if any) with respect to any Vested RSRs. For purposes of these Terms, “Dividend Equivalents” means the aggregate amount of dividends paid by the Company on a number of shares of Common Stock equivalent to the number of

Vested RSRs during the period from the Grant date until the date the Vested RSRs are paid (without interest or other adjustments to reflect the time value of money). Dividend Equivalents (if any) will be paid at the same time as the Vested RSRs to which they relate are paid. Dividend Equivalents will be paid in cash.

2. Early Termination of Award; Termination of Employment.

2.1 *General.* The RSRs (and related Dividend Equivalents) subject to the award, to the extent not previously vested, shall terminate and become null and void if and when (a) the award terminates in connection with a Change in Control pursuant to Section 6 below, or (b) except as provided in Sections 2.6 and in Section 6, the Grantee ceases for any reason to be an employee of the Company or one of its subsidiaries.

2.2 *Leave of Absence.* Unless the Committee otherwise provides (at the time of the leave or otherwise), if the Grantee is granted a leave of absence by the Company, the Grantee (a) shall not be deemed to have incurred a termination of employment at the time such leave commences for purposes of the award, and (b) shall be deemed to be employed by the Company for the duration of such approved leave of absence for purposes of the award. A termination of employment shall be deemed to have occurred if the Grantee does not timely return to active employment upon the expiration of such approved leave or if the Grantee commences a leave that is not approved by the Company.

2.3 Salary Continuation. Subject to Section 2.2 above, the term “employment” as used herein means active employment by the Company and salary continuation without active employment (other than a leave of absence approved by the Company that is covered by Section 2.2) will not, in and of itself, constitute “employment” for purposes hereof (in the case of salary continuation without active employment, the Grantee’s cessation of active employee status shall, subject to Section 2.2, be deemed to be a termination of “employment” for purposes hereof). Furthermore, salary continuation will not, in and of itself, constitute a leave of absence approved by the Company for purposes of the award.

2.4 Sale or Spinoff of Subsidiary or Business Unit. For purposes of the RSRs (and related Dividend Equivalents) subject to the award, a termination of employment of the Grantee shall be deemed to have occurred if the Grantee is employed by a subsidiary or business unit and that subsidiary or business unit is sold, spun off, or otherwise divested, the Grantee does not otherwise continue to be employed by the Company or one of its subsidiaries after such event, and the divested entity or business (or its successor or a parent company) does not assume the award in connection with such transaction.

2.5 Continuance of Employment Required. Except as expressly provided in Section 2.6 and in Section 6, the vesting of the RSRs (and related Dividend Equivalents) subject to the award requires continued employment through the third anniversary of the Grant Date as a condition to the vesting of any portion of the award. Employment for only a portion of the vesting period, even if a substantial portion, will not entitle the Grantee to any proportionate vesting or avoid or mitigate a termination of rights and benefits upon or following a termination of employment. Nothing contained in these Terms, the Stock Plan System, or the Plan constitutes an employment commitment by the Company or any subsidiary, affects the Grantee’s status (if the Grantee is otherwise an at-will employee) as an employee at will who is subject to termination without cause, confers upon the Grantee any right to continue in the employ of the Company or any subsidiary, or interferes in any way with the right of the Company or of any subsidiary to terminate such employment at any time.

2.6 Death or Disability. If the Grantee dies or incurs a Disability while employed by the Company or a subsidiary and such death or Disability occurs more than six months after the Grant Date, the outstanding and previously unvested RSRs (and related Dividend Equivalents) subject to the award shall vest as of the date of the Grantee’s death or Disability, as applicable. RSRs (and related Dividend Equivalents) vesting under this

Section shall be paid within 60 days following the earlier of (a) Grantee’s death or (b) Grantee’s Disability. In the event of the Grantee’s death prior to the delivery of shares or other payment with respect to any vested RSRs (and related Dividend Equivalents), the Grantee’s Successor shall be entitled to any payments to which the Grantee would have been entitled under these Terms with respect to such vested and unpaid RSRs (and related Dividend Equivalents).

3. Non-Transferability and Other Restrictions.

3.1 Non-Transferability. The award, as well as the RSRs (and related Dividend Equivalents) subject to the award, are non-transferable and shall not be subject in any manner to sale, transfer, anticipation, alienation, assignment, pledge, encumbrance or charge. The foregoing transfer restrictions shall not apply to transfers to the Company. Notwithstanding the foregoing, the Company may honor any transfer required pursuant to the terms of a court order in a divorce or similar domestic relations matter to the extent that such transfer does not adversely affect the Company’s ability to register the offer and sale of the underlying shares on a Form S-8 Registration Statement and such transfer is otherwise in compliance with all applicable legal, regulatory and listing requirements.

3.2 Forfeiture or Recoupment of Awards. If, prior to payment or issuance of shares with respect to the award, Grantee’s employment is terminated for Cause (or Grantee has engaged in misconduct that could have resulted in Grantee’s termination of employment for Cause if Grantee had remained an employee), the Company may reduce or eliminate any payments or issuances of shares with respect to the award. Further, any payments or issuances of shares with respect to the award are subject to recoupment pursuant to the Company’s Policy Regarding the Recoupment of Certain Performance-Based Compensation Payments as in effect from time to time, as well as any recoupment or similar provisions of applicable law, and the Grantee shall promptly make any reimbursement requested by the Board or Committee pursuant to such policy or applicable law with respect to the award. The Grantee agrees, by accepting the award, that the Company and its affiliates may deduct from any amounts it may owe the Grantee from time to time (such as wages or other compensation) to the extent of any amounts the Grantee is required to reimburse the Company pursuant to such policy or applicable law with respect to the award.

4. Post-Employment Conduct.

4.1 Corporate Policy Council Contribution. You acknowledge and agree that as a member of the Corporate Policy Council (“CPC”), you are involved in

managing the global operations of the Company, incorporated in Delaware and headquartered in Virginia. You are involved in the most sensitive and proprietary matters affecting the Company, its subsidiaries, predecessors, and/or affiliates (collectively, "Northrop Grumman"), including from a technical, strategic and financial perspective, and are widely exposed to confidential, sensitive and proprietary information concerning Northrop Grumman's global operations, at the headquarters and each of the operating sectors, including in the areas of manned and unmanned aircraft, space, C4ISR, cyber, sensors, electronics, through-life support and technical services. Your job responsibilities require that you have a primary office location in Virginia and/or you spend substantial time at the corporate headquarters in Virginia, among other things, attending CPC and other leadership meetings, and managing operations and employees in Virginia. You occupy one of the most senior executive positions in the Company and have far-reaching access to highly confidential, valuable and sensitive information, customer, vendor and employee relationships, intellectual property, strategic and tactical plans, and financial information and plans. The Company has a legitimate business interest in restricting your ability to compete in the specific manner set forth below. The Company has provided you this grant, subject to these Terms and as consideration for the restrictive covenants set forth in this Section 4.

4.2 Non-Competition. For a period of twelve (12) months from the date of the termination of Grantee's employment for any reason (other than a Reduction-in-Force as determined at the Company's sole discretion) ("Termination"), you will not, directly or indirectly, oversee, control, participate in, or support the design, operation, research, manufacture, marketing, sale, or distribution of "Competitive Products and Services". For the purpose of this section, "Competitive Products and Services" shall mean products or services that compete for resources with, or are an alternative or potential alternative to, the products sold or services provided by Northrop Grumman, including without limitation products and services in the areas of manned and unmanned aircraft, space, C4ISR, cyber, sensors, electronics, through-life support and technical services.

4.3 Non-Solicitation of Customers. For a period of eighteen (18) months from your Termination, you shall not, directly or indirectly, solicit any customer, supplier, or teammate of Northrop Grumman with whom you engaged, or about whom you received confidential, sensitive, or proprietary information, in the course of your employment with Northrop Grumman, for purposes of providing products or services in competition with Northrop Grumman. In the case of a governmental,

regulatory or administrative agency, commission, department or other governmental authority, the customer is determined by reference to the specific program offices or activities for which Northrop Grumman provides goods or services.

4.4 Non-Solicitation of Employees. For a period of twenty-four (24) months from your Termination, you shall not, directly or indirectly, solicit or offer to hire, any person who was, within a period of six months prior to your Termination, employed by Northrop Grumman, with whom you worked or about whom you received information in the course of your employment with Northrop Grumman.

4.5 Non-Disparagement. You will not issue or communicate any statement, whether verbal or written, or take any other action that disparages or may be interpreted to disparage the Company, its products, services, officers, directors, or employees; provided that the foregoing shall not apply to any truthful statements made in connection with a legal process, including government investigation.

4.6 Exceptions. You may request an exception to the covenants in Sections 4.2, 4.3, or 4.4 by making a written request to the Company's Chief Human Resources Officer, with such exceptions being considered at the sole discretion of the Company and communicated in writing to you.

4.7 Reasonableness. You agree that the restrictions set forth in Sections 4.2, 4.3, and 4.4 are (i) reasonable and necessary in all respects, including duration, territory and scope of activity, in order to protect the Company's legitimate business interests, (ii) that the parties have attempted to limit your right to compete only to the extent necessary to protect the Company's legitimate business interests, and (iii) that you will be able to earn a livelihood without violating the restrictions in this section. It is the intent of the parties that the provisions of this section shall be enforced to the fullest extent permissible under applicable law. However, if any portion of Sections 4.2, 4.3, or 4.4 is deemed unenforceable, the parties agree that a court or arbitrator may revise the portion deemed unenforceable to the maximum extent possible to achieve the objective of the parties, and the remainder of the section shall remain in full force and affect.

4.8 Remedies. If you violate any provision in Section 4.2, 4.3, 4.4 and/or 4.5 of this section, the Company shall have the right to terminate without payment to you any unvested and/or unpaid RSRs (and associated Dividend Equivalents) and require that you

immediately deliver to the Company an amount in cash equal to the aggregate Fair Market Value, determined as of the vesting and/or payment date of all RSRs already received, including any Dividend Equivalents, within one year prior to the breach. Further, you acknowledge and agree that a breach of any of the provisions of this section will result in immediate, irreparable, and continuing damage to the Company for which there is no adequate remedy at law, and the Company will be entitled to injunctive relief, a decree of specific performance, and other relief as may be proper, including monetary damages, to the maximum extent available.

5. Compliance with Laws; No Stockholder Rights Prior to Issuance.

The Company's obligation to make any payments or issue any shares with respect to the award is subject to full compliance with all then applicable requirements of law, the Securities and Exchange Commission, or other regulatory agencies having jurisdiction over the Company and its shares, and of any exchange upon which stock of the Company may be listed. The Grantee shall not have the rights and privileges of a stockholder, including without limitation the right to vote or receive dividends (except as expressly provided in these Terms with respect to Dividend Equivalents), with respect to any shares which may be issued in respect of the RSRs until the date appearing on the certificate(s) for such shares (or, in the case of shares entered in book entry form, the date that the shares are actually recorded in such form for the benefit of the Grantee), if such shares become deliverable.

6. Adjustments; Change in Control.

6.1. Adjustments. The RSRs, Dividend Equivalents, and the shares subject to the award are subject to adjustment upon the occurrence of events such as stock splits, stock dividends and other changes in capitalization in accordance with Section 6(a) of the Plan.

6.2. Possible Acceleration on Change in Control. Notwithstanding the provisions of Section 2 hereof, and further subject to the Company's ability to terminate the award as provided in Section 6.3 below, the outstanding and previously unvested RSRs (and related Dividend Equivalents) subject to the award shall become fully vested as of the date of the Grantee's termination of employment if, either within the Protected Period corresponding to a Change in Control of the Company or within twenty-four (24) calendar months following the date of a Change in Control of the Company, the Grantee's employment by the Company and its subsidiaries is involuntarily terminated by the Company

and its subsidiaries for reasons other than Cause or by the Grantee for Good Reason.

Notwithstanding anything else contained herein to the contrary, the termination of the Grantee's employment (or other events giving rise to Good Reason) shall not entitle the Grantee to any accelerated vesting pursuant to this Section 6.2 if there is objective evidence that, as of the commencement of the Protected Period, the Grantee had specifically been identified by the Company as an employee whose employment would be terminated as part of a corporate restructuring or downsizing program that commenced prior to the Protected Period and such termination of employment was expected at that time to occur within six (6) months.

Payment of any RSRs (and related Dividend Equivalents) that vest under this Section 6.2 will be made within 60 days of the termination of the Grantee's employment.

6.3. Automatic Acceleration; Early Termination. If the Company undergoes a Change in Control triggered by clause (iii) or (iv) of the definition thereof and the Company is not the surviving entity and the successor to the Company (if any) (or a Parent thereof) does not agree in writing prior to the occurrence of the Change in Control to continue and assume the award following the Change in Control, or if for any other reason the award would not continue after the Change in Control, then upon the Change in Control the outstanding and previously unvested RSRs (and related Dividend Equivalents) subject to the award shall vest fully and completely. Unless the Committee expressly provides otherwise in the circumstances, no acceleration of vesting of the award shall occur pursuant to this Section 6.3 in connection with a Change in Control if either (a) the Company is the surviving entity, or (b) the successor to the Company (if any) (or a Parent thereof) agrees in writing prior to the Change in Control to assume the award. The Committee may make adjustments pursuant to Section 6(a) of the Plan and/or deem an acceleration of vesting of the award pursuant to this Section 6.3 to occur sufficiently prior to an event if necessary or deemed appropriate to permit the Grantee to realize the benefits intended to be conveyed with respect to the shares underlying the RSRs (and related Dividend Equivalents); provided, however, that, the Committee may reinstate the original terms of the award if the related event does not actually occur.

Payment of any RSRs (and related Dividend Equivalents) that vest under this Section 6.3 will be made within 60 days of the Change in Control.

7. Tax Matters.

7.1. *Tax Withholding.* The Company or the subsidiary which employs the Grantee shall be entitled to require, as a condition of making any payments or issuing any shares upon vesting of the RSRs (and related Dividend Equivalents), that the Grantee or other person entitled to such shares or other payment pay the minimum sums required to be withheld by federal, state, local or other applicable tax law with respect to such vesting or payment. Alternatively, the Company or such subsidiary, in its discretion, may make such provisions for the withholding of taxes as it deems appropriate (including, without limitation, withholding the taxes due from compensation otherwise payable to the Grantee or reducing the number of shares otherwise deliverable with respect to the award (valued at their then Fair Market Value) by the amount necessary to satisfy such statutory minimum withholding obligations).

7.2. *Transfer Taxes.* The Company will pay all federal and state transfer taxes, if any, and other fees and expenses in connection with the issuance of shares in connection with the vesting of the RSRs.

7.3. *Compliance with Code.* These Terms are designed to be exempt from Code Section 409A, and the Committee shall administer and construe the award, and may amend the Terms of the award, in such a way as to be exempt from and to avoid adverse tax consequences under Code Section 409A.

7.4. *Unfunded Arrangement.* The right of the Grantee to receive payment under the award shall be an unsecured contractual claim against the Company. As such, neither the Grantee nor any Successor shall have any rights in or against any specific assets of the Company based on the award. Awards shall at all times be considered entirely unfunded for tax purposes.

7.5 *Code Section 280G.* Notwithstanding any other provision of this Agreement to the contrary, in the event that any amounts payable to you as a result of Section 6.2 or 6.3 hereof, either alone or together with amounts payable pursuant to any other plan, program or arrangement (a) constitute "parachute payments" within the meaning of Section 280G of the Code, and (b) but for this Section 7.5 would be subject to the excise tax imposed by Section 4999 of the Code or any comparable successor provisions (the "Excise Tax"), then the vesting acceleration provided in Section 6.2 or 6.3, as applicable, shall be either (a) provided to you in full, or (b) provided to you to such lesser extent that would result in no portion of the payments so accelerated being subject to the Excise Tax, whichever of the foregoing amounts, when taking into account applicable federal, state, local and foreign income and employment taxes, the Excise

Tax, and any other applicable taxes, results in the receipt by you, on an after-tax basis, of the greatest amount of benefits, notwithstanding that all or some portion of such benefits may be subject to the Excise Tax. All determinations required to be made under this Section 7.5 shall be made by a registered public accounting firm selected by the Company, which shall provide supporting calculations both to the Company and you no later than the date of the applicable Change in Control. In the event that the Payments are to be reduced pursuant to this Section 7.5, such Payments shall be reduced such that the reduction of compensation to be provided to the Executive as a result of this Section 7.5 is minimized. In applying this principle, the reduction shall be made in a manner consistent with the requirements of Section 409A and where two economically equivalent amounts are subject to reduction but payable at different times, such amounts shall be reduced on a pro rata basis but not below zero.

8. Choice of Law; Venue; Arbitration.

This agreement shall be governed by the laws of the State of Delaware. Any cause of action or claim arising out of or related to the terms and conditions applicable to this grant will be determined through final and binding arbitration, in accordance with Northrop Grumman CTM H200 USHR 2-32, provided that the prevailing party in the arbitration shall be entitled to receive from the losing party reasonably incurred attorneys' fees and costs. You and the Company agree that any arbitration hearing and related proceedings shall be convened and conducted in Falls Church, VA. If you or the Company believes they require immediate relief to enforce or challenge these terms, before arbitration is commenced or concluded, either party may seek injunctive or other provisional equitable relief from a state or federal court in the Commonwealth of Virginia. All court actions or proceedings arising under these terms shall be heard in a state or federal court in the Commonwealth of Virginia. The Company and you hereby agree to the jurisdiction of the state and federal courts in the Commonwealth of Virginia and waive any right to object to such actions on grounds of venue, jurisdiction or convenience.

9. Committee Authority.

The Committee has the discretionary authority to determine any questions as to the date when the Grantee's employment terminated and the cause of such termination and to interpret any provision of these Terms, the Grant Letter, the Stock Plan System, the Plan, and any other applicable rules. Any action taken by, or inaction of, the Committee relating to or pursuant to these Terms, the Grant Letter, the Stock Plan System, the Plan, or any other applicable rules shall be within the

absolute discretion of the Committee and shall be conclusive and binding on all persons.

10. Plan; Amendment.

The RSRs (and related Dividend Equivalents) subject to the award are governed by, and the Grantee's rights are subject to, all of the terms and conditions of the Plan and any other rules adopted by the Committee, as the foregoing may be amended from time to time. The Grantee shall have no rights with respect to any amendment of these Terms or the Plan unless such amendment is in writing and signed by a duly authorized officer of the Company. In the event of a conflict between the provisions of the Grant Letter and/or the Stock Plan System and the provisions of these Terms and/or the Plan, the provisions of these Terms and/or the Plan, as applicable, shall control.

11. Required Holding Period.

The holding requirements of this Section 11 shall apply to any Grantee who is an elected or appointed officer of the Company on the date Vested RSRs are paid (or, if earlier, on the date the Grantee's employment by the Company and its subsidiaries terminates for any reason). Any Grantee subject to this Section 11 shall not be permitted to sell, transfer, anticipate, alienate, assign, pledge, encumber or charge the number of shares equal to 50% of the total payout of Vested RSRs (net of taxes withheld) until the earlier of (A) the third anniversary of the date such shares of Common Stock are paid to the Grantee, (B) the date the Grantee's employment by the Company and its subsidiaries terminates due to the Grantee's death or Disability, (C) the occurrence of a Change in Control that results in termination and payment under Section 6.2 or 6.3 above, or (D) with respect to Grantee's entering a U.S. federal government position only, the latest of (i) the date the Grantee's employment with the Company terminates, or (ii) the date the Grantee formally accepts the government position in writing, or (iii) the date the government confirms the Grantee (for positions requiring nomination and confirmation). For purposes of this Section 11, the total payout of Vested RSRs shall be determined on a net basis after taking into account any shares otherwise deliverable with respect to the award that the Company withholds to satisfy tax obligations pursuant to Section 7.1. If Grantee is paid less than 50% of the total payout of Vested RSRs (net of taxes) in shares, then all of the shares received will be subject to the holding period requirements in this Section 11. Any shares of Common Stock received in respect of shares that are covered by the holding period requirements of this Section 11 (such as shares received in respect of a stock split or stock

dividend) shall be subject to the same holding period requirements as the shares to which they relate.

12. Definitions.

Whenever used in these Terms, the following terms shall have the meanings set forth below and, when the meaning is intended, the initial letter of the word is capitalized:

"Board" means the Board of Directors of the Company.

"Cause" means the occurrence of either or both of the following:

- (i) The Grantee's conviction for committing an act of fraud, embezzlement, theft, or other act constituting a felony (other than traffic related offenses, as a result of vicarious liability, or as a result of good faith actions as an officer of the Company); or
- (ii) Willful misconduct by the Grantee that causes financial or reputational harm to the Company. However, no act, or failure to act, on the Grantee's part shall be considered "willful" unless done, or omitted to be done, by the Grantee not in good faith and without reasonable belief that his or her action or omission was in the best interest of the Company.

"Change in Control" is used as defined in the Plan.

"Code" means the United States Internal Revenue Code of 1986, as amended.

"Committee" means the Company's Compensation Committee or any successor committee appointed by the Board to administer the Plan.

"Common Stock" means the Company's common stock.

"Disability" means, with respect to a Grantee, that the Grantee: (i) is unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or can be expected to last for a continuous period of not less than twelve months; or (ii) is, by reason of any medically determinable physical or mental impairment which can be expected to result in death or can be expected to last for a continuous period of not less than twelve months, receiving income replacement benefits for a period of not less than three months under an accident and health plan covering employees of the Grantee's employer.

“**Fair Market Value**” is used as defined in the Plan; provided, however, the Committee in determining such Fair Market Value for purposes of the award may utilize such other exchange, market, or listing as it deems appropriate.

“**Good Reason**” means, without the Grantee’s express written consent, the occurrence of any one or more of the following:

- (i) A material and substantial reduction in the nature or status of the Grantee’s authorities or responsibilities (when such authorities and/or responsibilities are viewed in the aggregate) from their level in effect on the day immediately prior to the start of the Protected Period, other than (A) an inadvertent act that is remedied by the Company promptly after receipt of notice thereof given by the Grantee, and/or (B) changes in the nature or status of the Grantee’s authorities or responsibilities that, in the aggregate, would generally be viewed by a nationally-recognized executive placement firm as resulting in the Grantee having not materially and substantially fewer authorities and responsibilities (taking into consideration the Company’s industry) when compared to the authorities and responsibilities applicable to the position held by the Grantee immediately prior to the start of the Protected Period. The Company may retain a nationally-recognized executive placement firm for purposes of making the determination required by the preceding sentence and the written opinion of the firm thus selected shall be conclusive as to this issue.

In addition, if the Grantee is a vice president, the Grantee’s loss of vice-president status will constitute “Good Reason”; provided that the loss of the title of “vice president” will not, in and of itself, constitute Good Reason if the Grantee’s lack of a vice president title is generally consistent with the manner in which the title of vice president is used within the Grantee’s business unit or if the loss of the title is the result of a promotion to a higher level office. For the purposes of the preceding sentence, the Grantee’s lack of a vice-president title will only be considered generally consistent with the manner in which such title is used if most persons in the business unit with authorities, duties, and responsibilities comparable to those of the Grantee immediately prior to the commencement of the Protected Period do not have the title of vice-president.

- (ii) A material reduction by the Company in the Grantee’s annualized rate of base salary as in effect at the start of the Protected Period, or as the same shall be increased from time to time.
- (iii) A material reduction in the aggregate value of the Grantee’s level of participation in any of the Company’s short and/or long-term incentive compensation plans (excluding stock-based incentive compensation plans), employee benefit or retirement plans, or policies, practices, or arrangements in which the Grantee participates immediately prior to the start of the Protected Period; provided, however, that a reduction in the aggregate value shall not be deemed to be “Good Reason” if the reduced value remains substantially consistent with the average level of other employees who have positions commensurate with the position held by the Grantee immediately prior to the start of the Protected Period.
- (iv) A material reduction in the Grantee’s aggregate level of participation in the Company’s stock-based incentive compensation plans from the level in effect immediately prior to the start of the Protected Period; provided, however, that a reduction in the aggregate level of participation shall not be deemed to be “Good Reason” if the reduced level of participation remains substantially consistent with the average level of participation of other employees who have positions commensurate with the position held by the Grantee immediately prior to the start of the Protected Period.
- (v) The Grantee is informed by the Company that his or her principal place of employment for the Company will be relocated to a location that is greater than fifty (50) miles away from the Grantee’s principal place of employment for the Company at the start of the corresponding Protected Period; provided that, if the Company communicates an intended effective date for such relocation, in no event shall Good Reason exist pursuant to this clause (v) more than ninety (90) days before such intended effective date.

The Grantee’s right to terminate employment for Good Reason shall not be affected by the Grantee’s incapacity due to physical or mental illness. The Grantee’s continued employment shall not constitute a consent to, or a waiver of rights with respect to, any circumstances constituting Good Reason herein.

“**Parent**” is used as defined in the Plan.

“**Plan**” means the Northrop Grumman 2011 Long-Term Incentive Stock Plan, as it may be amended from time to time.

The “**Protected Period**” corresponding to a Change in Control of the Company shall be a period of time determined in accordance with the following:

- (i) If the Change in Control is triggered by a tender offer for shares of the Company’s stock or by the offeror’s acquisition of shares pursuant to such a tender offer, the Protected Period shall commence on the date of the initial tender offer and shall continue through and including the date of the Change in Control; provided that in no case will the Protected Period commence earlier than the date that is six (6) months prior to the Change in Control.
- (ii) If the Change in Control is triggered by a merger, consolidation, or reorganization of the Company with or involving any other corporation, the Protected Period shall commence on the date that serious and substantial discussions first take place to effect the merger, consolidation, or reorganization and shall continue through and including the date of the Change in Control; provided that in no case will the Protected Period commence earlier than the date that is six (6) months prior to the Change in Control.
- (iii) In the case of any Change in Control not described in clause (i) or (ii) above, the Protected Period shall commence on the date that is six (6) months prior to the Change in Control and shall continue through and including the date of the Change in Control.

“**Successor**” means the person acquiring a Grantee’s rights to a grant under the Plan by will or by the laws of descent or distribution.

**Severance Plan for
Elected and Appointed Officers of
Northrop Grumman Corporation
As amended and restated effective January 1, 2019**

1. **Purpose of Plan.** The purpose of the Plan is to provide severance benefits for eligible elected and appointed officers of Northrop Grumman Corporation who reside and work in the United States. The terms of this amended and restated Plan are applicable to Qualifying Terminations that occur on or after January 1, 2019.

2. **Definitions.** The terms defined in this section shall have the meaning given below:

- (a) **“Committee”** means the Compensation Committee of the Board of Directors of the Company or any successor to the Committee.
- (b) **“Code”** means the Internal Revenue Code of 1986, as amended.
- (c) **“Company”** means Northrop Grumman Corporation.
- (d) **“CPC”** means the Corporate Policy Council.
- (e) **“Disability”** means any disability of an Officer recognized as a disability for purposes of the Company’s long-term disability plan, or similar plan later adopted by the Company in place of such plan.
- (f) **“Key Employee”** means an employee treated as a “specified employee” as of his Separation from Service under Code section 409A(a)(2)(B)(i) of the Company or its affiliate (i.e., a key employee (as defined in Code section 416(i) without regard to paragraph (5) thereof) if the Company’s stock is publicly traded on an established securities market or otherwise. The Company shall determine in accordance with a uniform Company policy which Officers are Key Employees as of each December 31 in accordance with IRS regulations or other guidance under Code section 409A, provided that in determining the compensation of individuals for this purpose, the definition of compensation in Treas. Reg. § 1.415(c)-2(d)(3) shall be used. Such determination shall be effective for the twelve (12) month period commencing on April 1 of the following year.
- (g) **“Officer”** means an elected or appointed officer of Northrop Grumman Corporation who resides and works in the United States.
- (h) **“Plan”** means this Severance Plan for Elected and Appointed Officers of Northrop Grumman Corporation, as it may be amended from time to time.
- (i) **“Qualifying Termination”** means any one of the following (i) an Officer’s involuntary termination of employment with the Company, other than Termination for Cause or mandatory retirement, or (ii) an Officer’s election to terminate employment with the Company in lieu of accepting a downgrade to a non-Officer position or status. “Qualifying Termination” does not include any change in the Officer’s employment status due to any transfer within the Company or to an affiliate, or to a purchaser of assets or a portion of the business of the Company or an affiliate in connection with the purchase, Disability, voluntary termination or normal retirement.
- (j) **“Release”** means the Separation Agreement and General Release prepared by the Company at the time of the Officer’s termination of employment, which may include such terms as the Company deems appropriate, including certain post-employment restrictions as a condition of receiving benefits under the Plan.

(k) **“Separation from Service”** or **“Separate from Service”** means a “separation from service” within the meaning of Code section 409A.

(l) **“Termination for Cause”** means an Officer’s termination of employment with the Company because of:

- (i) The continued failure by the Officer to devote reasonable time and effort to the performance of his duties (other than a failure resulting from the Officer’s incapacity due to physical or mental illness) after written demand for improved performance has been delivered to the Officer by the Company which specifically identifies how the Officer has not devoted reasonable time and effort to the performance of his duties;
- (ii) The willful engaging by Officer in misconduct which is substantially injurious to the Company, monetarily or otherwise; or
- (iii) The Officer’s conviction for committing an act of fraud, embezzlement, theft, or other act constituting a felony (other than traffic related offenses or as a result of vicarious liability).

A Termination for Cause shall not include a termination attributable to:

- (i) Bad judgment or negligence on the part of the Officer other than habitual negligence; or
- (ii) An act or omission believed by the Officer in good faith to have been in or not opposed to the best interests of the Company and reasonably believed by the Officer to be lawful.

3. Eligibility Requirements.

(a) Benefits under the Plan are subject to the Company’s sole discretion and approval.

(b) To be considered to receive benefits under the Plan an Officer must meet the following conditions:

- (i) The Officer must experience a Qualifying Termination that results in termination of employment. If, before termination of employment occurs due to the Qualifying Termination event, the Officer voluntarily quits, retires, or experiences a Termination for Cause, the Officer will not receive benefits under this Plan.
- (ii) The Officer must sign the Release.
- (iii) The Officer must not be in a class of employees eligible for another severance plan maintained by the Company or an affiliate, including, without limitation, the Northrop Grumman Innovation Systems Severance Benefit Plan - Grade 21 (formerly named the Orbital ATK Severance Benefit Plan - Grade 21) or the Northrop Grumman Innovation Systems Executive Severance Plan (formerly named the Orbital ATK Executive Severance Plan). This section 3(b)(iii) shall be inapplicable effective July 1, 2019, for Qualifying Terminations that occur on or after that date.

4. Severance Benefits. Upon the Qualifying Termination of any eligible Officer, the terminated Officer shall be entitled to the following benefits under the Plan: (a) a lump-sum severance cash payment, (b) an

extension of the Officer's existing medical and dental coverage, (c) a prorated annual cash bonus payment, and (d) certain other fringe benefits.

- (a) Lump-sum Cash Severance Payment. The designated Appendix describes the lump sum severance benefit available to the Officer.
- (b) Extension of Medical and Dental Benefits. The Company will continue to pay its portion of the Officer's medical and dental benefits for the period of time following the Officer's termination date that is specified in the designated Appendix, provided that for the balance of the month that includes the Officer's termination date and for the immediately following month, the coverage will be at no cost to the Officer. Such continuation coverage shall run concurrently with COBRA continuation coverage (or similar state law). The Officer must continue to pay his portion of the cost of this coverage with after-tax dollars. If rates for active employees increase during this continuation period, the contribution amount will increase proportionately. Also, if medical and dental benefits are modified, terminated or changed in any way for active employees during this continuation period the Officer will also be subject to such modification, termination or change. Following the continuation period specified in the designated Appendix the Officer will be eligible to receive COBRA benefits for any remaining portion of the applicable COBRA period (typically 18 months) at normal COBRA rates. The unreimbursed COBRA period (*e.g.*, the period when the Officer must pay full COBRA rates in order to receive COBRA benefits) starts the first day of the month following the end of the continuation period specified in the designated Appendix.

Example: A Non-CPC Officer receives a layoff notice on June 5, 2017, and his last day of work is June 19, 2017. The Officer's 18-month COBRA period commences June 20, 2017. The Officer will continue to receive medical and dental coverage from June 20, 2017 through July 31, 2017 at no cost to the Officer. The Officer will continue to receive medical and dental coverage from August 1, 2017 through June 19, 2018, as long as the Officer continues to pay the appropriate active employee contribution. Full COBRA rates will apply to the Officer from June 20, 2018 until the end of the remaining COBRA period on December 19, 2018.

If the Officer is not covered by medical and dental benefits at the time of his termination, this section 4(b) will not apply and no continuation coverage will be offered. No health or welfare benefits other than medical and dental will be continued pursuant to the Plan, including but not limited to disability benefits.

The medical and dental benefits to be provided or payments to be made under this section 4(b) shall be reduced to the extent that the Officer is eligible for benefits or payments for the same occurrence under another employer sponsored plan to which the Officer is entitled because of his employment subsequent to the Qualifying Termination.

To the extent the benefits under this section 4(b) are, or ever become, taxable to the Officer and to the extent the benefits continue beyond the period in which the Officer would be entitled (or would, but for the Plan, be entitled) to COBRA continuation coverage if the Officer elected such coverage and paid the applicable premiums, the Company shall administer such continuation of coverage consistent with the following additional requirements as set forth in Treas. Reg. § 1.409A-3(i)(1)(iv):

- (i) Officer's eligibility for benefits in one year will not affect Officer's eligibility for benefits in any other year;

(ii) Any reimbursement of eligible expenses will be made on or before the last day of the year following the year in which the expense was incurred; and

(iii) Officer's right to benefits is not subject to liquidation or exchange for another benefit.

In the event the preceding sentence applies and the Officer is a Key Employee, provision of these benefits after the COBRA period shall commence on the first day of the seventh month following the Officer's Separation from Service (or, if earlier, the first day of the month after the Officer's death).

(c) Company Performance Related Payment. The Officer will be eligible for a severance payment equal to a pro-rata portion of the bonus he or she would have received under the Company annual incentive plan in which he or she was a participant for the year in which the Qualifying Termination occurred, in addition to the lump-sum cash severance payment described in section 4(a). For this purpose, the pro-rated bonus (if any) will be based on the applicable annual incentive plan payout formula, with any applicable individual performance factor set at 1.00, prorated from the beginning of the performance period (January 1st) to the Officer's date of termination. The severance payment contemplated by this Section 4(c) will be paid when the annual bonuses are paid to active employees between February 15 and March 15 of the year following termination. Notwithstanding anything to the contrary in this section 4(c), if the Officer's bonus opportunity for the fiscal year in which his or her termination occurs is covered by the Company's Incentive Compensation Plan (or similar successor bonus program designed to comply with the performance-based compensation exception under Section 162(m) of the Code), then the Officer's severance payment pursuant to this section 4(c) shall not exceed the maximum bonus the Officer would have been entitled to receive under the Company's Incentive Compensation Plan for that fiscal year, assuming the Officer had been employed through the date bonuses are paid under such plan for that year, and otherwise calculated under the terms of such plan based on actual performance for that fiscal year (but without giving effect to any discretion of the plan administrator to reduce the bonus amount from the maximum otherwise determined in accordance with such plan).

(d) Other Fringe Benefits. All reimbursements will be within the limits established in the Executive Perquisite Program. These perquisites will cease as of the date of termination except for the following:

(i) Financial Planning. If an Officer is eligible for financial planning reimbursement at the time of termination, the Officer will be reimbursed for any financial planning fees as specified in the designated Appendix. For these purposes, "financial planning reimbursement" includes any income tax preparation fee reimbursement the Officer may be entitled to under the financial planning reimbursement terms and conditions applicable to the Officer at the time of termination. The financial planning (including income tax preparation fee) reimbursements contemplated by the Appendices are subject to any other applicable limitations that may apply under the financial planning reimbursement terms and conditions applicable to the Officer at the time of termination (for example, and without limitation, annual caps on amounts that may be used in connection with income tax preparation). All such reimbursements pursuant to this section 4(d)(i) shall be administered consistent with the following additional requirements as set forth in Treas. Reg. § 1.409A-3(i)(1)(iv): (1) Officer's eligibility for benefits in one year will not affect Officer's eligibility for benefits in any other year; (2) any reimbursement of eligible expenses will be made on or before the last day of the year following the year in which the

expense was incurred; and (3) Officer's right to benefits is not subject to liquidation or exchange for another benefit. In addition, no reimbursements shall be made to an Officer who is a Key Employee for six months following the Officer's Separation from Service.

- (ii) **Outplacement Service.** The Officer will be reimbursed for the cost of reasonable outplacement services provided by the Company's outplacement service provider for services provided within one year after the Officer's date of termination; provided, however, that the total reimbursement shall be limited to an amount equal to fifteen percent (15%) of the Officer's base salary as of the date of termination. All services will be subject to the current contract with the provider, and all such expenses shall be reimbursed as soon as practicable, but in no event later than the end of the year following the year the Officer Separates from Service.
- (e) **Time and Form of Payment.** The severance benefits under section 4(a) will be paid to the eligible Officer in a lump sum as soon as practicable following the Officer's Separation from Service, but in no event beyond thirty (30) days from such date, provided the Officer signs the Release within twenty one (21) days following the Officer's Separation from Service. Notwithstanding the foregoing, if the Officer is a Key Employee, the lump sum payment shall be made on or within thirty (30) days after the first day of the seventh month following the Officer's Separation from Service (or, if earlier, the first day of the month after the Officer's death), provided the Officer signs the Release within twenty-one (21) days following the Officer's Separation from Service. This amount will be paid after all regular taxes and withholdings have been deducted. No payment made pursuant to the Plan is eligible compensation under any of the Company's benefit plans, including without limitation, pension, savings, or deferred compensation plans.

5. Limitation of Plan Benefits. Notwithstanding anything contained in this Plan to the contrary, if upon or following a change in the "ownership or effective control" of the Company or in the "ownership of a substantial portion of the assets" of the Company (each within the meaning of Section 280G of the Code), the tax imposed by Section 4999 of the Code or any similar or successor tax (the "Excise Tax") applies, solely because of such transaction, to any payments, benefits and/or amounts received by the Officer pursuant to the Plan or otherwise, including, without limitation, any amounts received, or deemed received within the meaning of any provision of the Code, by the Officer as a result of (and not by way of limitation) any automatic vesting, lapse of restrictions and/or accelerated target or performance achievement provisions, or otherwise, applicable to outstanding grants or awards to the Officer under any of the Company's incentive plans, including without limitation, the 2001 Long-Term Incentive Stock Plan and the 1993 Long Term Incentive Stock Plan (collectively, the "Total Payments"), then the Total Payments shall be reduced (but not below zero) so that the maximum amount of the Total Payments (after reduction) shall be one dollar (\$1.00) less than the amount which would cause the Total Payments to be subject to the Excise Tax; provided that such reduction to the Total Payments shall be made only if the total after-tax benefit to the Officer is greater after giving effect to such reduction than if no such reduction had been made. If such a reduction is required, the Company shall reduce or eliminate the Total Payments by first reducing or eliminating any cash severance benefits, then by reducing or eliminating any accelerated vesting of stock options, then by reducing or eliminating any accelerated vesting of other equity awards, then by reducing or eliminating any other remaining Total Payments, in each case in reverse order beginning with the payments which are to be paid the farthest in time from the date of the transaction triggering the Excise Tax. The preceding provisions of this section 5 shall take precedence over the provisions of any other plan, arrangement or agreement governing the Officer's rights and entitlements to any benefits or compensation.

6. Offset for Other Benefits Received. The benefits under the Plan are in lieu of, and not in addition to, any other severance or separation benefits for which the Officer is eligible under any Company plan, policy or arrangements (including but not limited to, severance benefits provided under any employment agreement, retention incentive agreement, or similar benefits under any individual change in control agreements, plans, policies, arrangements and change in control agreements of acquired companies or business units) (collectively, “severance plans”). If an Officer receives any benefit under any severance plan, such benefit shall cause a corresponding reduction in benefits under this Plan. If, despite any release that the Officer signs in connection with the Plan, such Officer is later awarded and receives benefits under any other severance plan(s), any benefits that the Officer receives under the Plan will be treated as having been received under those other severance plans for purposes of calculating total benefits received under those other severance plans (that is, benefits under those other severance plans will be reduced by amounts received under the Plan).

7. Administration. The Plan shall be administered by the Benefit Plans Administrative Committee (the “Plan Administrator”). The Plan Administrator has sole and absolute discretion to interpret the terms of the Plan, eligibility for benefits, and determine questions of fact. The Plan Administrator may delegate any of its duties or authority to any individual or entity.

8. Claims and Appeals Procedures.

Claims Procedure. If an Officer believes that he or she is entitled to benefits under the Plan and has not received them, the Officer or his authorized representative (each, a “claimant”) may file a claim for benefits. The Vice President of Compensation and Benefits decides claims for benefits under the Plan. The claimant must submit the written claim to the following address:

Vice President of Compensation and Benefits
Northrop Grumman Corporation
2980 Fairview Park Drive
Falls Church, VA 22042

The letter must state the reason why the claimant believes the Officer is entitled to benefits, and the letter must be received no later than 90 days after the Officer’s termination of employment, or 90 days after a payment was due, whichever comes first.

If the claim is denied, in whole or in part, the claimant will receive a written response within 90 days. This response will include (i) the reason(s) for the denial, (ii) reference(s) to the specific Plan provisions on which denial is based, (iii) a description of any additional information necessary to perfect the claim, and (iv) a description of the Plan’s claims and appeals procedures. In some cases more than 90 days may be needed to make a decision, in which case the claimant will be notified prior to the expiration of the 90 days that more time is needed to review the claim and the date by which the Plan expects to render the decision. In no event will the extension be for more than an additional 90 days.

