

2018 ANNUAL REPORT

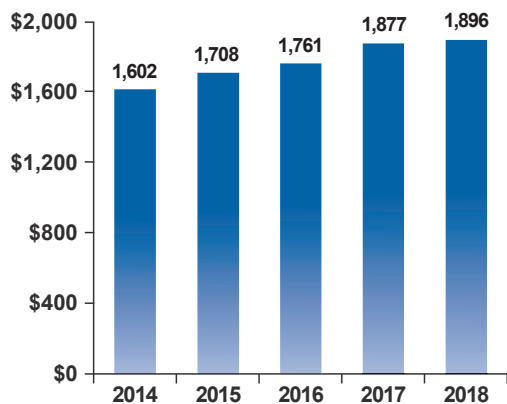


AEROJET ROCKETDYNE 
Holdings, Inc.

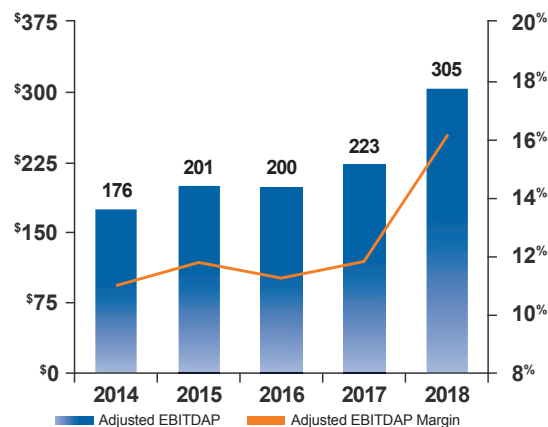
Aerojet Rocketdyne Holdings Financial Performance Highlights

(In millions, except percentage amounts)