Appeal of Denied Claim. The claimant may appeal a denied claim by filing an appeal with the Benefit Plans Administrative Committee within 60 days after the claim is denied. The written appeal should be sent to the Benefit Plans Administrative Committee at the following address:

Benefit Plans Administrative Committee
Northrop Grumman Corporation
2980 Fairview Park Drive
Falls Church, VA 22042

As part of the appeal process the claimant will be given the opportunity to submit written comments and information and be provided, upon request and free or charge, with copies of documents and other information relevant to the claim. The review on appeal will take into account all information submitted on appeal, whether or not it was submitted or considered in the initial benefit determination. A decision will be made on the appeal within 60 days, unless additional time is needed. If more time is needed, the claimant will be notified prior to the expiration of the 60 days that up to an additional 60 days is needed and the date by which the Plan expects to render the decision. If the claim is denied, in whole or in part, on appeal the claimant will receive a written response which will include (i) the reason(s) for the denial, (ii) references to the specific Plan provisions on which the denial is based, (iii) a statement that the claimant is entitled to receive, upon request and free of charge, copies of all documents and other information relevant to the claim on appeal, and (iv) a description of the Plan's claims and appeals procedures.

If the claim is denied on appeal, the Officer has the right to bring an action under Section 502(a) of the Employee Retirement Income Security Act of 1974, as amended. Any claimant must pursue all claims and appeals procedures described in the Plan document before seeking any other legal recourse with respect to Plan benefits. In addition, any lawsuit must be filed within six months from the date of the denied appeal, or two years from the Officer's termination date, whichever occurs first.

In exercising their authority and responsibility for deciding claims and appeals, the Vice President of Compensation and Benefits (claims) and the Benefit Plans Administrative Committee (appeals) each have full discretionary authority, including, without limitation, authority to construe the terms of the Plan and to make factual determinations. Their determinations and actions will be conclusive and binding on all persons, and no determination or action will be modified by a court unless the determination or action is proven to be arbitrary or capricious.

9. Amendment. The Company (acting through the Committee) reserves the right at any time to terminate or amend this Plan in any respect and without the consent of any Officer.

10. Unfunded Obligations. All benefits due an Officer or the Officer's beneficiary under this Plan are unfunded and unsecured and are payable out of the general funds of the Company. The Company, in its sole and absolute discretion, may establish a trust associated with the payment of Plan benefits, provided that the trust does not alter the characterization of the Plan as an "unfunded plan" for purposes of the Employee Retirement Income Security Act, as amended. Any such trust shall make distributions in accordance with the terms of the Plan.

11. Transferability of Benefits. The right to receive payment of any benefits under this Plan shall not be transferred, assigned or pledged except by beneficiary designation or by will or under the laws of descent and distribution.

12. Taxes. The Company may withhold from any payment due under this Plan any taxes required to be withheld under applicable federal, state or local tax laws or regulations.

13. Gender. The use of masculine pronouns in this Plan shall be deemed to include both males and females.

14. Construction, Governing Laws. The Plan is intended as (i) a pension plan within the meaning of Section 3(2) of the Employee Retirement Income Security Act, as amended ("ERISA"), and (ii) an unfunded pension plan maintained by the Company for a select group of management or highly

compensated employees within the meaning of Department of Labor Regulation 2520.104-23 promulgated under ERISA, and Sections 201, 301, and 401 of ERISA. Nothing in this Plan creates a vested right to benefits in any employee or any right to be retained in the employ of the Company. Except to the extent that federal legislation or applicable regulation shall govern, the validity and construction of the Plan and each of its provisions shall be subject to and governed by the laws of the Commonwealth of Virginia.

15. Severability. If any provision of the Plan is found, held or deemed to be void, unlawful or unenforceable under any applicable statute or other controlling law, the remainder of the Plan shall continue in full force and effect.

IN WITNESS WHEREOF, this Amendment and Restatement is hereby executed by a duly authorized officer on this 20th day of December, 2018.

NORTHROP GRUMMAN CORPORATION

By: /s/ Denise M. Peppard

Denise M. Peppard

Corporate Vice President and Chief Human Resources Officer

Appendix for Corporate Policy Council (CPC) Officers

The following benefits shall apply for purposes of eligible Officers who are members of the CPC:

Section 4(a). Lump-sum Cash Severance Payment. The lump sum cash severance payment shall equal one and one half (1.5) times the sum of (A) one year's base salary as in effect on the effective date of the Officer's termination, plus (B) the Officer's target annual bonus established under the Company's annual incentive plan in which he or she was a participant for the fiscal year in which the date of termination occurs. No supplemental bonuses or other bonuses will be combined with the Officer's annual bonus for purposes of this computation.

Section 4(b). Extension of Medical and Dental Benefits. The Company will continue to pay its portion of the Officer's medical and dental benefits for eighteen months following the Officer's termination date.

Section 4(d)(i). Financial Planning. If the Officer is eligible for financial planning reimbursement at the time of termination, the Officer will be reimbursed for any financial planning fees incurred before his termination date. In addition, the Officer will be reimbursed for the following financial planning fees incurred after his termination date: (i) any fees incurred in the year in which the date of termination occurs, provided that the total financial planning reimbursement for such year (including fees incurred before and after the date of termination) shall not exceed \$18,500 and (ii) any fees incurred in the year following the year in which the date of termination occurs, provided that the total financial planning reimbursement for such year shall not exceed \$18,500.

Appendix for non-CPC Officers

The following benefits shall apply for purposes of eligible Officers who are not members of the CPC:

Section 4(a). Lump-sum Cash Severance Payment. The lump sum cash severance payment shall equal the sum of (A) one year's base salary as in effect on the effective date of the Officer's termination, plus (B) the Officer's target annual bonus established under the Company's annual incentive plan in which he or she was a participant for the fiscal year in which the date of termination occurs. No supplemental bonuses or other bonuses will be combined with the Officer's annual bonus for purposes of this computation.

Section 4(b). Extension of Medical and Dental Benefits. The Company will continue to pay its portion of the Officer's medical and dental benefits for one year following the Officer's termination date.

Section 4(d)(i). Financial Planning. If the Officer is eligible for financial planning reimbursement at the time of termination, the Officer will be reimbursed for any financial planning fees incurred before his termination date. In addition, the Officer will be reimbursed for the following financial planning fees incurred after his termination date: (i) any fees incurred in the year in which the date of termination occurs, provided that the total financial planning reimbursement for such year (including fees incurred before and after the date of termination) shall not exceed \$7,500 and (ii) any fees incurred in the year following the year in which the date of termination occurs, provided that the total financial planning reimbursement for such year shall not exceed \$7,500.

**NORTHROP GRUMMAN INNOVATION SYSTEMS
NONQUALIFIED DEFERRED COMPENSATION PLAN**
Amended and Restated Effective January 1, 2019

History and Purpose

The Northrop Grumman Innovation Systems Nonqualified Deferred Compensation Plan (the "Plan") is hereby amended and restated effective as of January 1, 2019, except as otherwise provided herein. Prior to January 1, 2019, the Plan was named the Orbital ATK, Inc. Nonqualified Deferred Compensation Plan, and was maintained by Northrop Grumman Innovation Systems, Inc. (formerly Orbital ATK, Inc.). Effective January 1, 2019, Northrop Grumman Corporation maintains and sponsors the Plan.

Effective January 1, 2003, ALLIANT TECHSYSTEMS INC., now named Northrop Grumman Innovation Systems, Inc. (hereinafter, the "Company"), established a nonqualified, unfunded deferred compensation plan (the "Plan") which is currently embodied in a document titled "ALLIANT TECHSYSTEMS INC. NONQUALIFIED DEFERRED COMPENSATION PLAN (As amended and Restated March 18, 2003)" as amended (the "Prior Plan Statement"). Deferred compensation credited under the Plan which relates entirely to services performed on or before December 31, 2004 shall continue to be governed by the terms of the Prior Plan Statement, attached hereto as Appendix A. Deferred compensation credited under the Plan which relates all or in part to services performed on or after January 1, 2005 shall be governed by the terms of this Plan restatement, the terms of which are intended to comply with the deferred compensation provisions in the American Jobs Creation Act of 2004. Clarifying amendments were made on September 6, 2007 to comply with the American Jobs Creation Act of 2004. Additional clarifying changes were made on October 29, 2007. Changes were made effective November 1, 2014 to exclude benefits for former Participants who became employees of Vista Outdoor Inc. as of that date. Additional clarifying amendments and administrative changes were made effective February 16, 2016.

Effective January 1, 2019, the Plan is frozen, and no benefits shall accrue under this Plan with respect to compensation earned for services performed after December 31, 2018. Except to the extent modified by Appendix B hereto, the terms of the Plan in effect on December 31, 2018 shall continue to govern.

This Plan is intended (1) to comply with section 409A of the Internal Revenue Code, as amended (the "Code") and official guidance issued thereunder, and (2) to be "a plan which is unfunded and is maintained by an employer primarily for the purpose of providing deferred compensation for a select group of management or highly compensated employees" within the meaning of sections 201(2), 301(a)(3) and 401(a)(1) of the Employee Retirement Income Security Act of 1974. Notwithstanding any other provision of this Plan, this Plan shall be interpreted, operated and administered in a manner consistent with these intentions.

ARTICLE 1
Definitions

For the purposes of this Plan, unless otherwise clearly apparent from the context, the following phrases or terms shall have the following indicated meanings:

- 1.1 “Account Balance” shall mean, with respect to a Participant, an entry on the records of the Employer equal to the sum of the Participant’s Annual Accounts. The Account Balance shall be a bookkeeping entry only and shall be utilized solely as a device for the measurement and determination of the amounts to be paid to a Participant, or his or her designated Beneficiary, pursuant to this Plan.
- 1.2 “Annual Account” shall mean, with respect to a Participant, an entry on the records of the Employer equal to the following amount: (i) the sum of the Participant’s Annual Deferral Amount, Company Contribution Amount and Company Restoration Matching Amount for any one Plan Year, plus (ii) amounts credited or debited to such amounts pursuant to this Plan, less (iii) all distributions made to the Participant or his or her Beneficiary pursuant to this Plan that relate to the Annual Account for such Plan Year. The Annual Account shall be a bookkeeping entry only and shall be utilized solely as a device for the measurement and determination of the amounts to be paid to a Participant, or his or her designated Beneficiary, pursuant to this Plan.
- 1.3 “Annual Deferral Amount” shall mean that portion of a Participant's Base Salary, Performance Cash and Performance Shares that a Participant defers in accordance with Article 3 for any one Plan Year, without regard to whether such amounts are withheld and credited during such Plan Year. In the event of a Participant's Retirement, Disability, death or Termination of Employment prior to the end of a Plan Year, such year's Annual Deferral Amount shall be the actual amount withheld prior to such event.
- 1.4 “Annual Installment Method” shall be an annual installment payment over the number of years selected by the Participant in accordance with this Plan, calculated as follows: (i) for the first annual installment, the Participant’s vested portion of each Annual Account shall be calculated as of the close of business on the Participant’s Benefit Distribution Date, and (ii) for remaining annual installments, the vested portion of each applicable Annual Account shall be calculated on each anniversary of the Benefit Distribution Date (or if such calculation date is not a business day, the preceding business day). Each annual installment shall be calculated by multiplying this balance by a fraction, the numerator of which is one and the denominator of which is the remaining number of annual payments due the Participant. By way of example, if the Participant elects a 10-year Annual Installment Method as the form of Retirement Benefit for an Annual Account, the first payment shall be 1/10 of the vested balance of such Annual Account, calculated as described in this definition. The following year, the payment shall be 1/9 of the vested balance of such Annual Account, calculated as described in this definition.
- 1.5 “Annual Performance Share Amount” shall mean the portion of the Participant’s Annual Deferral Amount, if any, representing Performance Shares deferred in accordance with Article 3 of the Plan. Annual Performance Share Amounts shall be credited to the Performance Share

Accounts of Participants, determined by the number of performance shares that would otherwise be paid based upon the achievement of the performance goals and the other requirements for the payment of performance shares, but for the election to defer.

- 1.6 “Base Salary” shall mean the annual cash compensation relating to services performed during any calendar year, excluding distributions from nonqualified deferred compensation plans, bonuses, commissions, overtime, fringe benefits, profit sharing contributions, stock options, relocation expenses, incentive payments, non-monetary awards, and automobile and other allowances paid to a Participant for employment services rendered (whether or not such allowances are included in the Employee’s gross income). Base Salary shall be calculated before reduction for compensation voluntarily deferred or contributed by the Participant pursuant to all qualified or nonqualified plans of any Employer and shall be calculated to include amounts not otherwise included in the Participant’s gross income under Code Sections 125, 402(e)(3), 402(h), or 403(b) pursuant to plans established by any Employer; provided, however, that all such amounts will be included in compensation only to the extent that had there been no such plan, the amount would have been payable in cash to the Employee. In no event shall Base Salary include any amounts payable to the Participant prior to the commencement of his or her participation in this Plan.
- 1.7 “Beneficiary” shall mean one or more persons, trusts, estates or other entities, designated in accordance with Article 10, that are entitled to receive benefits under this Plan upon the death of a Participant.
- 1.8 “Beneficiary Designation Form” shall mean the form established from time to time by the Senior Vice President of Human Resources that a Participant completes, signs and returns to the Company to designate one or more Beneficiaries.
- 1.9 “Benefit Distribution Date” shall mean the date that triggers distribution of a Participant’s vested Account Balance. A Participant’s Benefit Distribution Date shall be the earliest to occur of any one of the following:
- (a) If the Participant Retires, his or her Benefit Distribution Date shall be the last day of the six-month period immediately following the date on which the Participant Retires; provided, however, in the event the Participant changes his or her Retirement Benefit election for one or more Annual Accounts in accordance with Section 5.2(a), his or her Benefit Distribution Date for such Annual Account(s) shall be postponed in accordance with such Section 5.2(a); or
 - (b) If the Participant experiences a Termination of Employment, his or her Benefit Distribution Date shall be the last day of the six-month period immediately following the date on which the Participant experiences a Termination of Employment; provided, however, in the event the Participant elects to receive one or more Annual Accounts as of the first anniversary of his or her Termination of Employment in accordance with Section 6.2, his or her Benefit Distribution Date shall be postponed in accordance with such Section 6.2; or
 - (c) The date on which the Company is provided with proof that is satisfactory to the Senior Vice President of Human Resources of the Participant’s death, if the Participant dies prior to the complete distribution of his or her vested Account Balance; or

- (d) The date on which the PRC (or the Committee in the case of a Section 16 Officer or as otherwise required by Section 15.4 of this Plan) determines the Participant is Disabled.
- 1.10 “Board” shall mean the board of directors of the Company.
- 1.11 “CEO” shall mean the Chief Executive Officer of the Company.
- 1.12 “Claimant” shall have the meaning set forth in Section 15.1.
- 1.13 “Code” shall mean the Internal Revenue Code of 1986, as amended from time to time.
- 1.14 “Committee” shall mean the Compensation and Human Resources Committee the Board of Directors of the Company.
- 1.15 “Company” shall mean Orbital ATK, Inc., a Delaware corporation, and any successor to all or substantially all of the Company’s assets or business.
- 1.16 “Company Contribution Account” shall mean (i) the sum of the Participant’s Company Contribution Amounts, plus (ii) amounts credited or debited to the Participant’s Company Contribution Account in accordance with this Plan, less (iii) all distributions made to the Participant or his or her Beneficiary pursuant to this Plan that relate to the Participant’s Company Contribution Account.
- 1.17 “Company Contribution Amount” shall mean, for any one Plan Year, the amount determined in accordance with Section 3.5.
- 1.18 “Company Restoration Matching Account” shall mean (i) the sum of all of a Participant’s Company Restoration Matching Amounts, plus (ii) amounts credited or debited to the Participant’s Company Restoration Matching Account in accordance with this Plan, less (iii) all distributions made to the Participant or his or her Beneficiary pursuant to this Plan that relate to the Participant’s Company Restoration Matching Account.
- 1.19 “Company Restoration Matching Amount” shall mean, for any one Plan Year, the amount determined in accordance with Section 3.6.
- 1.20 “Death Benefit” shall mean the benefit set forth in Article 8.
- 1.21 “Deduction Limitation” shall mean the limitation on a benefit that may otherwise be distributable pursuant to the provisions of this Plan, as set forth in Section 17.15.
- 1.22 “Deferral Account” shall mean (i) the sum of all of a Participant’s Annual Deferral Amounts, plus (ii) amounts credited or debited to the Participant’s Deferral Account in accordance with this Plan, less (iii) all distributions made to the Participant or his or her Beneficiary pursuant to this Plan that relate to his or her Deferral Account.
- 1.23 “Disability” or “Disabled” shall mean that a Participant is (i) unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or can be expected to last for a continuous period of not less than 12 months, or (ii) by reason of any medically determinable physical or mental impairment which can be expected to result in death or can be expected to last for a continuous period of not less than 12 months, receiving income replacement benefits for a period of not less than three months under an accident or health plan covering employees of the Participant’s Employer.

- 1.24 “Disability Benefit” shall mean the benefit set forth in Article 7.
- 1.25 “Election Form” shall mean the form, which may be in electronic format, established from time to time by the Committee that a Participant completes, signs and returns to the Company to make an election under the Plan.
- 1.26 “Employee” shall mean a person who is an employee of any Employer.
- 1.27 “Employer(s)” shall mean the Company and/or any of its subsidiaries (now in existence or hereafter formed or acquired) that have employees who participate in the Plan.
- 1.28 “ERISA” shall mean the Employee Retirement Income Security Act of 1974, as amended from time to time.
- 1.29 “401(k) Plan” shall mean a plan adopted by the Employer that is qualified under Code Section 401(a) that contains a cash or deferral arrangement described in Code Section 401(k), as amended from time to time.
- 1.30 “Participant” shall mean any Employee (i) who is selected to participate in the Plan and (ii) who submits an executed Election Form and Beneficiary Designation Form, which are accepted by the Company.
- 1.31 “Performance Cash” shall mean any performance-based cash compensation, in addition to Base Salary, earned by a Participant under any Employer's annual or long-term bonus and incentive plans for services rendered during a performance period of at least 12 months, as further specified on an Election Form approved by the Committee in its sole discretion.
- 1.32 “Performance Shares” shall mean any performance-based stock compensation earned by a Participant under any Employer performance award plan for services rendered during a performance period of at least 12 months, as further specified on an Election Form approved by the Committee in its sole discretion.
- 1.33 “Performance Share Account” shall mean the portion of the Deferral Account equal to (i) the sum of all of a Participant's Annual Performance Share Amounts, plus (ii) the value of the number of additional share units credited as a result of stock dividends or deemed reinvestment of cash dividends, less (iii) all distributions made to the Participant or his or her Beneficiary pursuant to this Plan that relate to his or her Performance Share Account.
- 1.34 “PIC” shall mean the Orbital ATK Pension Investment Committee.
- 1.35 “Plan” shall mean the Orbital ATK, Inc. Nonqualified Deferred Compensation Plan (formerly named the Alliant Techsystems Inc. Nonqualified Deferred Compensation Plan), which shall be evidenced by this instrument, as it may be amended from time to time.
- 1.36 “Plan Year” shall mean a period beginning on January 1 of each calendar year and continuing through December 31 of such calendar year.
- 1.37 “Prior Plan Statement” shall mean the document, attached hereto as Appendix A and which is a part of the Plan, titled “ALLIANT TECHSYSTEMS INC. NONQUALIFIED DEFERRED COMPENSATION PLAN (As amended and Restated March 18, 2003)” as amended.
- 1.38 “PRC” shall mean the Orbital ATK Pension and Retirement Committee.

- 1.39 “Retirement”, “Retire(s)” or “Retired” shall mean, with respect to an Employee, separation from service with all Employers and all entities treated as members of the same controlled group with any Employer under Code Section 414(b) or (c), for any reason other than a leave of absence, death or Disability on or after the attainment of age 55 with two Years of Service. Controlled group membership shall be determined by substituting “at least 50 percent” for “at least 80 percent” each place it appears in Code Section 1563(a)(1), (2) and (3), and by substituting “at least 50 percent” for “at least 80 percent” each place it appears in Treas. Reg. §1.414(c)-2.
- 1.40 “Retirement Benefit” shall mean the benefit set forth in Article 5.
- 1.41 “Scheduled Distribution” shall mean the distribution set forth in Section 4.1.
- 1.42 “Section 16 Officer” shall mean an “officer” of the Company as defined in the rules promulgated under Section 16 of the Securities Exchange Act of 1934, as amended.
- 1.43 “Senior Vice President of Human Resources” shall mean the most senior officer of the Company in charge of the human resources function at the time the action is taken with respect to the Plan.
- 1.44 “Terminate the Plan” or “Termination of the Plan” shall mean a determination by the Committee that (i) all Participants shall no longer be eligible to participate in the Plan, (ii) all deferral elections for such Participants shall terminate, and (iii) such Participants shall no longer be eligible to receive Company contributions under this Plan.
- 1.45 “Termination Benefit” shall mean the benefit set forth in Article 6.
- 1.46 “Termination of Employment” shall mean the separation from service with all Employers and all entities treated as members of the same controlled group with any Employer under Code Section 414(b) or (c), voluntarily or involuntarily, for any reason other than Retirement, Disability, death or an authorized leave of absence. Controlled group membership shall be determined by substituting “at least 50 percent” for “at least 80 percent” each place it appears in Code Section 1563(a)(1), (2) and (3), and by substituting “at least 50 percent” for “at least 80 percent” each place it appears in Treas. Reg. §1.414(c)-2.
- 1.47 “Trust” shall mean one or more trusts established by the Company in accordance with Article 16.1.48 “Unforeseeable Financial Emergency” shall mean an unanticipated emergency that is caused by an event beyond the control of the Participant that would result in severe financial hardship to the Participant resulting from (i) a sudden and unexpected illness or accident of the Participant, the Participant’s spouse, or a dependent of the Participant, (ii) a loss of the Participant’s property due to casualty, or (iii) such other similar extraordinary and unforeseeable circumstances arising as a result of events beyond the control of the Participant, all as determined in the sole discretion of the Senior Vice President of Human Resources or, in the case of a Section 16 Officer, the Committee.
- 1.49 “Years of Service” shall mean an Employee’s period of service with Orbital ATK, Inc. or a related Employer measured in full years. A Participant shall receive credit for one full year of “Service” for each Plan Year in which the Participant had at least 1,000 hours of service for a participating Employer or related Employer.

ARTICLE 2

Selection, Enrollment, Eligibility

- 2.1 **Selection.** Participation in the Plan shall be limited to a select group of management or highly compensated Employees, as determined by the CEO in his or her sole discretion; provided, however, that all Section 16 Officers shall be eligible to participate in the Plan (while employed as a Section 16 Officer) and need not be selected by the CEO in order to be eligible to participate in the Plan.
- 2.2 **Enrollment and Eligibility Requirements; Commencement of Participation.** As a condition to participation, each selected Employee who is eligible to participate in the Plan effective as of the first day of a Plan Year shall complete, execute and return to the Company an Election Form and a Beneficiary Designation Form prior to the first day of such Plan Year, or such other earlier deadline as may be established by the Senior Vice President of Human Resources in his or her sole discretion. In addition, the Committee may establish from time to time such other enrollment requirements as it determines, in its sole discretion, are necessary.
- (a) A selected Employee who first becomes eligible to participate in this Plan after the first day of a Plan Year must complete these requirements within 30 days after he or she first becomes eligible to participate in the Plan, or within such other earlier deadline as may be established by the Senior Vice President of Human Resources, in his or her sole discretion, in order to participate for that Plan Year. In such event, such person's participation in this Plan shall not commence earlier than 30 days after he or she first becomes eligible to participate in the Plan or, in the case of an Employee who is not a Section 16 Officer, on the date determined by the Senior Vice President of Human Resources, and such person shall not be permitted to defer under this Plan any portion of his or her Base Salary, Performance Cash and/or Performance Shares that are paid with respect to services performed prior to his or her participation commencement date, except to the extent permissible under Code Section 409A and related Treasury guidance or Regulations.
- (b) Each selected Employee who is eligible to participate in the Plan shall commence participation in the Plan only after the Employee has met all enrollment requirements set forth in this Plan and required by the Committee, including returning all required documents to the Company within the specified time period. Notwithstanding the foregoing, the Company shall process such Participant's deferral election as soon as administratively practicable after such deferral election is submitted to the Company.
- (c) If an Employee fails to meet all requirements contained in this Section 2.2 within the period required, that Employee shall not be eligible to participate in the Plan during such Plan Year.

2.3 **Termination of a Participant's Eligibility** . The CEO (or in the case of a Section 16 Officer, the Committee) shall have the right, in his or her sole discretion, to (i) prevent the Participant from making future deferral elections, and/or (ii) take further action that the CEO or the Committee deems appropriate. Notwithstanding the foregoing, in the event of a Termination of the Plan in accordance with Section 1.43, the termination of the affected Participants' eligibility for participation in the Plan shall not be governed by this Section 2.3, but rather shall be governed by Section 1.43 and Section 12.1. In the event that a Participant is no longer eligible to defer compensation under this Plan, the Participant's Account Balance shall continue to be governed by the terms of this Plan until such time as the Participant's Account Balance is paid in accordance with the terms of this Plan. Notwithstanding any provision of this Plan to the contrary, no former Employee who becomes an employee of Vista Outdoor Inc. on or about November 1, 2014 shall thereafter be a Participant or be entitled to any benefit under this Plan.

ARTICLE 3

Deferral Commitments; Company Contribution Amounts; Company Restoration Matching Amounts; Vesting; Crediting; Taxes

3.1 **Minimum Deferrals.**

(a) Annual Deferral Amount. For each Plan Year, a Participant may elect to defer, as his or her Annual Deferral Amount, Base Salary, Performance Cash and/or Performance Shares in the following minimum amounts for each deferral elected:

Cash Compensation	Minimum Amount
Base Salary	1%
Performance Cash	1%

Equity Compensation	Deferral Amount
Performance Shares	1%

If, prior to the beginning of a Plan Year, a Participant has made an election for less than the stated minimum amounts, or if no election is made, the amount deferred shall be zero. If, at any time after the beginning of a Plan Year, a Participant has deferred less than the stated minimum amounts for that Plan Year, any amount credited to the Participant's Account Balance as the Annual Deferral Amount for that Plan Year shall be distributed to the Participant within 60 days after the last day of the Plan Year.

hh(b) **Short Plan Year.** Notwithstanding the foregoing, if a Participant first becomes a Participant after the first day of a Plan Year the minimum Annual Deferral Amount shall be an amount equal to the minimum set forth above, multiplied by a fraction, the numerator of which is the number of complete months remaining in the Plan Year and the denominator of which is 12.

3.2 Maximum Deferral.

(a) **Annual Deferral Amount.** For each Plan Year, a Participant may elect to defer, as his or her Annual Deferral Amount, Base Salary, Performance Cash and/or Performance Shares up to the following maximum percentages for each deferral elected:

Deferral	Maximum Percentage
Base Salary	70%
Performance Cash	100%
Performance Shares	100%

(b) **Short Plan Year.** Notwithstanding the foregoing, if a Participant first becomes a Participant after the first day of a Plan Year, the maximum Annual Deferral Amount shall be limited to the amount of compensation not yet earned by the Participant as of the date the Participant submits an Election Form to the Company for acceptance.

3.3 Election to Defer; Effect of Election Form.

(a) **First Plan Year.** In connection with a Participant's commencement of participation in the Plan, the Participant shall make an irrevocable deferral election for the Plan Year in which the Participant commences participation in the Plan, along with such other elections as the Senior Vice President of Human Resources (or in the case of a Section 16 Officer, the Committee) deems necessary or desirable under the Plan. For these elections to be valid, the Election Form must be completed and signed by the Participant, timely delivered to the Company (in accordance with Section 2.2 above) and accepted by the Company.

(b) **Subsequent Plan Years.** For each succeeding Plan Year, an irrevocable deferral election for that Plan Year, and such other elections as the Senior Vice President of Human Resources (or in the case of a Section 16 Officer, the Committee) deems necessary or desirable under the Plan, shall be made by timely delivering a new Election Form to the Company, in

accordance with the terms of the Plan, before the end of the Plan Year preceding the Plan Year for which the election is made. If no such Election Form is timely delivered for a Plan Year, the Annual Deferral Amount shall be zero for that Plan Year.

- (c) **Performance-Based Compensation.** Notwithstanding the foregoing, an irrevocable deferral election pertaining to Performance Cash or Performance Shares may be made by timely delivering an Election Form to the Company, in accordance with the terms of the Plan, no later than the earlier of (i) six months before the end of the performance period or (ii) such earlier date as the Senior Vice President of Human Resources may determine, in his or her sole discretion, for the Plan Year. For any Plan Year the Committee may determine, in its sole discretion, that any such election shall be limited to the portion of Performance Cash and/or Performance Shares designated by the Committee. "Performance-based compensation" shall be compensation based on services performed over a period of at least 12 months, in accordance with Code Section 409A and related guidance.
- (d) **Restricted Stock Amounts.** Effective January 1, 2005, deferrals of restricted stock (which do not otherwise qualify as Performance Shares) shall not be permitted under this Plan. Notwithstanding the foregoing, a Participant's election to defer restricted stock which was made on or prior to December 31, 2004 under the terms of the Prior Plan Statement with respect to restricted stock which vests on or after January 1, 2005 shall be treated as an Annual Performance Share Amount under this Plan restatement. As of the date on which such restricted stock amounts vest, such Participant's Performance Share Account shall be credited with the number of units equal to the number of shares of Orbital ATK common stock that would have otherwise been delivered to the Participant. Such units shall become payable in accordance with the terms of this Plan statement (and not the Prior Plan Statement). Restricted stock deferrals which vested and were credited to this Plan on or prior to December 31, 2004 shall be governed exclusively under the terms of the Prior Plan Statement.
- 3.4 **Withholding and Crediting of Annual Deferral Amounts.** For each Plan Year, the Base Salary portion of the Annual Deferral Amount shall be withheld from each regularly scheduled Base Salary payroll in equal amounts, as adjusted from time to time for increases and decreases in Base Salary. The Performance Cash and/or Performance Shares portion of the Annual Deferral Amount shall be withheld at the time the Performance Cash and/or Performance Shares are or otherwise would be paid to the Participant, whether or not this occurs during the Plan Year itself. Annual Deferral Amounts shall be credited to a Participant's Deferral Account as soon as reasonably practicable following the time such amounts would otherwise have been paid to the Participant.
- 3.5 **Company Contribution Amount.** For each Plan Year, the CEO (or in the case of a Section 16 Officer, the Committee) may, in his or her sole discretion, credit any amount to any Participant's Annual Account under this Plan, which amount shall be part of the Participant's Company Contribution Amount for that Plan Year. The amount so credited to a Participant may be smaller or larger than the amount credited to any other Participant, and the amount credited to any Participant for a Plan Year may be zero, even though one or more other Participants receive a Company Contribution Amount for that Plan Year. The Company Contribution Amount

described in this Section 3.5, if any, shall be credited to the Participant's Annual Account for the applicable Plan Year on a date or dates to be determined by the CEO (or the Committee as applicable), in his or her sole discretion.

- 3.6 **Company Restoration Matching Amount.** A Participant's Company Restoration Matching Amount for any Plan Year shall be the amount necessary to make up for the lost share, if any, of matching contributions (but not elective deferred contributions) under the 401(k) Plan attributable to the Participant's deferrals under this Plan that would have otherwise been allocated to the account of the Participant under the 401(k) Plan for such Plan Year. The amount so credited to a Participant under this Plan for any Plan Year (i) may be smaller or larger than the amount credited to any other Participant and (ii) may differ from the amount credited to such Participant in the preceding Plan Year. The Participant's Company Restoration Matching Amount, if any, shall be credited to the Participant's Annual Account for the applicable Plan Year as soon as administratively practicable after the amount can be determined for the applicable Plan Year.
- 3.7 **Crediting of Amounts after Benefit Distribution.** Notwithstanding any provision in this Plan to the contrary, if the complete distribution of a Participant's vested Account Balance occurs prior to the date on which any portion of (i) the Annual Deferral Amount that a Participant has elected to defer in accordance with Section 3.3, (ii) the Company Contribution Amount, or (iii) the Company Restoration Matching Amount, would otherwise be credited to the Participant's Account Balance, such amounts shall not be credited to the Participant's Account Balance, but shall be paid to the Participant in a single lump sum as soon as administratively practicable after the amount can be determined.
- 3.8 **Vesting.** A Participant shall at all times be 100% vested in his or her Account Balance; provided, however, that a Participant shall be vested in any Company Contribution Amount credited to his or her Company Contribution Account in accordance with the vesting schedule(s) set forth in his or her employment agreement or any other agreement entered into between the Participant and his or her Employer, or as declared by the CEO (or, in the case of a Section 16 Officer, the Committee). A different vesting schedule may apply to each Company Contribution Amount credited to the Participant's Company Contribution Account. If no vesting schedule is specified in such agreements or declared by the CEO or Committee, as applicable, a Company Contribution Amount shall be 100% vested.
- 3.9 **Crediting and Debiting of Account Balances.** In accordance with, and subject to, the rules and procedures that are established from time to time by the PIC, amounts shall be credited or debited to a Participant's Account Balance in accordance with the following rules:
- (a) **Measurement Funds.** The Participant may elect one or more of the measurement funds selected by the PIC, in its sole discretion, which are based on certain mutual funds or other collective investment vehicles (the "Measurement Funds"), for the purpose of crediting or debiting additional amounts to his or her Account Balance (other than the Performance Share Account). As necessary, the PIC may, in its sole discretion, discontinue, substitute or add a Measurement Fund.
 - (b) **Election of Measurement Funds.** A Participant, in connection with his or her initial deferral election in accordance with Section 3.3(a) above, shall elect, on the Election Form, one or more Measurement Fund(s) (as described in Section 3.9(a) above) to be used to

determine the amounts to be credited or debited to his or her Account Balance (other than the Performance Share Account). If a Participant does not elect any of the Measurement Funds as described in the previous sentence, the Participant's Account Balance (other than the Performance Share Account) shall automatically be allocated into the target date Measurement Fund most closely aligned with Plan participants who are age 65 and older, or a substantially similar Measurement Fund among the Plan's available Measurement Funds, as determined by the PIC from time to time, in its sole discretion. The Participant may (but is not required to) elect, by submitting an Election Form to the Company that is accepted by the Company, to add or delete one or more Measurement Fund(s) to be used to determine the amounts to be credited or debited to his or her Account Balance (other than the Performance Share Account), or to change the portion of his or her Account Balance (other than the Performance Share Account) allocated to each previously or newly elected Measurement Fund. If an election is made in accordance with the previous sentence, it shall apply as of the first business day that is administratively practicable, and shall continue thereafter for each subsequent day in which the Participant participates in the Plan, unless changed in accordance with the previous sentence.

- (c) **Proportionate Allocation.** In making any election described in Section 3.9(b) above, the Participant shall specify on the Election Form, in increments of 1%, the percentage of his or her Account Balance or Measurement Fund, as applicable, to be allocated/reallocated.
- (d) **Annual Performance Share Amounts.** Annual Performance Shares Amounts shall be allocated to the Orbital ATK common stock Measuring Fund as of the date on which such performance shares would otherwise have been paid under the applicable Company stock incentive plan, and the Participant's Performance Share Account shall be credited with the number of units equal to the number of shares of Orbital ATK common stock that would have otherwise been delivered to the Participant.
- (i) **Cash Dividends.** An amount shall be credited on any cash dividend payment date in that number of units equal to the number of shares that could have been purchased on the dividend payment date, based upon the closing price of Orbital ATK common stock as reported on the New York Stock Exchange for such date, with the value of the cash dividends paid on shares of stock equal to the number of units credited to the Performance Share Account as of the record date for such dividend.
- (ii) **Changes in Orbital ATK Common Stock.** In the event that the Committee shall determine that any dividend or other distribution (whether in the form of cash, shares, other securities or other property), recapitalization, stock split, reverse stock split, reorganization, merger, consolidation, split-up, spin-off, combination, repurchase or exchange of shares of the Company's common stock or other securities of the Company, issuance of warrants or other rights to purchase shares of the Company's common stock or other securities of the Company or other similar corporate transaction or event affects the Company's common stock such that an adjustment is determined by the Committee to be appropriate in order to prevent dilution or enlargement of the benefits or potential benefits intended to be made available under the Plan, then the Committee shall, in such manner as it may deem

equitable, adjust the number, value and/or type of units that are credited to the Participants' Performance Share Account.

- (iii) **Voting.** No Participant or Beneficiary shall be entitled to any voting rights with respect to any units credited to the Performance Share Account.

(e) **Crediting or Debiting Method.** The performance of each Measurement Fund (either positive or negative) will be determined on a daily basis based on the manner in which such Participant's Account Balance has been hypothetically allocated among the Measurement Funds by the Participant.

(f) **No Actual Investment.** Notwithstanding any other provision of this Plan that may be interpreted to the contrary, the Measurement Funds are to be used for measurement purposes only, and a Participant's election of any such Measurement Fund, the allocation of his or her Account Balance thereto, the calculation of additional amounts and the crediting or debiting of such amounts to a Participant's Account Balance shall not be considered or construed in any manner as an actual investment of his or her Account Balance in any such Measurement Fund. In the event that the Company or the Trustee (as that term is defined in the Trust), in its own discretion, decides to invest funds in any or all of the investments on which the Measurement Funds are based, no Participant shall have any rights in or to such investments themselves. Without limiting the foregoing, a Participant's Account Balance shall at all times be a bookkeeping entry only and shall not represent any investment made on his or her behalf by the Company or the Trust; the Participant shall at all times remain an unsecured creditor of the Company.

3.10 FICA and Other Taxes.

(a) **Annual Deferral Amounts.** For each Plan Year in which an Annual Deferral Amount is being withheld from a Participant, the Participant's Employer(s) shall withhold, in a manner determined by the Employer(s), the Participant's share of FICA and other employment taxes on such Annual Deferral Amount. If necessary, the Company may reduce the Annual Deferral Amount in order to comply with this Section 3.10.

(b) **Company Restoration Matching Account and Company Contribution Account.**

When a Participant's Annual Account is credited with a Company Restoration Matching Amount and/or Company Contribution Amount (or, if such amount is subject to a vesting schedule, when such Participant is vested in such amount), the Participant's Employer(s) shall withhold, in a manner determined by the Employer(s), the Participant's share of FICA and other employment taxes on such Company Restoration Matching Amount and/or Company Contribution Amount. If necessary, the Company may reduce the vested portion of the Participant's Company Restoration Matching Account or Company Contribution Account, as applicable, in order to comply with this Section 3.10.

(c) **Distributions.** The Participant's Employer(s), or the trustee of the Trust, shall withhold from any payments made to a Participant under this Plan all federal, state and local income, employment and other taxes required to be withheld by the Employer(s), or the trustee of the Trust, in connection with such payments, in amounts and in a manner to be determined in the sole discretion of the Employer(s) and the trustee of the Trust.

ARTICLE 4

Scheduled Distribution; Unforeseeable Financial Emergencies

- 4.1 **Scheduled Distribution.** In connection with each election to defer an Annual Deferral Amount, a Participant may irrevocably elect to receive a Scheduled Distribution, in the form of a lump sum payment, from the Plan with respect to all or a portion of the Annual Account (excluding Annual Performance Share Amounts and Company Contribution Amounts). The Scheduled Distribution shall be a lump sum payment in an amount that is equal to the portion of the Annual Account the Participant elected to have distributed as a Scheduled Distribution, plus amounts credited or debited in the manner provided in Section 3.9 above on that amount, calculated as of the close of business on the date on which the Scheduled Distribution becomes payable (or on the immediately preceding business day if such date is not a business day). Subject to the other terms and conditions of this Plan, each Scheduled Distribution elected shall be paid out during a 60-day period commencing immediately after the first day of any Plan Year designated by the Participant. The Plan Year designated by the Participant must be at least three Plan Years after the end of the Plan Year to which the Participant's deferral election described in Section 3.3 relates. By way of example, if a Scheduled Distribution is elected for Annual Accounts that are earned in the Plan Year commencing January 1, 2005, the Scheduled Distribution would become payable during a 60-day period commencing January 1, 2009.
- 4.2 **Postponing Scheduled Distributions.** A Participant may elect to postpone a Scheduled Distribution described in Section 4.1 above, and have such amount paid out during a 60-day period commencing immediately after an allowable alternative distribution date designated by the Participant in accordance with this Section 4.2. In order to make this election, the Participant must submit a new Scheduled Distribution Election Form to the Company in accordance with the following criteria:
- (a) Such Scheduled Distribution Election Form must be submitted to and accepted by the Company at least 12 months prior to the Participant's previously designated Scheduled Distribution Date;
 - (b) The new Scheduled Distribution Date selected by the Participant must be the first day of a Plan Year, and must be at least five years after the previously designated Scheduled Distribution Date; and
 - (c) The election of the new Scheduled Distribution Date shall have no effect until at least 12 months after the date on which the election is made;
- Provided, however, a Participant may elect to postpone each Scheduled Distribution no more than one time.
- 4.3 **Certain Benefits Take Precedence Over Scheduled Distributions.** If a Benefit Distribution Date occurs that triggers a benefit under Articles 5, 6, 7 or 8, any Annual Account that is subject to a Scheduled Distribution election under Section 4.1 shall not be paid in accordance with Section 4.1, but shall be paid in accordance with the other applicable Article. Notwithstanding the foregoing, the Committee shall interpret this Section 4.3 in a manner that is consistent with Code

Section 409A and other applicable tax law, including but not limited to guidance issued after the effective date of this Plan.

4.4 Withdrawal Payout; Suspensions for Unforeseeable Financial Emergencies.

- (a) If the Participant experiences an Unforeseeable Financial Emergency, the Participant may petition the Senior Vice President of Human Resources (or in the case of a Section 16 Officer, the Committee) to receive a partial or full payout from the Plan. The Participant shall only receive a payout from the Plan to the extent such payout is deemed necessary by the Senior Vice President of Human Resources or the Committee, as applicable, to satisfy the Participant's Unforeseeable Financial Emergency, plus amounts reasonably necessary to pay taxes reasonably anticipated as a result of the distribution. If a Participant receives a payout due to an Unforeseeable Financial Emergency, such Participant's deferrals under this Plan shall cease. The Participant may not again elect to defer compensation until the enrollment period for the Plan Year that begins at least 12 months after such payout (or such later enrollment period, if required by Code Section 409A and other applicable tax law).
- (b) The payout shall not exceed the lesser of (i) the Participant's vested Account Balance, calculated as of the close of business on the date on which the amount becomes payable, as determined by the Senior Vice President of Human Resources or Committee, as applicable, or (ii) the amount necessary to satisfy the Unforeseeable Financial Emergency, plus amounts reasonably necessary to pay taxes reasonably anticipated as a result of the distribution. Notwithstanding the foregoing, a Participant may not receive a payout from the Plan to the extent that the Unforeseeable Financial Emergency is or may be relieved (A) through reimbursement or compensation by insurance or otherwise, (B) by liquidation of the Participant's assets, to the extent the liquidation of such assets would not itself cause severe financial hardship or (C) by suspension of deferrals under this Plan, if the Senior Vice President of Human Resources or the Committee, as applicable, determines that suspension is required by Code Section 409A and other applicable tax law.
- (c) If the Senior Vice President of Human Resources or the Committee, as applicable, approves a Participant's petition for payout, the Participant's deferrals under this Plan shall be suspended as of the date of such approval and the Participant shall receive a payout from the Plan within 60 days of the date of such approval.
- (d) Notwithstanding the foregoing, the Senior Vice President of Human Resources or the Committee, as applicable, shall interpret all provisions relating to suspension and/or payout under this Section 4.4 in a manner that is consistent with Code Section 409A and other applicable tax law, including but not limited to guidance issued after the effective date of this Plan.

**ARTICLE 5
Retirement Benefit**

5.1 **Retirement Benefit.** A Participant who Retires shall receive, as a Retirement Benefit, his or her vested Account Balance, calculated as of the close of business on the Participant's Benefit Distribution Date.

5.2 **Payment of Retirement Benefit.**

- (a) In connection with a Participant's election to defer an Annual Deferral Amount, the Participant shall elect the form in which his or her Annual Account for such Plan Year will be paid. The Participant may elect to receive each Annual Account in the form of a lump sum or pursuant to an Annual Installment Method of up to 15 years. The Participant may change this election one time by submitting an Election Form to the Company in accordance with the following criteria:
- (i) The election to modify the form of payment for such Annual Account shall have no effect until at least 12 months after the date on which the election is made;
 - (ii) The first payment related to such Annual Account shall be delayed at least five years from the originally scheduled Benefit Distribution Date for such Annual Account, as described in Section 1.9(a);
 - (iii) Notwithstanding the foregoing, the Company, the Committee and the Senior Vice President of Human Resources, as applicable, shall interpret all provisions relating to changing the Annual Account election under this Article 5 in a manner that is consistent with Code Section 409A and other applicable tax law, including but not limited to guidance issued after the effective date of this Plan. The Election Form most recently accepted by the Company shall govern the payout of the Annual Account. If a Participant does not make any election with respect to the payment of the Annual Account, then such Participant shall be deemed to have elected to receive the Annual Account in a lump sum.
- (b) The lump sum payment shall be made, or installment payments shall commence, no later than 60 days after the Benefit Distribution Date. Remaining installments, if any, shall continue in accordance with the Participant's election for each Annual Account and shall be paid no later than 60 days after each anniversary of the Benefit Distribution Date.
- (c) Notwithstanding a Participant's election to receive payment of an Annual Account in installments, if the Participant's vested Account Balance, calculated as of the close of business on the Participant's Benefit Distribution Date (or on the immediately preceding business day if such date is not a business day) is determined to have a value of \$25,000 or less, the Participant's entire Account Balance shall be paid in a single lump sum no later than 60 days after the Benefit Distribution Date.

ARTICLE 6
Termination Benefit

6.1 **Termination Benefit.** A Participant who experiences a Termination of Employment shall receive, as a Termination Benefit, his or her vested Account Balance, calculated as of the close of business on the Participant's Benefit Distribution Date (or the first anniversary thereof, in accordance with

the Participant's election below). If the calculation date is not a business day, then such calculation shall be made on the immediately preceding business day.

- 6.2 **Payment of Termination Benefit.** In connection with a Participant's election to defer an Annual Deferral Amount, the Participant shall elect to receive each Annual Account in a lump sum payment: (i) no later than 60 days after the last day of the six-month period immediately following the date on which the Participant experiences a Termination of Employment or (ii) no later than 60 days after the first anniversary of such Termination of Employment. If a Participant does not make any election with respect to the payment of the Annual Account, the Annual Account shall be paid to the Participant no later than 60 days after the last day of the six-month period immediately following the date on which the Participant experiences a Termination of Employment.

ARTICLE 7 Disability Benefit

- 7.1 **Disability Benefit.** Upon a Participant's Disability, the Participant shall receive a Disability Benefit, which shall be equal to the Participant's vested Account Balance, calculated as of the close of business on the Participant's Benefit Distribution Date (or on the immediately preceding business day if such date is not a business day).
- 7.2 **Payment of Disability Benefit.** The Disability Benefit shall be paid to the Participant in a lump sum payment no later than 60 days after the Participant's Benefit Distribution Date.

ARTICLE 8 Death Benefit

- 8.1 **Death Benefit.** The Participant's Beneficiary(ies) shall receive a Death Benefit upon the Participant's death which will be equal to the Participant's vested Account Balance, calculated as of the close of business on the Participant's Benefit Distribution Date (or on the immediately preceding business day if such date is not a business day).
- 8.2 **Payment of Death Benefit.** The Death Benefit shall be paid to the Participant's Beneficiary(ies) in a lump sum payment no later than 60 days after the Participant's Benefit Distribution Date. In no event, however, shall the Death Benefit be paid later than the later of (i) 90 days after the date of the Participant's death or (ii) the last day of the calendar year in which the Participant's death occurs.

ARTICLE 9 Form of Payment

- 9.1 **Payment in Cash or Common Stock.** Payment of a Participant's Annual Account shall be made in cash; provided, however, that payment of the portion of the Participant's Account Balance attributable to the Participant's Performance Share Account, if any, shall be made, net of withholding taxes, exclusively in shares of the Company's common stock.

- 9.2 **Relation to Stock Incentive Plan.** Benefits attributable to Performance Share Accounts which are paid in shares of the Company's common stock are subject to any applicable terms, conditions and restrictions required by the applicable Company stock incentive plan.

ARTICLE 10

Beneficiary Designation

- 10.1 **Beneficiary.** Each Participant shall have the right, at any time, to designate his or her Beneficiary(ies) (both primary as well as contingent) to receive any benefits payable under the Plan to a beneficiary upon the death of a Participant. The Beneficiary designated under this Plan may be the same as or different from the Beneficiary designation under any other plan of an Employer in which the Participant participates.
- 10.2 **Beneficiary Designation; Change; Spousal Consent.** A Participant shall designate his or her Beneficiary by completing and signing the Beneficiary Designation Form, and returning it to the Company. A Participant shall have the right to change a Beneficiary by completing, signing and otherwise complying with the terms of the Beneficiary Designation Form and the Company's rules and procedures, as in effect from time to time. If the Participant names someone other than his or her spouse as a Beneficiary, the Senior Vice President of Human Resources may, in his or her sole discretion, determine that spousal consent is required to be provided in a form designated by the Senior Vice President of Human Resources, executed by such Participant's spouse and returned to the Company. Upon the acceptance by the Company of a new Beneficiary Designation Form, all Beneficiary designations previously filed shall be canceled. The Company shall be entitled to rely on the last Beneficiary Designation Form filed by the Participant and accepted by the Company prior to his or her death.
- 10.3 **Acknowledgment.** No designation or change in designation of a Beneficiary shall be effective until received and acknowledged in writing by the Company.
- 10.4 **No Beneficiary Designation.** If a Participant fails to designate a Beneficiary as provided in Sections 10.1, 10.2 and 10.3 above or, if all designated Beneficiaries predecease the Participant or die prior to complete distribution of the Participant's benefits, then the Participant's designated Beneficiary shall be deemed to be his or her surviving spouse. If the Participant has no surviving spouse, the benefits remaining under the Plan to be paid to a Beneficiary shall be payable to the executor or personal representative of the Participant's estate.
- 10.5 **Doubt as to Beneficiary.** If the Senior Vice President of Human Resources has any doubt as to the proper Beneficiary to receive payments pursuant to this Plan, he or she shall have the right, exercisable in his or her discretion, to cause the Participant's Employer to withhold such payments until this matter is resolved to his or her satisfaction.
- 10.6 **Discharge of Obligations.** The payment of benefits under the Plan to a Beneficiary shall fully and completely discharge the Company, the Employer, the Committee and the Vice President of Human Resources from all further obligations under this Plan with respect to the Participant.

ARTICLE 11
Leave of Absence

- 11.1 **Paid Leave of Absence.** If a Participant is authorized by the Participant's Employer to take a paid leave of absence from the employment of the Employer, (i) the Participant shall continue to be considered eligible for the benefits provided in Articles 4, 5, 6, 7 or 8 in accordance with the provisions of those Articles, and (ii) the Annual Deferral Amount shall continue to be withheld during such paid leave of absence in accordance with Section 3.3.

ARTICLE 12
Termination of Plan, Amendment or Modification

- 12.1 **Termination of Plan.** Although the Company anticipates that it will continue the Plan for an indefinite period of time, there is no guarantee that the Company will continue the Plan or will not terminate the Plan at any time in the future. Accordingly, the Company reserves the right to Terminate the Plan (as defined in Section 1.43). In the event of a Termination of the Plan, the Measurement Funds available to Participants following the Termination of the Plan shall be comparable in number and type to those Measurement Funds available to Participants in the Plan Year preceding the Plan Year in which the Termination of the Plan is effective. Following a Termination of the Plan, Participant Account Balances shall remain in the Plan until the Participant becomes eligible for the benefits provided in Articles 4, 5, 6, 7 or 8 in accordance with the provisions of those Articles. The Termination of the Plan shall not adversely affect any Participant or Beneficiary who has become entitled to the payment of any benefits under the Plan as of the date of termination; provided, however, the Company shall have the right, in its sole discretion, and notwithstanding any elections made by the Participant, to immediately pay all benefits in a lump sum following such Termination of the Plan, if (i)(A) Termination is not proximate to a downturn in the financial health of the Company, (B) the Company terminates all arrangements required to be aggregated with the Plan pursuant to Code Section 409A, (C) lump sum payments are made between 12 and 24 months following Termination of the Plan, and (D) the Company does not establish a new plan that would have been aggregated with the Plan for purposes of Code Section 409A within three years following Termination of the Plan, or (ii) Termination is in connection with dissolution or change in control of the Company, or such other circumstances permitted by applicable guidance, and in accordance with such other corresponding conditions required by Code Section 409A and regulations or other guidance issued thereunder.

12.2 **Amendment.**

- (a) The Committee may, at any time, amend or modify the Plan in whole or in part.

Notwithstanding the foregoing, no amendment shall be effective to decrease the value of a Participant's vested Account Balance in existence at the time the amendment is made. In no event shall the Company, the Employer or the Committee be responsible for any decline in a Participant's Account Balance as a result of the selection, discontinuation, addition, substitution, crediting or debiting of the Measurement Funds pursuant to Section 3.9.

- (b) Notwithstanding any provision of the Plan to the contrary, in the event that the Committee determines that any provision of the Plan may cause amounts deferred under the Plan to become immediately taxable to any Participant under Code Section 409A, and related guidance, the Committee may (i) adopt such amendments to the Plan and appropriate policies and procedures, including amendments and policies with retroactive effect, that the Committee determines necessary or appropriate to preserve the intended tax treatment of the Plan benefits provided by the Plan and/or (ii) take such other actions as the Committee determines necessary or appropriate to comply with the requirements of Code Section 409A, and related guidance.

- 12.3 **Effect of Payment.** The full payment of the Participant's vested Account Balance under Articles 4, 5, 6, 7 or 8 of the Plan shall completely discharge all obligations to a Participant and his or her designated Beneficiaries under this Plan.

ARTICLE 13 Administration

- 13.1 **Committee Duties.** Except as otherwise provided in this Plan, this Plan shall be administered by the Committee. The Committee shall also have the discretion and authority to (i) make, amend, interpret and enforce all appropriate rules and regulations for the administration of this Plan and (ii) decide or resolve any and all questions including interpretations of this Plan, as may arise in connection with the Plan. When making a determination or calculation, the Company, Committee and the Senior Vice President of Human Resources, as applicable, shall be entitled to rely on information furnished by a Participant.

- 13.2 **Agents.** In the administration of this Plan, the Committee may, from time to time, employ agents and delegate to them such administrative duties as it sees fit (including acting through a duly appointed representative) and may from time to time consult with counsel who may be counsel to any Employer.

- 13.3 **Binding Effect of Decisions.** The decision or action of the Administrator with respect to any question arising out of or in connection with the administration, interpretation and application of the Plan and the rules and regulations promulgated hereunder shall be final and conclusive and binding upon all persons having any interest in the Plan.

- 13.4 **Indemnity.** All Employers shall indemnify and hold harmless the members of the Committee, the PIC, the PRC, the CEO, the Senior Vice President of Human Resources, any Employee to

whom duties have been or may be delegated under this Plan, and the Administrator against any and all claims, losses, damages, expenses or liabilities arising from any action or failure to act with respect to this Plan, except in the case of an individual's willful misconduct.

- 13.5 **Employer Information.** To enable the Committee and/or Administrator to perform its functions, the Company and each Employer shall supply full and timely information to the Committee and/or Administrator, as the case may be, on all matters relating to the compensation of its Participants, the date and circumstances of the Retirement, Disability, death or Termination of Employment of its Participants, and such other pertinent information as the Committee or Administrator may reasonably require.

ARTICLE 14 Other Benefits and Agreements

- 14.1 **Coordination with Other Benefits.** The benefits provided for a Participant and Participant's Beneficiary under the Plan are in addition to any other benefits available to such Participant under any other plan or program for employees of the Participant's Employer. The Plan shall supplement and shall not supersede, modify or amend any other such plan or program except as may otherwise be expressly provided.

ARTICLE 15 Claims Procedures

- 15.1 **Presentation of Claim.** Any Participant or Beneficiary of a deceased participant (such Participant or Beneficiary being referred to below as a "Claimant") may deliver to the PRC (or in the case of a Section 16 Officer, the Committee) a written claim for a determination with respect to the amounts distributable to such Claimant from the Plan. If such a claim relates to the contents of a notice received by the Claimant, the claim must be made within 60 days after such notice was received by the Claimant. All other claims must be made within 180 days of the date on which the event that caused the claim to arise occurred. The claim must state with particularity the determination desired by the Claimant.
- 15.2 **Notification of Decision.** The PRC (or in the case of a Section 16 Officer, the Committee) shall consider a Claimant's claim within a reasonable time, but no later than 90 days (45 days in the case of a determination of Disability) after receiving the claim. If the PRC or the Committee, as applicable, determines that special circumstances require an extension of time for processing the claim, written notice of the extension shall be furnished to the Claimant prior to the termination of the initial 90-day period (45-day period in the case of a determination of Disability, or initial 30-day extension of such 45-day period). In no event shall such extension exceed a period of 90 days from the end of the initial period (in the case of a determination of Disability, an initial extension of 30 days, or an additional subsequent extension of an additional 30 days). The extension notice shall indicate the special circumstances requiring an extension of time and the date by which the PRC or the Committee expects to render the benefit determination. The PRC or the Committee, as applicable, shall notify the Claimant in writing:

- (a) that the Claimant's requested determination has been made, and that the claim has been allowed in full; or
- (b) that the PRC or the Committee has reached a conclusion contrary, in whole or in part, to the Claimant's requested determination, and such notice must set forth in a manner calculated to be understood by the Claimant:
 - (i) the specific reason(s) for the denial of the claim, or any part of it;
 - (ii) specific reference(s) to pertinent provisions of the Plan upon which such denial was based;
 - (iii) a description of any additional material or information necessary for the Claimant to perfect the claim, and an explanation of why such material or information is necessary;
 - (iv) an explanation of the claim review procedure set forth in Section 15.3 below; and
 - (v) a statement of the Claimant's right to bring a civil action under ERISA Section 502(a) following an adverse benefit determination on review.

15.3 **Review of a Denied Claim.** On or before 60 days (180 days in the case of a determination of Disability) after receiving a notice from the PRC (or in the case of a Section 16 Officer, the Committee) that a claim has been denied, in whole or in part, a Claimant (or the Claimant's duly authorized representative) may file with the PRC or the Committee, as applicable, a written request for a review of the denial of the claim. The Claimant (or the Claimant's duly authorized representative):

- (a) may, upon request and free of charge, have reasonable access to, and copies of, all documents, records and other information relevant to the claim for benefits;
- (b) may submit written comments or other documents; and/or
- (c) may request a hearing, which the PRC or the Committee (as applicable), in its sole discretion, may grant.

15.4 **Decision on Review.** The PRC (or in the case of a Section 16 Officer, the Committee) shall render its decision on review promptly, and no later than 60 days (45 days in the case of a determination of Disability) after the receipt of the Claimant's written request for a review of the denial of the claim. If the PRC or the Committee, as applicable, determines that special circumstances require an extension of time for processing the claim, written notice of the extension shall be furnished to the Claimant prior to the termination of the initial 60-day period (45-day period in the case of a determination of Disability). In no event shall such extension exceed a period of 60 days (45 days in the case of a determination of Disability) from the end of the initial period. The extension notice shall indicate the special circumstances requiring an extension of time and the date by which the PRC or the Committee, as applicable, expects to render the benefit determination. In rendering its decision, the PRC or the Committee, as applicable, shall take into account all comments, documents, records and other information submitted by the Claimant relating to the claim, without regard to whether such information was submitted or considered in the initial benefit determination. Notwithstanding any provisions of this Section 15.4 to the contrary, all

decisions on review of a determination of Disability shall be made by the Committee (or the Board in the case of a Section 16 Officer). The decision must be written in a manner calculated to be understood by the Claimant, and it must contain:

- (a) specific reasons for the decision;
- (b) specific reference(s) to the pertinent Plan provisions upon which the decision was based;
- (c) a statement that the Claimant is entitled to receive, upon request and free of charge, reasonable access to and copies of, all documents, records and other information relevant (as defined in applicable ERISA regulations) to the Claimant's claim for benefits; and
- (d) a statement of the Claimant's right to bring a civil action under ERISA Section 502(a).

15.5 **Legal Action.** A Claimant's compliance with the foregoing provisions of this Article 15 is a mandatory prerequisite to a Claimant's right to commence any legal action with respect to any claim for benefits under this Plan. Any legal action must be brought within two years after the Claimant knew or should have known of the principal facts on which the claim is based or, if earlier, 90 days after the procedure under this Article 15 is completed.

15.6 **Determinations.** Benefits under the Plan will be paid only if the PRC (or in the case of a Section 16 Officer, the Committee) decides in its discretion that the applicant is entitled to them. The PRC or the Committee, as applicable, has discretionary authority to grant or deny benefits under the Plan. The PRC shall have the sole discretion, authority and responsibility to interpret and construe this Plan Statement and all relevant documents and information, and to determine all factual and legal questions under the Plan, in relation to a person's (other than a Section 16 Officer) claim for benefits. The Committee shall have the sole discretion, authority and responsibility to interpret and construe this Plan Statement and all relevant documents and information, and to determine all factual and legal questions under the Plan, including but not limited to the entitlement of all persons to benefits and the amounts of their benefits. The Committee's discretionary authority shall include all matters arising under the Plan.

ARTICLE 16 Trust

16.1 **Establishment of the Trust.** In order to provide assets from which to fulfill the obligations of the Participants and their beneficiaries under the Plan, the Company may establish a trust by a trust agreement with a third party, the trustee, to which each Employer may, in its discretion, contribute cash or other property to provide for the benefit payments under the Plan, (the "Trust").

16.2 **Interrelationship of the Plan and the Trust.** The provisions of the Plan shall govern the rights of a Participant to receive distributions pursuant to the Plan. The provisions of the Trust shall govern the rights of the Employers, Participants and the creditors of the Company to the assets transferred to the Trust. The Company shall at all times remain liable to carry out its obligations under the Plan.

- 16.3 **Distributions From the Trust.** The Company's obligations under the Plan may be satisfied with Trust assets distributed pursuant to the terms of the Trust, and any such distribution shall reduce the Company's obligations under this Plan.

ARTICLE 17
Miscellaneous

- 17.1 **Status of Plan.** The Plan is intended to be a plan that is not qualified within the meaning of Code Section 401(a) and that "is unfunded and is maintained by an employer primarily for the purpose of providing deferred compensation for a select group of management or highly compensated employees" within the meaning of ERISA Sections 201(2), 301(a)(3) and 401(a)(1). The Plan shall be administered and interpreted (i) to the extent possible in a manner consistent with that intent and (ii) in accordance with Code Section 409A and other applicable tax law, including but not limited to Treasury Regulations promulgated pursuant to Code Section 409 A.
- 17.2 **Unsecured General Creditor.** Participants and their Beneficiaries, heirs, successors and assigns shall have no legal or equitable rights, interests or claims in any property or assets of the Company. For purposes of the payment of benefits under this Plan, any and all of the Company's assets shall be, and remain, the general, unpledged unrestricted assets of the Company. The Company's obligation under the Plan shall be merely that of an unfunded and unsecured promise to pay money in the future.
- 17.3 **Employer's Liability.** The Company's liability for the payment of benefits shall be defined only by the Plan. The Company shall have no obligation to a Participant under the Plan except as expressly provided in the Plan.
- 17.4 **Nonassignability.** Neither a Participant nor any other person shall have any right to commute, sell, assign, transfer, pledge, anticipate, mortgage or otherwise encumber, transfer, hypothecate, alienate or convey in advance of actual receipt, the amounts, if any, payable hereunder, or any part thereof, which are, and all rights to which are expressly declared to be, unassignable and non-transferable. No part of the amounts payable shall, prior to actual payment, be subject to seizure, attachment, garnishment or sequestration for the payment of any debts, judgments, alimony or separate maintenance owed by a Participant or any other person, be transferable by operation of law in the event of a Participant's or any other person's bankruptcy or insolvency or be transferable to a spouse as a result of a property settlement or otherwise (including without limitation any domestic relations order, whether or not a "qualified domestic relations order" under section 414(p) of the Code and section 206(d) of ERISA) before the Account Balance is distributed to the Participant or Beneficiary.
- 17.5 **Not a Contract of Employment.** The terms and conditions of this Plan shall not be deemed to constitute a contract of employment between the Company or any Employer and the Participant. Such employment is hereby acknowledged to be an "at will" employment relationship that can be terminated at any time for any reason, or no reason, with or without cause, and with or without notice, unless expressly provided in a written employment agreement. Nothing in this Plan shall

be deemed to give a Participant the right to be retained in the service of the Company or any Employer or to interfere with the right of the Company or any Employer to discipline or discharge the Participant at any time.

- 17.6 **Furnishing Information.** A Participant or his or her Beneficiary will cooperate with the Company by furnishing any and all information requested by the Company and take such other actions as may be requested in order to facilitate the administration of the Plan and the payments of benefits hereunder, including but not limited to taking such physical examinations as the Company may deem necessary.
- 17.7 **Terms.** Whenever any words are used herein in the singular or in the plural, they shall be construed as though they were used in the plural or the singular, as the case may be, in all cases where they would so apply.
- 17.8 **Captions.** The captions of the articles, sections and paragraphs of this Plan are for convenience only and shall not control or affect the meaning or construction of any of its provisions.
- 17.9 **Governing Law.** Subject to ERISA, the provisions of this Plan shall be construed and interpreted according to the internal laws of the State of Minnesota without regard to its conflicts of laws principles.
- 17.10 **Notice.** Any notice or filing required or permitted to be given to the Company under this Plan shall be sufficient if in writing and hand-delivered, or sent by registered or certified mail, to the address below:

Northrop Grumman Corp.
Attn: Vice President, Compensation & Benefits
2980 Fairview Park Drive
Falls Church, VA 22042

Such notice shall be deemed given as of the date of delivery or, if delivery is made by mail, as of the date shown on the postmark on the receipt for registration or certification.

Any notice or filing required or permitted to be given to a Participant under this Plan shall be sufficient if in writing and hand-delivered, or sent by mail, to the last known address of the Participant.

- 17.11 **Successors.** The provisions of this Plan shall bind and inure to the benefit of the Company and its successors and assigns and the Participant and the Participant's designated Beneficiaries.
- 17.12 **Spouse's Interest.** The interest in the benefits hereunder of a spouse of a Participant who has predeceased the Participant shall automatically pass to the Participant and shall not be transferable by such spouse in any manner, including but not limited to such spouse's will, nor shall such interest pass under the laws of intestate succession.
- 17.13 **Validity.** In case any provision of this Plan shall be illegal or invalid for any reason, said illegality or invalidity shall not affect the remaining parts hereof, but this Plan shall be construed and enforced as if such illegal or invalid provision had never been inserted herein.

- 17.14 **Incompetent.** If the Senior Vice President of Human Resources determines in its discretion that a benefit under this Plan is to be paid to a minor, a person declared incompetent or to a person incapable of handling the disposition of that person's property, he or she may direct payment of such benefit to the guardian, legal representative or person having the care and custody of such minor, incompetent or incapable person. The Senior Vice President of Human Resources may require proof of minority, incompetence, incapacity or guardianship, as it may deem appropriate prior to distribution of the benefit. Any payment of a benefit shall be a payment for the account of the Participant and the Participant's Beneficiary, as the case may be, and shall be a complete discharge of any liability under the Plan for such payment amount.
- 17.15 **Deduction Limitation on Benefit Payments.** The Company may determine that as a result of the application of the limitation under Code Section 162(m), a distribution payable to a Participant pursuant to this Plan would not be deductible if such distribution were made at the time required by the Plan. If the Company makes such a determination, then the distribution shall not be paid to the Participant until such time as the distribution first becomes deductible. The amount of the distribution shall continue to be adjusted in accordance with Section 3.9 above until it is distributed to the Participant. The amount of the distribution, plus amounts credited or debited thereon, shall be paid to the Participant or his or her Beneficiary (in the event of the Participant's death) at the earliest possible date, as determined by the Company, on which the deductibility of compensation paid or payable to the Participant for the taxable year of the Company during which the distribution is made will not be limited by Section 162(m). Notwithstanding the foregoing, the Committee shall interpret this provision in a manner that is consistent with Code Section 409A and other applicable tax law, including but not limited to guidance issued after the effective date of this Plan.
- 17.16 **Insurance.** The Company, on its own behalf or on behalf of the trustee of the Trust, and, in its sole discretion, may apply for and procure insurance on the life of the Participant, in such amounts and in such forms as the Trust may choose. The Company or the trustee of the Trust, as the case may be, shall be the sole owner and beneficiary of any such insurance. The Participant shall have no interest whatsoever in any such policy or policies, and at the request of the Company shall submit to medical examinations and supply such information and execute such documents as may be required by the insurance company or companies to whom the Company has applied for insurance.

* * *

IN WITNESS WHEREOF, this Amendment and Restatement is hereby executed by a duly authorized officer on this 18th day of December, 2018.

NORTHROP GRUMMAN INNOVATION SYSTEMS

By: /s/ Beth Pitts-Madonna

Beth Pitts-Madonna

Vice President, Human Resources and Administration

APPENDIX A

**Alliant Techsystems Inc. Nonqualified Deferred Compensation Plan
(As Amended and Restated March 18, 2003)**

APPENDIX B

Provisions Applicable Effective January 1, 2019

Effective January 1, 2019, the Plan is frozen, and no benefits shall accrue under this Plan with respect to compensation earned for services performed after December 31, 2018.

Notwithstanding anything herein to the contrary, effective January 1, 2019:

1. The term “Company” shall mean Northrop Grumman Corporation.
2. Except as provided in section 8 of this Appendix B, the term “Committee” or “PRC” shall mean the Company’s Benefit Plans Administrative Committee and the Committee shall perform the administrative functions of the Committee and the PRC.
3. The term “PIC” shall mean the Company’s Benefit Plans Investment Committee.
4. The term “Plan” shall mean the Northrop Grumman Innovation Systems Nonqualified Deferred Compensation Plan.
5. No individual shall become a Participant in the Plan after December 31, 2018.
6. No individual is eligible to complete any Election Form, or otherwise defer any compensation under the Plan, with respect to compensation for services performed after December 31, 2018.
7. No Company Contribution Amounts, Company Restoration Matching Amounts, or Performance Share Amounts shall be credited to any Participant for any Plan Year beginning after December 31, 2018.
8. For purposes of Section 12.2 of the Plan, the term “Committee” shall mean Northrop Grumman Corporation.
9. The Company’s Vice President, Compensation & Benefits shall have all authority and discretion to interpret the terms of the Plan.

Except to the extent modified by this Appendix B, the terms of the Plan in effect on December 31, 2018 shall continue to govern.

NORTHROP GRUMMAN
SAVINGS EXCESS PLAN

(Amended and Restated Effective as of January 1, 2019)

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INTRODUCTION

The Northrop Grumman Savings Excess Plan (the "Plan") is hereby amended and restated effective January 1, 2019. This restatement amends the June 29, 2018 restatement of the Plan. Notwithstanding the foregoing or anything to the contrary in the Plan, this amended and restated Plan document does not affect amounts earned and vested under the Plan prior to 2005.

Northrop Grumman Corporation (the "Company") established this Plan for participants in the Northrop Grumman Savings Plan who exceed the limits under sections 401(a)(17) or 415(c) of the Internal Revenue Code. This Plan is intended (1) to comply with section 409A of the Internal Revenue Code, as amended (the "Code") and official guidance issued thereunder (except with respect to amounts covered by Appendix B), and (2) to be "a plan which is unfunded and is maintained by an employer primarily for the purpose of providing deferred compensation for a select group of management or highly compensated employees" within the meaning of sections 201(2), 301(a)(3) and 401(a)(1) of the Employee Retirement Income Security Act of 1974. Notwithstanding any other provision of this Plan, this Plan shall be interpreted, operated and administered in a manner consistent with these intentions.

ARTICLE 1

DEFINITIONS

1.1 Definitions

Whenever the following words and phrases are used in this Plan, with the first letter capitalized, they shall have the meanings specified below.

- (a) "Account" shall mean the recordkeeping account set up for each Participant to keep track of amounts to his or her credit.
- (b) "Administrative Committee" means the committee in charge of Plan administration, as described in Article VII and Appendix D.
- (c) "Affiliated Companies" shall mean the Company and any entity affiliated with the Company under Code sections 414(b) or (c).

(d) "Base Salary" shall mean a Participant's annual base salary, excluding bonuses, commissions, incentive and all other remuneration for services rendered to the Affiliated Companies and prior to reduction for any salary contributions to a plan established pursuant to section 125 of the Code or qualified pursuant to section 401(k) of the Code.

(e) "Beneficiary" or "Beneficiaries" shall mean the person or persons, including a trustee, personal representative or other fiduciary, last designated in writing by a Participant in accordance with procedures established by the Administrative Committee to receive the benefits specified hereunder in the event of the Participant's death.

(1) No Beneficiary designation shall become effective until it is filed with the Administrative Committee.

(2) Any designation shall be revocable at any time through a written instrument filed by the Participant with the Administrative Committee with or without the consent of the previous Beneficiary.

No designation of a Beneficiary other than the Participant's spouse shall be valid unless consented to in writing by such spouse. If there is no such designation or if there is no surviving designated Beneficiary, then the Participant's surviving spouse shall be the Beneficiary. If there is no surviving spouse to

receive any benefits payable in accordance with the preceding sentence, the duly appointed and currently acting personal representative of the Participant's estate (which shall include either the Participant's probate estate or living trust) shall be the Beneficiary. In any case where there is no such personal representative of the Participant's estate duly appointed and acting in that capacity within 90 days after the Participant's death (or such extended period as the Administrative Committee determines is reasonably necessary to allow such personal representative to be appointed, but not to exceed 180 days after the Participant's death), then Beneficiary shall mean the person or persons who can verify by affidavit or court order to the satisfaction of the Administrative Committee that they are legally entitled to receive the benefits specified hereunder. Any payment made pursuant to such determination shall constitute a full release and discharge of the Plan, the Administrative Committee and the Company. Effective January 1, 2007, a Participant will automatically revoke a designation of a spouse as primary beneficiary upon the dissolution of their marriage.

(3) In the event any amount is payable under the Plan to a minor, payment shall not be made to the minor, but instead be paid (a) to that person's living parent(s) to act as custodian, (b) if that person's parents are then divorced, and one parent is the sole custodial parent, to such custodial parent, or (c) if no parent of that person is then living, to a custodian selected by the Administrative Committee to hold the funds for the minor under the Uniform Transfers or Gifts to Minors Act in effect in the jurisdiction in which the minor resides. If no parent is living and the Administrative Committee decides not to select another custodian to hold the funds for the minor, then payment shall be made to the duly appointed and currently acting guardian of the estate for the minor or, if no guardian of the estate for the minor is duly appointed and currently acting within 60 days after the date the amount becomes payable, payment shall be deposited with the court having jurisdiction over the estate of the minor. Any payment made pursuant to such determination shall constitute a full release and discharge of the Plan, the Administrative Committee and the Company.

(4) Payment by the Affiliated Companies pursuant to any unrevoked Beneficiary designation, or to the Participant's estate if no such designation exists, of all benefits owed hereunder shall terminate any and all liability of the Affiliated Companies.

(f) "Board" shall mean the Board of Directors of the Company.

(g) "Bonuses" shall mean the bonuses earned under the Company's formal incentive plans as defined by the Administrative Committee, but shall exclude the NGIS Annual Bonus Plan.

(h) "Code" shall mean the Internal Revenue Code of 1986, as amended.

(i) "Committees" shall mean the Committees appointed as provided in Article VII.

(j) "Company" shall mean Northrop Grumman Corporation and any successor.

(k) "Company Contributions" shall mean contributions by the Company to a Participant's Account.

(l) "Compensation" shall be Compensation as defined by Section 5.01 of the NGSP.

(m) "CPSC Contributions" shall mean the Company contributions under Section 3.2(b)(7).

(n) "CPSC Participant" shall mean an Employee who is eligible to participate in the NGSP, receives Company Profit Sharing Contributions under the NGSP, and is classified by the Affiliated Companies as an Employee and not as an independent contractor.

(o) "CPSC Subaccount" shall mean the portion of a Participant's Account made up of CPSC Contributions and earnings thereon.

(p) "Disability" or "Disabled" shall mean the Participant's inability to perform each and every duty of his or her occupation or position of employment due to illness or injury as determined in the sole and absolute discretion of the Administrative Committee.

(q) "Eligible Compensation" shall mean (1) Compensation prior to January 1, 2009, and (2) after 2008, Base Salary and Bonuses, reduced by the amount of any deferrals made from such amounts under the Northrop Grumman Deferred Compensation Plan. Notwithstanding the foregoing, effective January 1, 2017, Eligible Compensation shall not include any amount paid to an Eligible Employee following the end of the month first following the month in which the Eligible Employee has a Separation from Service. Notwithstanding the foregoing, Eligible Compensation shall not include any amount deferred under the OADCP (as such term is defined in Appendix E) that otherwise would be payable in 2019.

(r) "Eligible Employee" shall mean any Employee who meets the following conditions:

(1) he or she is eligible to participate in the NGSP;

(2) he or she is classified by the Affiliated Companies as an Employee and not as an independent contractor; and

(3) he or she meets any additional eligibility criteria set by the Administrative Committee. Additional eligibility criteria established by the Administrative Committee may include specifying classifications of Employees who are eligible to participate and the date as of which various groups of Employees will be eligible to participate. This includes, for example, Administrative Committee authority to delay eligibility for employees of newly acquired companies who become Employees.

Notwithstanding the foregoing or anything to the contrary in the Plan, and effective as of and contingent upon the Closing, designated employees of Northrop Grumman Innovation Systems, Inc. ("NGIS") who meet the relevant eligibility criteria, shall be eligible to participate in the Plan effective January 1, 2019, and shall be eligible to make an election under Section 3.1 of the Plan during the 2018 Open Enrollment Period to defer Eligible Compensation for the 2019 Plan Year.

(s) "Employee" shall mean any common law employee of the Affiliated Companies who is classified as an employee by the Affiliated Companies.

(t) "ERISA" shall mean the Employee Retirement Income Security Act of 1974, as it may be amended from time to time.

(u) "Investment Committee" means the committee in charge of investment aspects of the Plan, as described in Article VII.

(v) "Key Employee" means an employee who on the date of his Separation from Service is treated as a "specified employee" under Code section 409A in accordance with a uniform Company policy.

(w) "NEC Contributions" means the Company contributions under Section 3.2(b)(3) and Section 3.2(b)(6).

(x) "NEC Participant" means an Employee who is eligible to participate in the NGSP, receives Non-Elective Contributions under the NGSP and is classified by the Affiliated Companies as an Employee and not as an independent contractor. An Employee is a NEC Participant for a Plan Year only if the Employee is an Employee on December 31 of the Plan Year for which the NEC Contribution is being made, provided however, that the Employee will also be considered a NEC Participant for such Plan Year if the Employee (1) dies while employed or is laid off or involuntarily terminated other than for cause during the Plan Year for which the NEC Contribution is being made or (2) is performing qualifying military service (as defined in the NGSP) and would receive a Non-Elective Contribution under the NGSP.

(y) "NEC Subaccount" shall mean the portion of a Participant's Account made up of NEC Contributions and earnings thereon.

(z) "NGSP" means the Northrop Grumman Savings Plan.

(aa) "Open Enrollment Period" means the period designated by the Administrative Committee for electing deferrals for the following Plan Year.

(bb) "Participant" shall mean any Eligible Employee who participates in this Plan in accordance with Article II or any Employee who is a RAC Participant, a NEC Participant, or a CPSC Participant.

(cc) "Participant Contributions" shall have the same meaning as that term is defined in the NGSP.

(dd) "Payment Date" shall mean:

(1) for distributions upon early termination under Section B.1(a), a date after the end of the month in which termination of employment occurs; and

(2) for distributions after Retirement, Disability or death under Section B.1(b), a date after the end of the month in which occurs Retirement, the determination of Disability by the Administrative Committee, or the notification of the Administrative Committee of the Participant's death (or later qualification of the Beneficiary or Beneficiaries), as applicable.

The exact date in each case will be determined by the Administrative Committee to allow time for administrative processing.

(ee) "Plan" shall be the Northrop Grumman Savings Excess Plan.

(ff) "Plan Year" shall be the calendar year.

(gg) "RAC Contributions" shall mean the Company contributions under Section 3.2(b)(2) and Section 3.2(b)(5).

(hh) "RAC Participant" shall mean an Employee who is eligible to participate in the NGSP, receives Retirement Account Contributions under the NGSP, and is classified by the Affiliated Companies as an Employee and not as an independent contractor. Notwithstanding the foregoing, an Employee who becomes eligible to participate in the Officers Supplemental Executive Retirement Program II ("OSERP II") under the Northrop Grumman Supplemental Plan 2 shall immediately cease to be eligible for RAC Contributions. Effective for Plan Years beginning on or after January 1, 2019, an Employee is a RAC Participant for a Plan Year only if the Employee is an Employee on December 31 of the Plan Year for which the RAC Contribution is being made, provided however, that the Employee will also be considered a RAC Participant for such Plan Year if the Employee (1) dies while employed or is laid off or involuntarily terminated other than for cause during the Plan Year for which the RAC Contribution is being made or (2) is performing qualifying military service (as defined in the NGSP) and would receive a Retirement Account Contribution under the NGSP.

(ii) "RAC Subaccount" shall mean the portion of a Participant's Account made up of RAC Contributions and earnings thereon.

(jj) "Retirement" shall mean termination of employment with the Affiliated Companies after reaching age 55.

(kk) "Separation from Service" or "Separates from Service" or "Separating from Service" means a "separation from service" within the meaning of Code section 409A.

ARTICLE II

PARTICIPATION

2.1 In General

- (a) An Eligible Employee may become a Participant by complying with the procedures established by the Administrative Committee for enrolling in the Plan. Anyone who becomes an Eligible Employee will be entitled to become a Participant during an Open Enrollment Period.
- (b) A RAC Participant will become a Participant when RAC Contributions are first made to his or her RAC Subaccount.
- (c) A NEC Participant will become a Participant when NEC Contributions are first made to his or her NEC Subaccount.
- (d) A CPSC Participant will become a Participant when CPSC Contributions are first made to his or her CPSC Subaccount.
- (e) An individual will cease to be a Participant when he or she no longer has a positive balance to his or her Account under the Plan.

2.2 Disputes as to Employment Status

(a) Because there may be disputes about an individual's proper status as an Employee or non-Employee, this Section describes how such disputes are to be handled with respect to Plan participation.

(b) The Affiliated Companies will make the initial determination of an individual's employment status.

(1) If an individual is not treated by the Affiliated Companies as a common law employee, then the Plan will not consider the individual to be an "Eligible Employee" and he or she will not be entitled to participate in the Plan.

(2) This will be so even if the individual is told he or she is entitled to participate in the Plan and given a summary of the plan and enrollment forms or other actions are taken indicating that he or she may participate.

(c) Disputes may arise as to an individual's employment status. As part of the resolution of the dispute, an individual's status may be changed by the Affiliated Companies from non-Employee to Employee. Such Employees are not Eligible Employees and will not be entitled to participate in the Plan.