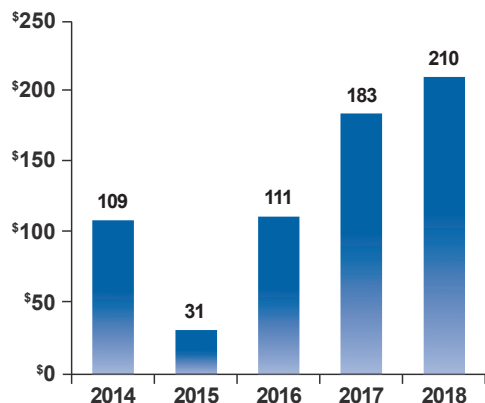
Net Sales



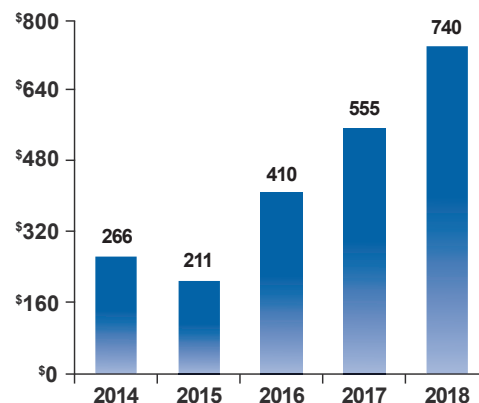
Adjusted EBITDAP⁽¹⁾



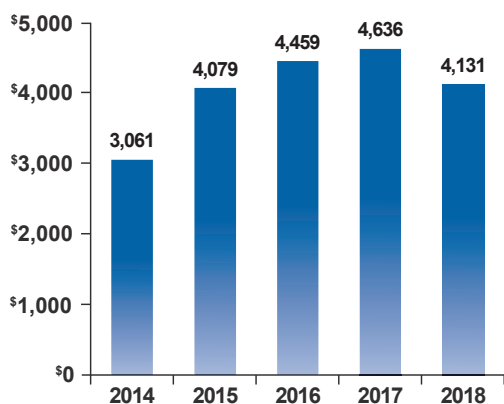
Free Cash Flow⁽²⁾



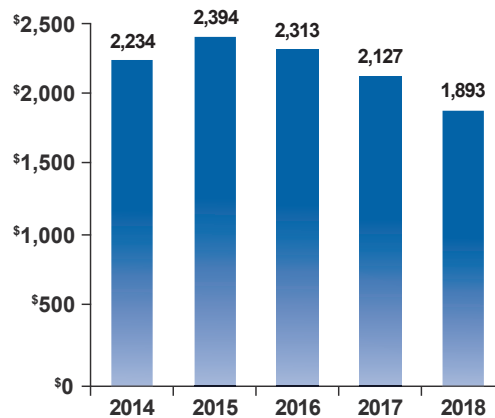
Cash and Marketable Securities⁽³⁾



Total Backlog⁽⁴⁾



Funded Backlog



Notes:

(1) Non-GAAP Measure. The Company defines Adjusted EBITDAP as GAAP net income (loss) adjusted to exclude interest expense, interest income, income taxes, depreciation and amortization, retirement benefits net of amounts that are recoverable under our U.S. government contracts, and unusual items.

(2) Non-GAAP Measure. Defined as cash flow from operating activities less capital expenditures.

(3) Cash includes cash equivalents and restricted cash.

(4) Total remaining performance obligation also referred to as backlog.

DEAR FELLOW STAKEHOLDERS,



From our 100% mission success on Delta and Atlas launches, to propelling spacecraft to the Sun and Mars and significant contributions to our nation's defense, Aerojet Rocketdyne achieved a historic 2018. Revenue and profits continued to grow, margins improved, and cash flow generation was higher than at any time in our recent history. Shareholders have been rewarded with a 92% 5-year return.

We have accomplished a lot since the acquisition of Rocketdyne a little over five years ago. We have a world-class propulsion business with capabilities that run the spectrum – solid, liquid, electric and hypersonic air-breathing propulsion systems. We have made significant changes to our leadership team, implemented a new Enterprise Resource Planning system, acquired and successfully integrated Coleman Aerospace, and launched the Aerojet Rocketdyne Business Operating System (ARBOS).

ARBOS continued to deliver improved business results by driving a process-oriented, data-driven and customer-focused culture across every area of our business – from office support functions to the manufacturing floor. Through the adoption of lean principles and standardized metrics, we were able to drive efficiencies and mitigate risks in multiple processes and locations.

We are now three years into our implementation of ARBOS and have eliminated more than one million square feet of factory and office space. Since 2014, sales per headcount have grown by 30%, with fewer resources required to support solid top line growth. EBITDAP margins have grown by more than three full points from 10.6% at the end of 2013 to 13.8% in 2018, excluding the gain from better than expected environmental recovery of \$43 million, recorded in 2018. The top line has nearly doubled compared to the pre-Rocketdyne levels.

This strong performance has been enabled by two critical factors: our Competitive Improvement Program (CIP) and ARBOS, both of which have driven focus and provided the tools necessary to improve the efficiency of our operations and the affordability of our products.

As part of CIP, we are making the investments needed in equipment and people including the opening of modernized, more automated sites that are right-sized and ready for the future. We have now relocated manufacturing capabilities for three key missile defense products without additional cost to the customer or concerns about quality and have constructed or upgraded 22 state-of-the-art buildings in Camden, Arkansas, and Orange County, Virginia, all while closing more than 400 excess buildings company-wide. There is always more to do, but thus far I am proud to say that CIP and ARBOS are working. The transformation of our great company continues.

*The transformation
of our great
company continues.*

DRIVING INNOVATION AND COMPETITIVENESS

During 2018 we completed the first phase of CIP, launched in March 2015. Production of our Terminal High Altitude Area Defense solid rocket boosters and our Standard Missile-3 Throttling Divert and Attitude Control Systems has successfully transitioned from Sacramento to our Camden and Orange sites, respectively. These moves reduced our underutilized operational footprint in Sacramento by more than one million square feet, decreasing overhead costs and increasing operational efficiency. Our continued focus on reducing program and material costs as well as internal affordability initiatives, has resulted in better than expected cost reductions for our government and industry customers while improving our competitive posture for future business.