ARTICLE III

DEFERRAL ELECTIONS

3.1 Elections to Defer Eligible Compensation

(a) Timing. An Eligible Employee who meets the requirements of Section 2.1(a) may elect to defer Eligible Compensation earned in a Plan Year by filing an election in the Open Enrollment Period for the Plan Year. For purposes of determining whether an election filed pursuant to this Section 3.1(a) applies, Eligible Compensation that is Base Salary shall be considered earned in the Plan Year in which, absent such election, it would otherwise be paid. The Open Enrollment Period for Compensation that is Base Salary shall end no later than

December 31 of the Plan Year prior to the Plan Year in which the Base Salary is earned. The Open Enrollment Period for Compensation that is Bonus compensation shall end no later than June 30 of the Plan Year in which the performance period for the Bonus ends. An election to participate for a Plan Year is irrevocable.

(b) Election Rules. An Eligible Employee's election may be made in writing, electronically, or as otherwise specified by the Administrative Committee. Such election shall specify the Eligible Employee's rate of deferral for contributions to the Plan, which shall be between 1% and 50%, and shall address distribution of the deferred amounts as described in Section 6.1. All elections must be made in accordance with the rules, procedures and forms provided by the Administrative Committee. The Administrative Committee may change the rules, procedures and forms from time to time and without prior notice to Participants.

(c) Cancellation of Election. If a Participant becomes disabled (as defined under Code section 409A) during a Plan Year, his deferral election for such Plan Year shall be cancelled.

3.2 Contribution Amounts

(a) Participant Contributions. An Eligible Employee's contributions under the Plan for a Plan Year will begin once his or her Compensation for the Plan Year exceeds the Code section 401(a)(17) limit for the Plan Year. The Participant's elected deferral percentage will be applied to his or her Eligible Compensation for the balance of the Plan Year.

(b) Company Contributions. The Company will make Company Contributions to a Participant's Account as provided in (1), (2), (3), (4), (5), (6) and (7) below.

(1) Matching Contributions. The Company will make a Company Contribution equal to the matching contribution rate for which the Participant is eligible under the NGSP for the Plan Year multiplied by the amount of the Participant's contributions under subsection (a).

(2) RAC Contributions. Effective July 1, 2008, the Company will make RAC Contributions equal to a percentage of a RAC Participant's Compensation for a Plan Year in excess of the Code section 401(a)(17) limit. The percentage used to calculate a RAC Participant's contribution for the 2016 Plan Year and each subsequent Plan Year shall be based on the RAC Participant's age on December 31, 2016 as follows:

- (i) Three percent if not yet age 35.
- (ii) Four percent if 35 or older, but not yet 50.
- (iii) Five percent if age 50 or older.

(3) NEC Contributions. Effective January 1, 2019, the Company will make NEC Contributions equal to a percentage of a NEC Participant's Compensation in excess of the Code section 401(a)(17) limit for the Plan Year. The percentage used to calculate a NEC Participant's NEC Contribution for the 2019 Plan Year and each subsequent Plan Year shall be based on the NEC Participant's age and years of service on December 31 of the Plan Year, as described below:

- (i) Two and one half percent if age and years of service are less than 40.
- (ii) Three percent if age and years of service are 40 through 59.
- (iii) Four percent if age and years of service are at least 60.

For this purpose, years of service shall be calculated in the same manner as for purposes of determining Non-Elective Contributions under the NGSP.

(4) Make-Up Matching Contributions for Contribution Limitation. If an Eligible Employee's Participant Contributions under the NGSP for a Plan Year are limited by the Code section 415(c) contribution limit before the Eligible Employee's Participant Contributions under the NGSP are limited by the Code section 401(a)(17) compensation limit, the Company will make a Company Contribution equal to the amount of matching contributions for which the Eligible Employee would have been eligible under the NGSP were Code section 415(c) not applied, reduced by the actual amount of matching contributions made for the Plan Year under the NGSP.

(5) Make-Up RAC Contributions for Contribution Limitation. If an Eligible Employee is a RAC Participant and his Retirement Account Contributions under the NGSP for a Plan Year are limited by the Code section 415(c) contribution limit before the RAC Participant's Retirement Account Contributions under the NGSP are limited by the Code section 401(a)(17) compensation limit, the Company will make a Company Contribution equal to the amount of Retirement Account Contributions for which the RAC Participant would have been eligible under the NGSP were Code section 415(c) not applied, reduced by the actual amount of Retirement Account Contributions made for the Plan Year under the NGSP.

(6) Make-Up NEC Contributions for Contribution Limitation. If an Eligible Employee is a NEC Participant and his Non-Elective Contributions under the NGSP for a Plan Year are limited by the Code section 415(c) contribution limit before the NEC Participant's Non-Elective Contributions under the NGSP are limited by the Code section 401(a)(17) compensation limit, the Company will make a Company Contribution equal to the amount of Non-Elective Contributions for which the NEC Participant would have been eligible under the NGSP were Code section 415(c) not applied, reduced by the actual amount of Non-Elective Contributions made for the Plan Year under the NGSP.

(7) Make-Up CPSC Contributions for Contribution Limitation. If an Eligible Employee is a CPSC Participant and his Company Profit Sharing Contributions under the NGSP for a Plan Year are limited by the Code section 415(c) contribution limit before the CPSC Participant's Company Profit Sharing Contributions under the NGSP are limited by the Code section 401(a)(17) compensation limit, the Company will make a Company Contribution equal to the amount of Company Profit Sharing Contributions for which the CPSC Participant would have been eligible under the NGSP were Code section 415(c) not applied, reduced by the actual amount of Company Profit Sharing Contributions made for the Plan Year under the NGSP.

3.3 Crediting of Deferrals

Amounts deferred by a Participant under the Plan shall be credited to the Participant's Account as soon as practicable after the amounts would have otherwise been paid to the Participant. Company contributions under Section 3.2(b)(1) will be credited to Accounts as soon as practicable after each payroll cycle in which they accrue. Company contributions under Section 3.2(b)(2), Section 3.2(b)(3), Section 3.2(b)(4), Section 3.2(b)(5), Section 3.2(b)(6) and Section 3.2(b)(7) will be credited annually for each Plan Year within the time prescribed by law, including extensions of time, for filing the Company's federal income tax return for the Plan Year.

3.4 Investment Elections

(a) The Investment Committee will establish a number of different investment funds or other investment options for the Plan. The Investment Committee may change the funds or other investment options from time to time, without prior notice to Participants.

(b) Participants may elect how their future contributions and existing Account balances will be deemed invested in the various investment funds and may change their elections from time to time. If a Participant does not elect how future contributions will be deemed invested, contributions will be deemed invested in the qualified default investment alternative ("QDIA") that applies to the Participant under the NGSP.

(c) The deemed investments for a RAC Participant's RAC Subaccount, the deemed investments for a NEC Participant's NEC Subaccount, and the deemed investments for a CPSC Participant's CPSC

Subaccount, must be the same as the deemed investments for the Participant's Company contributions under Section 3.2(b)(1).

(d) Selections of investments, changes and transfers must be made according to the rules and procedures of the Administrative Committee.

(1) The Administrative Committee may prescribe rules that may include, among other matters, limitations on the amounts that may be transferred and procedures for electing transfers.

(2) The Administrative Committee may prescribe valuation rules for purposes of investment elections and transfers. Such rules may, in the Administrative Committee's discretion, use averaging methods to determine values and accrue estimated expenses. The Administrative Committee may change the methods it uses for valuation from time to time.

(3) The Administrative Committee may prescribe the periods and frequency with which Participants may change deemed investment elections and make transfers.

(4) The Administrative Committee may change its rules and procedures from time to time and without prior notice to Participants.

(e) Effective January 13, 2011, Participant investment elections involving a Company stock investment fund (e.g., transfers into or out of the fund) may be restricted, including in accordance with Company policies generally applicable to employee transactions in Company stock.

3.5 Investment Return Not Guaranteed

Investment performance under the Plan is not guaranteed at any level. Participants may lose all or a portion of their contributions due to poor investment performance.

ARTICLE IV

ACCOUNTS

4.1 Accounts

The Administrative Committee shall establish and maintain a recordkeeping Account for each Participant under the Plan.

4.2 Valuation of Accounts

The valuation of Participants' recordkeeping Accounts will reflect earnings, losses, expenses and distributions, and will be made in accordance with the rules and procedures of the Administrative Committee.

(a) The Administrative Committee may set regular valuation dates and times and also use special valuation dates and times and procedures from time to time under unusual circumstances and to protect the financial integrity of the Plan.

(b) The Administrative Committee may use averaging methods to determine values and accrue estimated expenses.

(c) The Administrative Committee may change its valuation rules and procedures from time to time and without prior notice to Participants.

4.3 Use of a Trust

The Company may set up a trust to hold any assets or insurance policies that it may use in meeting its obligations under the Plan. Any trust set up will be a rabbi trust and any assets placed in the trust shall continue for all purposes to be part of the general assets of the Company and shall be available to its general creditors in the event of the Company's bankruptcy or insolvency.

ARTICLE V

VESTING AND FORFEITURES

5.1 In General

A Participant's interest in his or her Account will be nonforfeitable, subject to the exceptions in Section 5.2.

5.2 Exceptions

The following exceptions apply to the vesting rule in Section 5.1 above:

(a) A RAC Participant, a NEC Participant and a CPSC Participant shall become fully vested in his or her RAC Subaccount, NEC Subaccount or CPSC Subaccount (as applicable) and earnings thereon upon the earliest of the following dates, provided he or she is an Employee at such time: (i) the date he or she completes three years of service, (ii) the date of his or her 65th birthday, (iii) the date of his or her death, (iv) the date he or she becomes Disabled, or (v) the date Company Contributions are completely discontinued or the Plan is terminated. Notwithstanding anything to the contrary, if a Participant terminates employment with the Affiliated Companies prior to vesting as set forth in this Section 5.2(a), his or her unvested RAC Subaccount, NEC Subaccount or CPSC Subaccount and earnings thereon shall be immediately forfeited upon such termination. For this purpose, years of service shall be calculated in the same manner as for purposes of determining vesting under the NGSP (including the treatment of a break in service).

(b) A Participant whose original date of hire with the Affiliated Companies is after April 30, 2012 shall become fully vested in his or her Company matching contributions under Sections 3.2(b)(1) and (4) and earnings thereon upon the earliest of the following dates, provided he or she is an Employee at such time: (i) the date he or she completes three years of service, (ii) the date of his or her 65th birthday, (iii) the date of his or her death, or (iv) the date he or she becomes Disabled, or (v) the date Company Contributions are completely discontinued or the Plan is terminated. Notwithstanding anything to the contrary, if a Participant terminates employment with the Affiliated Companies prior to vesting as set for in this Section 5.2(b), his or her unvested Company matching contributions under Sections 3.2(b)(1) and (4) and earnings thereon shall be immediately forfeited upon such termination. For this purpose, years of service shall be calculated in the same manner as for purposes of determining vesting in Retirement Account Contributions under the NGSP (including the treatment of a break in service).

(c) Forfeitures on account of a lost payee. See Section 6.6.

(d) Forfeitures under an escheat law.

(e) Recapture of amounts improperly credited to a Participant's Account or improperly paid to or with respect to a Participant.

(f) Expenses charged to a Participant's Account.

- (g) Investment losses.

ARTICLE VI

DISTRIBUTIONS

6.1 Distribution Rules for Non-RAC, Non-NEC and Non-CPSC Amounts

The rules in this Section 6.1 apply to distribution of a Participant's Account other than the RAC Subaccount, the NEC Subaccount and the CPSC Subaccount.

Notwithstanding the foregoing, Appendix B governs the distribution of amounts that were earned and vested (within the meaning of Code section 409A and regulations thereunder) under the Plan prior to 2005 (and earnings thereon) and are exempt from the requirements of Code section 409A. Thus, this Section 6.1 does not apply to these pre-2005 deferrals, but does apply to all other amounts deferred under the Plan.

(a) Separate Distribution Election. A Participant must make a separate distribution election for each year's contributions. A Participant generally makes a distribution election at the same time the Participant makes the deferral election, i.e., during the Open Enrollment Period.

(b) Distribution Upon Separation. A Participant may elect on a deferral form to have the vested portion of his Account related to amounts deferred under the deferral form and Company contributions for the same year (and earnings thereon) distributed in a lump sum or in quarterly or annual installments over a period of 1 to 15 years. Lump sum payments under the Plan will be made in the month following the Participant's Separation from Service. Installment payments shall commence in the March, June, September or December next following the month of Separation from Service. If a Participant does not make a distribution election and his vested Account balance (including amounts subject to Appendix B) exceeds \$50,000 and the Participant is age 55 or older at the time the Participant Separates from Service, the Participant will receive quarterly installments over a 10-year period. Otherwise, a Participant not making an election will receive a lump sum payment. Notwithstanding the foregoing, if the Participant's vested Account balance (including amounts subject to Appendix B) is \$50,000 or less or the Participant is under age 55 at the time the Participant Separates from Service, the vested Account balance shall be distributed in a lump sum payment in the month following the Participant's Separation from Service.

Notwithstanding the timing rules in the foregoing paragraph, distributions may not be made to a Key Employee upon a Separation from Service before the date which is six months after the date of the Key Employee's Separation from Service (or, if earlier, the date of death of the Key Employee). All payments to be made upon the Separation from Service shall be delayed six months in accordance with Treas. Reg. section 1.409A-3(i)(2)(ii).

At the discretion of the Administrative Committee, a distribution may commence earlier or later than the date specified above, provided that the timing of any such commencement complies with Treas. Reg. section 1.409A-3(d) or any successor thereto.

(c) Changes in Form of Distribution. A Participant may make up to two subsequent elections to change the form of a distribution for any year's deferrals and Company contributions. Such an election, however, shall be effective only if the following conditions are satisfied:

- (1) The election may not take effect until at least twelve (12) months after the date on which the election is made; and

(2) The distribution will be made exactly five (5) years from the date the distribution would have otherwise been made.

6.2 Distribution Rules for RAC Subaccount, NEC Subaccount and CPSC Subaccount

The full vested balance in a RAC Subaccount, a NEC Subaccount and a CPSC Subaccount shall be distributed in a lump sum upon a RAC Participant's, NEC Participant's or CPSC Participant's (as applicable) Separation from Service. Notwithstanding the foregoing, distribution will not be made to a Key Employee upon a Separation from Service until the date which is six months after the date of the Key Employee's Separation from Service (or, if earlier, the date of death of the Key Employee).

At the discretion of the Administrative Committee, a distribution may commence earlier or later than the date specified above, provided that the timing of any such commencement complies with Treas. Reg. section 1.409A-3(d) or any successor thereto.

6.3 Effect of Taxation

If a Participant's benefits under the Plan are includible in income pursuant to Code section 409A, the Company shall have the discretion to accelerate the distribution of all or a portion of such includible benefits to the Participant, provided that the Participant shall not be given a direct or indirect election as to whether such discretion is exercised.

6.4 Permitted Delays

Notwithstanding the foregoing, any payment to a Participant under the Plan shall be delayed upon the Committee's reasonable anticipation of one or more of the following events:

- (a) The Company's deduction with respect to such payment would be eliminated by application of Code section 162(m); or
- (b) The making of the payment would violate Federal securities laws or other applicable law;
- (c) provided, that any payment delayed pursuant to this Section 6.4 shall be paid in accordance with Code section 409A.

6.5 Payments Not Received At Death

In the event of the death of a Participant before receiving a payment, payment will be made to his or her estate if death occurs on or after the date of a check that has been issued by the Plan. Otherwise, payment of the amount will be made to the Participant's Beneficiary.

6.6 Inability to Locate Participant

In the event that the Administrative Committee is unable to locate a Participant or Beneficiary within two years following the required payment date, the amount allocated to the Participant's Account shall be forfeited. If, after such forfeiture and prior to termination of the Plan, the Participant or Beneficiary later claims such benefit, such benefit shall be reinstated without interest or earnings for the forfeiture period.

6.7 Committee Rules

All distributions are subject to the rules and procedures of the Administrative Committee. The Administrative Committee may also require the use of particular forms. The Administrative Committee may change its rules, procedures and forms from time to time and without prior notice to Participants.

ARTICLE VII

ADMINISTRATION

7.1 Committees

(a) Effective April 27, 2006, the Administrative Committee shall be comprised of the individuals (in their corporate capacity) who are members of the Administrative Committee for Northrop Grumman Deferred Compensation Plan. If no such Administrative Committee exists, the members of the Administrative Committee for the Plan shall be individuals holding the following positions within the Company (as such titles may be modified from time to time), or their successors in office: the Corporate Vice President and Chief Human Resources and Administration Officer; the Corporate Vice President, Controller and Chief Accounting Officer; the Vice President, Taxation; the Vice President, Compensation, Benefits and HRIS; and the Corporate Director, Benefits Administration and Services. A member of the Administrative Committee may resign by delivering a written notice of resignation to the Corporate Vice President and Chief Human Resources and Administration Officer.

(b) Prior to April 27, 2006, the Administrative Committee shall be comprised of the individuals appointed by the Compensation Committee of the Board (the "Compensation Committee").

(c) An Investment Committee (referred to together with the Administrative Committee as, the "Committees"), comprised of one or more persons, shall be appointed by and serve at the pleasure of the Board (or its delegate). The number of members comprising the Investment Committee shall be determined by the Board, which may from time to time vary the number of members. A member of the Investment Committee may resign by delivering a written notice of resignation to the Board. The Board may remove any member by delivering a certified copy of its resolution of removal to such member. Vacancies in the membership of the Investment Committee shall be filled promptly by the Board.

7.2 Committee Action

Each Committee shall act at meetings by affirmative vote of a majority of the members of that Committee. Any determination of action of a Committee may be made or taken by a majority of a quorum present at any meeting thereof, or without a meeting, by resolution or written memorandum signed by a majority of the members of the Committee then in office. A member of a Committee shall not vote or act upon any matter which relates solely to himself or herself as a Participant. The Chairman or any other member or members of each Committee designated by the Chairman may execute any certificate or other written direction on behalf of the Committee of which he or she is a member.

The Compensation Committee shall appoint a Chairman from among the members of the Administrative Committee and a Secretary who may or may not be a member of the Administrative Committee. The Administrative Committee shall conduct its business according to the provisions of this Article and the rules contained in the current edition of Robert's Rules of Order or such other rules of order the Administrative Committee may deem appropriate. The Administrative Committee shall hold meetings from time to time in any convenient location.

7.3 Powers and Duties of the Administrative Committee

The Administrative Committee shall enforce the Plan in accordance with its terms, shall be charged with the general administration of the Plan, and shall have all powers necessary to accomplish its purposes, including, but not by way of limitation, the following:

- (a) To construe and interpret the terms and provisions of this Plan and make all factual determinations;

(b) To compute and certify to the amount and kind of benefits payable to Participants and their Beneficiaries;

(c) To maintain all records that may be necessary for the administration of the Plan;

(d) To provide for the disclosure of all information and the filing or provision of all reports and statements to Participants, Beneficiaries or governmental agencies as shall be required by law;

(e) To make and publish such rules for the regulation of the Plan and procedures for the administration of the Plan as are not inconsistent with the terms hereof;

(f) To appoint a Plan administrator or any other agent, and to delegate to them such powers and duties in connection with the administration of the Plan as the Administrative Committee may from time to time prescribe (including the power to subdelegate);

(g) To exercise powers granted the Administrative Committee under other Sections of the Plan; and

(h) To take all actions necessary for the administration of the Plan, including determining whether to hold or discontinue insurance policies purchased in connection with the Plan.

7.4 Powers and Duties of the Investment Committee

The Investment Committee shall have all powers necessary to accomplish its purposes, including, but not by way of limitation, the following:

(a) To select types of investment and the actual investments against which earnings and losses will be measured;

(b) To oversee any rabbi trust; and

(c) To appoint agents, and to delegate to them such powers and duties in connection with its duties as the Investment Committee may from time to time prescribe (including the power to subdelegate).

7.5 Construction and Interpretation

The Administrative Committee shall have full discretion to construe and interpret the terms and provisions of this Plan, to make factual determinations and to remedy possible inconsistencies and omissions. The Administrative Committee's interpretations, constructions and remedies shall be final and binding on all parties, including but not limited to the Affiliated Companies and any Participant or Beneficiary. The Administrative Committee shall administer such terms and provisions in a uniform and nondiscriminatory manner and in full accordance with any and all laws applicable to the Plan.

7.6 Information

To enable the Committees to perform their functions, the Affiliated Companies adopting the Plan shall supply full and timely information to the Committees on all matters relating to the compensation of all Participants, their death or other events that cause termination of their participation in this Plan, and such other pertinent facts as the Committees may require.

7.7 Committee Compensation, Expenses and Indemnity

(a) The members of the Committees shall serve without compensation for their services hereunder.

(b) The Committees are authorized to employ such accounting, consultants or legal counsel as they may deem advisable to assist in the performance of their duties hereunder.

(c) To the extent permitted by ERISA and applicable state law, the Company shall indemnify and hold harmless the Committees and each member thereof, the Board and any delegate of the Committees who is an employee of the Affiliated Companies against any and all expenses, liabilities and claims, including legal fees to defend against such liabilities and claims arising out of their discharge in good faith of responsibilities under or incident to the Plan, other than expenses and liabilities arising out of willful misconduct. This indemnity shall not preclude such further indemnities as may be available under insurance purchased by the Company or provided by the Company under any bylaw, agreement or otherwise, as such indemnities are permitted under ERISA and state law.

7.8 Disputes

The Company's standardized "Northrop Grumman Nonqualified Retirement Plans Claims and Appeals Procedures" shall apply in handling claims and appeals under this Plan.

ARTICLE VIII

MISCELLANEOUS

8.1 Unsecured General Creditor

Participants and their Beneficiaries, heirs, successors, and assigns shall have no legal or equitable rights, claims, or interest in any specific property or assets of the Affiliated Companies. No assets of the Affiliated Companies shall be held in any way as collateral security for the fulfilling of the obligations of the Affiliated Companies under this Plan. Any and all of the Affiliated Companies' assets shall be, and remain, the general unpledged, unrestricted assets of the Affiliated Companies. The obligation under the Plan of the Affiliated Companies adopting the Plan shall be merely that of an unfunded and unsecured promise of those Affiliated Companies to pay money in the future, and the rights of the Participants and Beneficiaries shall be no greater than those of unsecured general creditors. It is the intention of the Affiliated Companies that this Plan be unfunded for purposes of the Code and for purposes of Title I of ERISA.

8.2 Restriction Against Assignment

(a) The Company shall pay all amounts payable hereunder only to the person or persons designated by the Plan and not to any other person or corporation. No part of a Participant's Accounts shall be liable for the debts, contracts, or engagements of any Participant, his or her Beneficiary, or successors in interest, nor shall a Participant's Accounts be subject to execution by levy, attachment, or garnishment or by any other legal or equitable proceeding, nor shall any such person have any right to alienate, anticipate, sell, transfer, commute, pledge, encumber, or assign any benefits or payments hereunder in any manner whatsoever. If any Participant, Beneficiary or successor in interest is adjudicated bankrupt or purports to anticipate, alienate, sell, transfer, commute, assign, pledge, encumber or charge any distribution or payment from the Plan, voluntarily or involuntarily, the Administrative Committee, in its discretion, may cancel such distribution or payment (or any part thereof) to or for the benefit of such Participant, Beneficiary or successor in interest in such manner as the Administrative Committee shall direct.

(b) The actions considered exceptions to the vesting rule under Section 5.2 will not be treated as violations of this Section.

(c) Notwithstanding the foregoing, all or a portion of a Participant's vested Account balance may be paid to another person as specified in a domestic relations order that the Administrative Committee

determines is qualified (a "Qualified Domestic Relations Order"). For this purpose, a Qualified Domestic Relations Order means a judgment, decree, or order (including the approval of a settlement agreement) which is:

- (1) issued pursuant to a State's domestic relations law;
- (2) relates to the provision of child support, alimony payments or marital property rights to a spouse, former spouse, child or other dependent of the Participant;
- (3) creates or recognizes the right of a spouse, former spouse, child or other dependent of the Participant to receive all or a portion of the Participant's benefits under the Plan; and
- (4) meets such other requirements established by the Administrative Committee.

The Administrative Committee shall determine whether any document received by it is a Qualified Domestic Relations Order. In making this determination, the Administrative Committee may consider the rules applicable to "domestic relations orders" under Code section 414(p) and ERISA section 206(d), and such other rules and procedures as it deems relevant.

8.3 Restriction Against Double Payment

If a court orders an assignment of benefits despite Section 8.2, the affected Participant's benefits will be reduced accordingly. The Administrative Committee may use any reasonable actuarial assumptions to accomplish the offset under this Section.

8.4 Withholding

There shall be deducted from each payment made under the Plan or any other compensation payable to the Participant (or Beneficiary) all taxes, which are required to be withheld by the Affiliated Companies in respect to such payment or this Plan. The Affiliated Companies shall have the right to reduce any payment (or compensation) by the amount of cash sufficient to provide the amount of said taxes.

8.5 Amendment, Modification, Suspension or Termination

The Company may, in its sole discretion, terminate, suspend or amend this Plan at any time or from time to time, in whole or in part for any reason. Notwithstanding the foregoing, no amendment or termination of the Plan shall reduce the amount of a Participant's Account balance as of the date of such amendment or termination. Upon termination of the Plan, distribution of balances in Accounts shall be made to Participants and Beneficiaries in the manner and at the time described in Article VI, unless the Company determines in its sole discretion that all such amounts shall be distributed upon termination in accordance with the requirements under Code section 409A.

Notwithstanding the foregoing, no amendment of the Plan shall apply to amounts that were earned and vested (within the meaning of Code section 409A and regulations thereunder) under the Plan prior to 2005, unless the amendment specifically provides that it applies to such amounts. The purpose of this restriction is to prevent a Plan amendment from resulting in an inadvertent "material modification" to amounts that are "grandfathered" and exempt from the requirements of Code section 409A.

8.6 Governing Law

To the extent not preempted by ERISA, this Plan shall be construed, governed and administered in accordance with the laws of Delaware.

8.7 Receipt and Release

Any payment to a payee in accordance with the provisions of the Plan shall, to the extent thereof, be in full satisfaction of all claims against the Plan, the Committees and the Affiliated Companies. The Administrative Committee may require such payee, as a condition precedent to such payment, to execute a receipt and release to such effect.

8.8 Payments on Behalf of Persons Under Incapacity

In the event that any amount becomes payable under the Plan to a person who, in the sole judgment of the Administrative Committee, is considered by reason of physical or mental condition to be unable to give a valid receipt therefore, the Administrative Committee may direct that such payment be made to any person found by the Committee, in its sole judgment, to have assumed the care of such person. Any payment made pursuant to such determination shall constitute a full release and discharge of the Administrative Committee and the Company.

8.9 Limitation of Rights and Employment Relationship

Neither the establishment of the Plan, any trust nor any modification thereof, nor the creating of any fund or account, nor the payment of any benefits shall be construed as giving to any Participant, or Beneficiary or other person any legal or equitable right against the Affiliated Companies or any trustee except as provided in the Plan and any trust agreement; and in no event shall the terms of employment of any Employee or Participant be modified or in any way be affected by the provisions of the Plan and any trust agreement.

8.10 Headings

Headings and subheadings in this Plan are inserted for convenience of reference only and are not to be considered in the construction of the provisions hereof.

8.11 Liabilities Transferred to HII

Northrop Grumman Corporation distributed its interest in Huntington Ingalls Industries, Inc. ("HII") to its shareholders on March 31, 2011 (the "HII Distribution Date"). Pursuant to an agreement between Northrop Grumman Corporation and HII, on the HII Distribution Date certain employees and former employees of HII ceased to participate in the Plan and the liabilities for these participants' benefits under the Plan were transferred to HII. On and after the HII Distribution Date, the Company and the Plan, and any successors thereto, shall have no further obligation or liability to any such participant with respect to any benefit, amount, or right due under the Plan.

* * *

IN WITNESS WHEREOF, this Amendment and Restatement is hereby executed by a duly authorized officer on this 20th day of December, 2018.

NORTHROP GRUMMAN CORPORATION

By: /s/ Denise M. Peppard
Denise M. Peppard
Corporate Vice President and
Chief Human Resources Officer

APPENDIX A – 2005 TRANSITION RELIEF

The following provisions apply only during 2005, pursuant to transition relief granted in IRS Notice 2005-1:

A.1 Cash-Out

Participants Separating from Service during 2005 for any reason before age 55 will receive an immediate lump sum distribution of their Account balances. Other Participants Separating from Service in 2005 will receive payments in accordance with their prior elections.

A.2 Elections

During the Plan's open enrollment period in June 2005 Participants may fully or partially cancel 2005 deferral elections and receive in 2005 a refund of amounts previously deferred in 2005.

In addition, individuals working in Company facilities impacted by Hurricane Katrina may stop or reduce 2005 elective contributions to the Plan at any time during 2005. All payments under this Section A.2 will be made before the end of calendar year 2005.

A.3 Key Employees

Key Employees Separating from Service on or after July 1, 2005, with distributions subject to Code section 409A and scheduled for payment in 2006 within six months of Separation from Service, may choose I or II below, subject to III:

- I. Delay the distributions described above for six months from the date of Separation from Service. The delayed payments will be paid as a single sum with interest at the end of the six-month period, with the remaining payments resuming as scheduled.
- II. Accelerate the distributions described above into a payment in 2005 without interest adjustments.
- III. Key Employees must elect I or II during 2005.

APPENDIX B – DISTRIBUTION RULES FOR PRE-2005 AMOUNTS

Distribution of amounts earned and vested (within the meaning of Code section 409A and regulations thereunder) under the Plan or a Merged Plan prior to 2005 (and earnings thereon) are exempt from the requirements of Code section 409A and shall be made in accordance with the Plan or the applicable Merged Plan terms as in effect on December 31, 2004 and as summarized in the following provisions, except as otherwise provided in Appendix C.

B.1 Distribution of Contributions

(a) Distributions Upon Early Termination.

(1) Voluntary Termination. If a Participant voluntarily terminates employment with the Affiliated Companies before age 55 or Disability, distribution of his or her Account will be made in a lump sum on the Participant's Payment Date.

(2) Involuntary Termination. If a Participant involuntarily terminates employment with the Affiliated Companies before age 55, distribution of his or her Account will generally be made in quarterly or annual installments over a fixed number of whole years not to exceed 15 years, commencing on the Participant's Payment Date, in accordance with the Participant's original election on his or her deferral election form. Payment will be made in a lump sum if the Participant had originally elected a lump sum, if the Account balance is \$50,000 or less, or if the Administrative Committee so specifies.

(b) Distribution After Retirement, Disability or Death. In the case of a Participant who separates from service with the Affiliated Companies on account of Retirement, Disability or death and has an Account balance of more than \$50,000, the Account shall be paid to the Participant (and after his or her death to his or her Beneficiary) in substantially equal quarterly installments over 10 years commencing on the Participant's Payment Date unless an optional form of benefit has been specified pursuant to Section B.1(b)(1).

(1) An optional form of benefit may be elected by the Participant, on the form provided by Administrative Committee, during his or her initial election period from among those listed below:

(i) A lump sum distribution on the Participant's Payment Date.

(ii) Quarterly installments over a period of at least 1 and no more than 15 years beginning on the Participant's Payment Date.

(iii) Annual installments over a period of at least 2 and no more than 15 years beginning on the Participant's Payment Date.

(2) A Participant from time to time may modify the form of benefit that he or she has previously elected. Upon his or her separation from service, the most recently elected form of distribution submitted at least 12 months prior to separation will govern. If no such election exists, distributions will be paid under the 10-year installment method.

(3) In the case of a Participant who terminates employment with the Affiliated Companies on account of Retirement, Disability or death with an Account balance of \$50,000 or less, the Account shall be paid to the Participant in a lump sum distribution on the Participant's Payment Date.

(4) In general, upon the Participant's death, payment of any remaining Account balance will be made to the Beneficiary in a lump sum on the Payment Date. But the Beneficiary will receive any remaining installments (starting on the Payment Date) if the Participant was receiving installments, or if the Participant died on or after age 55 with an Account balance over \$50,000 and with an effective installment payout

election in place. In such cases, the Beneficiary may still elect a lump sum payment of the remaining Account balance, but only with the Administrative Committee's consent.

(5) In the event that this Plan is terminated, the amounts allocated to a Participant's Account shall be distributed to the Participant or, in the event of his or her death, to his or her Beneficiary in a lump sum.

APPENDIX C – MERGED PLANS

C.1 Plan Mergers

(a) Merged Plans. As of their respective effective dates, the plans listed in (c) (the "Merged Plans") are merged into this Plan. All amounts from those plans that were merged into this Plan are held in their corresponding Accounts.

(b) Accounts. Effective as of the dates below, Accounts are established for individuals who, before the merger, had account balances under the merged plans. These individuals will not accrue benefits under this Plan unless they become Participants by virtue of being hired into a covered position with an Affiliated Company, but they will be considered Participants for purposes of the merged accounts. The balance credited to the Participant's merged plan account will, effective as of the date provided in the table below, be invested in accordance with the terms of this Plan. Except as provided in section C.2 below, amounts merged into this Plan from the merged plans are governed by the terms of this Plan.

(c) Table.

Name of Merged Plans	Merger Effective Dates	Merged Account Names
Northrop Grumman Benefits Equalization Plan	December 10, 2004	NG BEP Account
Northrop Grumman Space & Mission Systems Corp. Deferred Compensation Plan	December 10, 2004	S & MS Deferred Compensation Account
BDM International, Inc. 1997 Executive Deferred Compensation Plan ("BDM Plan")	April 29, 2005	BDM Account
PRC Inc. Executive Deferred Compensation Plan ("PRC Plan")	November 9, 2012	PRC EDCP Account (or Sub-Account, as applicable)

C.2 Merged Plans – General Rule

(a) NG BEP Account and S & MS Deferred Compensation Account. Distributions from Participants' NG BEP and S & MS Deferred Compensation Accounts are made under the provisions of Appendix B, except as provided in this Section.

(1) Amounts in the Participant's NG BEP Account and the S & MS Deferred Compensation Account shall be paid out in accordance with elections made under the Merged Plans.

(2) The Participant's "Payment Date" for amounts in the NG BEP Account and the S & MS Deferred Compensation Account shall be deemed to be the end of January following the Participant's termination of employment.

(3) The reference to \$50,000 in the provisions of Appendix B shall be deemed to be \$5,000 with respect to amounts in the NG BEP Account and the S & MS Deferred Compensation Account.

(4) The Administrative Committee shall assume the rights and responsibilities of the Directors/Committee with respect to determining whether a Participant's NG BEP Account may be paid out in a form other than the automatic form of payment.

(5) The Administrative Committee shall assume the rights and responsibilities of the Committee or Special Committee with respect to determining whether a Participant's S & MS Deferred Compensation Account may be paid out in a form other than the automatic form of payment.

(6) For purposes of determining the time of payment of a Participant's NG BEP Account, a Participant's employment will not be deemed to have terminated following the Participant's layoff until the earlier of the end of the twelve-month period following layoff (without a return to employment with the Affiliated Companies) or the date on which the Participant retires under any pension plan maintained by the Affiliated Companies.

(7) A Participant's S & MS Deferred Compensation Account shall be paid to the Participant no later than the January 5 next preceding the Participant's 80th birthday.

(8) In no event will payments of amounts in the Participant's NG BEP Account and the S & MS Deferred Compensation Account be accelerated or deferred beyond the payment schedule provided under the Merged Plans. However, any election to change the time or form of payment for such an amount may be made based on the terms of the relevant Merged Plan as in effect on October 3, 2004.

(b) BDM Account. Distributions of a Participant's vested BDM Account balance shall be made in accordance with this Section C.2(b), and Article VI shall not apply to such distributions. A Participant shall be vested in his BDM Account balance in accordance with the vesting provisions of the BDM Plan.

(1) Timing of Payment: A Participant's vested BDM Account balance shall be distributed in accordance with elections made under the BDM Plan. For those Participants who have not commenced distributions as of April 29, 2005, payments from the BDM Account will commence at the time designated on his or her BDM enrollment and election form, unless extended prior to such date. However, if such a Participant did not elect a fixed date (or elect the earlier of a fixed date or termination of employment), his or her vested BDM Account balance will be paid as soon as administratively practicable following termination of employment in the form designated under Section C.2(b)(2) below.

(2) Form of Payment: A Participant's vested BDM Account balance shall be paid in cash. The vested BDM Account balance will be paid in (i) a lump sum, (ii) five (5) or ten (10) substantially equal annual installments (adjusted for gains and losses), or (iii) a combination thereof, as selected by the Participant (or Beneficiary) prior to the date on which amounts are first payable to the Participant (or Beneficiary) under Section C.2(b)(1) above. If the Participant fails to designate properly the manner of payment, such payment will be made in a lump sum.

(3) Death Benefits: If a Participant dies before commencement of payment of his BDM Account balance, the entire Account balance will be paid at the times provided in Section C.2(b)(2) above to his or her Beneficiary. If a Participant dies after commencement but before he or she has received all payments from his vested BDM Account balance, the remaining installments shall be paid annually to the Beneficiary. For purposes of this Section C.2(b), a Participant's Beneficiary, unless subsequently changed, will be the designated beneficiary(ies) under the BDM Plan or if none, the Participant's spouse, if then living, but otherwise the Participant's then living descendants, if any, per stirpes, but, if none, the Participant's estate.

(4) Lost Participant: In the event that the Administrative Committee is unable to locate a Participant or Beneficiary within three years following the payment date under Section C.2(b)(1) above, the amount allocated to the Participant's BDM Account shall be forfeited. If, after such forfeiture and prior to termination of the Plan, the Participant or Beneficiary later claims such benefit, such benefit shall be reinstated without interest or earnings for the forfeiture period. In lieu of such a forfeiture, the Administrative Committee has

the discretion to direct distribution of the vested BDM Account balance to any one or more or all of the Participant's next of kin, and in the proportions as the Administrative Committee determines.

(5) Committee Rules: All distributions are subject to the rules and procedures of the Administrative Committee. The Administrative Committee may also require the use of particular forms. The Administrative Committee may change its rules, procedures and forms from time to time and without prior notice to Participants.

(6) Payment Schedule: In no event will payments of amounts in the Participant's BDM Account be accelerated or deferred beyond the payment schedule provided under the BDM Plan.

(7) Application to Trustee: BDM International, Inc. set aside amounts in a grantor trust to assist it in meeting its obligations under the BDM Plan. Notwithstanding Section C.2(b)(5) above and the claims procedures provided in Section 7.8, a Participant may make application for payment of benefits under this Section C.2(b) directly to the trustee of such trust.

(c) PRC EDCP Account. Notwithstanding anything to the contrary, the following provisions in this Section C.2(c) summarize the distribution rules in effect under the PRC Plan with respect to the PRC EDCP Account balances, and those PRC Plan distribution terms shall continue to govern the distributions of the PRC EDCP Account balances. Article VI and Appendix B shall not apply to the PRC EDCP Account balances. Nothing in this Section C.2(c) shall change or alter the distribution terms of the PRC Plan in effect as of any date. All capitalized terms in this Section C.2(c) not otherwise defined in the Plan shall be defined in accordance with the terms of the PRC Plan as in effect immediately prior to the PRC Plan's merger with the Plan on November 9, 2012.

(1) Vesting. All Participants are vested in their PRC EDCP Account balances in accordance with the vesting provisions of the PRC Plan.

(2) Fixed Payment Dates; Termination of Employment. A Participant's vested PRC EDCP Account balance shall be distributed in accordance with his elections made under the PRC Plan. However, if such a Participant did not elect a fixed date or termination of employment with all Employers (or elect the earlier of a fixed date or termination of employment) for any particular portion of his or her vested PRC EDCP Account, such portion of his or her PRC EDCP Account balance will be valued and payable at or commence at such Participant's termination of employment according to the provisions of Sections C.2(c)(4) and (5).

(3) Hardship Distributions. In the event of financial hardship of the Participant, as hereinafter defined, the Participant may apply to the Administrative Committee for the distribution of all or any part of his or her vested PRC EDCP Account. The Administrative Committee shall consider the circumstances of each such case, and the best interests of the Participant and his or her family, and shall have the right, in its sole and absolute discretion, if applicable, to allow such distribution, or, if applicable, to direct a distribution of part of the amount requested, or to refuse to allow any distribution. Upon a finding of financial hardship, the Administrative Committee shall make or cause the appropriate distribution to be made to the Participant from amounts held by the Company or the Trustee in respect of the Participant's vested PRC EDCP Account. In no event shall the aggregate amount of the distribution exceed either the full value of the Participant's vested PRC EDCP Account or the amount determined by the Administrative Committee, in its sole and absolute discretion, to be necessary to alleviate the Participant's financial hardship (which financial hardship may be considered to include any taxes due because of the distribution occurring because of this Section), and which is not reasonably available from other resources of the Participant. For purposes of this Section, the value of the Participant's vested PRC EDCP Account shall be determined as of the date of the distribution. "Financial hardship" means (i) a severe financial hardship to the Participant resulting from a sudden and unexpected illness or accident of the Participant or of a dependent (as defined in Code section 152(a)) of the Participant, (ii) loss of the Participant's property due to casualty, or (iii) other similar extraordinary and unforeseeable circumstances arising as a result of events beyond the control of the Participant, each as determined to exist by the Administrative Committee. A distribution may be made under this Section only with the consent of the Administrative Committee.

(4) Amount and Time of Payment. Subject to Section C.2(c)(3), a Participant (or his or her Beneficiary) shall become entitled to receive a vested PRC EDCP Sub-Account balance commencing on the Payment Date for such sub-account. For this purpose, the "Payment Date" will be the relevant date or event triggering payment as provided under Section C.2(c)(2). Notwithstanding the foregoing, a Participant may elect to postpone a Payment Date to a later date, provided the election is made at least 12 months prior to the scheduled Payment Date. For example, a Participant could elect (i) to postpone a fixed payment date to a later fixed payment date, or (ii) elect to postpone the payment date for an amount payable upon termination of employment to a date that necessarily occurs after termination of employment (e.g., two years after termination of employment). There is no limit on the number of such elections a Participant may make. Any payment due hereunder from the Trust which is not paid by the Trust for any reason will be paid by the Employer from its general assets.

(5) Method of Payment.

(i) Form of Payment. Unless otherwise elected by the Participant and permitted by the Trustee in its sole and absolute discretion, a Participant's vested PRC EDCP Account balance shall be paid in cash. In the case of distributions to a Participant or his or her Beneficiary by virtue of an entitlement pursuant to Section C.2(c)(2), an aggregate amount equal to the Participant's vested PRC EDCP Sub-Account will be paid by the Trust or the Employer, as provided by Section C.2(c)(4), in a lump sum or in five (5) or ten (10) substantially equal annual installments (adjusted for gains and losses, and reduced by any required withholding or other deductions from such payments), as selected by the Participant on his or her Participant Enrollment and Election Form for such sub-account. If the Participant fails to designate properly the manner of payment, such payment will be made in a lump sum.

If a Participant receiving installment distributions pursuant to Section C.2(c)(7) is re-employed by the Employer, the remaining distributions due to the Participant shall be suspended until such time as the Participant (or his or her Beneficiary) once again becomes eligible for benefit payments, at which time such distribution shall commence, subject to the limitations and conditions contained in the PRC Plan.

(ii) Subsequent Deferral Elections. Such form of payment may be changed by the Participant provided (A) the election is made at least 12 months prior to the payment date for the PRC EDCP Sub-Account provided under Section C.2(c)(4) and (B) the form of payment is not accelerated (i.e., an election of installments may not be changed to a lump sum and an election of 10 annual installments may not be changed to 5 annual installments). There is no limit on the number of such elections a Participant may make.

(6) Death Benefits. If a Participant dies before terminating his or her employment with the Employer and before the commencement of payments to the Participant hereunder, the entire value of the Participant's PRC EDCP Account (which may include credits for insurance contract death benefits deemed to be received by the PRC EDCP Account) shall be paid, as provided in Section C.2(c)(5), to the Beneficiary designated under the Plan, unless the Employer elects a more rapid form or schedule of distribution.

Upon the death of a Participant after payments hereunder have begun but before he or she has received all payments to which he or she is entitled under the Plan, the remaining benefit payments shall be paid to the Beneficiary designated under the Plan, in the manner in which such benefits were payable to the Participant, unless the Employer elects a more rapid form or schedule of distribution.

(7) Application to Trustee. Notwithstanding Section 6.7 above and the claims procedures provided in Section 7.8, on the date or dates on which a Participant or Beneficiary is entitled to payment under Section C.2(c)(2), the Participant or Beneficiary need not make application for payment to the Administrative Committee, but instead may make application for payment directly to the Trustee who shall, subject to any restrictions or limitations contained in the Trust, pay the Participant or Beneficiary the appropriate amount directly from the Trust without the consent of PRC or the Employer. The Trustee shall report the amount of each such payment, and any withholding thereon, to the Company.

APPENDIX D – COMMITTEES AND APPOINTMENTS

Notwithstanding anything to the contrary in this Plan, effective October 25, 2011, the Chief Executive Officer of Northrop Grumman Corporation shall appoint, and shall have the power to remove, the members of (1) an Administrative Committee that shall have responsibility for administering the Plan (including as such responsibilities are described in Article VII of the Plan) and (2) an Investment Committee that shall have responsibility for overseeing any rabbi trusts or other informal funding for the Plan.

APPENDIX E – Eligible OADCP Participants

E.1 The following words and phrases used in this Appendix E, with the first letter capitalized, shall have the meanings specified below:

(a) "Eligible OADCP Participant" means an employee of NGIS who is employed as of December 31, 2018 and has elected to defer Performance Cash under the OADCP that otherwise would be payable in 2019.

(b) "OADCP" means the Northrop Grumman Innovation Systems Nonqualified Deferred Compensation Plan (formerly the Orbital ATK, Inc. Nonqualified Deferred Compensation Plan).

(c) "Performance Cash" shall have the meaning assigned to such term under the OADCP.

E.2 Notwithstanding anything to the contrary in this Plan, effective June 29, 2018 an Eligible OADCP Participant shall become a Participant in the Plan.

E.3 An Eligible OADCP Participant shall receive:

(a) A Company Contribution equal to the matching contribution rate for which the Eligible OADCP Participant is eligible under the NGSP for 2019 multiplied by the amount of Performance Cash deferred by the Eligible OADCP Participant under the OADCP for Performance Cash otherwise payable in 2019; and

(b) A Company Contribution equal to the nonelective company contribution amount that the Eligible OADCP Participant would have received under the NGSP had the Performance Cash otherwise payable in 2019 not been deferred under the OADCP.

E.4 An Eligible OADCP Participant shall be vested in his or her Company Contributions under Section E.3 pursuant to the rules set forth in Section 5.2(b) of the Plan.

NORTHROP GRUMMAN
OFFICERS RETIREMENT ACCOUNT CONTRIBUTION PLAN

(Amended and Restated Effective as of January 1, 2019)

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INTRODUCTION

The Northrop Grumman Officers Retirement Account Contribution Plan (the "Plan") was adopted effective as of October 1, 2009. The Plan is hereby amended and restated effective as of January 1, 2019, except as otherwise provided herein. This restatement amends the June 29, 2018 restatement of the Plan.

This Plan is intended (1) to comply with section 409A of the Internal Revenue Code, as amended (the "Code") and official guidance issued thereunder, and (2) to be "a plan which is unfunded and is maintained by an employer primarily for the purpose of providing deferred compensation for a select group of management or highly compensated employees" within the meaning of sections 201(2), 301(a)(3) and 401(a)(1) of the Employee Retirement Income Security Act of 1974. Notwithstanding any other provision of this Plan, this Plan shall be interpreted, operated and administered in a manner consistent with these intentions.

ARTICLE I

DEFINITIONS

1.1 Definitions

Whenever the following words and phrases are used in this Plan, with the first letter capitalized, they shall have the meanings specified below.

"Account" shall mean the recordkeeping account set up for each Participant to keep track of amounts to his or her credit.

"Administrative Committee" means the committee in charge of Plan administration, as described in Article VI.

"Affiliated Companies" shall mean the Company and any entity affiliated with the Company under Code sections 414(b) or (c).

"Beneficiary" or "Beneficiaries" shall mean the person or persons, including a trustee, personal representative or other fiduciary, last designated in writing by a Participant in accordance with procedures established by the Administrative Committee to receive the benefits specified hereunder in the event of the Participant's death.

(a) No Beneficiary designation shall become effective until it is filed with the Administrative Committee.

(b) Any designation shall be revocable at any time through a written instrument filed by the Participant with the Administrative Committee with or without the consent of the previous Beneficiary.

No designation of a Beneficiary other than the Participant's spouse shall be valid unless consented to in writing by such spouse. If there is no such designation or if there is

no surviving designated Beneficiary, then the Participant's surviving spouse shall be the Beneficiary. If there is no surviving spouse to receive any benefits payable in accordance with the preceding sentence, the duly appointed and currently acting personal representative of the Participant's estate (which shall include either the Participant's probate estate or living trust) shall be the Beneficiary. In any case where there is no such personal representative of the Participant's estate duly appointed and acting in that capacity within 90 days after the Participant's death (or such extended period as the Administrative Committee determines is reasonably necessary to allow such personal representative to be appointed, but not to exceed 180 days after the Participant's death), then Beneficiary shall mean the person or persons who can verify by affidavit or court order to the satisfaction of the Administrative Committee that they are legally entitled to receive the benefits specified hereunder. Any payment made pursuant to such determination shall constitute a full release and discharge of the Plan, the Administrative Committee and the Company. A Participant will automatically revoke a designation of a spouse as primary beneficiary upon the dissolution of their marriage.

(c) In the event any amount is payable under the Plan to a minor, payment shall not be made to the minor, but instead be paid (1) to that person's living parent(s) to act as custodian, (2) if that person's parents are then divorced, and one parent is the sole custodial parent, to such custodial parent, or (3) if no parent of that person is then living, to a custodian selected by the Administrative Committee to hold the funds for the minor under the Uniform Transfers or Gifts to Minors Act in effect in the jurisdiction in which the minor resides. If no parent is living and the Administrative Committee decides not to select another custodian to hold the funds for the minor, then payment shall be made to the duly appointed and currently acting guardian of the estate for the minor or, if no guardian of the estate for the minor is duly appointed and currently acting within 60 days after the date the amount becomes payable, payment shall be deposited with the court having jurisdiction over the estate of the minor. Any payment made pursuant to such determination shall constitute a full release and discharge of the Plan, the Administrative Committee and the Company.

(d) Payment by the Affiliated Companies pursuant to any unrevoked Beneficiary designation, or to the Participant's estate if no such designation exists, of all benefits owed hereunder shall terminate any and all liability of the Affiliated Companies.

"Board" shall mean the Board of Directors of the Company.

"Code" shall mean the Internal Revenue Code of 1986, as amended.

"Committees" shall mean the Committees appointed as provided in Article VI.

"Company:" shall mean Northrop Grumman Corporation and any successor.

"Company Contributions" shall mean credits to a Participant's Account, as described in Section 3.2.

"Compensation" shall be "compensation" as defined by Section 5.01 of the NGSP. Notwithstanding the foregoing, for purposes of this Plan, a Participant's "Compensation" shall

also include bonus amounts otherwise payable during the 2019 calendar year deferred at such Participant's election under the Orbital ATK, Inc. Nonqualified Deferred Compensation Plan.

"Compensation Committee" shall mean the Compensation Committee of the Company's Board of Directors.

"Disability" or "Disabled" shall mean the Participant's inability to perform each and every duty of his or her occupation or position of employment due to illness or injury as determined in the sole and absolute discretion of the Administrative Committee.

"Eligible Employee" shall mean any Employee who meets the following conditions:

(a) Prior to January 1, 2015:

(1) he or she is an elected or appointed officer of an Affiliated Company other than Vinnell Corporation, Component Technologies or Premier America Credit Union;

(2) he or she is eligible to participate in the Northrop Grumman Savings Plan;

(3) he or she is not eligible to actively accrue benefits under Appendix F ("CPC SERP"), Appendix G ("OSERP"), or Appendix I ("OSERP II") of the Northrop Grumman Supplemental Plan 2; and

(4) he or she is not otherwise designated as being ineligible to participate in the Plan.

Notwithstanding the foregoing, effective October 14, 2013, a country executive outside the U.S. reporting to the Corporate Global Business Development Officer who is employed by a U.S. entity, on a U.S. payroll and participating in U.S. benefit plans and who will serve as an expatriate on an overseas assignment in this role shall be treated as an Eligible Employee.

(b) On or after January 1, 2015:

(1) he or she is an elected or appointed officer of an Affiliated Company other than Vinnell Corporation, Component Technologies or Premier America Credit Union; and

(2) he or she is eligible to participate in the Northrop Grumman Savings Plan; and

(3) he or she is not otherwise designated as being ineligible to participate in the Plan.

Notwithstanding the foregoing, (i) a country executive outside the U.S. reporting to the Corporate Global Business Development Officer who is employed by a U.S. entity, on a U.S. payroll and participating in U.S. benefit plans and who will serve as an expatriate on an overseas assignment in this role shall be treated as an Eligible Employee, and (ii) an executive on U.S. payroll who was serving as a Company Vice President and continues employment as an executive but in a non-Vice President position during secondment to an affiliated company shall be treated as an Eligible Employee able to continue participation in the Plan at the same level as appointed officers of the Company, subject to a designation of eligibility (or subsequent ineligibility) by either the Company's Chief Human Resources Officer or the Vice President of Compensation (as such titles may be modified from time to time).

For the avoidance of doubt, an employee classified by an Affiliated Company as Grade V04 at any time beginning January 1, 2019 through December 31, 2019 shall not be eligible to participate in the Plan.

"Employee" shall mean any common law employee of the Affiliated Companies who is classified as an employee by the Affiliated Companies.

"ERISA" shall mean the Employee Retirement Income Security Act of 1974, as it may be amended from time to time.

"Investment Committee" means the committee in charge of investment aspects of the Plan, as described in Article VI.

"Key Employee" means an employee who on the date of his Separation from Service is treated as a "specified employee" under Code section 409A in accordance with a uniform Company policy.

"NGIS" means Northrop Grumman Innovation Systems, Inc.

"NGSP" means the Northrop Grumman Savings Plan.

"Participant" shall mean any Eligible Employee who participates in this Plan in accordance with Article II.

"Plan" shall be the Northrop Grumman Officers Retirement Account Contribution Plan.

"Plan Year" shall mean the calendar year.

"Separation from Service" means a "separation from service" within the meaning of Code section 409A.

ARTICLE II

PARTICIPATION

2.1 In General

(a) An Employee shall automatically become a Participant and eligible for Company Contributions as of the later of October 1, 2009 or the date the Employee becomes an Eligible Employee.

(b) An individual will cease to be a Participant when he or she no longer has a positive balance in his or her Account.

2.2 Disputes as to Employment Status

(a) Because there may be disputes about an individual's proper status as an Employee or non-Employee, this Section describes how such disputes are to be handled with respect to Plan participation.

(b) The Affiliated Companies will make the initial determination of an individual's employment status.

(1) If an individual is not treated by the Affiliated Companies as a common law employee, then the Plan will not consider the individual to be an "Eligible Employee" and he or she will not be entitled to participate in the Plan.

(2) This will be so even if the individual is told he or she is entitled to participate in the Plan and given a summary of the plan or other actions are taken indicating that he or she may participate.

(c) Disputes may arise as to an individual's employment status. As part of the resolution of the dispute, an individual's status may be changed by the Affiliated Companies from non-Employee to Employee. Such Employees are not Eligible Employees and will not be entitled to participate in the Plan.

ARTICLE III

CREDITS TO ACCOUNTS

3.1 Accounts

The Administrative Committee shall establish and maintain a recordkeeping Account for each Participant under the Plan.

3.2 Company Contribution Credits

Effective January 1, 2019, if a Participant qualifies as an Eligible Employee during a Plan Year, the Participant's Account shall be credited with a Company Contribution for the Plan Year within the time prescribed by law, including extensions of time, for filing the Company's federal income tax return for the Plan Year. The Company Contribution for a Plan Year shall equal 4% of the Participant's Compensation for the Plan Year. Notwithstanding the foregoing, a Participant will only be eligible for a Company Contribution for a Plan Year if the Participant is an Eligible Employee on December 31 of the Plan Year, provided however, that the Employee will also be eligible for a Company Contribution for a Plan Year if the Employee (1) dies while employed or is laid off or involuntarily terminated other than for cause during the Plan Year or (2) is performing qualifying military service (as defined in the NGSP), is reemployed and would be eligible to receive make-up company contributions under the NGSP or the if the Employee dies or becomes disabled while performing qualifying military service.

3.3 Investment Elections

(a) The Investment Committee will establish a number of different investment funds or other investment options for the Plan. The Investment Committee may change the funds or other investment options from time to time, without prior notice to Participants.

(b) Participants may elect how future contributions and existing Account balances will be deemed invested in the various investment funds and may change their elections from time to time. If a Participant does not elect how future contributions will be deemed invested, contributions will be deemed invested in the qualified default investment alternative ("QDIA") that would apply to the Participant under the NGSP.

(c) Selections of investments, changes and transfers must be made according to the rules and procedures of the Administrative Committee.

(1) The Administrative Committee may prescribe rules that may include, among other matters, limitations on the amounts that may be transferred and procedures for electing transfers.

(2) The Administrative Committee may prescribe valuation rules for purposes of investment elections and transfers. Such rules may, in the Administrative Committee's discretion, use averaging methods to determine values and accrue estimated expenses. The Administrative Committee may change the methods it uses for valuation from time to time.

(3) The Administrative Committee may prescribe the periods and frequency with which Participants may change deemed investment elections and make transfers.

(4) The Administrative Committee may change its rules and procedures from time to time and without prior notice to Participants.

(d) Participant investment elections involving a Company stock investment fund (e.g., transfers into or out of the fund) may be restricted, including in accordance with Company policies generally applicable to employee transactions in Company stock.

3.4 Valuation of Accounts

(a) The valuation of Participants' Accounts will reflect earnings, losses, expenses and distributions, and will be made in accordance with the rules and procedures of the Administrative Committee.

(b) The Administrative Committee may set regular valuation dates and times and also use special valuation dates and times and procedures from time to time under unusual circumstances and to protect the financial integrity of the Plan.

(c) The Administrative Committee may use averaging methods to determine values and accrue estimated expenses.

(d) The Administrative Committee may change its valuation rules and procedures from time to time and without prior notice to Participants.

3.5 Use of a Trust

The Company may set up a trust to hold any assets or insurance policies that it may use in meeting its obligations under the Plan. Any trust set up will be a rabbi trust and any assets placed in the trust shall continue for all purposes to be part of the general assets of the Company and shall be available to its general creditors in the event of the Company's bankruptcy or insolvency.

3.6 Investment Return Not Guaranteed

Investment performance under the Plan is not guaranteed at any level. Participants may lose all or a portion of the Company Contributions credited to their Accounts due to poor investment performance.

ARTICLE IV

VESTING AND FORFEITURES

4.1 In General

Except as provided in Section 4.2 below, a Participant shall become fully vested in his or her Account balance upon the earliest of the following dates, provided he or she is an Employee at such time: (i) the date he or she completes three years of service, (ii) the date of his or her 65th birthday, (iii) the date of his or her death, (iv) the date he or she becomes Disabled, or (v) the date Company Contributions are completely discontinued or the Plan is terminated. Notwithstanding the foregoing, any elected or appointed officer of an Affiliated Company as of

December 31, 2011 shall be 100% vested in his or her Account balance upon entry to the Plan if the officer becomes a Participant in the Plan on January 1, 2015. Notwithstanding anything to the contrary, if a Participant terminates employment with the Affiliated Companies prior to vesting as set forth in this Section 4.1, his or her unvested Account balance and earnings thereon shall be immediately forfeited upon such termination. For this purpose, years of service shall be calculated in the same manner as for purposes of determining vesting in Retirement Account Contributions under the NGSP (including the treatment of a break in service). Notwithstanding the foregoing, years of service under the Plan for vesting purposes shall also include periods of service with Orbital ATK, Inc. (and its subsidiaries companies) to the extent included in years of service under the NGSP.

4.2 Exceptions

The following exceptions apply to the vesting rules in Sections 4.1 above:

- (a) Forfeitures on account of a lost payee. See Section 5.5.
- (b) Forfeitures under an escheat law.
- (c) Recapture of amounts improperly credited to a Participant's Account or improperly paid to or with respect to a Participant.
- (d) Expenses charged to a Participant's Account.
- (e) Investment losses.
- (f) Forfeitures due to certain competitive activities under Article VIII.

ARTICLE V

DISTRIBUTIONS

5.1 Normal Distribution Rules

The vested balance in a Participant's Account shall be distributed in a lump sum upon a Participant's Separation from Service. Notwithstanding the foregoing, distribution will not be made to a Key Employee upon a Separation from Service until the date which is six months after the date of the Key Employee's Separation from Service (or, if earlier, the date of death of the Key Employee).

At the discretion of the Administrative Committee, distribution may be made earlier or later than the date specified above, provided that the timing of any such distribution complies with Treas. Reg. section 1.409A-3(d) or any successor thereto.

5.2 Effect of Taxation

If a Participant's benefits under the Plan are includible in income pursuant to Code section 409A, the Company shall have the discretion to accelerate the distribution of all or a portion of such includible benefits to the Participant, provided that the Participant shall not be given a direct or indirect election as to whether such discretion is exercised.

5.3 Permitted Delays

Notwithstanding the foregoing, any payment to a Participant under the Plan shall be delayed upon the Administrative Committee's reasonable anticipation of one or more of the following events:

- (a) The Company's deduction with respect to such payment would be eliminated by application of Code section 162(m); or
- (b) The making of the payment would violate Federal securities laws or other applicable law;
- (c) provided, that any payment delayed pursuant to this Section 5.3 shall be paid in accordance with Code section 409A.

5.4 Payments Not Received At Death

In the event of the death of a Participant before receiving a payment, payment will be made to his or her estate if death occurs on or after the date of a check that has been issued by the Company. Otherwise, payment of the amount will be made to the Participant's Beneficiary.

5.5 Inability to Locate Participant

In the event that the Administrative Committee is unable to locate a Participant or Beneficiary within two years following the required payment date, the amount allocated to the Participant's Account shall be forfeited.

5.6 Committee Rules

All distributions are subject to the rules and procedures of the Administrative Committee. The Administrative Committee may also require the use of particular forms. The Administrative Committee may change its rules, procedures and forms from time to time and without prior notice to Participants.

ARTICLE VI

ADMINISTRATION

6.1 Committees

(a) The Administrative Committee shall be appointed by the Company.

(b) An Investment Committee (referred to together with the Administrative Committee as, the "Committees"), comprised of one or more persons, shall be appointed by and serve at the pleasure of the Board (or its delegate). The number of members comprising the Investment Committee shall be determined by the Board, which may from time to time vary the number of members. A member of the Investment Committee may resign by delivering a written notice of resignation to the Board. The Board may remove any member by delivering a certified copy of its resolution of removal to such member. Vacancies in the membership of the Investment Committee shall be filled promptly by the Board.

6.2 Committee Action

Each Committee shall act at meetings by affirmative vote of a majority of the members of that Committee. Any determination of action of a Committee may be made or taken by a majority of a quorum present at any meeting thereof, or without a meeting, by resolution or written memorandum signed by a majority of the members of the Committee then in office. A member of a Committee shall not vote or act upon any matter which relates solely to himself or herself as a Participant. The Chairman or any other member or members of each Committee designated by the Chairman may execute any certificate or other written direction on behalf of the Committee of which he or she is a member.

The Company shall appoint a Chairman from among the members of the Administrative Committee and a Secretary who may or may not be a member of the Administrative Committee. The Administrative Committee shall conduct its business according to the provisions of this Article and the rules contained in the current edition of Robert's Rules of Order or such other rules of order the Administrative Committee may deem appropriate. The Administrative Committee shall hold meetings from time to time in any convenient location.

6.3 Powers and Duties of the Administrative Committee

The Administrative Committee shall enforce the Plan in accordance with its terms, shall be charged with the general administration of the Plan, and shall have all powers necessary to accomplish its purposes, including, but not by way of limitation, the following:

- (a) To construe and interpret the terms and provisions of this Plan and make all factual determinations;
- (b) To compute and certify to the amount and kind of benefits payable to Participants and their Beneficiaries;

(c) To maintain all records that may be necessary for the administration of the Plan;

(d) To provide for the disclosure of all information and the filing or provision of all reports and statements to Participants, Beneficiaries or governmental agencies as shall be required by law;

(e) To make and publish such rules for the regulation of the Plan and procedures for the administration of the Plan as are not inconsistent with the terms hereof;

(f) To appoint a Plan administrator or any other agent, and to delegate to them such powers and duties in connection with the administration of the Plan as the Administrative Committee may from time to time prescribe (including the power to subdelegate);

(g) To exercise powers granted the Administrative Committee under other Sections of the Plan; and

(h) To take all actions necessary for the administration of the Plan, including determining whether to hold or discontinue insurance policies purchased in connection with the Plan.

6.4 Powers and Duties of the Investment Committee

The Investment Committee shall have all powers necessary to accomplish its purposes, including, but not by way of limitation, the following:

(a) To select types of investment and the actual investments against which earnings and losses will be measured;

(b) To oversee any rabbi trust; and

(c) To appoint agents, and to delegate to them such powers and duties in connection with its duties as the Investment Committee may from time to time prescribe (including the power to subdelegate).

6.5 Construction and Interpretation

The Administrative Committee shall have full discretion to construe and interpret the terms and provisions of this Plan, to make factual determinations and to remedy possible inconsistencies and omissions. The Administrative Committee's interpretations, constructions and remedies shall be final and binding on all parties, including but not limited to the Affiliated Companies and any Participant or Beneficiary. The Administrative Committee shall administer such terms and provisions in a uniform and nondiscriminatory manner and in full accordance with any and all laws applicable to the Plan.

6.6 Information

To enable the Committees to perform their functions, the Affiliated Companies adopting the Plan shall supply full and timely information to the Committees on all matters relating to the compensation of all Participants, their death or other events that cause termination of their participation in this Plan, and such other pertinent facts as the Committees may require.

6.7 Committee Compensation, Expenses and Indemnity

(a) The members of the Committees shall serve without compensation for their services hereunder.

(b) The Committees are authorized to employ such accounting, consultants or legal counsel as they may deem advisable to assist in the performance of their duties hereunder.

(c) To the extent permitted by ERISA and applicable state law, the Company shall indemnify and hold harmless the Committees and each member thereof, the Board and any delegate of the Committees who is an employee of the Affiliated Companies against any and all expenses, liabilities and claims, including legal fees to defend against such liabilities and claims arising out of their discharge in good faith of responsibilities under or incident to the Plan, other than expenses and liabilities arising out of willful misconduct. This indemnity shall not preclude such further indemnities as may be available under insurance purchased by the Company or provided by the Company under any bylaw, agreement or otherwise, as such indemnities are permitted under ERISA and state law.

6.8 Claims

The Company's standardized "Northrop Grumman Nonqualified Retirement Plans Claims and Appeals Procedures" (the "Claims Procedures") shall apply in handling claims and appeals under this Plan.

ARTICLE VII

MISCELLANEOUS

7.1 Unsecured General Creditor

Participants and their Beneficiaries, heirs, successors, and assigns shall have no legal or equitable rights, claims, or interest in any specific property or assets of the Affiliated Companies. No assets of the Affiliated Companies shall be held in any way as collateral security for the fulfilling of the obligations of the Affiliated Companies under this Plan. Any and all of the Affiliated Companies' assets shall be, and remain, the general unpledged, unrestricted assets of the Affiliated Companies. The obligation under the Plan of the Affiliated Companies adopting the Plan shall be merely that of an unfunded and unsecured promise of those Affiliated Companies to pay money in the future, and the rights of the Participants and Beneficiaries shall be no greater

than those of unsecured general creditors. It is the intention of the Affiliated Companies that this Plan be unfunded for purposes of the Code and for purposes of Title I of ERISA.

7.2 Restriction Against Assignment

(a) The Company shall pay all amounts payable hereunder only to the person or persons designated by the Plan and not to any other person or corporation. No part of a Participant's Accounts shall be liable for the debts, contracts, or engagements of any Participant, his or her Beneficiary, or successors in interest, nor shall a Participant's Accounts be subject to execution by levy, attachment, or garnishment or by any other legal or equitable proceeding, nor shall any such person have any right to alienate, anticipate, sell, transfer, commute, pledge, encumber, or assign any benefits or payments hereunder in any manner whatsoever. If any Participant, Beneficiary or successor in interest is adjudicated bankrupt or purports to anticipate, alienate, sell, transfer, commute, assign, pledge, encumber or charge any distribution or payment from the Plan, voluntarily or involuntarily, the Administrative Committee, in its discretion, may cancel such distribution or payment (or any part thereof) to or for the benefit of such Participant, Beneficiary or successor in interest in such manner as the Administrative Committee shall direct.

(b) The actions considered exceptions to the vesting rule under Section 4.2 will not be treated as violations of this Section.

(c) Notwithstanding the foregoing, all or a portion of a Participant's vested Account balance may be paid to another person as specified in a domestic relations order that the Administrative Committee determines is qualified (a "Qualified Domestic Relations Order"). For this purpose, a Qualified Domestic Relations Order means a judgment, decree, or order (including the approval of a settlement agreement) which is:

- (1) issued pursuant to a State's domestic relations law;
- (2) relates to the provision of child support, alimony payments or marital property rights to a spouse, former spouse, child or other dependent of the Participant;
- (3) creates or recognizes the right of a spouse, former spouse, child or other dependent of the Participant to receive all or a portion of the Participant's benefits under the Plan; and
- (4) meets such other requirements established by the Administrative Committee.

The Administrative Committee shall determine whether any document received by it is a Qualified Domestic Relations Order. In making this determination, the Administrative Committee may consider the rules applicable to "domestic relations orders" under Code section 414(p) and ERISA section 206(d), and such other rules and procedures as it deems relevant.

7.3 Restriction Against Double Payment

If a court orders an assignment of benefits despite Section 7.2, the affected Participant's benefits will be reduced accordingly. The Administrative Committee may use any reasonable actuarial assumptions to accomplish the offset under this Section.

7.4 Withholding

There shall be deducted from each payment made under the Plan or any other compensation payable to the Participant (or Beneficiary) all taxes, which are required to be withheld by the Affiliated Companies in respect to such payment or this Plan. The Affiliated Companies shall have the right to reduce any payment (or compensation) by the amount of cash sufficient to provide the amount of said taxes.

7.5 Amendment, Modification, Suspension or Termination

The Company may, in its sole discretion, terminate, suspend or amend this Plan at any time or from time to time, in whole or in part for any reason. Notwithstanding the foregoing, no amendment or termination of the Plan shall reduce the amount of a Participant's Account balance as of the date of such amendment or termination. Upon termination of the Plan, distribution of balances in Accounts shall be made to Participants and Beneficiaries in the manner and at the time described in Article V, unless the Company determines in its sole discretion that all such amounts shall be distributed upon termination in accordance with the requirements under Code section 409A.

7.6 Governing Law

To the extent not preempted by ERISA, this Plan shall be construed, governed and administered in accordance with the laws of Delaware.

7.7 Receipt and Release

Any payment to a payee in accordance with the provisions of the Plan shall, to the extent thereof, be in full satisfaction of all claims against the Plan, the Committees and the Affiliated Companies. The Administrative Committee may require such payee, as a condition precedent to such payment, to execute a receipt and release to such effect.

7.8 Payments on Behalf of Persons Under Incapacity

In the event that any amount becomes payable under the Plan to a person who, in the sole judgment of the Administrative Committee, is considered by reason of physical or mental condition to be unable to give a valid receipt therefore, the Administrative Committee may direct that such payment be made to any person found by the Committee, in its sole judgment, to have assumed the care of such person. Any payment made pursuant to such determination shall constitute a full release and discharge of the Administrative Committee and the Company.

7.9 Limitation of Rights and Employment Relationship

Neither the establishment of the Plan, any trust nor any modification thereof, nor the creating of any fund or account, nor the payment of any benefits shall be construed as giving to any Participant, or Beneficiary or other person any legal or equitable right against the Affiliated Companies or any trustee except as provided in the Plan and any trust agreement; and in no event shall the terms of employment of any Employee or Participant be modified or in any way be affected by the provisions of the Plan and any trust agreement.

7.10 Headings

Headings and subheadings in this Plan are inserted for convenience of reference only and are not to be considered in the construction of the provisions hereof.

7.11 Liabilities Transferred to HII

Northrop Grumman Corporation distributed its interest in Huntington Ingalls Industries, Inc. ("HII") to its shareholders on March 31, 2011 (the "HII Distribution Date"). Pursuant to an agreement between Northrop Grumman Corporation and HII, on the HII Distribution Date certain employees and former employees of HII ceased to participate in the Plan and the liabilities for these participants' benefits under the Plan were transferred to HII. On and after the HII Distribution Date, the Company and the Plan, and any successors thereto, shall have no further obligation or liability to any such participant with respect to any benefit, amount, or right due under the Plan.

ARTICLE VIII

FORFEITURE OF BENEFITS

8.1 In General

Notwithstanding any other provision of this Plan, this Article VIII applies to the portion of a Participant's Account balance accrued after 2011.

8.2 Determination of a Forfeiture Event

The Compensation Committee or its delegate will, in its sole discretion, determine whether a Forfeiture Event (as defined in Section 8.4) has occurred; provided that no Forfeiture Event shall be incurred by a Participant who has a termination of employment due to mandatory retirement pursuant to Company policy. Such a determination may be made by the Compensation Committee or its delegate for up to one year following the date that the Compensation Committee has actual knowledge of the circumstances that could constitute a Forfeiture Event.

8.3 No Forfeiture Event for Certain Terminations after Change in Control

Notwithstanding the foregoing, no Forfeiture Event shall be incurred by a Participant who, within the two year period following a Change in Control (as defined in the Northrop Grumman 2011 Long-Term Incentive Stock Plan or successor plan in effect at the time the relevant event occurs ("LTISP")), is involuntarily terminated for reasons other than Cause or voluntarily terminates for Good Reason. The terms "Cause" and "Good Reason" shall be defined in accordance with the LTISP and its associated grant certificates. This Article VIII may not be amended during the two year period commencing on the date of such a Change in Control.

8.4 Forfeiture Event Defined

A "Forfeiture Event" means that, while employed by any of the Affiliated Companies or at any time in the two year period immediately following the Participant's last day of employment by one of the Affiliated Companies, the Participant, either directly or indirectly through any other person, is employed by, renders services (as a director, consultant or otherwise) to, has any ownership interest in, or otherwise participates in the financing, operation, management or control of, any business that is then in competition with the business of any of the Affiliated Companies. A Participant will not, however, be considered to have incurred a Forfeiture Event solely by reason of owning up to (and not more than) two percent (2%) of any class of capital stock of a corporation that is registered under the Securities Exchange Act of 1934.

8.5 Amount of Forfeiture

(a) If the Compensation Committee or its delegate determines that a Forfeiture Event has occurred, the relevant Participant may forfeit up to 100% of his or her Account balance accrued after 2011. The amount forfeited, if any, will be determined by the Compensation Committee or its delegate in its sole discretion, and may consist of all or a portion of the Account balance accrued after 2011 and not yet paid.

(b) Any forfeiture pursuant to this Article VIII will also apply with respect to survivor benefits or benefits assigned under a Qualified Domestic Relations Order.

8.6 Notice and Claims Procedure

(a) The Company will provide timely notice to any Participant who incurs a forfeiture pursuant to this Article VIII. Any delay by the Company in providing such notice will not otherwise affect the amount or timing of any forfeiture determined by the Compensation Committee or its delegate.

(b) The procedures set forth in the Claims Procedures will apply to any claims and appeals arising out of or related to any forfeiture under this Article VIII, except as provided below:

(1) The Compensation Committee, or its delegate, will serve in place of the designated decision-makers on any such claims and appeals.

(2) After a claimant has exhausted his remedies under the Claims Procedures, including the appeal stage, the claimant forgoes any right to file a civil action under ERISA section 502(a), but instead may present any claims arising out of or related to any forfeiture under this Article VIII to final and binding arbitration in the manner described below:

(A) A claimant must file a demand for arbitration no later than one year following a final decision on the appeal under the Claims Procedures. After such period, no claim for arbitration may be filed, and the decision becomes final. A claimant must deliver a demand for arbitration to the Company's General Counsel.

(B) Any claims presented shall be settled by arbitration consistent with the Federal Arbitration Act, and consistent with the then-current Arbitration Rules and Procedures for Employment Disputes, or equivalent, established by JAMS, a provider of private dispute resolution services.

(C) The parties will confer to identify a mutually acceptable arbitrator. If the parties are unable to agree on an arbitrator, the parties will request a list of proposed arbitrators from JAMS and:

(i) If there is an arbitrator on the list acceptable to both parties, that person will be selected. If there is more than one arbitrator on the list acceptable to both parties, each party will rank each arbitrator in order of preference, and the arbitrator with the highest combined ranking will be selected.

(ii) If there is no arbitrator acceptable to both parties on the list, the parties will alternately strike names from the list until only one name remains, who will be selected.

(D) The fees and expenses of the arbitrator will be borne equally by the claimant and the Company. Each side will be entitled to use a representative, including an attorney, at the arbitration. Each side will bear its own deposition, witness, expert, attorneys' fees, and other expenses to the same extent as if the matter were being heard in court. If, however, any party prevails on a claim, which (if brought in court) affords the prevailing party attorneys' fees and/or costs, then the arbitrator may award reasonable fees and/or costs to the prevailing party to the same extent as would apply in court. The arbitrator will resolve any dispute as to who is the prevailing party and as to the reasonableness of any fee or cost.

(E) The arbitrator will take into account all comments, documents, records, other information, arguments, and theories submitted by the claimant relating to the claim, or considered by the Compensation Committee or its delegate relating to the claim, but only to the extent that it was previously provided as part of the initial decision or appeal request on the claim.

The arbitrator may grant a claimant's claim only if the arbitrator determines it is justified based on: (i) the Compensation Committee, or its delegate erred upon an issue of law in the appeal request, or (ii) the Compensation Committee's, or its delegate's, findings of fact during the appeal process were not supported by the evidence.

(F) The arbitrator shall issue a written opinion to the parties stating the essential findings and conclusions upon which the arbitrator's award is based. The decision of the arbitrator will be final and binding upon the claimant and the Company. A reviewing court may only confirm, correct, or vacate an award in accordance with the standards set forth in the Federal Arbitration Act, 9 U.S.C. §§ 1-16.

(G) In the event any court finds any portion of this procedure to be unenforceable, the unenforceable section(s) or provision(s) will be severed from the rest, and the remaining section(s) or provisions(s) will be otherwise enforced as written.

8.7 Application

Should a Forfeiture Event occur, this Article VIII is in addition to, and does not in any way limit, any other right or remedy of the Affiliated Companies, at law or otherwise, in connection with such Forfeiture Event.

* * *

2018. IN WITNESS WHEREOF, this Plan is hereby executed by a duly authorized officer on this 20th day of December,

NORTHROP GRUMMAN CORPORATION

By: /s/ Denise M. Peppard
Denise M. Peppard
Corporate Vice President and
Chief Human Resources Officer

APPENDIX A – COMMITTEES AND APPOINTMENTS

Notwithstanding anything to the contrary in this Plan, effective as of October 25, 2011, the Chief Executive Officer of the Company shall appoint, and shall have the power to remove, the members of (1) an Administrative Committee that shall have responsibility for administering the Plan (including as such responsibilities are described in Article VI of the Plan) and (2) an Investment Committee that shall have responsibility for overseeing any rabbi trusts or other informal funding for the Plan.

**NORTHROP GRUMMAN CORPORATION
SPECIAL OFFICER RETIREE MEDICAL PLAN
(Amended and Restated Effective October 1, 2018)**

ARTICLE 1 INTRODUCTION

- 1.01 Purpose. The purpose of the Northrop Grumman Corporation Special Officer Retiree Medical Plan ("Plan") is to provide lifetime retiree medical and life insurance benefits to eligible elected officers of Northrop Grumman Corporation ("the Company") and their eligible dependents as described in the Plan. The Plan provides for the continuation of welfare benefits to a select group of management or highly compensated employees within the meaning of Department of Labor Regulation 29 CFR section 2520.104-24 and Sections 201, 301, and 401 of the Employee Retirement Income Security Act of 1974 ("ERISA"). The Plan was most recently amended and restated effective January 1, 2015 to reflect administrative clarifications necessitated by the Company's termination of medical benefit coverage for actively employed executives under the Northrop Grumman Executive Medical Plan ("Executive Medical Plan"). This amendment and restatement is effective October 1, 2018 and revises the Plan's benefit commencement requirement to permit deferred enrollment for medical benefits, clarifies the Plan's surviving spouse medical benefit eligibility provisions and eliminates life insurance coverage for Vested Participants who retire on or after October 1, 2018.
- 1.02 Substantive Benefits. This document describes the standard eligibility provisions and terms of coverage under the Plan. The actual medical benefit coverage will be provided pursuant to the terms of the insurance contract or contracts issued by an insurance carrier or carriers selected by the Company. The actual life insurance coverage will be provided through an insurance contract or contracts issued by an insurance carrier or carriers selected by the Company.

ARTICLE 2 DEFINITIONS

- 2.01 Board. The Company's Board of Directors.
- 2.02 Committee. The Compensation and Management Development Committee of the Board.
- 2.03 Continuation Coverage. Continued medical coverage under the Plan after a Qualifying Event has occurred. Such medical coverage is identical to the medical coverage as provided under the Plan to similarly situated persons with respect to whom a Qualifying Event has not occurred.
- 2.04 Continuation Coverage Election Period. The period beginning on the date of the Qualifying Event and ending sixty (60) days after the later of (a) the date the Qualified Beneficiary would lose medical coverage on account of the Qualifying Event, or (b) the date that the Qualified Beneficiary is provided with notice of his or her right to elect Continuation Coverage.

- 2.05 Grandfathered Participants. Participants who were actively employed by the Company on September 30, 2003.
- 2.06 Participant. An elected officer of the Company who is designated by the Board or the Committee as eligible to participate in the Plan.
- 2.07 Prior Plan. The Northrop Grumman Special Officer Retiree Medical Plan as in effect prior to October 1, 2003.
- 2.08 Qualified Beneficiary. A retired Vested Participant's spouse or dependent who, on the day before a Qualifying Event, has medical coverage under the Plan. In the case of a Qualifying Event described in subsection 2.09(iv) below, Qualified Beneficiary means a retired Vested Participant who had retired on or before the date of substantial elimination of medical coverage and any person who on the day before the Qualifying Event is the spouse or Surviving Spouse of the retired Vested Participant or a covered dependent child of the retired Vested Participant or Surviving Spouse.
- 2.09 Qualifying Event. Any of: (i) the death of a retired Vested Participant, but only with respect to a beneficiary who is not the Surviving Spouse of the retired Vested Participant; (ii) the divorce or legal separation of a retired Vested Participant from his spouse; (iii) a dependent child ceasing to be eligible for medical coverage as a dependent child of a retired Vested Participant under the dependent eligibility provisions of the insurance contract through which coverage is provided; or (iv) a proceeding in a case under Title 11 of the United States Code with respect to the Company; provided, however, that any such event will be a Qualifying Event only if it will cause the Qualified Beneficiary an immediate or deferred loss of medical coverage under the Plan. For purposes of this subsection, a loss of medical coverage means to cease to be eligible for medical benefits under the Plan under the same terms and conditions as in effect immediately before the Qualifying Event. A loss of medical coverage will be considered a deferred loss of medical coverage for purposes of this provision if the loss of medical coverage does not occur at the time of the Qualifying Event but occurs before the end of what would be the maximum period of Continuation Coverage under section 8.04 below. In the case of a Qualifying Event described in (iv), a loss of medical coverage includes a substantial elimination of medical coverage with respect to a Qualified Beneficiary within one year before or after the date of commencement of the bankruptcy proceeding.
- 2.10 Surviving Spouse. The individual to whom the retired Vested Participant was legally married under applicable State law both at the time of the retired Vested Participant's retirement and at the time of the retired Vested Participant's death.
- 2.11 Vested Participant. A Participant with either five years of service as an elected officer of the Company or 30 years of total service with the Company and its affiliates.

ARTICLE 3 ELIGIBILITY

- 3.01 Eligibility. Eligibility for the Plan is limited to those elected officers of the Company who are designated as eligible to participate in the Plan by the Board or the Committee. The eligible spouse and dependents of a Vested Participant will be eligible for medical benefits under the Plan commencing at the same time the Vested Participant's medical benefits commence. Spouse and dependent eligibility will be determined in accordance with the terms of the insurance contract through which coverage is provided. A Vested Participant's eligibility for life insurance coverage will be subject to the terms of the life insurance contract or contracts through which such coverage is provided. Life insurance coverage shall not be provided to Vested Participants who retire on or after October 1, 2018. The spouse and dependents of a Vested Participant are not eligible for life insurance coverage under the Plan.
- 3.02 Revocation of Eligibility. The Board or Committee may revoke a non-Vested Participant's Plan eligibility without the Participant's consent. The Board or Committee may revoke a Vested Participant's or Surviving Spouse's Plan eligibility, provided that the Vested Participant or, after the Vested Participant's death, his or her Surviving Spouse, consents to the revocation.
- 3.03 Automatic Cessation of Eligibility. A Participant who is not a Vested Participant will automatically cease to be a Participant under the Plan upon the earlier of the following: (i) the date the Participant terminates employment with the Company; or (ii) the date the Participant ceases to be an elected officer of the Company. However, the Board or the Committee may make provision for a Participant who ceases to be an elected officer of the Company, but does not terminate employment with the Company, to continue to accrue service credited toward becoming a Vested Participant. The spouse or dependent of a Participant will cease to be eligible for medical benefits under the Plan upon the earlier of the following: (i) the date the Participant ceases to be a Participant under the Plan; or (ii) the date the spouse or dependent ceases to be eligible in accordance with the terms of the insurance contract through which coverage is provided.
- 3.04 Plan Freeze. No elected officer whose date of election is effective after March 21, 2007 shall be designated as eligible to participate in the Plan. An elected officer who is a Participant as of March 21, 2007 may continue to earn service toward becoming a Vested Participant after that date in accordance with the terms of the Plan.

ARTICLE 4 COMMENCEMENT OF BENEFITS AND COSTS

- 4.01 Commencement of Benefits.
- (a) Upon Retirement. A Vested Participant may elect to commence benefits under the Plan coincident with retirement from the Company under the terms of the supplemental executive retirement plan in which the Vested Participant participates. Except as provided in section 4.01(b) below, if the election to commence is not made at the time of retirement, the Vested Participant and his or her dependents cease to

be eligible for the Plan and no subsequent election to commence benefits will be allowed.

- (b) Deferred Commencement. A Vested Participant who retires on or after October 1, 2018 may elect to commence medical benefits under the Plan at any time following retirement and until the date he or she attains age 65. If the Vested Participant does not elect to commence medical benefits coincident with retirement, the Vested Participant's medical benefits will commence as soon as reasonably practicable after the Vested Participant notifies the Company of his or her election to commence medical benefits. The Surviving Spouse of a retired Vested Participant who dies before electing to commence medical benefits under the Plan may elect to commence medical benefits under the Plan at any time after the Vested Participant's death and until the date the Surviving Spouse attains age 65. A Surviving Spouse's medical benefits in this situation will commence as soon as reasonably practicable after the Surviving Spouse notifies the Company of his or her election to commence medical benefits.

4.02 Duration of Benefits. Subject to the Company's right to amend or terminate the Plan (as limited by subsection 6.01(b)) and except as provided in section 3.01, life insurance coverage will be provided for the life of the Vested Participant and medical coverage will be provided for the life of the Vested Participant and the life of his or her Surviving Spouse, if any. Eligible dependent medical coverage will only be available during the life of the Vested Participant and the life of his or her Surviving Spouse, if any, subject to ARTICLE 8.

4.03 Coverage Provided. Medical coverage will be provided pursuant to the terms of the insurance contract issued by the insurance carrier selected by the Company, as such contract is modified from time to time. Life insurance coverage will be provided through an insurance contract or contracts issued by an insurance carrier or carriers selected by the Company. Life insurance coverage will be in the amount of \$450,000 at the Vested Participant's retirement and will be reduced by \$50,000 effective as of each January 1 thereafter until the amount reaches \$250,000.

4.04 Medicare. A Vested Participant, spouse or Surviving Spouse must enroll in Medicare Parts A and B when first eligible in order to receive benefits under this Plan. If he or she fails to enroll, medical benefit coverage under this Plan will cease upon the date the Vested Participant, spouse or Surviving Spouse first becomes eligible for Medicare Parts A and B.

4.05 Costs of Coverage.

(a) Medical Coverage.

- i. The Vested Participant (or Surviving Spouse, following the death of a Vested Participant) will be responsible for any participant cost items, such as coinsurance, copayments, and deductibles, as determined by the Company in its discretion and described in the insurance contract through which coverage is provided. Subject to subsection (a)(ii) below, the level of

participant (or Surviving Spouse) contributions toward the cost of coverage (i.e., premiums) will be frozen at the amount of the required participant contribution in effect under the Executive Medical Plan as of the date the Vested Participant commenced benefits under this Plan. For a Vested Participant who commences benefits under this Plan on or after July 1, 2014, the level of participant (or Surviving Spouse) contributions toward the cost of coverage will be frozen at the amount of the required participant contribution under the Executive Medical Plan as of June 30, 2014, subject to adjustment as described in subsection (a)(ii) below.

- ii. A Vested Participant's or Surviving Spouse's contribution toward the cost of coverage may vary based on the level of coverage (one-person, two or more persons, etc.) in effect.

(b) Life Insurance Coverage. The cost of life insurance coverage will be paid in full by the Company.

4.06 Cessation of Medical Coverage. Eligibility for the continuation of medical benefits pursuant to the Plan will cease if any payment required to be made by the Vested Participant or dependent (for example, participant contributions, copayments or deductibles) is not timely paid in accordance with procedures established by the Company.

ARTICLE 5 SPECIAL COVERAGE PROVISIONS

5.01 Grandfathered Participants. Grandfathered Participants have the right, if otherwise eligible for the Plan at the time of retirement, to elect to be covered: (i) under the terms of the Prior Plan as in effect as of September 30, 2003; or (ii) the Plan as in effect at the time the Grandfathered Participant's benefits commence. Such election will be made pursuant to forms and procedures specified by the Company.

ARTICLE 6 CHANGE IN CONTROL

6.01 Effect of Change in Control. Upon the occurrence of a "change in control" as defined in the Company's Change-In-Control Severance Plan (as in effect at the time of the event), each of the following will occur:

- (a) Each Participant will become a "Vested Participant."
- (b) The Plan may not be terminated or amended in any manner that adversely affects the benefits of a Participant without his or her consent.
- (c) All Participant contributions, co-pays, deductibles and any other participant or dependent cost items will be frozen as of the date of the change in control.

ARTICLE 7 CLAIMS AND APPEALS PROCEDURES

- 7.01 Claim for Medical or Life Insurance Benefit. A claim or appeal relating to medical benefits under the Plan will be subject to the claims and appeals procedures set forth in the insurance contract through which coverage is provided or the applicable coverage certificate relating to such insurance contract. A claim or appeal relating to life insurance benefits under the Plan will be subject to the claims and appeals procedures set forth in the insurance contract through which such coverage is provided or the applicable coverage certificate relating to such insurance contract.
- 7.02 Administrative Claims. A claim or appeal relating to eligibility to participate in the Plan, status as a Vested Participant, required contributions or any other claim or appeal that is not a claim or appeal relating to a medical or life insurance benefit under the Plan will be considered an “Administrative Claim” and will be subject to the claims and appeals procedures set forth in this section 7.02. Administrative Claims will be decided by the Corporate Vice President and Chief Human Resources Officer, or his or her delegate, who will be the claims administrator and the appropriate named fiduciary with respect to such claims.
- (a) Notice of decision on any Administrative Claim will be furnished to the claimant within 90 days after receipt of the Administrative Claim by the claims administrator. The claims administrator may take one 90 day extension if circumstances warrant.
 - (b) A claimant whose Administrative Claim is denied in whole or in part will receive written notice of the denial within the timeframe specified in subsection 7.02(a) above setting forth: (i) the specific reasons for the denial; (ii) reference to the specific Plan provisions on which the denial is based; (iii) a description of any additional material or information necessary for the claimant to perfect the Administrative Claim and an explanation of why such material or information is necessary; and (iv) information as to the steps the claimant must take to submit his or her claim for review, including the time limit for submitting the claim for review.
 - (c) A claimant whose Administrative Claim is denied in whole or in part may request review of the denied Administrative Claim not later than 60 days after receipt of written notification of the denial. A claimant’s request for review must be in writing. The claimant may submit written comments, documents, records and other information relating to the Administrative Claim and the claimant will be provided upon request with reasonable access to and copies of documents, records and other information relevant to his or her Administrative Claim. The claims administrator, in his or her sole discretion, will determine whether a document, record or other information is relevant to a claimant’s Administrative Claim.
 - (d) Notice of decision on review of an Administrative Claim will be furnished to the claimant within 60 days after receipt of the request for review by the claims administrator. The claims administrator may take one 60 day extension if circumstances warrant.

- (e) A claimant whose Administrative Claim is denied upon review will be furnished with written notice of the denial within the timeframe specified in subsection 7.02(d) above setting forth: (i) the specific reasons for the denial; (ii) reference to the specific Plan provisions on which the denial is based; (iii) a statement that the claimant is entitled to receive, upon request and free of charge, reasonable access to and copies of documents, records and other information relevant to his or her Administrative Claim; and (iv) a statement of the claimant's right to bring an action under section 502(a) of ERISA. The claims administrator, in his or her sole discretion, will determine whether a document, record or other information is relevant to a claimant's Administrative Claim. The decision of the claims administrator on a claimant's request for review shall be final and conclusive.

ARTICLE 8 CONTINUATION OF MEDICAL COVERAGE

- 8.01 General. In addition to the Surviving Spouse medical coverage described above, Continuation Coverage under the Plan may be purchased after the date medical coverage would ordinarily terminate under the Plan as a result of a Qualifying Event.
- 8.02 Participant/Beneficiary Notice Requirements. In the case of the Qualifying Events described in subsections 2.09(ii) and (iii) above, the retired Vested Participant or his or her spouse or dependent must provide notice of the occurrence of the Qualifying Event not later than 60 days after the occurrence. Such notice must be provided to the COBRA administrator for the Plan.
- 8.03 Availability of Continuation Coverage. Upon the occurrence of a Qualifying Event, each Qualified Beneficiary will be offered an opportunity to purchase Continuation Coverage under the Plan. The election to purchase Continuation Coverage must be made during the Continuation Coverage Election Period in such form and manner as the Company prescribes. A Qualified Beneficiary who fails to elect Continuation Coverage during the Continuation Coverage Election Period following a Qualifying Event will not be entitled to elect Continuation Coverage with respect to such Qualifying Event.
- 8.04 Period of Continuation Coverage. Continuation Coverage as elected by the Qualified Beneficiary will extend for the period beginning on the date of loss of coverage as a result of the Qualifying Event and ending on the earliest of the following dates:
- (a) If the Qualifying Event was divorce or legal separation, death of the retired Vested Participant, or loss of dependent child status, 36 months after the date Continuation Coverage began;
 - (b) If the Qualifying Event was a proceeding in a case under Title 11 of the United States Code: (i) for a Qualified Beneficiary who is the retired Vested Participant, the retired Vested Participant's date of death; (ii) for a Qualified Beneficiary who is the surviving spouse (determined without regard to whether such spouse was married to the Vested Participant at the time of his or her termination of employment with the Company

and its affiliates) or dependent child of the retired Vested Participant, 36 months after the date of death of the retired Vested Participant;

- (c) The first day for which timely payment for Continuation Coverage is not made with respect to the Qualified Beneficiary as provided in section 8.05 below;
- (d) The date upon which the Company ceases to maintain any group health plan;
- (e) The date upon which the Qualified Beneficiary first becomes covered under another group health plan after the date Continuation Coverage is elected; provided, Continuation Coverage will not terminate if the other group health plan contains an exclusion or limitation with respect to any preexisting condition that affects the Qualified Beneficiary, unless that limitation or exclusion does not apply to the Qualified Beneficiary because of the requirements of the Health Insurance Portability and Accountability Act of 1996;
- (f) The date that the Qualified Beneficiary first becomes entitled to Medicare benefits under Title XVIII of the Social Security Act after the date Continuation Coverage is elected.

Notwithstanding anything herein to the contrary, the Company may terminate the Continuation Coverage of a Qualified Beneficiary on the same basis that the Company terminates medical coverage under the Plan for a similarly situated Participant with respect to whom a Qualifying Event has not occurred.

8.05 Payment for Continuation Coverage.

- (a) Each Qualified Beneficiary who has elected to purchase Continuation Coverage will make a monthly payment to the Company in an amount up to 102% of the applicable premium determined by the Company in accordance with Internal Revenue Code Section 4980B(f)(4).
- (b) The payment for the period of Continuation Coverage beginning on the date a Qualified Beneficiary would otherwise lose coverage as a result of a Qualifying Event and ending on the last day of the month during which the Qualified Beneficiary elects Continuation Coverage will be due on the date the Qualified Beneficiary elects Continuation Coverage and payment made within forty-five (45) days of such date will be deemed timely payment. The monthly payments for the remainder of the period of Continuation Coverage will be due as of the first day of the month for which the coverage is provided and payment made within thirty (30) days of the due date for each monthly installment will be deemed timely payment.

ARTICLE 9 GENERAL PROVISIONS

- 9.01 Amendment and Plan Termination. Except as provided in ARTICLE 6, the Company may amend or terminate the Plan at any time for any reason.

- 9.02 Assignment of Benefits. A Vested Participant or dependent may not, either voluntarily or involuntarily, assign, anticipate, alienate, commute, sell, transfer, pledge or encumber any benefits to which he or she is or may become entitled under the Plan, nor may Plan benefits be subject to attachment or garnishment by any of his or her creditors or to legal process.
- 9.03 Nonduplication of Benefits. This Section applies if the Company is required to make payments under this Plan to a person or entity other than the payees described in the Plan. In such a case, any coverage due the Participant (or his or her dependent) under the Plan will be reduced by the actuarial value of the coverage extended or payments made to such other person or entity.
- 9.04 Medicare Primary. Medicare coverage is primary to medical coverage offered pursuant to the Plan. Plan coverage will be secondary to Medicare to the maximum extent permissible under law.
- 9.05 Funding. Participants have the status of general unsecured creditors of the Company and the Plan constitutes a mere promise by the Company to continue eligibility for executive medical and life insurance coverage pursuant to the terms of the Plan.
- 9.06 Construction. The Committee will have full and sole discretionary authority to determine eligibility, construe and interpret the terms of the Plan, and determine factual issues, including the power to remedy possible ambiguities, inconsistencies or omissions.
- 9.07 Governing Law. This Plan will be governed by the law of the State of California, except to the extent superseded by federal law.
- 9.08 Non-Standard Provisions. The Board or Committee may in their discretion apply eligibility requirements or terms of coverage other than the standard provisions with respect to an individual.

NORTHROP GRUMMAN CORPORATION

By: /s/ Denise M. Peppard
Denise Peppard
Corporate Vice President and

Chief Human Resources Officer

Date: December 3, 2018

**NORTHROP GRUMMAN INNOVATION SYSTEMS
DEFINED BENEFIT
SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN**

As Amended and Restated Effective January 1, 2019

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**NORTHROP GRUMMAN INNOVATION SYSTEMS
DEFINED BENEFIT
SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN**

As Amended and Restated January 1, 2019

Section 1

INTRODUCTION

1.1 Purposes of Plan. The purposes of the Northrop Grumman Innovation Systems Defined Benefit Supplemental Executive Retirement Plan (formerly known as the “Orbital ATK, Inc. Defined Benefit Supplemental Executive Retirement Plan”) are: (1) to restore the benefit amounts that would be payable to select participants in certain tax-qualified defined benefit pension plans sponsored by Northrop Grumman Corporation (the “Company”) as described in Section 3.2 hereof (the “Pension Plans”) absent the limitations in sections 401(a)(17) and 415 of the Internal Revenue Code of 1986, as amended (the “Code”), and absent a participant’s election to voluntarily defer compensation, (2) to pay frozen benefits under certain frozen plans as described in Appendix B, Appendix C and Appendix D, and (3) in certain cases, to provide additional benefits pursuant to employment agreements or other similar agreements between Orbital ATK, Inc. (“Orbital ATK”) and employees who are members of a select group of management or highly compensated employees as described in Appendices E and F.

1.2 History. The Company sponsors tax-qualified defined benefit Pension Plans called: the “NORTHROP GRUMMAN INNOVATION SYSTEMS PENSION AND RETIREMENT PLAN,” (formerly known as the “Orbital ATK, Inc. Pension and Retirement Plan”) and the “THIOKOL PROPULSION PENSION PLAN” (the “Pension Plans”) for the purpose of providing retirement benefits to certain employees of Northrop Grumman Innovation Systems, Inc. (“NGIS”) and its affiliates. The Pension Plans are subject to the Employee Retirement Income Security Act of 1974, as amended, (“ERISA”), and are intended to qualify under section 401(a) of the Code. By operation of section 401(a) of the Code, benefits under the Pension Plans are restricted so that they do not exceed maximum benefits allowed under section 415 of the Code. In addition, the maximum amount of annual compensation which may be taken into account for any plan participant may not exceed a fixed dollar amount which is established under section 401(a)(17) of the Code.

In 1990, Alliant Techsystems Inc. (“Alliant”), the predecessor of Orbital ATK, was spun-off from Honeywell Inc. and, in connection therewith, established the Alliant Techsystems Inc. Retirement Plan as a “spin-off” from the Honeywell Inc. Retirement Benefit Plan. Effective September 28, 1990, for the purpose of paying the benefits Participating Employees would have been entitled to if Code section 415 and Code section 401(a)(17) limitations were not in effect and, also, to pay certain employees transferred from Honeywell Inc. benefits already accrued under the nonqualified plans sponsored by Honeywell Inc., Alliant adopted a plan known as the “ALLIANT TECHSYSTEMS INC. SUPPLEMENTARY RETIREMENT PLAN (SRP)” by adoption of a document entitled the “Honeywell Supplementary Retirement Plan (SRP),” and a plan known as

the “ALLIANT TECHSYSTEMS INC. SUPPLEMENTARY EXECUTIVE RETIREMENT PLAN FOR COMPENSATION IN EXCESS OF \$200,000 (\$200K SERP)” by adoption of a document entitled the “Honeywell Supplementary Executive Retirement Plan for Compensation in Excess of \$200,000 (\$200K SERP) (Amended through April 17, 1990).” In addition, Alliant adopted a plan known as the “ALLIANT TECHSYSTEMS INC. SUPPLEMENTARY EXECUTIVE RETIREMENT PLAN FOR CECF PARTICIPANTS” by adoption of a document entitled the “Honeywell Supplementary Executive Retirement Plan for CECF Participants (Amended Through April 17, 1990)” as a frozen plan with benefits only for certain employees acquired from Honeywell Inc. who were participants in the Plan while employed by Honeywell Inc. Alliant also adopted a plan known as the “ALLIANT TECHSYSTEMS INC. SUPPLEMENTARY EXECUTIVE RETIREMENT PLAN FOR BENEFITS IN EXCESS OF LIMITS UNDER TAX REFORM ACT OF 1986” by adoption of a document entitled the “Honeywell Supplementary Executive Retirement Plan for Benefits in Excess of Limits under Tax Reform Act of 1986” as a frozen plan with benefits only for certain employees acquired from Honeywell Inc. who were participants in the Plan while employed by Honeywell Inc.

Pursuant to the subsequent acquisition of certain assets, employees and pension plan assets and obligations from Hercules Incorporated (the “Hercules Acquisition”), effective March 15, 1995, Alliant adopted a plan known as the “ALLIANT TECHSYSTEMS INC. AEROSPACE PENSION RESTORATION PLAN” by adoption of the portion of a document entitled the “Hercules Employee Pension Restoration Plan Effective October 1, 1990” that provides benefits based on the Hercules Incorporated Retirement Income Plan and its successor plans, including the Hercules Incorporated Retirement Income Plan (Government-Owned, Corporation-Operated) and the Hercules Incorporated Pension Plan.

Alliant also adopted, pursuant to the Hercules Acquisition, the ALLIANT TECHSYSTEMS INC. DEFERRED COMPENSATION PLAN (a plan which is memorialized in a document entitled the “Hercules Deferred Compensation Plan”) as a frozen plan with frozen benefits for certain employees acquired from Hercules Incorporated.

Effective September 1, 1999, Alliant adopted a nonqualified deferred compensation plan known as the “ALLIANT TECHSYSTEMS INC. MANAGEMENT DEFERRED COMPENSATION PLAN” which provides that certain employees can voluntarily defer compensation pursuant to a prior irrevocable agreement. Effective as of January 1, 2003, Alliant amended and restated its nonqualified deferred compensation plan by the adoption of a document entitled “ALLIANT TECHSYSTEMS INC. NONQUALIFIED DEFERRED COMPENSATION PLAN.”

Pursuant to the acquisition of certain assets, employees and pension plan assets and obligations from Alcoa, Inc. (the “Thiokol Acquisition”), Alliant adopted a plan known as the THIOKOL CORPORATION EXCESS PENSION PLAN (a plan which is memorialized in a document entitled “Thiokol Corporation Excess Pension Plan (Restated Effective October 1, 1990)”) that provides benefits based on the Thiokol Propulsion Pension Plan for certain Thiokol Propulsion employees

acquired from Alcoa, Inc. The Thiokol Corporation Excess Pension Plan was merged with and into this Alliant Techsystems Inc. Supplemental Executive Pension Plan effective January 1, 2003.

Alliant also adopted, pursuant to the Thiokol Acquisition, the CORDANT TECHNOLOGIES INC. SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN (a plan which is memorialized in a document entitled "CORDANT TECHNOLOGIES INC. SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN Amended and Restated Effective July 22, 1999"), as a frozen plan with frozen benefits for certain employees acquired from Alcoa, Inc. The Cordant Technologies Inc. Supplemental Executive Retirement Plan was merged with and into the Alliant Techsystems Inc. Supplemental Executive Pension Plan effective January 1, 2003.

1.3 Adoption of Plan. Effective January 1, 2003, Alliant adopted a document entitled "ALLIANT TECHSYSTEMS INC. SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN" as a complete amendment and restatement of the Alliant Techsystems Inc. Supplementary Retirement Plan, the Alliant Techsystems Inc. Supplementary Executive Retirement Plan for Compensation in Excess of \$200,000, the Alliant Techsystems Inc. Supplementary Executive Retirement Plan for CECP Participants, the Alliant Techsystems Inc. Supplementary Executive Retirement Plan for Benefits in Excess of Limits under Tax Reform Act of 1986, the Alliant Techsystems Inc. Aerospace Pension Restoration Plan, the Alliant Techsystems Inc. Deferred Compensation Plan, the Thiokol Corporation Excess Pension Plan and the Cordant Technologies Inc. Supplemental Executive Retirement Plan for employees who retire, die or otherwise terminate employment on or after January 1, 2003.

The Alliant Techsystems Inc. Supplementary Executive Retirement Plan for CECP Participants is attached as Appendix A and incorporated herein for purposes of paying the benefits due thereunder, effective January 1, 2003. It applies only to those Participating Employees who were participants in the Honeywell Inc. CECP Plan and who are entitled to a "grandfathered" benefit under the Alliant Techsystems Inc. Retirement Plan.

The Alliant Techsystems Inc. Supplementary Executive Retirement Plan for Benefits in Excess of Limits under Tax Reform Act of 1986 is attached as Appendix B and incorporated herein for purposes of paying the benefits due thereunder, effective January 1, 2003. It applies only to those Participating Employees who were participants in such plan and who are entitled to a "grandfathered" benefit under Alliant Techsystems Inc. Retirement Plan.

The Alliant Techsystems Inc. Deferred Compensation Plan is attached as Appendix C and incorporated herein for purposes of paying frozen benefits for certain employees acquired from Hercules Incorporated.

The Cordant Technologies Supplemental Executive Retirement Plan is attached as Appendix D and incorporated herein for purposes of paying any benefit obligations acquired under that plan, which will be paid hereunder.

This Plan was amended and restated effective January 1, 2005 to comply with section 409A of the Code, to add certain benefits/distribution options for persons in Schedules 1 and 2, and to provide certain additional benefits as described in Appendix F.

This Plan was amended and restated effective July 1, 2013 to rename it the “ALLIANT TECHSYSTEMS INC. DEFINED BENEFIT SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN” and to reflect certain changes to the Pension Plans.

This Plan was amended and restated effective February 2, 2015 to take into account the spinoff of Vista Outdoor Inc.

This Plan was amended and restated effective January 1, 2016 to reflect the merger of Alliant with Orbital Sciences Corporation, effective February 9, 2015, and to rename it the “ORBITAL ATK, INC. DEFINED BENEFIT SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN.”

This Plan is amended and restated effective January 1, 2019 to reflect (a) a change in the name of Orbital ATK, Inc. to Northrop Grumman Innovation Systems, Inc. coincident with the merger of Orbital ATK into Northrop Grumman Corporation; (b) a change in the plan sponsor from Orbital ATK to the Company; (c) a change in the name of the Plan to “NORTHROP GRUMMAN INNOVATION SYSTEMS DEFINED BENEFIT SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN; and (d) corresponding updates to the governance and administration of the Plan.

SECTION 2

PLAN NAME

This plan shall be referred to as the NORTHROP GRUMMAN INNOVATION SYSTEMS DEFINED BENEFIT SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN (the “Plan”).

SECTION 3

PARTICIPATING EMPLOYEES

3.1 **Participating Employees.** The individuals eligible to participate in and receive benefits under the Plan (“Participating Employees”) are those employees of NGIS and its affiliates:

- (a) who are participants in the Alliant Techsystems, Inc. Nonqualified Deferred Compensation Plan or any other nonqualified deferred compensation plan maintained by the Company and its affiliates; or
- (b) whose individual employment agreement or other separate written agreement between Orbital ATK (or an affiliate of Orbital ATK) and such employee specifies that such employee is eligible to receive benefits under this Plan; or
- (c) who are Participants in one of the Pension Plans (as described in Section 3.2 below) and (i) who are actively employed by NGIS or its affiliates or on approved leave of

absence, and (ii) whose benefits under the applicable Pension Plan would be greater if computed without regard to the limits imposed under Code sections 401(a)(17) and 415; or

- (d) who were affirmatively selected for participation in this Plan by the Chief Executive Officer (“CEO”) of Orbital ATK (or any person authorized to act on behalf of the CEO by the Board of Directors of Alliant Techsystems Inc. (the “Board of Directors”) and, for a Section 16 Officer, by the Compensation and Human Resources Committee of the Board of Directors).

Notwithstanding anything apparently to the contrary contained in this Plan, the Plan shall be construed and administered to prevent the duplication of benefits provided under this Plan and any other qualified or nonqualified plan maintained in whole or in part by the Company or any predecessor, successor or affiliate.

Notwithstanding anything apparently to the contrary contained in this Plan, no individual hired or rehired as an employee of NGIS, its predecessor, or any of its affiliates on or after January 1, 2007 shall be a Participating Employee with respect to any period of employment beginning on or after January 1, 2007, except as and in accordance with such terms as may be specified by the Personnel and Compensation Committee of the Board of Directors of Orbital ATK or, effective on or after June 6, 2018, by the Company.

3.2 Applicable Pension Plans. For purposes of this Plan, the “Pension Plans” are:

- (a) Northrop Grumman Innovation Systems Pension and Retirement Plan, including the benefit structures under such plan known as the Alliant Techsystems Inc. Retirement Formula, the Alliant Techsystems Inc. Aerospace Pension Formula, the ATK SEG Retirement Formula, the Federal Cartridge Company Pension Formula, the ATK Pension Equity Formula, the Alliant Lake City Retirement Formula, the Alliant Techsystems Inc. Retirement Income Formula (GOCO), and the ATK Cash Balance Formula; and
- (b) Thiokol Propulsion Pension Plan, including the benefit structures known as the Former Thiokol Propulsion Pension Plan Formula, the Thiokol Pension Equity Formula, and the Thiokol Cash Balance Formula.

3.3 Overriding Exclusion. Notwithstanding anything apparently to the contrary in this Plan or in any written communication, summary, resolution or document or oral communication, no individual shall be a Participating Employee in this Plan, develop benefits under this Plan or be entitled to receive benefits under this Plan (either for the employee or his or her survivors) unless such individual is a member of a select group of management or highly compensated employees (as that expression is used in ERISA). If a court of competent jurisdiction, any representative of the U.S. Department of Labor or any other governmental, regulatory or similar body makes any direct or indirect, formal or informal, determination that an individual is not a member of a select group of management or highly compensated employees (as that expression is used in ERISA),

such individual shall not be (and shall not have ever been) a Participating Employee in this Plan at any time. If any person not so defined has been erroneously treated as a Participating Employee in this Plan, upon discovery of such error such person's erroneous participation shall immediately terminate *ab initio* and upon demand such person shall be obligated to reimburse Alliant for all amounts erroneously paid to him or her.

SECTION 4

BENEFITS PAYABLE

4.1 Benefit for Participating Employees

4.1.1 **Amount of Benefit.** This Plan shall pay to Participating Employees the excess, if any, of:

- (a) the amount that would have been payable under the applicable Pension Plan if such benefit had been determined:
 - (i) without regard to the benefit limitations under section 415 of the Code, and
 - (ii) without regard to compensation limitation of section 401(a)(17) of the Code, and
 - (iii) by including in Recognized Compensation, Earnings and Final Average Earnings (as defined under the applicable Pension Plan) amounts not otherwise included because they were deferred at the election of the Participating Employee under the Alliant Techsystems Inc. Nonqualified Deferred Compensation Plan or any other nonqualified deferred compensation plan at the time or times when they would have been included but for such election to defer; and
 - (iv) as adjusted pursuant to the terms of any employment agreement or any separate written agreement between Orbital ATK (or an affiliate of Orbital ATK) and the Participating Employee; minus
- (b) the amount actually paid from the applicable Pension Plan.

Notwithstanding anything to the contrary in the Plan, if the Participating Employee is a Participant in the Northrop Grumman Innovation Systems Pension and Retirement Plan under the benefit structure formerly known as the ATK SEG Retirement Plan or the Federal Cartridge Company Pension Plan, any service of such Participating Employee before December 7, 2001, shall be disregarded for benefit accrual purposes in determining any excess benefit provided under this Plan.

Notwithstanding anything to the contrary in the Plan, this Plan shall pay to Participating Employees identified on Schedule 1 attached to the Plan who terminate employment at or after age 55 the greater of (i) the amount determined under this Section 4.1.1 or (ii) the amount determined under this Section 4.1.1 as of June 30, 2013 as if the applicable Pension Plan were the benefit structure

known as the ATK Pension Equity Formula under the Northrop Grumman Innovation Systems Pension and Retirement Plan plus the amount otherwise determined under Section 4.1.1 with respect to service beginning July 1, 2013.

Notwithstanding anything apparently to the contrary in this Plan, no benefit of a Participating Employee who is a former employee of Alliant or any of its affiliates and who is rehired by Orbital ATK, its predecessor or successor, or any of its affiliates on or after January 1, 2007 shall be attributable in whole or in part to employment, services or compensation after such rehire date, except as and in accordance with such terms as may be specified by the Personnel and Compensation Committee of the Board of Directors of Orbital ATK or, effective on or after June 6, 2018, by the Company.

4.1.2 Form of Payment.

- (a) Except as otherwise provided in this Section 4.1.2, for any Participating Employee who terminates employment and receives or begins to receive benefits under the applicable Pension Plan on or before December 31, 2006, the benefit under this Plan (minus any withholding and payroll taxes which must be deducted therefrom) shall be paid to the Participating Employee in the same manner, at the same time, for the same duration and in the same form as if such benefit has been paid directly from the applicable Pension Plan. All elections and optional forms of settlement in effect and all other rules governing the payment of benefits under the applicable Pension Plan shall, to the extent practicable, be given effect under this Plan so that the Participating Employee will receive from a combination of the applicable Pension Plan and this Plan the same benefit (minus the withholding, payroll and other taxes which must be deducted therefrom) which would have been received under the applicable Pension Plan if this Plan benefit had been paid from the applicable Pension Plan.
- (b) The provisions of subsection (a) of this Section 4.1.2 shall apply to any Participating Employee who terminated employment before January 1, 2005 and accrued no benefit under this Plan after December 31, 2004, but who does not receive or begin to receive benefits under the applicable Pension Plan on or before December 31, 2006.
- (c) Each Participating Employee identified on Schedule 2 attached to this Plan shall be permitted to elect on or before December 31, 2005 to receive benefits under this Plan in the form of a lump sum or any other form of payment available under the applicable Pension Plan. Lump sum payments shall be calculated as of the first day of the month following termination of employment, using the interest rate and mortality table described in section 417(e) of the Code, as in effect under the Pension Plan on the first day of the month following termination of employment. Such payment shall be or begin to be made on the first day of the seventh month following the month in which the Participating Employee terminates employment if the

Participating Employee is a “key employee,” within the meaning of section 416(i) of the Code (disregarding section 416(i)(5)), or on the first day of the first month following termination of employment if the Participating Employee is not such a “key employee,” but in no event later than the later of (i) the ninetieth day after whichever such date applies, or (ii) the last day of the calendar year in which such date occurs.

Lump sum payments to “key employees” shall be credited with simple interest from the first day of the month following termination of employment to the date of payment at the interest rate described in section 417(e) of the Code, as in effect under the Pension Plan on the first day of the month following termination of employment. In the case of payments in a form other than a lump sum, the first such payment to a Participating Employee who is a “key employee” shall include the amounts of the monthly payments for the preceding six months. If a Participating Employee identified in Schedule 2 elects a joint and survivor annuity, and the Participating Employee’s joint annuitant dies before payments begin, amounts otherwise payable as a joint and survivor annuity shall be paid in the form of a single life annuity.

- (d) Each Participating Employee not described in subsections (a), (b) or (c) of this Section 4.1.2, who terminates employment on or before December 31, 2006, shall receive payment of benefits under this Plan in the form of a lump sum on the later of (i) the earliest date after January 1, 2007 on which payment is administratively practicable, or (ii) the first day of the seventh month following termination of employment, but in neither case later than December 31, 2007. Lump sum payments shall be calculated as of January 1, 2007, using the mortality table described in section 417(e) of the Code and an interest rate that is the greater of 6% or the rate described in section 417(e) of the Code, as in effect under the Pension Plan on that date, except that lump sums for Participating Employees covered by the benefit structures known as (A) the Alliant Techsystems Inc. Retirement Formula, the ATK Pension Equity Formula or the ATK Cash Balance Formula under the Northrop Grumman Innovation Systems Pension and Retirement Plan, or (B) the Thiokol Pension Equity Formula or Thiokol Cash Balance Formula under the Thiokol Propulsion Pension Plan, shall be their Account Balances (as that term is defined under those benefit structures, respectively). Lump sum payments made after January 31, 2007 shall be credited with simple interest for the period from January 1, 2007 until the date of payment at a rate equal to the greater of 6% or the rate described in section 417(e) of the Code, as in effect under the Pension Plan on January 1, 2007.
- (e) Each Participating Employee not described in subsections (a), (b), (c), or (d) of this Section 4.1.2 shall receive payment of benefits under this Plan in the form of a lump sum on the later of (i) the first day of the seventh month following the month in which the Participating Employee terminates employment or (ii) February 1 of the

calendar year following the calendar year in which the Participating Employee terminates employment, but in neither case later than the last day of the calendar year following the calendar year in which the Participating Employee terminates employment. All lump sum amounts paid under this Subsection (e) shall be determined as of the date of termination of employment, based on the mortality table described in section 417(e) of the Code and an interest rate that is the greater of 6% or the interest rate described in section 417(e) of the Code (as in effect under the Pension Plan on the first day of the month following termination of employment), except that lump sums for Participating Employees covered by the benefit structures known as (A) the Alliant Techsystems Inc. Retirement Formula, the ATK Pension Equity Formula or the ATK Cash Balance Formula under the Northrop Grumman Innovation Systems Pension and Retirement Plan, or (B) the Thiokol Pension Equity Formula or Thiokol Cash Balance Formula under the Thiokol Propulsion Pension Plan, shall be their Account Balances (as that term is defined under those benefit structures, respectively). Simple interest will be credited for the period from the first day of the month following termination of employment until the date of payment, at a rate equal to the greater of 6% or the rate described in section 417(e) of the Code, as in effect under the Pension Plan on the first day of the month following termination of employment.

- (f) For purposes of Section 4.6.2 and subsections (d) and (e) of this Section 4.1.2, for lump sums calculated using the stated interest and mortality factors, lump sum amounts shall be determined on the basis of (i) the immediate annuity to which the Participating Employee is entitled under the applicable Pension Plan in the case of a Participating Employee who is entitled to an immediate annuity under the applicable Pension Plan, or (ii) the annuity to which the Participating Employee is entitled at Normal Retirement Age (as that term is defined in the applicable Pension Plan) under the applicable Pension Plan in the case of a Participating Employee who is not entitled to an immediate annuity under the applicable Pension Plan.
- (g) Any reference in this Plan to termination of employment shall mean the separation from service with Alliant and all entities treated as members of the same controlled group with Alliant under section 414(b) or (c) of the Code. Controlled group membership shall be determined by substituting “at least 50 percent” for “at least 80 percent” each place it appears in section 1563(a)(1), (2) and (3) of the Code, and by substituting “at least 50 percent” for “at least 80 percent” each place it appears in Treas. Reg. § 1.414(0-2).

4.2 **Benefit to Beneficiaries.**

4.2.1 **Amount of Benefit.** Unless the Participating Employee (i) is identified on Schedule 2 attached to this Plan and has received or begun to receive his or her benefits under this Plan prior to death, or (ii) has received a lump sum under Section 4.1 hereof, there shall be paid under this

Plan to the surviving spouse or other joint or contingent annuitant or beneficiary the excess, if any, of

- (a) the amount which would have been payable under the applicable Pension Plan if such benefit had been determined:
 - (i) without regard to the benefit limitations of section 415 of the Code, and
 - (ii) without regard to compensation limitation of section 401(a)(17) of the Code, and
 - (iii) by including in Recognized Compensation, Earnings and Final Average Earnings (as defined under the applicable Pension Plan) amounts not otherwise included because they were deferred at the election of the Participating Employee under the Alliant Techsystems Inc. Nonqualified Deferred Compensation Plan or any other nonqualified deferred compensation plan at the time or times when they would have been included but for such election to defer; and
 - (iv) as adjusted pursuant to the terms of any employment agreement or any separate written agreement between Orbital ATK and the Participating Employee; minus
- (b) the amount actually paid from the applicable Pension Plan.

4.2.2 Form of Payment. Except as may be specifically provided in this Plan, this benefit (minus any withholding and payroll taxes which must be deducted therefrom) shall be paid to such person in the same manner, at the same time, for the same duration and in the same form as if such benefit has been paid directly from the applicable Pension Plan. All elections and optional forms of settlement in effect and all other rules governing the payment of benefits under the applicable Pension Plan shall, to the extent practicable, be given effect under this Plan so that such person will receive from a combination of the applicable Pension Plan and this Plan the same benefit (minus the withholding, payroll and other taxes which must be deducted therefrom) if this Plan benefit had been paid from the applicable Pension Plan. Notwithstanding the foregoing provisions of this Section 4.2.2, in the event of the death of any Participating Employee who (i) is not described in subsections (a), (b), or (c) of Section 4.1.2 or (ii) is described in subsection (c) of Section 4.1.2 but dies before payment under this Plan has been made or begun, payment of any benefits under this Section 4.2 shall be made in a lump sum, determined in accordance with Section 4.1.2(d) or (e), as applicable, as soon as administratively practicable after the Participating Employee's death, but in no event later than the later of the ninetieth day after the Participating Employee's death or the last day of the calendar year in which the Participating Employee's death occurs.

4.3 Special Rule for CECP. This Plan shall pay to Participating Employees who are also entitled to benefits under the Alliant Techsystems Inc. Supplementary Executive Retirement Plan for CECP Participants (see Appendix A) the excess, if any, of:

- (i) the amount that would have been payable under the applicable Pension Plan if such benefit had been determined without regard to the benefit limitations under section 415 of the Code and without regard to compensation limitation of section 401(a)(17) of the Code plus, if applicable, the amount that would have been payable if the amount of any deferred incentive award in the year in which the award would otherwise have been paid by the Honeywell Inc. Corporate Executive Compensation Plan would have been included under the definition of “Earnings” for purposes of arriving at “Final Average Earnings,” over
- (ii) the amount actually paid from the applicable Pension Plan after taking into account the benefit limitations under section 415 of the Code and the compensation limitation of section 401(a)(17) of the Code plus, if applicable, the amount actually paid from the Honeywell Inc. Corporate Executive Compensation Plan for CECP Participants (Appendix A).

This benefit (minus any withholding and payroll taxes which must be deducted therefrom) shall be paid to the Participating Employee in the same manner, at the same time, for the same duration and in the same form as if such benefit has been paid directly from the applicable Pension Plan. All elections and optional forms of settlement in effect and all other rules governing the payment of benefits under the applicable Pension Plan shall, to the extent practicable, be given effect under this Plan so that the Participating Employee will receive from a combination of the applicable Pension Plan and this Plan the same benefit (minus the withholding, payroll and other taxes which must be deducted therefrom) which would have been received under the applicable Pension Plan if the limitation on benefits under section 415 of the Code, the compensation limitation of section 401(a)(17) of the Code and the exclusion from the definition of “Earnings” of the amount of any deferred incentive award had not been in effect.

4.4 Vesting. The benefit of a Participating Employee under this Plan shall vest when the applicable Pension Plan vests, including any full (100%) vesting due to a Change in Control (as defined under the applicable Pension Plan), or, if earlier, pursuant to the terms of any employment agreement or separate written agreement between Orbital ATK (or an affiliate of Orbital ATK) and the Participating Employee.

4.5 General Distribution Rules.

4.5.1 Section 162(m) Determination. If a Participating Employee will receive a lump sum under the Plan pursuant to Section 4.1 or Section 4.3 and if the Company, by action of the Vice President of Compensation & Benefits or such successor title, determines that delaying the time such payment is made would increase the probability that such payment would be fully deductible for federal or state income tax purposes, the Company may unilaterally delay the time of the making of such payment or any portion of such payment until the earliest year during which the Company reasonably anticipates that the payment will be fully deductible, but not later than twenty-four (24) months after the date such payment would otherwise be payable.

4.5.2 **Exception for Small Benefits.** Notwithstanding any other provision of this Plan to the contrary, any benefit which is payable under this Plan to a Participating Employee or a beneficiary shall be paid in a lump sum payment, at the time otherwise required under the terms of this Plan, if the present value of the benefit (as determined under the actuarial factors for the applicable Pension Plan for such Participating Employee or beneficiary) is \$50,000 or less, and the Participating Employee or beneficiary either has accrued a benefit under this Plan after December 31, 2004 or is not receiving benefit payments under this Plan on or before December 31, 2005. In the case of any Participating Employee or beneficiary who accrued no benefit under this Plan after December 31, 2004 and is receiving benefit payments under this Plan on or before December 31, 2005, the Administrative Committee, in its discretion, may pay any remaining benefit which is payable under this Plan in a lump sum payment if the present value of the benefit (as determined under the actuarial factors for the applicable Pension Plan for such Participating Employee or beneficiary) is \$50,000 or less. Notwithstanding any provisions of this Section 4.6.2 to the contrary, lump sums for Participating Employees covered by the benefit structures known as (A) the Alliant Techsystems Inc. Retirement Formula, the ATK Pension Equity Formula or the ATK Cash Balance Formula under the Northrop Grumman Innovation Systems Pension and Retirement Plan, or (B) the Thiokol Pension Equity Formula or Thiokol Cash Balance Formula under the Thiokol Propulsion Pension Plan, shall be their Account Balances (as that term is defined under those benefit structures, respectively).

SECTION 5

FUNDING

5.1 **Funding.** Alliant shall be responsible for paying all benefits due hereunder. Until all payments due under Section 4 are paid in full and for the purpose of facilitating the payment of benefits due under those Sections, the Company may (but shall not be required to) establish and maintain a grantor trust pursuant to an agreement between the Company and a trustee selected by the Company; provided, however, that any such grantor trust must be structured so that it does not result in any federal income tax consequences to any Participating Employee until such employee actually receives payments due under Section 4. The Company may contribute to a grantor trust thereby created such amounts as it may from time to time determine.

5.2 **Corporate Obligation.** Neither the Company's officers nor any member of its Board of Directors nor any member of the Administrative Committee nor the Investment Committee in any way secures or guarantees the payment of any benefit or amount which may become due and payable hereunder to or with respect to any Participating Employee. Each Participating Employee and other person entitled at any time to payments hereunder shall look solely to the assets of the Company for such payments as an unsecured, general creditor. After benefits shall have been paid to or with respect to a Participating Employee and such payment purports to cover in full the benefit hereunder, such former Participating Employee or other person or persons, as the case may be, shall have no further right or interest in the other assets of the Company in connection with this Plan. Neither the Company nor any of its officers nor any member of its Boards of Directors nor any member of

the Administrative Committee nor the Investment Committee shall be under any liability or responsibility for failure to effect any of the objectives or purposes of the Plan by reason of the insolvency of the Company. It is the intention of the Company that this Plan be unfunded for purposes of the Code and for purposes of Title I of ERISA.

SECTION 6

GENERAL MATTERS

6.1 **Amendment and Termination.** The Company may, in its sole discretion, terminate, suspend or amend this Plan at any time or from time to time, in whole or in part for any reason and without notice, including with regard to persons expecting to receive benefits in the future and persons already receiving benefits at the time of such action. Notwithstanding the foregoing, the Company may not amend or terminate the Plan with respect to benefits that have accrued and are vested pursuant to Section 4.3, the applicable Pension Plan or an individual agreement between Orbital ATK and the Participating Employee. Upon termination of the Plan, distribution of benefits shall be made to Participating Employees and beneficiaries in the manner and at the time described in Section 4, unless the Company determines in its sole discretion that all such amendments shall be distributed upon termination in accordance with the requirements of section 409A of the Code to the extent applicable.

6.2 **Limited Benefits.** This Plan shall not provide any benefits with respect to any defined contribution plan.

6.3 **Spendthrift Provision.** No Participating Employee, surviving spouse, joint or contingent annuitant or beneficiary shall have the power to transmit, assign, alienate, dispose of, pledge or encumber any benefit payable under this Plan before its actual payment to such person. The Administrative Committee shall not recognize any such effort to convey any interest under this Plan. No benefit payable under this Plan shall be subject to attachment, garnishment, execution following judgment or other legal process before actual payment to such person. Notwithstanding the foregoing, all or a portion of a Participating Employee's vested benefit under this Plan may be paid to another person as specified in a domestic relations order that the Administrative Committee determines is qualified (a "Qualified Domestic Relations Order"). For this purpose, a Qualified Domestic Relations Order means a judgment, decree or order (including the approval of a settlement agreement) which is:

- (a) Issued pursuant to a State's domestic relations law;
- (b) Relates to the provision of child support, alimony payments or marital property rights to a spouse, former spouse, child or other dependent of the Participating Employee;
- (c) Creates or recognizes the right of a spouse, former spouse, child or other dependent of the Participating Employee to receive all or a portion of the Participating Employee's benefits under the Plan; and

- (d) Meets such other requirements established by the Administrative Committee.

The Administrative Committee shall determine whether any document received by it is a Qualified Domestic Relations Order. In making this determination, the Administrative Committee may consider the rules applicable to “domestic relations orders” under section 414(p) the Code and section 206(d) of ERISA, and such other rules and procedures as it deems relevant.

6.4 Errors in Computations. The Company shall not be liable or responsible for any error in the computation of any benefit payable to or with respect to any Participating Employee resulting from any misstatement of fact made by the Participating Employee or by or on behalf of any survivor to whom such benefit shall be payable, directly or indirectly, to the Company, and used by the Company in determining the benefit. The Company shall not be obligated or required to increase the benefit payable to or with respect to such Participating Employee which, on discovery of the misstatement, is found to be understated as a result of such misstatement of the Participating Employee. However, the benefit of any Participating Employee which is overstated by reason of any such misstatement or any other reason shall be reduced to the amount appropriate in view of the truth (and to recover any prior overpayment).

6.5 Correction of Errors. If any Participating Employee in any written statement required under the Plan document shall misstate such Participating Employee’s age or the age of any person upon whose survival the payment of any benefit in respect of such Participating Employee is contingent or any other fact the misstatement of which would affect the amount of a benefit payable hereunder, the accrual of benefits in respect of such Participating Employee shall not be invalidated, but the amount of the benefit to be available with respect to such Participating Employee will be adjusted retroactively to the amount which would have been payable if such fact or facts had not been misstated. It is recognized that errors may occur during the administration of the Plan which may result in incorrect statement or payment of benefits. If an administrative error occurs, the amount of benefits available to such Participating Employee shall be the correct amount determined under the Plan document and future benefits to such Participating Employee shall be adjusted to reflect any prior mistakes. If no further benefits are payable under the Plan, the Administrative Committee will take whatever steps it determines are reasonable to collect such overpayments on behalf of the Plan. In no event will the Plan be liable to pay any greater benefit in respect of any Participating Employee than that which would have been payable on the basis of the truth and the provisions of this Plan document.

SECTION 7

FORFEITURE OF BENEFITS

All unpaid benefits under this Plan shall be permanently forfeited upon the determination by the Company, acting through the Vice President of Compensation & Benefits or such successor title, that the Participating Employee, either before or after termination of employment:

- (a) engaged in a criminal or fraudulent conduct resulting in material harm to the Company or an affiliate of the Company; or
- (b) made an unauthorized disclosure to any competitor of any material confidential information, trade information or trade secrets of the Company or an affiliate of the Company; or
- (c) provided the Company or an affiliate of the Company with materially false reports concerning his or her business interests or employment; or
- (d) made materially false representations which are relied upon by the Company or an affiliate of the Company in furnishing information to an affiliate, partner, shareholders, accountants, auditor, a stock exchange, the Securities and Exchange Commission or any regulatory or governmental agency; or
- (e) maintained an undisclosed, unauthorized and material conflict of interest in the discharge of the duties owed by him or her to the Company or an affiliate of the Company; or
- (f) engaged in conduct causing a serious violation of state and federal law by the Company or an affiliate of the Company; or
- (g) engaged in theft of assets or funds of the Company or an affiliate of the Company; or
- (h) has been convicted of any crime which directly or indirectly arose out of his her employment relationship with the Company or an affiliate of the Company or materially affected his or her ability to discharge the duties of his or her employment with the Company or an affiliate of the Company; or
- (i) engaged during his or her employment or within two (2) years after termination of employment in any employment with a competitor, or engaged in any activity in competition with the Company, without the consent of the Company.

SECTION 8

ADMINISTRATION

8.1 **Committees.** The Chief Executive Officer of the Company shall appoint, and shall have the power to remove, the members of the Administrative Committee and the Investment Committee (collectively, the “Committee”).

8.2 **Committee Action.** Each Committee shall act at meetings by affirmative vote of a majority of the members of that Committee. Any determination of action of a Committee may be made or taken by a majority of a quorum present at any meeting thereof, or without a meeting, by resolution or written memorandum signed by a majority of the members of the Committee then in office. A member of a Committee shall not vote or act upon any matter which relates solely to himself or

herself as a Participating Employee. The Chair or any other member or members of each Committee designated by the Chair may execute any certificate or other written direction on behalf of the Committee of which he or she is a member.

The Chief Executive Officer of the Company shall appoint a Chair from among the members of the Administrative Committee and a Secretary who may or may not be a member of the Administrative Committee. The Administrative Committee shall conduct its business according to the provisions of this Section and the rules contained in the current edition of Robert's Rules of Order or such other rules of order the Administrative Committee may deem appropriate. The Administrative Committee shall hold meetings from time to time in any convenient location.

8.3 Powers and Duties of the Administrative Committee. The Administrative Committee shall enforce the Plan in accordance with its terms, shall be charged with the general administration of the Plan, and shall have all powers necessary to accomplish its purposes, including, but not by way of limitation, the following:

- (a) To construe and interpret the terms and provisions of this Plan and make all factual determinations;
- (b) To compute and certify to the amount and kind of benefits payable to Participating Employees and their beneficiaries;
- (c) To maintain all records that may be necessary for the administration of the Plan;
- (d) To provide for the disclosure of all information and the filing or provision of all reports and statements to Participating Employees, beneficiaries or governmental agencies as shall be required by law;
- (e) To make and publish such rules for the regulation of the Plan and procedures for the administration of the Plan as are not inconsistent with the terms hereof;
- (f) To appoint a Plan administrator or any other agent, and to delegate to them such powers and duties in connection with the administration of the Plan as the Administrative Committee may from time to time prescribe (including the power to subdelegate);
- (g) To exercise powers granted the Administrative Committee under other Sections of the Plan; and
- (h) To take all actions necessary for the administration of the Plan, including determining whether to hold or discontinue insurance policies purchased in connection with the Plan.

8.4 Powers and Duties of the Investment Committee. The Investment Committee shall have all powers necessary to accomplish its purposes, including, but not by way of limitation, the following:

- (a) To oversee any rabbi trust; and
- (b) To appoint agents, and to delegate to them such powers and duties in connection with its duties as the Investment Committee may from time to time prescribe (including the power to subdelegate).

8.5 Construction and Interpretation. The Administrative Committee shall have full discretion to construe and interpret the terms and provisions of this Plan, to make factual determinations and to remedy possible inconsistencies and omissions. The Administrative Committee's interpretations, constructions and remedies shall be final and binding on all parties, including but not limited to the affiliates of the Company and any Participating Employee or beneficiary. The Administrative Committee shall administer such terms and provisions in a uniform and nondiscriminatory manner and in full accordance with any and all laws applicable to the Plan.

8.6 Information. To enable the Committees to perform their functions, the affiliates of the Company adopting the Plan shall supply full and timely information to the Committees on all matters relating to the compensation of all Participating Employees, their death or other events that cause termination of their participation in this Plan, and such other pertinent facts as the Committees may require.

8.7 Committee Compensation, Expenses and Indemnity.

- (a) The members of the Committees shall serve without compensation for their services hereunder.
- (b) The Committees are authorized to employ such accounting, consultants or legal counsel as they may deem advisable to assist in the performance of their duties hereunder.
- (c) To the extent permitted by ERISA and applicable state law, the Company shall indemnify and hold harmless the Committees and each member thereof, the Board and any delegate of the Committees who is an employee of the affiliates of the Company against any and all expenses, liabilities and claims, including legal fees to defend against such liabilities and claims arising out of their discharge in good faith of responsibilities under or incident to the Plan, other than expenses and liabilities arising out of willful misconduct. This indemnity shall not preclude such further indemnities as may be available under insurance purchased by the Company or provided by the Company under any bylaw, agreement or otherwise, as such indemnities are permitted under ERISA and state law.

8.8 Determinations. The Vice President of Compensation & Benefits or such successor title has been delegated the authority to make such determinations as may be required from time to time and as set forth in Section 4.5.1 and Section 7. Each interested party may act and rely upon all information reported to them hereunder and need not inquire into the accuracy thereof, nor be charged with any notice to the contrary.

8.9 **Claims.** The Company's standardized "Northrop Grumman Nonqualified Retirement Plans Claims and Appeals Procedures" (the "Claims Procedures") shall apply in handling claims and appeals under this Plan, provided that any time limits and statute of limitations referenced in the prior restatement of this Plan shall apply with respect to initial claims filed prior to January 1, 2019.

8.10 **Delegation.** The Committee and its members shall not be liable for an act or omission of another person with regard to a responsibility that has been allocated or delegated to such other person pursuant to the terms of the Plan or to procedures set forth in accordance with the Plan.

8.11 **Conflict of Interest.** If any individual to whom authority has been delegated or redelegated hereunder shall also be a Participating Employee in this Plan, such Participating Employee shall have no authority with respect to any matter specially affecting such Participating Employee's individual rights hereunder or the interest of a person superior to him or her in the organization (as distinguished from the rights of all Participating Employees and beneficiaries or a broad class of Participating Employees and beneficiaries), all such authority being reserved exclusively to other individuals as the case may be, to the exclusion of such Participating Employee, and such Participating Employee shall act only in such Participating Employee's individual capacity in connection with any such matter.

8.12 **Tax Withholding.** The Company or its affiliates shall withhold the amount of any federal, state or local income tax or other tax required to be withheld by the Company or its affiliates under applicable law with respect to any amount payable under the Plan.

SECTION 9

CONSTRUCTION

9.1 **Defined Terms.** Words and phrases used in this Plan with initial capital letters, which are defined in the applicable Pension Plans' documents and which are not separately defined in this Plan shall have the same meaning ascribed to them in the applicable Pension Plans' documents unless in the context in which they are used it would be clearly inappropriate to do so.

9.2 **ERISA Status.** This Plan is maintained with the understanding that it is a nonqualified deferred compensation plan for the benefit of a select group of management or highly compensated employees within the meaning of section 201(2), section 301(3) and section 401(a)(1) of ERISA. Each provision shall be interpreted and administered accordingly. If any individually contracted supplemental retirement arrangement with any Section 16 Officer is deemed to be covered by ERISA, such arrangement shall be included in the Plan but only to the extent that such inclusion is necessary to comply with ERISA.

9.3 **IRC Status.** This Plan is intended to be a nonqualified deferred compensation arrangement. The rules of section 401(a) *et seq.* of the Code shall not apply to this Plan. The rules of section 3121(v) and section 3306(r)(2) *afire* Code shall apply to this Plan.

9.4 **Effect on Other Plans.** This Plan shall not alter, enlarge or diminish any person's employment rights or obligations or rights or obligations under the Pension Plans or any other plan.

It is specifically contemplated that the Pension Plans will, from time to time, be amended and possibly terminated. All such amendments and termination shall be given effect under this Plan (it being expressly intended that this Plan shall not lock in the benefit structures of the Pension Plans as they exist at the adoption of this Plan or upon the commencement of participation, or commencement of benefits by any Participating Employee).

9.5 **Disqualification.** Notwithstanding any other provision of this Plan or any election or designation made under the Plan, any individual who feloniously and intentionally kills a Participating Employee shall be deemed for all purposes of this Plan and all elections and designations made under this Plan to have died before such Participating Employee. A final judgment of conviction of felonious and intentional killing is conclusive for this purpose.

9.6 **Rules of Document Construction.** Whenever appropriate, words used herein in the singular may be read in the plural, or words used herein in the plural may be read in the singular; the masculine may include the feminine; and the words “hereof,” “herein” or “hereunder” or other similar compounds of the word “here” shall mean and refer to the entire Plan and not to any particular paragraph or Section of this Plan unless the context clearly indicates to the contrary. The titles given to the various Sections of this Plan are inserted for convenience of reference only and are not part of this Plan, and they shall not be considered in determining the purpose, meaning or intent of any provision hereof.

9.7 **References to Laws.** Any reference in this Plan to a statute or regulation shall be considered also to mean and refer to any subsequent amendment or replacement of that statute or regulation.

9.8 **Effect on Employment.** Neither the terms of this Plan nor the benefits hereunder nor the continuance thereof shall be a term of the employment of any employee. Except as provided in Section 6.1, the Company shall not be obliged to continue the Plan. The terms of this Plan shall not give any employee the right to be retained in the employment of NGIS or any of its affiliates.

9.9 **Choice of Law.** This instrument has been executed and delivered in Delaware and has been drawn in conformity to the laws of that state and shall, except to the extent that federal law is controlling, be construed and enforced in accordance with the laws of Delaware.

* * *

IN WITNESS WHEREOF, this Amendment and Restatement of the Plan is hereby executed by a duly authorized officer this 18th day of December, 2018.

NORTHROP GRUMMAN CORPORATION

/s/ Beth Pitts-Madonna

By:

Northrop Grumman Innovation Systems,
Inc.
Beth Pitts-Madonna
Vice President, Human Resources and
Administration

APPENDIX A

ALLIANT TECHSYSTEMS INC. SUPPLEMENTARY EXECUTIVE RETIREMENT PLAN FOR CECP PARTICIPANTS

ARTICLE I

DEFINITIONS

- 1.1. **Act.** The Employee Retirement Income Security Act of 1974, as from time to time amended.
- 1.2. **Base Plan.** The Alliant Techsystems Inc. Retirement Plan, as from time to time amended.
- 1.3. **Code.** The Internal Revenue Code of 1986, as from time to time amended.
- 1.4. **Corporate Executive Compensation Plan (CECP).** An incentive compensation plan maintained by Honeywell to provide incentive compensation for a select group of management or highly compensated employees, as from time to time amended.
- 1.5. **Early Retirement.** Retirement by a Participant under his or her Base Plan, which is defined as the termination of employment on or after his or her 55th birthday and after he or she has been credited with 10 or more years of “Credited Service for Benefit Accrual,” under the Base Plan.
- 1.6. **Earnings Limitation.** The maximum amount of compensation of a Participant and his or her family members permitted to be taken into account under the Base Plan pursuant to Section 401(a)(17) of the Code.
- 1.7. **Effective Date.** The original effective date of this Plan was January 1, 1985.
- 1.8. **Honeywell.** Honeywell Inc., a Delaware corporation.
- 1.9. **Normal Retirement.** Retirement by a Participant on or after his or her “Normal Retirement Date” under his or her Base Plan. “Normal Retirement Date” is the last day of the calendar month in which a Participant reaches age 65.
- 1.10. **Participant.** An employee of Alliant Techsystems Inc. (“Alliant”) who is a participant in the Base Plan on or after January 1, 1985, whose earnings are in excess of the Earnings Limitation under the Base Plan. No controlling shareholder or independent contractor shall be a Participant.
- 1.11. **Plan.** The Alliant Techsystems Inc. Supplementary Executive Retirement Plan for CECP Participants. No controlling shareholder or independent contractor shall be a Participant.
- 1.12. **Total and Permanent Disability.** The disability of a Participant whereby such Participant is wholly disabled by bodily injury or disease and will be permanently, continuously and wholly prevented thereby for life from engaging in any occupation or employment for wage or profit.

ARTICLE II

BENEFITS

2.1. **Benefit.** Upon termination of employment, a Participant shall be eligible for a benefit in an amount equal to his or her benefit under his or her Base Plan computed by including under the definition of “Earnings” for purposes of arriving at “Final Average Earnings” under the Base Plan the amount of any deferred incentive award in the year in which the award would otherwise have been paid by the Honeywell Inc. Corporate Executive Compensation Plan, less the amount of his or her benefit determined under his or her Base Plan without including under the definition of “Earnings” for purposes of arriving at “Final Average Earnings” under the Base Plan the amount of any deferred incentive award in the year in which the award would otherwise have been paid by the Honeywell Inc. Corporate Executive Compensation Plan.

2.2. **Pre-retirement Surviving Spouse Benefit.** Upon the death of a married Participant who has not yet retired under the Base Plan, his or her surviving spouse to whom he or she was formally married on the date of his or her death shall be eligible for a benefit in an amount equal to such surviving spouse’s “Pre-retirement Surviving Spouse Benefit” under the Participant’s Base Plan computed by including under the definition of “Earnings” for purposes of arriving at “Final Average Earnings” under the Base Plan the amount of any deferred incentive award in the year in which the award would otherwise have been paid by the Corporate Executive Compensation Plan, less the amount of the annual “Pre-retirement Surviving Spouse Benefit” determined under the deceased Participant’s Base Plan without such adjustments to “Earnings” for purposes of arriving at “Final Average Earnings.”

ARTICLE III

PAYMENT OF BENEFITS

A benefit under the Plan shall be paid in the form of the benefit paid with respect to the Participant under his or her Base Plan. Any election, designation of a beneficiary(ies) or contingent annuitant(s), or revocation in effect under the Participant’s Base Plan shall be in effect under the Plan.

ARTICLE IV

GENERAL CONDITIONS

All general provisions of the Alliant Techsystems Inc. Supplemental Executive Retirement Plan shall apply hereunder.

APPENDIX B

ALLIANT TECHSYSTEMS INC. SUPPLEMENTARY EXECUTIVE RETIREMENT PLAN FOR BENEFITS IN EXCESS OF LIMITS UNDER TAX REFORM ACT OF 1986

Article I

DEFINITIONS

- 1.1. **Act.** The Tax Reform Act of 1986.
- 1.2. **Base Plan.** The Alliant Techsystems Inc. Retirement Plan, as from time to time amended.
- 1.3. **Code.** The Internal Revenue Code of 1986, as from time to time amended.
- 1.4. **Early Retirement.** Retirement by a Participant under his or her Base Plan, which is defined as the termination of employment on or after his or her 55th birthday and after he or she has been credited with 10 or more years of “Credited Service for Benefit Accrual,” under the Base Plan.
- 1.5. **Earnings Limitation.** The maximum amount of compensation of a Participant and his or her family members permitted to be taken into account under the Base Plan pursuant to Section 401(a)(17) of the Code.
- 1.6. **Effective Date.** The original effective date of this Plan was July 1, 1989.
- 1.7. **Honeywell.** Honeywell Inc., a Delaware corporation.
- 1.8. **Normal Retirement.** Retirement by a Participant on or after his or her “Normal Retirement Date” under his or her Base Plan. “Normal Retirement Date” is the last day of the calendar month in which a Participant reaches age 65.
- 1.9. **Participant.** An employee of Alliant Techsystems Inc. (“Alliant”) who is a participant in the Base Plan on or after July 1, 1989, whose accrued benefit under the Base Plan, as a highly compensated employee as defined under section 414(q)(1)(A) or (B) of the Code as in effect on July 1, 1989, was frozen as of June 31, 1989, in compliance with IRS Notice 88-131, Alternative IID. No controlling shareholder or independent contractor shall be a Participant.
- 1.10. **Plan.** The Alliant Techsystems Inc. Supplementary Executive Retirement Plan for Benefits in Excess of Limits under Tax Reform Act of 1986. No controlling shareholder or independent contractor shall be a Participant.
- 1.11. **Total and Permanent Disability.** The disability of a Participant whereby such Participant is wholly disabled by bodily injury or disease and will be permanently, continuously and wholly prevented thereby for life from engaging in any occupation or employment for wage or profit.

1.12. **TRA '86 Amendment Date.** The date the Honeywell Retirement Benefit Plan was amended to comply with the Act.

Article II

BENEFITS

2.1. **Benefit.** Upon termination of employment, a Participant shall be eligible for a benefit, if any, computed:

- (a) by including the greater of (i) the Participant's benefit under the Base Plan computed on the TRA '86 Amendment Date without regard to the Base Plan's amendment in compliance with IRS Notice 88-131, Alternative IID, which served to freeze the accrued benefit of highly compensated participants pursuant to the provisions of the Base Plan, or (ii) the Participant's benefit under the Base Plan as amended to comply with the Act,
- (b) by including under the definition of "Earnings" for the purposes of arriving at "Final Average Earnings" under the Base Plan the Participant's "Earnings" under the Base Plan which are in excess of the Earnings Limitation,
- (c) by including under the definition of "Earnings" for purposes of arriving at "Final Average Earnings" under the Base Plan the amount of any deferred incentive compensation award in the year in which the award would have otherwise been paid by the Honeywell Inc. Corporate Executive Compensation Plan,
- (d) without regard to the provisions of such Base Plan limiting the maximum benefit payable thereunder to the maximum benefit permitted under the provision of section 415 of the Code in a pension plan qualifying under section 401 of the Code,

and then subtracting from the amount determined above, the following: (i) the amount of the Participant's benefit determined under the Base Plan, as amended to comply with the Act; (ii) the amount the Participant's benefit provided under the Alliant Techsystems Inc. Supplementary Executive Retirement Plan for Compensation in Excess of \$200,000; (iii) the amount of the Participant's benefit provided under the Alliant Techsystems Inc. Supplementary Executive Retirement Plan for CECF Participants; and (iv) the amount of the Participant's benefit provided under the Alliant Techsystems Inc. Supplementary Retirement Plan.

2.2. **Pre-retirement Surviving Spouse Benefit.** Upon the death of a married Participant who has not yet retired under the Base Plan, his or her surviving spouse to whom he or she was formally married on the date of his or her death shall be eligible for a benefit in an amount, if any, computed:

- (a) by including the greater of (i) the surviving spouse's "Pre-retirement Surviving Spouse Benefit" under the Base Plan computed on the TRA '86 Amendment Date without regard to the Base Plan's amendment in compliance with IRS Notice 88-131,

Alternative IID, or (ii) the surviving spouse's "Pre-Retirement Surviving Spouse Benefit" under the Base Plan as amended to comply with the Act,

- (b) by including under the definition of "Earnings" for the purposes of arriving at "Final Average Earnings" under the Base Plan the deceased Participant's "Earnings" under the Base Plan which are in excess of the Earnings Limitation,
- (c) by including under the definition of "Earnings" for purposes of arriving at "Final Average Earnings" under the Base Plan the amount of any deferred incentive compensation award in the year in which the award would have otherwise been paid to the deceased Participant by the Honeywell Inc. Corporate Executive Compensation Plan,
- (d) without regard to the provisions of such Base Plan limiting the maximum benefit payable thereunder to the maximum benefit permitted under the provision of section 415 of the Code in a pension plan qualifying under section 401 of the Code,

and then subtracting from the amount determined above, the following: (i) the amount of the surviving spouse's "Pre-retirement Surviving Spouse Benefit" determined under the Base Plan, as amended to comply with the Act; (ii) the amount the surviving spouse's "Pre-retirement Surviving Spouse Benefit" provided under Alliant Techsystems Inc. Supplementary Executive Retirement Plan for Compensation in Excess of \$200,000; (iii) the amount of the surviving spouse's "Pre-retirement Surviving Spouse Benefit" provided under the Alliant Techsystems Inc. Supplementary Executive Retirement Plan for CECP Participants; and (iv) the amount of the surviving spouse's "Pre-retirement Surviving Spouse Benefit" provided under the Alliant Techsystems Inc. Supplementary Retirement Plan.

Article III

PAYMENT OF BENEFITS

A benefit under the Plan shall be paid in the form of the benefit paid with respect to the Participant under his or her Base Plan. Any election, designation of a beneficiary(ies) or contingent annuitant(s), or revocation in effect under the Participant's Base Plan shall be in effect under the Plan.

Article IV

GENERAL CONDITIONS

All general provisions of the Alliant Techsystems Inc. Supplemental Executive Retirement Plan shall apply hereunder.

APPENDIX C

ALLIANT TECHSYSTEMS INC. DEFERRED COMPENSATION PLAN

Alliant adopted, pursuant to the Hercules Acquisition, the Plan known as the "Alliant Techsystems Inc. Deferred Compensation Plan" (the "Deferred Compensation Plan") to provide benefits to certain employees acquired from Hercules Inc. The plan was adopted as a frozen plan to provide only identified benefits accrued prior to the Hercules Acquisition. That plan is memorialized in a plan document entitled "Hercules Deferred Compensation Plan." This Appendix C lists the employees who are entitled to benefits under the Deferred Compensation Plan upon termination of employment from Alliant and the amount of each such employee's accrued benefit as of December 31, 1994.

John Crane	\$2,656.00
James E. Woolwine	5,003.65

These benefits will accrue interest at the rate of 2.25% for the calendar quarter ending March 31, 1995, and for each calendar quarter thereafter the amount of interest shall be determined by multiplying the account balance on the last business day of each calendar quarter by an amount equal to one-fourth of the prime rate of interest as reported in *The Wall Street Journal, Midwest Edition*, plus one percent (1%) on the last business day of the calendar quarter. The form of payment shall be a single lump sum payable as soon as administratively feasible after the employee's termination of employment; provided, however, that the PRC, as defined in the Northrop Grumman Innovation Systems Pension and Retirement Plan, may unilaterally delay payment for up to 12 months (in which case the amount will continue to be credited with interest on a quarterly basis). Notwithstanding the foregoing, the benefit may be paid in a form other than a single lump sum if such alternative form is agreed to in writing by both Alliant and the Participating Employee.

APPENDIX D

**CORDANT TECHNOLOGIES INC.
SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN**

Alliant adopted, pursuant to the Thiokol Acquisition, the Plan known as the “Cordant Technologies Inc. Supplemental Executive Retirement Plan” (the “Cordant SERP”) to provide benefits to certain employees acquired from Alcoa, Inc. The plan was adopted as a frozen plan to provide only identified benefits accrued prior to the Thiokol Acquisition. That plan is memorialized in a plan document entitled “CORDANT TECHNOLOGIES INC. SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN Amended and Restated Effective July 22, 1999.” This Appendix D lists the remaining employee who is currently receiving benefits under the Cordant SERP and the monthly amount of his benefit.

Joseph Lombardo

\$7,468.15 per month in the form of a joint & 50%
surviving spouse annuity

APPENDIX E

INDIVIDUAL EMPLOYMENT AGREEMENTS

A Participating Employee's benefit under this Plan shall be determined in accordance with Section 4 of this Plan and the terms of the applicable Pension Plan except as adjusted by any employment agreements between Alliant and a Participating Employee. This Appendix E lists the Participating Employees who are entitled to benefits under this Plan as adjusted pursuant to the terms of their individual employment agreements.

A. Executive Officers (as defined under the Securities Exchange Act of 1934)

Participating Employee

Benefit Adjusted Pursuant To

Daniel J. Murphy

Employment Agreement dated October 1, 2003

B. Participants Who Are Not Executive Officers (as defined under the Securities Exchange Act of 1934)

Participating Employee

Benefit Adjusted Pursuant To

Paul David Miller

Employment Agreement dated January 1, 1999, as amended by a First Amendment to Employment Agreement dated as of July 20, 2000, and as amended by an amendment to Employment Agreement dated March 31, 2003

Richard Jowett

Special Agreement dated August 1, 2001

Anthony Fabinio

Employment Agreement dated May 2, 1995

Ron Peterson

Employment Agreement dated March 1, 1995

Paul Ross

Pension and Compensation Committee resolution dated March 19, 2002

Gerald Smith

Memo dated July 1, 2001

APPENDIX F

SPECIAL SERP BENEFIT

Effective upon his employment with Alliant Techsystems Inc. or one of its subsidiaries in 2006, John J. Cronin (“Executive”) will be provided with the following lump sum benefit in addition to the benefit calculated under Section 4.1.1 of the Plan, in the following amount:

If Executive remains employed by Alliant or its subsidiaries on his 55th birthday, he will be credited with an additional lump sum benefit under the Plan in the amount of \$600,000.

This lump sum benefit will increase by \$200,000 per year on each successive birthday the Executive remains employed by Alliant or its subsidiaries, beginning with his 56th birthday, up to a total additional lump sum benefit of \$1,600,000 on his 60th birthday. The additional lump sum benefit will not increase beyond \$1,600,000 due to employment by Alliant beyond Executive’s 60th birthday.

The additional lump sum benefit will be paid in accordance with Section 4.1.2(e) of the Plan.

If, prior to age 55, Executive voluntarily terminates employment from Alliant or has his employment from Alliant terminated for Cause, the additional lump sum benefit described above will not be paid.

If Executive dies prior to age 55 while employed by Alliant, his beneficiary will receive \$600,000 in addition to any benefit otherwise payable under the Plan as of the date of his death, in lieu of any benefits otherwise payable under this Appendix F.

If Executive is determined to be eligible for long-term disability benefits under Alliant’s Long Term Disability Plan as then in effect, while employed by Alliant prior to age 55, and continues to receive benefits under Alliant’s Long Term Disability Plan until age 55, he will be credited with an additional lump sum benefit of \$600,000, in lieu of any benefit otherwise payable under this Appendix F.

If Executive terminates employment prior to age 55 due to an involuntary termination which is not for Cause, or if he terminates employment prior to age 55 due to a Change in Control as that term is defined in the ATK Income Security Agreement, as amended from time to time, or any successor arrangement to the ATK Income Security Agreement, then he will be credited with an additional lump sum benefit in the amount of \$600,000, in lieu of any benefit otherwise payable under this Appendix F.

As used in this Appendix F, “Cause” shall mean (i) any material failure to perform Executive’s duties as assigned by the Chief Executive Officer (other than by reason of disability as described above), (ii) a violation of Alliant’s code of conduct or Alliant’s anti-harassment policy, (iii) gross negligence or willful or intentional wrongdoing or misconduct, (iv) a material breach of any confidentiality or non-competition agreement between Executive and Alliant, (v) a commission

of an act of personal dishonesty which involves (material) personal profit in connection with Alliant, or (vi) an indictment for a felony offense or a crime involving moral turpitude.

SCHEDULE 1

SERP

A. Executive Officers (as defined under the Securities Exchange Act of 1934)

Blake Larson

SCHEDULE 1

SERP

B. Participants Who Are Not Executive Officers (as defined under the Securities Exchange Act of 1934)

Dianne Deering Anton

Curtis Brock

Gary DiSalvo

Michael Dolby

Brent Ebert

Joan McCusker

Deb Moeschl

John Shroyer

Dave Wise

SCHEDULE 2

SERP

Chuck R. Lee

Edward T. Hikada

Nick G. Vlahakis

NORTHROP GRUMMAN INNOVATION SYSTEMS
DEFINED CONTRIBUTION SUPPLEMENTAL EXECUTIVE RETIREMENT PLAN
As Amended and Restated Effective January 1, 2019

Statement of Plan

The Northrop Grumman Innovation Systems Defined Contribution Supplemental Executive Retirement Plan (the "Plan") is hereby amended and restated effective as of January 1, 2019. Prior to January 1, 2019, the Plan was named the Orbital ATK, Inc. Defined Contribution Supplemental Executive Retirement Plan, and was maintained by Northrop Grumman Innovation Systems, Inc. (formerly Orbital ATK, Inc.). Effective January 1, 2019, Northrop Grumman Corporation maintains and sponsors the Plan.

Effective January 1, 2019, the Plan is frozen, and no benefits shall accrue under this Plan with respect to compensation earned for services performed after December 31, 2018. Except to the extent modified by Appendix A hereto, the terms of the Plan in effect on December 31, 2018 shall continue to govern.

This Plan is intended (1) to comply with section 409A of the Internal Revenue Code, as amended (the "Code") and official guidance issued thereunder, and (2) to be "a plan which is unfunded and is maintained by an employer primarily for the purpose of providing deferred compensation for a select group of management or highly compensated employees" within the meaning of sections 201(2), 301(a)(3) and 401(a)(1) of the Employee Retirement Income Security Act of 1974. Notwithstanding any other provision of this Plan, this Plan shall be interpreted, operated and administered in a manner consistent with these intentions.

ARTICLE 1

Definitions

For the purposes of this Plan, unless otherwise clearly apparent from the context, the following phrases or terms shall have the following indicated meanings:

- 1.1 “Account Balance” shall mean, with respect to a Participant, an entry on the records of the Employer equal to the sum of the Participant’s Annual Accounts under this Plan. The Account Balance shall be a bookkeeping entry only and shall be utilized solely as a device for the measurement and determination of the amounts to be paid to a Participant, or his or her designated Beneficiary, pursuant to this Plan.
- 1.2 “Administrator” shall mean the Company, the Committee, and any person or committee of persons responsible for performing administrative functions under this Plan.
- 1.3 “Annual Accounts” shall mean, with respect to a Participant, an entry on the records of the Employer equal to the following amount, the sum of: (i) the Participant’s Company 401(k) NEC Contribution Amount and the Company 401(k) Matching Contribution Amount for any one Plan Year, plus (ii) amounts credited or debited to such amounts pursuant to this Plan, less (iii) all distributions made to the Participant or his or her Beneficiary pursuant to this Plan that relate to the Annual Accounts for such Plan Year. The Annual Accounts shall be bookkeeping entries only and shall be utilized solely as a device for the measurement and determination of the amounts to be paid to a Participant, or his or her designated Beneficiary, pursuant to this Plan.
- 1.4 “Beneficiary” shall mean one or more persons, trusts, estates or other entities, designated in accordance with Article 5, that are entitled to receive benefits under this Plan upon the death of a Participant.
- 1.5 “Beneficiary Designation Form” shall mean the form, which may be in electronic format, established from time to time by the Senior Vice President of Human Resources that a Participant completes, signs and returns to the Company to designate one or more Beneficiaries.
- 1.6 “Benefit Distribution Date” shall mean the date that triggers distribution of a Participant’s vested Account Balance.

A Participant’s Benefit Distribution Date shall be the earliest to occur of any one of the following:

- (a) If the Participant experiences a Termination of Employment, his or her Benefit Distribution Date shall be the later of (i) the first day of the seventh month following the month in which the Participant experiences a Termination of Employment or (ii) the February 1 of the calendar year following the calendar year in which the Participant experiences a Termination of Employment; or

(b) As soon as administratively practicable after the Company is provided with proof that is satisfactory to the Senior Vice President of Human Resources of the Participant's death, if the Participant dies prior to the complete distribution of his or her vested Account Balance.

1.7 "Board" shall mean the board of directors of the Company.

1.8 "Claimant" shall have the meaning set forth in Section 11.1.

1.9 "Code" shall mean the Internal Revenue Code of 1986, as amended from time to time.

1.10 "Committee" shall mean the Compensation and Human Resources Committee of the Board of Directors of the Company or any successor committee of the Board.

1.11 "Company" shall mean ORBITAL, ATK INC., a Delaware corporation, and any successor to all or substantially all of the Company's assets or business. Prior to February 9, 2015, the Company was known as Alliant Techsystems, Inc.

1.12 "Company Contribution Account" shall mean (i) the sum of the Participant's Company 401(k) NEC Contributions and Company 401(k) Matching Contributions under this Plan, plus (ii) amounts credited or debited to the Participant's Company Contribution Account in accordance with this Plan, less (iii) all distributions made to the Participant or his or her Beneficiary pursuant to this Plan that relate to the Participant's Company Contribution Account

1.13 "Company Contribution Amounts" shall mean, for any one Plan Year, the amount determined in accordance with Section 3.1.

1.14 "Company 401(k) Matching Contributions" shall mean the sum of the Participant's Company 401(k) Matching Contribution Amounts under this Plan for all Plan Years.

1.15 "Company 401(k) Matching Contribution Amounts" shall mean, for any one Plan Year, the amount determined in accordance with Section 3.1(b).

1.16 "Company 401(k) NEC Contributions" shall mean the sum of the Participant's Company 401(k) NEC Contribution Amounts under this Plan for all Plan Years.

1.17 "Company 401(k) NEC Contribution Amounts" shall mean, for any one Plan Year, the amount determined in accordance with Section 3.1(a).

1.18 "Deduction Limitation" shall mean the limitation on a benefit that may otherwise be distributable pursuant to the provisions of this Plan, as set forth in Section 12.15.

1.19 "Employee" shall mean a person who is an employee of any Employer.

1.20 "Employer(s)" shall mean the Company and/or any of its subsidiaries (now in existence or hereafter formed or acquired) that have employees who participate in the Plan.

- 1.21 “ERISA” shall mean the Employee Retirement Income Security Act of 1974, as amended from time to time.
- 1.22 “401(k) Plan Before Tax Contributions” shall mean elective salary reduction deferral amounts made on a before tax basis on behalf of eligible participants under the 401(k) Plan.
- 1.23 “401(k) Plan Matching Contributions” shall mean employer contributions made on behalf of eligible participants in the 401(k) Plan, which are based on a specified percentage of the Participant’s 401(k) Plan Before Tax Contributions and Roth 401(k) Plan Contributions, if any, under the 401(k) Plan.
- 1.24 “401(k) Plan NEC” shall mean any non-elective contribution made on behalf of eligible participants under the 401(k) Plan that is based on age and service points.
- 1.25 “401(k) Plan NEC Percentage” shall mean the percentage of Recognized Compensation used for purposes of determining an eligible participant’s 401(k) NEC (as may be amended under the 401(k) Plan from time to time), as applicable, and which is currently one of the following:

Points (As defined in the 401(k) Plan)	Percentage
Less than 40	2.5%
40 to 59	3.0%
60 or more	4.0%

- 1.26 “401(k) Plan” shall mean the ORBITAL ATK, INC. 401(k) Plan, as amended from time to time.
- 1.27 “Investment Election Form” shall mean the form, which may be in electronic format, established from time to time by the PRC that a Participant completes, signs and returns to the Company to make an election under the Plan.
- 1.28 “Nonqualified Deferred Compensation Plan” shall mean the ORBITAL ATK, INC. Nonqualified Deferred Compensation Plan, as amended from time to time.
- 1.29 “Participant” shall mean any Employee who is eligible to participate in the Plan.
- 1.30 “Plan” shall mean the ORBITAL ATK, INC. Defined Contribution Supplemental Executive Retirement Plan, which shall be evidenced by this instrument, as it may be amended from time to time. Prior to January 1, 2016, the Plan was named the “ALLIANT TECHSYSTEMS INC. Defined Contribution Supplemental Executive Retirement Plan.”
- 1.31 “Plan Year” shall mean a period beginning on January 1 of each calendar year and continuing through December 31 of such calendar year.

1.32 “PRC” shall mean the ORBITAL ATK Pension and Retirement Committee.

1.33 “Recognized Compensation” shall mean, for the period in which such amounts are paid, Recognized Compensation as defined under the 401(k) Plan (as amended from time to time); provided, however, that in determining a Participant’s Recognized Compensation for purposes of this Plan there shall be included: (i) deferrals under the Nonqualified Deferred Compensation Plan to the extent that such compensation would have been recognized as Recognized Compensation under the 401(k) Plan in the Plan Year that it would have been paid had there been no deferral, and (ii) compensation that would have been recognized as Recognized Compensation under the 401(k) Plan for the Plan Year in which paid without regard to the dollar limitation in effect under section 401(a)(17) of the Code.

1.34 “Roth 401(k) Plan Contributions” shall mean elective salary reduction deferral amounts made on a Roth 401(k) after tax basis on behalf of eligible participants under the 401(k) Plan.

1.35 “Section 16 Officer” shall mean an “officer” of the Company as defined in the rules promulgated under Section 16 of the Securities Exchange Act of 1934, as amended.

1.36 “Senior Vice President of Human Resources” shall mean the most senior officer of the Company in charge of the human resources function at the time the action is taken with respect to the Plan.

1.37 “Terminate the Plan” or “Termination of the Plan” shall mean a determination by the Committee that all Participants shall no longer be eligible to participate in the Plan and that Participants shall no longer be eligible to receive Company contributions under this Plan.

1.38 “Termination of Employment” shall mean the separation from service with all Employers and all entities treated as members of the same controlled group with any Employer under Section 414(b) or (c) of the Code, voluntarily or involuntarily, for any reason other than death or an authorized leave of absence. Controlled group membership shall be determined by substituting “at least 50 percent” for “at least 80 percent” each place it appears in section 1563(a)(1), (2) and (3) of the Code, and by substituting “at least 50 percent” for “at least 80 percent” each place it appears in Treas. Reg. §1.414(c)-2.

1.39 “Trust” shall mean one or more trusts established by the Company in accordance with Article 10.

1.40 “Vesting Service” shall mean an Employee’s period of “Vesting Service” as determined under the 401(k) Plan.

ARTICLE 2

Eligibility

2.1 Eligibility. An employee of the Employer shall be eligible to receive a credit in accordance with Section 3.1 for a Plan Year if the employee: (i) is a participant in the

401(k) Plan and his or her 401(k) Plan NEC for the Plan Year is reduced by section 401(a)(17) of the Code; (ii) is a participant in the 401(k) Plan and the Nonqualified Deferred Compensation Plan and his or her 401(k) Plan NEC for the Plan Year is reduced due to the employee's deferrals under the Nonqualified Deferred Compensation Plan, or (iii) is a participant in the 401(k) Plan whose combined 401(k) Plan Before Tax Contributions and Roth 401(k) Plan Contributions under the 401(k) Plan equal or exceed the "applicable dollar amount" under Section 402(g)(i)(B) of the Code for a given Plan Year and whose Recognized Compensation for that Plan Year exceeds the annual compensation limit in effect for such Plan Year under Section 401(a)(17) of the Code.

2.2 Termination of a Participant's Eligibility. In the event that a Participant is no longer eligible to receive credits under this Plan, the Participant's Account Balance shall continue to be governed by the terms of this Plan until such time as the Participant's Account Balance is paid in accordance with the terms of this Plan.

ARTICLE 3

Company Contribution Amounts; Vesting; Crediting; Taxes

3.1 Company Contribution Amounts. The Company shall make contributions to the Plan as follows:

- (a) Company 401(k) NEC Contribution Amounts. If a Participant is eligible for a 401(k) Plan NEC for any Plan Year, a Participant's Company 401(k) NEC Contribution Amount under this Plan for that Plan Year shall be equal to:
- (1) a credit equal to the Participant's 401(k) Plan NEC Percentage multiplied by the Participant's Recognized Compensation for the Plan Year, if any, in excess of the annual compensation limit in effect for such Plan Year under section 401(a)(17) of the Code; and
 - (2) a credit equal to the Participant's 401(k) Plan NEC Percentage multiplied by the Recognized Compensation, if any, the Participant deferred under the Nonqualified Deferred Compensation Plan to the extent that such compensation would have been recognized as "Recognized Compensation" under the 401(k) Plan in the Plan Year that it would have been paid had there been no deferral under the Nonqualified Deferred Compensation Plan.
- (b) Company 401(k) Matching Contribution Amounts. If a Participant's 401(k) Plan Before Tax and Roth 401(k) Plan Contributions to the 401(k) Plan equal or exceed the maximum "applicable dollar amount" as in effect under Section 402(g)(i)(B) of the Code for a given Plan Year (without regard to any additional "catch up" contributions permitted under Section 414(v) of the Code), the Participant's Company 401(k) Matching Contribution Amount under this Plan for the Plan Year shall be equal to four and one-half percent (4½%) of the Participant's Recognized Compensation for the Plan Year, if any, in excess of the annual compensation limit in effect for such Plan Year under Section 401(a)(17) of the Code. If the Participant has not contributed the maximum applicable dollar amount in effect under Code §402(g) for the Plan Year, the Participant's

Company 401(k) Matching Contribution Amount under this Plan for the Plan Year is zero (0).

3.2 Crediting of Amounts after Benefit Distribution. Notwithstanding any provision in this Plan to the contrary, if the complete distribution of a Participant's vested Account Balance occurs prior to the date on which any portion of the Company Contribution Amount would otherwise be credited to the Participant's Account Balance, such amounts shall not be credited to the Participant's Account Balance, but shall be paid to the Participant in a single lump sum as soon as administratively practicable after the amount can be determined.

3.3 Vesting. If a Participant either dies, attains age 65 or becomes Totally Disabled (as defined in the 401(k) Plan) while employed by the Company, he or she shall be fully (100%) vested in his or her Account Balance under the Plan. In addition, all Participants who are actively employed by the Company shall become fully (100%) vested in their Account Balance under the Plan if the Company experiences a "Change in Control" (as defined in the Orbital ATK, Inc. Pension & Retirement Plan).

Otherwise, a Participant shall become vested in his or her Company NEC Contributions under this Plan (adjusted as provided in Sec. 3.4 herein) in accordance with the following schedule:

Years of Vesting Service Completed	NEC Vested Percentage
Less than three	0%
Three or more	100%

Also, a Participant shall otherwise become vested in his or her Company Matching Contributions under this Plan (adjusted as provided in Sec. 3.4 herein) in accordance with the following schedule:

Years of Vesting Service Completed	Matching Contribution Vested Percentage
Less than one	0%
One or more	100%

Notwithstanding the foregoing, all benefits under this Plan shall be permanently forfeited upon the determination by the Committee for that the Participant, either before or after Termination of Employment:

- (a) engaged in a criminal or fraudulent conduct resulting in material harm to the Company or an affiliate of the Company; or
- (b) made an unauthorized disclosure to any competitor of any material confidential information, trade information or trade secrets of the Company or an affiliate of the Company; or

- (c) provided Company or an affiliate of Company with materially false reports concerning his or her business interests or employment; or
- (d) made materially false representations which are relied upon by Company or an affiliate of Company in furnishing information to an affiliate, partner, stockholders, accountants, auditor, a stock exchange, the Securities and Exchange Commission or any regulatory or governmental agency; or
- (e) maintained an undisclosed, unauthorized and material conflict of interest in the discharge of the duties owed by him or her to the Company or an affiliate of the Company; or
- (f) engaged in conduct causing a serious violation of state or federal law by Company or an affiliate of Company; or
- (g) engaged in theft of assets or funds of the Company or an affiliate of the Company; or
- (h) has been convicted of any crime which directly or indirectly arose out of his her employment relationship with the Company or an affiliate of the Company or materially affected his or her ability to discharge the duties of his or her employment with the Company or an affiliate of the Company; or
- (i) engaged during his or her employment with an Employer or within two (2) years after termination of employment with an Employer in any employment with a competitor, or engaged in any activity in competition with the Company, without the consent of the Company.

3.4 Crediting and Debiting of Account Balances. In accordance with, and subject to, the rules and procedures that are established from time to time by the PRC, amounts shall be credited or debited to a Participant's Account Balance in accordance with the following rules:

- (a) Measurement Funds. The Participant may elect one or more of the measurement funds selected by the PRC, in its sole discretion, which are based on certain mutual funds or other collective investment vehicles (the "Measurement Funds"), for the purpose of crediting or debiting additional amounts to his or her Account Balance. As necessary, the PRC may, in its sole discretion, discontinue, substitute or add a Measurement Fund. Notwithstanding the above, no Measurement Fund shall be based primarily on common stock or other securities of the Company.
- (b) Election of Measurement Funds. A Participant, in connection with his or her initial commencement of participation in the Plan, shall elect, on the Investment Election Form, one or more Measurement Fund(s) (as described in Section 3.4(a) above) to be used to determine the amounts to be credited or debited to his or her Account Balance. If a Participant does not elect any of the

Measurement Funds as described in the previous sentence, the Participant's Account Balance shall automatically be allocated into the Measurement Fund as determined by the PRC from time to time, in its sole discretion. The Participant may (but is not required to) elect, by submitting an Investment Election Form to the Company that is accepted by the Company, to add or delete one or more Measurement Fund(s) to be used to determine the amounts to be credited or debited to his or her Account Balance, or to change the portion of his or her Account Balance allocated to each previously or newly elected Measurement Fund. If an election is made in accordance with the previous sentence, it shall apply as of the first business day that is administratively practicable, and shall continue thereafter for each subsequent day in which the Participant participates in the Plan, unless changed in accordance with the previous sentence.

- (c) Proportionate Allocation. In making any election described in Section 3.4(b) above, the Participant shall specify on the Investment Election Form, in increments of 1%, the percentage of his or her Account Balance or Measurement Fund, as applicable, to be allocated/reallocated.
- (d) Crediting or Debiting Method. The performance of each Measurement Fund (either positive or negative) will be determined on a daily basis based on the manner in which such Participant's Account Balance has been hypothetically allocated among the Measurement Funds by the Participant.
- (e) No Actual Investment. Notwithstanding any other provision of this Plan that may be interpreted to the contrary, the Measurement Funds are to be used for measurement purposes only, and a Participant's election of any such Measurement Fund, the allocation of his or her Account Balance thereto, the calculation of additional amounts and the crediting or debiting of such amounts to a Participant's Account Balance shall not be considered or construed in any manner as an actual investment of his or her Account Balance in any such Measurement Fund. In the event that the Company or the Trustee (as that term is defined in the Trust), in its own discretion, decides to invest funds in any or all of the investments on which the Measurement Funds are based, no Participant shall have any rights in or to such investments themselves. Without limiting the foregoing, a Participant's Account Balance shall at all times be a bookkeeping entry only and shall not represent any investment made on his or her behalf by the Company or the Trust; the Participant shall at all times remain an unsecured creditor of the Company.

3.5 FICA and Other Taxes.

- (a) Company Contribution Account. When a Participant's Annual Account is credited with a Company Contribution Amount (or, if such amount is subject to a vesting schedule, when such Participant is vested in such amount), the Participant's Employer(s) shall withhold, in a manner determined by the Employer(s), the Participant's share of FICA and other employment taxes on such Company Contribution Amount. If necessary, the Company may reduce

the vested portion of the Participant's Company Contribution Account, as applicable, in order to comply with this Section 3.5.

- (b) Distributions. The Participant's Employer(s), or the trustee of the Trust, shall withhold from any payments made to a Participant under this Plan all federal, state and local income, employment and other taxes required to be withheld by the Employer(s), or the trustee of the Trust, in connection with such payments, in amounts and in a manner to be determined in the sole discretion of the Employer(s) and the trustee of the Trust.

ARTICLE 4

Distribution of Benefits

- 4.1 Benefit Distribution Date. A Participant who dies or experiences a Termination of Employment shall receive his or her vested Account Balance, calculated as of the close of business on the Participant's Benefit Distribution Date. If the calculation date is not a business day, then such calculation shall be made on the immediately preceding business day.
- 4.2 Actual Payment Date. The Account Balance shall be paid to the Participant (or the Participant's Beneficiary(ies), as applicable) in a lump sum payment no later than 60 days after the Participant's Benefit Distribution Date in the event of a Termination of Employment, and in the event of death, no later than the later of 90 days after the date of death or the last day of the calendar year in which death occurs.
- 4.3 Payment in Cash. Payment of a Participant's Account Balance shall be made in cash.

ARTICLE 5

Beneficiary Designation

- 5.1 Beneficiary. Each Participant shall have the right, at any time, to designate his or her Beneficiary(ies) (both primary as well as contingent) to receive any benefits payable under the Plan to a beneficiary upon the death of a Participant. The Beneficiary designated under this Plan may be the same as or different from the Beneficiary designation under any other plan of an Employer in which the Participant participates.
- 5.2 Beneficiary Designation; Change; Spousal Consent. A Participant shall designate his or her Beneficiary by completing and signing the Beneficiary Designation Form, and returning it to the Company. A Participant shall have the right to change a Beneficiary by completing, signing and otherwise complying with the terms of the Beneficiary Designation Form and the Company's rules and procedures, as in effect from time to time. If the Participant names someone other than his or her spouse as a Beneficiary, the Senior Vice President of Human Resources may, in his or her sole discretion, determine that spousal consent is required to be provided in a form designated by the Senior Vice President of Human Resources, executed by such Participant's spouse and returned to the Company. Upon the acceptance by the Company of a new Beneficiary Designation Form, all Beneficiary designations previously filed shall be canceled. The Company shall be entitled to rely on the last

Beneficiary Designation Form filed by the Participant and accepted by the Company prior to his or her death.

- 5.3 Receipt. No designation or change in designation of a Beneficiary shall be effective until received by the Company in accordance with rules established by the Company.
- 5.4 No Beneficiary Designation. If a Participant fails to designate a Beneficiary as provided in Sections 5.1, 5.2 and 5.3 above or, if all designated Beneficiaries predecease the Participant or die prior to complete distribution of the Participant's benefits, then the Participant's designated Beneficiary shall be deemed to be his or her surviving spouse. If the Participant has no surviving spouse, the benefits remaining under the Plan to be paid to a Beneficiary shall be payable to the executor or personal representative of the Participant's estate.
- 5.5 Doubt as to Beneficiary. If the Senior Vice President of Human Resources has any doubt as to the proper Beneficiary to receive payments pursuant to this Plan, he or she shall have the right, exercisable in his or her discretion, to cause the Participant's Employer to withhold such payments until this matter is resolved to his or her satisfaction.
- 5.6 Discharge of Obligations. The payment of benefits under the Plan to a Beneficiary (as the Beneficiary is determined by the Senior Vice President of Human Resources) shall fully and completely discharge the Company, the Employer, the Committee, the PRC and the Vice President of Human Resources from all further obligations under this Plan with respect to the Participant.

ARTICLE 6
Leave of Absence

- 6.1 Paid Leave of Absence. If a Participant is authorized by the Participant's Employer to take a paid leave of absence from the employment of the Employer, the Participant shall remain in the Plan until the Participant becomes eligible for the benefits as provided in Article 4 in accordance with the provisions of that Article.
- 6.2 Unpaid Leave of Absence. If a Participant is authorized by the Participant's Employer to take an unpaid leave of absence from the employment of the Employer for any reason, the Participant shall remain in the Plan until the Participant becomes eligible for the benefits as provided in Article 4 in accordance with the provisions of that Article.

ARTICLE 7
Termination of Plan, Amendment or Modification

- 7.1 Termination of Plan. Although the Company anticipates that it will continue the Plan for an indefinite period of time, there is no guarantee that the Company will continue the Plan or will not terminate the Plan at any time in the future. Accordingly, the Company reserves the right to Terminate the Plan (as defined in Section 1.37). In the event of a Termination of the Plan, the Measurement Funds available to Participants following the Termination of the Plan shall be comparable in number and type to those Measurement

Funds available to Participants in the Plan Year preceding the Plan Year in which the Termination of the Plan is effective. Following a Termination of the Plan, Participant Account Balances shall remain in the Plan until the Participant becomes eligible for the benefits provided in Article 4 in accordance with the provisions of that Article. The Termination of the Plan shall not adversely affect any Participant or Beneficiary who has become entitled to the payment of any benefits under the Plan as of the date of termination; provided, however, the Company shall have the right, in its sole discretion, and notwithstanding any elections made by the Participant, to immediately pay all benefits in a lump sum following such Termination of the Plan, if (i)(A) Termination is not proximate to a downturn in the financial health of the Company, (B) the Company terminates all arrangements required to be aggregated with the Plan pursuant to Code Section 409A, (C) lump sum payments are made between 12 and 24 months following Termination of the Plan, and (D) the Company does not establish a new plan that would have been aggregated with the Plan for purposes of Code Section 409A within three years following Termination of the Plan, or (ii) Termination is in connection with dissolution or change in control of the Company, or such other circumstances permitted by applicable guidance, and in accordance with such other corresponding conditions required by Code Section 409A and regulations or other guidance issued thereunder.

7.2 Amendment.

- (a) The Committee may, at any time, amend or modify the Plan in whole or in part. Notwithstanding the foregoing, no amendment shall be effective to decrease the value of a Participant's vested Account Balance in existence at the time the amendment is made. In no event shall the Company, the Employer, the PRC or the Committee be responsible for any decline in a Participant's Account Balance as a result of the selection, discontinuation, addition, substitution, crediting or debiting of the Measurement Funds pursuant to Section 3.4.
- (b) Notwithstanding any provision of the Plan to the contrary, in the event that the Committee determines that any provision of the Plan may cause amounts deferred under the Plan to become immediately taxable to any Participant under Code Section 409A, and related guidance, the Committee may (i) adopt such amendments to the Plan and appropriate policies and procedures, including amendments and policies with retroactive effect, that the Committee determines necessary or appropriate to preserve the intended tax treatment of the Plan benefits provided by the Plan and/or (ii) take such other actions as the Committee determines necessary or appropriate to comply with the requirements of Code Section 409A, and related guidance.

7.3 Effect of Payment. The full payment of the Participant's vested Account Balance under Article 4 of the Plan shall completely discharge all obligations to a Participant and his or her designated Beneficiaries under this Plan.

ARTICLE 8
Administration

- 8.1 Committee Duties. Except as otherwise provided in this Plan, this Plan shall be administered by the Committee. The Committee shall also have the discretion and authority to (i) make, amend, interpret and enforce all appropriate rules and regulations for the administration of this Plan and (ii) decide or resolve any and all questions including interpretations of this Plan, as may arise in connection with the Plan. When making a determination or calculation, the Company, Committee and the Senior Vice President of Human Resources, as applicable, shall be entitled to rely on information furnished by a Participant.
- 8.2 Agents. In the administration of this Plan, the Committee may, from time to time, employ agents and delegate to them such administrative duties as it sees fit (including acting through a duly appointed representative) and may from time to time consult with counsel who may be counsel to any Employer.
- 8.3 Binding Effect of Decisions. The decision or action of the Administrator with respect to any question arising out of or in connection with the administration, interpretation and application of the Plan and the rules and regulations promulgated hereunder shall be final and conclusive and binding upon all persons having any interest in the Plan.
- 8.4 Indemnity. All Employers shall indemnify and hold harmless the members of the Committee, the PRC, the Senior Vice President of Human Resources, any Employee to whom duties have been or may be delegated under this Plan, and the Administrator against any and all claims, losses, damages, expenses or liabilities arising from any action or failure to act with respect to this Plan, except in the case of an individual's willful misconduct.
- 8.5 Employer Information. To enable the Committee and/or Administrator to perform its functions, the Company and each Employer shall supply full and timely information to the Committee and/or Administrator, as the case may be, on all matters relating to the compensation of its Participants, the date and circumstances of the death or Termination of Employment of its Participants, and such other pertinent information as the Committee or Administrator may reasonably require.

ARTICLE 9
Other Benefits and Agreements

- 9.1 Coordination with Other Benefits. The benefits provided for a Participant and Participant's Beneficiary under the Plan are in addition to any other benefits available to such Participant under any other plan or program for employees of the Participant's Employer. The Plan shall supplement and shall not supersede, modify or amend any other such plan or program except as may otherwise be expressly provided.

ARTICLE 10

Trust

- 10.1 Establishment of the Trust. In order to provide assets from which to fulfill the obligations of the Participants and their beneficiaries under the Plan, the Company may establish a trust by a trust agreement with a third party, the trustee, to which each Employer may, in its discretion, contribute cash or other property to provide for the benefit payments under the Plan, (the "Trust").
- 10.2 Interrelationship of the Plan and the Trust. The provisions of the Plan shall govern the rights of a Participant to receive distributions pursuant to the Plan. The provisions of the Trust shall govern the rights of the Employers, Participants and the creditors of the Company to the assets transferred to the Trust. The Company shall at all times remain liable to carry out its obligations under the Plan.
- 10.3 Distributions From the Trust. The Company's obligations under the Plan may be satisfied with Trust assets distributed pursuant to the terms of the Trust, and any such distribution shall reduce the Company's obligations under this Plan.

ARTICLE 11

Claims Procedures

- 11.1 Presentation of Claim. Any Participant or Beneficiary of a deceased Participant (such Participant or Beneficiary being referred to below as a "Claimant") may deliver to the Committee a written claim for a determination with respect to the amounts distributable to such Claimant from the Plan. If such a claim relates to the contents of a notice received by the Claimant, the claim must be made within 60 days after such notice was received by the Claimant. All other claims must be made within 180 days of the date on which the event that caused the claim to arise occurred. The claim must state with particularity the determination desired by the Claimant.
- 11.2 Notification of Decision. The Committee shall consider a Claimant's claim within a reasonable time, but no later than 90 days after receiving the claim. If the Committee determines that special circumstances require an extension of time for processing the claim, written notice of the extension shall be furnished to the Claimant prior to the termination of the initial 90-day period. In no event shall such extension exceed a period of 90 days from the end of the initial period. The extension notice shall indicate the special circumstances requiring an extension of time and the date by which the Committee expects to render the benefit determination. The Committee shall notify the Claimant in writing:
- (a) that the Claimant's requested determination has been made, and that the claim has been allowed in full; or
 - (b) that the Committee has reached a conclusion contrary, in whole or in part, to the Claimant's requested determination, and such notice must set forth in a manner calculated to be understood by the Claimant:

- (i) the specific reason(s) for the denial of the claim, or any part of it;
- (ii) specific reference(s) to pertinent provisions of the Plan upon which such denial was based;
- (iii) a description of any additional material or information necessary for the Claimant to perfect the claim, and an explanation of why such material or information is necessary;
- (iv) an explanation of the claim review procedure set forth in Section 11.3 below; and
- (v) a statement of the Claimant's right to bring a civil action under ERISA Section 502(a) following an adverse benefit determination on review.

11.3 Review of a Denied Claim. On or before 60 days after receiving a notice from the Committee that a claim has been denied, in whole or in part, a Claimant (or the Claimant's duly authorized representative) may file with the Committee a written request for a review of the denial of the claim. The Claimant (or the Claimant's duly authorized representative):

- (a) may, upon request and free of charge, have reasonable access to, and copies of, all documents, records and other information relevant to the claim for benefits;
- (b) may submit written comments or other documents; and/or
- (c) may request a hearing, which the Committee, in its sole discretion, may grant.

11.4 Decision on Review. The Committee shall render its decision on review promptly, and no later than 60 days after the receipt of the Claimant's written request for a review of the denial of the claim. If the Committee determines that special circumstances require an extension of time for processing the claim, written notice of the extension shall be furnished to the Claimant prior to the termination of the initial 60-day period. In no event shall such extension exceed a period of 60 days from the end of the initial period. The extension notice shall indicate the special circumstances requiring an extension of time and the date by which the Committee expects to render the benefit determination. In rendering its decision, the Committee shall take into account all comments, documents, records and other information submitted by the Claimant relating to the claim, without regard to whether such information was submitted or considered in the initial benefit determination. The decision must be written in a manner calculated to be understood by the Claimant, and it must contain:

- (a) specific reasons for the decision;
- (b) specific reference(s) to the pertinent Plan provisions upon which the decision was based;

(c) a statement that the Claimant is entitled to receive, upon request and free of charge, reasonable access to and copies of, all documents, records and other information relevant (as defined in applicable ERISA regulations) to the Claimant's claim for benefits; and

(d) a statement of the Claimant's right to bring a civil action under ERISA Section 502(a).

11.5 Legal Action. A Claimant's compliance with the foregoing provisions of this Article 11 is a mandatory prerequisite to a Claimant's right to commence any legal action with respect to any claim for benefits under this Plan. Any legal action must be brought within two years after the Claimant knew or should have known of the principal facts on which the claim is based or, if earlier, 90 days after the procedure under this Article 11 is completed.

11.6 Determinations. Benefits under the Plan will be paid only the Committee decides in its discretion that the applicant is entitled to them. The Committee has discretionary authority to grant or deny benefits under the Plan. The Committee shall have the sole discretion, authority and responsibility to interpret and construe this Plan Statement and all relevant documents and information, and to determine all factual and legal questions under the Plan, including but not limited to the entitlement of all persons to benefits and the amounts of their benefits. The Committee's discretionary authority shall include all matters arising under the Plan.

ARTICLE 12

Miscellaneous

12.1 Status of Plan. The Plan is intended to be a plan that is not qualified within the meaning of Code Section 401(a) and that "is unfunded and is maintained by an employer primarily for the purpose of providing deferred compensation for a select group of management or highly compensated employees" within the meaning of ERISA Sections 201(2), 301(a)(3) and 401(a)(1). The Plan shall be administered and interpreted (i) to the extent possible in a manner consistent with that intent and (ii) in accordance with Code Section 409A and other applicable tax law, including but not limited to Treasury Regulations promulgated pursuant to Code Section 409A.

12.2 Unsecured General Creditor. Participants and their Beneficiaries, heirs, successors and assigns shall have no legal or equitable rights, interests or claims in any property or assets of the Company. For purposes of the payment of benefits under this Plan, any and all of the Company's assets shall be, and remain, the general, unpledged unrestricted assets of the Company. The Company's obligation under the Plan shall be merely that of an unfunded and unsecured promise to pay money in the future.

12.3 Employer's Liability. The Company's liability for the payment of benefits shall be defined only by the Plan. The Company shall have no obligation to a Participant under the Plan except as expressly provided in the Plan.

12.4 Nonassignability. Neither a Participant nor any other person shall have any right to commute, sell, assign, transfer, pledge, anticipate, mortgage or otherwise

encumber, transfer, hypothecate, alienate or convey in advance of actual receipt, the amounts, if any, payable hereunder, or any part thereof, which are, and all rights to which are expressly declared to be, unassignable and non-transferable. No part of the amounts payable shall, prior to actual payment, be subject to seizure, attachment, garnishment or sequestration for the payment of any debts, judgments, alimony or separate maintenance owed by a Participant or any other person, be transferable by operation of law in the event of a Participant's or any other person's bankruptcy or insolvency or be transferable to a spouse as a result of a property settlement or otherwise (including without limitation any domestic relations order, whether or not a "qualified domestic relations order" under section 414(p) of the Code and section 206(d) of ERISA) before the Account Balance is distributed to the Participant or Beneficiary.

12.5 Not a Contract of Employment. The terms and conditions of this Plan shall not be deemed to constitute a contract of employment between the Company or any Employer and the Participant. Such employment is hereby acknowledged to be an "at will" employment relationship that can be terminated at any time for any reason, or no reason, with or without cause, and with or without notice, unless expressly provided in a written employment agreement. Nothing in this Plan shall be deemed to give a Participant the right to be retained in the service of the Company or any Employer or to interfere with the right of the Company or any Employer to discipline or discharge the Participant at any time.

12.6 Furnishing Information. A Participant or his or her Beneficiary will cooperate with the Company by furnishing any and all information requested by the Company and take such other actions as may be requested in order to facilitate the administration of the Plan and the payments of benefits hereunder, including but not limited to taking such physical examinations as the Company may deem necessary.

12.7 Terms. Whenever any words are used herein in the singular or in the plural, they shall be construed as though they were used in the plural or the singular, as the case may be, in all cases where they would so apply.

12.8 Captions. The captions of the articles, sections and paragraphs of this Plan are for convenience only and shall not control or affect the meaning or construction of any of its provisions.

12.9 Governing Law. Subject to ERISA, the provisions of this Plan shall be construed and interpreted according to the internal laws of the State of Minnesota without regard to its conflicts of laws principles.

12.10 Notice. Any notice or filing required or permitted to be given to the Company under this Plan shall be sufficient if in writing and hand-delivered, or sent by registered or certified mail, to the address below:

Northrop Grumman Corp.
Attn: Vice President, Compensation and Benefits
2980 Fairview Park Drive
Falls Church, VA 22042

Such notice shall be deemed given as of the date of delivery or, if delivery is made by mail, as of the date shown on the postmark on the receipt for registration or certification.

Any notice or filing required or permitted to be given to a Participant under this Plan shall be sufficient if in writing and hand-delivered, or sent by mail, to the last known address of the Participant.

12.11 Successors. The provisions of this Plan shall bind and inure to the benefit of the Company and its successors and assigns and the Participant and the Participant's designated Beneficiaries.

12.12 Spouse's Interest. The interest in the benefits hereunder of a spouse of a Participant who has predeceased the Participant shall automatically pass to the Participant and shall not be transferable by such spouse in any manner, including but not limited to such spouse's will, nor shall such interest pass under the laws of intestate succession.

12.13 Validity. In case any provision of this Plan shall be illegal or invalid for any reason, said illegality or invalidity shall not affect the remaining parts hereof, but this Plan shall be construed and enforced as if such illegal or invalid provision had never been inserted herein.

12.14 Incompetent. If the Senior Vice President of Human Resources determines in its discretion that a benefit under this Plan is to be paid to a minor, a person declared incompetent or to a person incapable of handling the disposition of that person's property, he or she may direct payment of such benefit to the guardian, legal representative or person having the care and custody of such minor, incompetent or incapable person. The Senior Vice President of Human Resources may require proof of minority, incompetence, incapacity or guardianship, as it may deem appropriate prior to distribution of the benefit. Any payment of a benefit shall be a payment for the account of the Participant and the Participant's Beneficiary, as the case may be, and shall be a complete discharge of any liability under the Plan for such payment amount.

12.15 Deduction Limitation on Benefit Payments. The Company may determine that as a result of the application of the limitation under Code Section 162(m), a distribution payable to a Participant pursuant to this Plan would not be deductible if such distribution were made at the time required by the Plan. If the Company makes such a determination, then the distribution shall not be paid to the Participant until such time as the distribution first becomes deductible. The amount of the distribution shall continue to be adjusted in accordance with Section 3.4 above until it is distributed to the Participant. The amount of the distribution, plus amounts credited or debited thereon, shall be paid to the Participant or his or her Beneficiary (in the event of the Participant's death) at the earliest possible date, as determined by the Company, on which the deductibility of compensation paid or payable to the Participant for the taxable year

of the Company during which the distribution is made will not be limited by Section 162(m). Notwithstanding the foregoing, the Committee shall interpret this provision in a manner that is consistent with Code Section 409A and other applicable tax law, including but not limited to guidance issued after the effective date of this Plan.

12.16 Insurance. The Company, on its own behalf or on behalf of the trustee of the Trust, and, in its sole discretion, may apply for and procure insurance on the life of the Participant, in such amounts and in such forms as the Trust may choose. The Company or the trustee of the Trust, as the case may be, shall be the sole owner and beneficiary of any such insurance. The Participant shall have no interest whatsoever in any such policy or policies, and at the request of the Company shall submit to medical examinations and supply such information and execute such documents as may be required by the insurance company or companies to whom the Company has applied for insurance.

IN WITNESS WHEREOF, this Amendment and Restatement is hereby executed by a duly authorized officer on this 18th day of December, 2018.

NORTHROP GRUMMAN INNOVATION SYSTEMS

By: /s/ Beth Pitts-Madonna

Beth Pitts-Madonna
Vice President, Human Resources and
Administration

APPENDIX A

Provisions Applicable Effective January 1, 2019

Effective January 1, 2019, the Plan is frozen, and no benefits shall accrue under this Plan with respect to compensation earned for services performed after December 31, 2018.

Notwithstanding anything herein to the contrary, effective January 1, 2019:

1. The term “Company” shall mean Northrop Grumman Corporation.
2. Except as provided in section 9 of this Appendix A, the term “Committee” shall mean the Company’s Benefit Plans Administrative Committee.
3. The term “PRC” shall mean the Company’s Benefit Plans Investment Committee.
4. The term “Plan” shall mean the Northrop Grumman Innovation Systems Defined Contribution Supplemental Executive Retirement Plan.
5. No individual shall become a Participant in the Plan after December 31, 2018.
6. No Company Contribution Amounts, 401(k) NEC Contribution Amounts or 401(k) Matching Contribution Amounts shall be credited to any Participant for any Plan Year beginning after December 31, 2018.
7. The Company’s Vice President, Compensation & Benefits shall have all authority and discretion to interpret the terms of the Plan.
8. References in Section 7.2 of the Plan to the “Committee” shall mean Northrop Grumman Corporation.

Except to the extent modified by this Appendix A, the terms of the Plan as amended and restated effective January 1, 2019 shall continue to govern.

January 30, 2019

Northrop Grumman Corporation
2980 Fairview Park Drive
Falls Church, Virginia 22042

Dear Sirs/Madams:

We have audited the consolidated financial statements of Northrop Grumman Corporation and its subsidiaries (the “Company”) as of December 31, 2018 and 2017, and for each of the three years in the period ended December 31, 2018, included in your Annual Report on Form 10-K to the Securities and Exchange Commission and have issued our report thereon dated January 30, 2019, which expresses an unqualified opinion and includes an explanatory paragraph concerning the Company’s election during 2018 to change its method of accounting for recognizing pension and other postretirement benefit plans actuarial gains and losses. Note 1 to such consolidated financial statements contains a description of your adoption during the year ended December 31, 2018 of a change in accounting method for recognizing actuarial gains and losses for all pension and other postretirement benefit plans from a corridor amortization method to immediate recognition. In our judgment, such change is to an alternative accounting principle that is preferable under the circumstances.

Yours truly,

/s/ Deloitte & Touche LLP
McLean, Virginia

NORTHROP GRUMMAN CORPORATION SUBSIDIARIES

**Address for all subsidiaries is:
 c/o NORTHROP GRUMMAN CORPORATION
 Office of the Secretary
 2980 Fairview Park Drive
 Falls Church, Virginia 22042**

Name of Subsidiary	Jurisdiction of Incorporation	Ownership Percentage
Northrop Grumman Systems Corporation	Delaware	100%
Northrop Grumman Overseas Holdings, Inc.	Delaware	100%
Northrop Grumman Innovation Systems, Inc.	Delaware	100%

The company has additional subsidiaries, which do not constitute significant subsidiaries.

All the above listed subsidiaries have been consolidated in the company's consolidated financial statements.

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Northrop Grumman Corporation
2980 Fairview Park Drive
Falls Church, Virginia 22042

We consent to the incorporation by reference in Registration Statement Nos. 033-59815, 033-59853, 333-67266, 333-100179, 333-107734, 333-121104, 333-125120, 333-127317, and 333-175798 on Form S-8; and Registration Statement No. 333-217087 on Form S-3; of our reports dated January 30, 2019, relating to the financial statements of Northrop Grumman Corporation and subsidiaries, which report expresses an unqualified opinion and includes an explanatory paragraph concerning the Company's election during 2018 to change its method of accounting for recognizing pension and other postretirement benefit plans actuarial gains and losses as well as the change in the manner in which it accounts for revenue from contracts with customers, and the effectiveness of Northrop Grumman Corporation and subsidiaries' internal control over financial reporting, which excludes Northrop Grumman Innovation Systems, appearing in this Annual Report on Form 10-K of Northrop Grumman Corporation for the year ended December 31, 2018.

/s/ Deloitte & Touche LLP
McLean, Virginia
January 30, 2019

**POWER OF ATTORNEY IN CONNECTION WITH THE
2018 ANNUAL REPORT ON FORM 10-K**

KNOW ALL MEN BY THESE PRESENTS, that each of the undersigned directors and officers of NORTHROP GRUMMAN CORPORATION, a Delaware corporation, does hereby appoint SHEILA C. CHESTON and JENNIFER C. MCGAREY, and each of them as his or her agents and attorneys-in-fact (the "Agents"), in his or her respective name and in the capacity or capacities indicated below, to execute and/or file the Annual Report on Form 10-K for the fiscal year ended December 31, 2018 (the "Report") under the Securities Exchange Act of 1934, as amended (the "Act"), and any one or more amendments to any part of the Report that may be required to be filed under the Act (including the financial statements, schedules and all exhibits and other documents filed therewith or constituting a part thereof) and to any part or all of any amendment(s) to the Report, whether executed and filed by the undersigned or by any of the Agents. Further, each of the undersigned does hereby authorize and direct the Agents to take any and all actions and execute and file any and all documents with the Securities and Exchange Commission (the "Commission"), which they deem necessary or advisable to comply with the Act and the rules and regulations or orders of the Commission adopted or issued pursuant thereto, to the end that the Report shall be properly filed under the Act. Finally, each of the undersigned does hereby ratify each and every act and documents which the Agents may take, execute or file pursuant thereto with the same force and effect as though such action had been taken or such document had been executed or filed by the undersigned, respectively.

This Power of Attorney shall remain in full force and effect until revoked or superseded by written notice filed with the Commission.

**CERTIFICATION PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Kathy J. Warden, certify that:

1. I have reviewed this report on Form 10-K of Northrop Grumman Corporation (“company”);
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the company's most recent fiscal quarter (the company's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and
5. The company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: January 30, 2019

/s/ **Kathy J. Warden**

Kathy J. Warden
Chief Executive Officer and President

**CERTIFICATION PURSUANT TO
SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Kenneth L. Bedingfield, certify that:

1. I have reviewed this report on Form 10-K of Northrop Grumman Corporation (“company”);
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the company as of, and for, the periods presented in this report;
4. The company's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the company and have:
 - a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the company, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - c) Evaluated the effectiveness of the company's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
 - d) Disclosed in this report any change in the company's internal control over financial reporting that occurred during the company's most recent fiscal quarter (the company's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the company's internal control over financial reporting; and
5. The company's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the company's auditors and the audit committee of the company's board of directors (or persons performing the equivalent functions):
 - a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the company's ability to record, process, summarize and report financial information; and
 - b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the company's internal control over financial reporting.

Date: January 30, 2019

/s/ **Kenneth L. Bedingfield**

Kenneth L. Bedingfield
Corporate Vice President and Chief Financial Officer

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of Northrop Grumman Corporation (the “company”) on Form 10-K for the period ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I, Kathy J. Warden, Chief Executive Officer and President of the company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the company.

Date: January 30, 2019

/s/ **Kathy J. Warden**

Kathy J. Warden
Chief Executive Officer and President

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of Northrop Grumman Corporation (the “company”) on Form 10-K for the period ended December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I, Kenneth L. Bedingfield, Corporate Vice President and Chief Financial Officer of the company, certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the company.

Date: January 30, 2019

/s/ Kenneth L. Bedingfield

Kenneth L. Bedingfield

Corporate Vice President and Chief Financial Officer