The second phase of CIP was announced in 2017 and is well underway. We are transitioning remaining production from our Sacramento facility to Huntsville and transferring all program, engineering and direct support roles to other sites so that they will be co-located with the programs they support. We were very pleased with the number of employees who chose to relocate, which was higher than anticipated, providing the company a greater level of continuity and knowledge retention.

We transitioned into our new Defense Headquarters in Huntsville in July and completed initial construction on our Advanced Manufacturing Facility in northern Huntsville. The construction of this facility has provided a unique opportunity to customize a production facility for our specific needs and upgrade from the facilities that served us so well for more than 50 years in Sacramento.

The outstanding progress we have made in executing CIP is a testament to the impressive level of professionalism and dedication of all the employees and stakeholders involved in the effort.

Strategically, we positioned ourselves in 2018 for a strong future, winning key contracts, including record purchases of our RL10 engines, and successfully testing the engines that will power NASA's Space Launch System (SLS) and its crew vehicle, Orion. On the defense side of our business, we performed ground-breaking work in hypersonics, an area the Pentagon has identified as its top technical priority. Aerojet Rocketdyne products also supported several successful missile defense tests for the Missile Defense Agency, helping to demonstrate and advance critical capabilities to protect our nation, warfighters, and allies.

Aerojet Rocketdyne is also at the forefront of innovations that are transforming the space and defense business. With advances such as a 3-D printed copper thrust chamber for our RL10 engine, we have driven down costs, added efficiencies, and established ourselves as the industry leader in additive manufacturing. We are also applying pioneering technologies to sensitive defense capabilities where we are a critical supplier.

I am proud of how Aerojet Rocketdyne met our commitments in 2018 to our shareholders and to our nation, providing quality products that help to protect our warfighters and push the boundaries of the possible in space.

FINANCIAL RESULTS AND OUTLOOK

Aerojet Rocketdyne financial performance in 2018 was strong. Sales of \$1,896 million grew 1% with 1 point of headwind from our required transition to the new revenue standard ASC606 and 4 points of headwind from the expected sunset of the AJ-60 solid rocket booster program for the Atlas V. Adjusted EBITDAP was up 37% to \$305 million, including a one-time benefit of \$43 million from a gain related to our environmental remediation provision. This adjustment was a result of reaching a determination with the U.S. government that certain environmental expenditures are reimbursable. Excluding this one-time gain, adjusted EBITDAP was up 17%. Cash generation was strong again in 2018, with free cash flow of \$210 million, significantly exceeding our goal of free cash flow above net income. Our continued focus on operational improvements, including cost reductions, tight working capital management, risk retirement and program management, contributed to Aerojet Rocketdyne's strong profit and cash flow performance.

Year-end contract backlog was \$4.1 billion, with an expected \$1.8 billion in revenue from backlog already under contract, within the next 12 months.

We anticipate continued success in 2019 as we build on this strong foundation. Our focus is on organic and inorganic growth opportunities, predictable and profitable program performance, and our cost structure – to maximize value for both our customers and our shareholders.

Maximizing value for our shareholders means attentive focus on Return on Invested Capital (ROIC), and responsible, disciplined capital deployment is a key priority. We continue to focus on expanding production capabilities in both our Huntsville, Alabama, and our Camden, Arkansas, facilities. Customer demand is strong for our key missile defense programs, tactical missiles and rockets, and our next generation programs. That, coupled with the continued execution of CIP necessitates our continued investment in these critical facilities. We continue to invest in our industry-leading position in additive manufacturing, and will continue to support the development of next-generation technologies like hypersonics, advanced electric propulsion and throttleable solid rocket motors.

In 2018, we renegotiated the terms of our senior credit facility. These revised terms yield a lower interest rate and less onerous covenants. Given our improved financial position, we also took the opportunity to increase our revolving line of credit from \$350 million to \$650 million, which provides low-cost financial flexibility.

In addition to our planned \$37 million cash contribution to the pension plan, we elected to make a discretionary \$95 million stock contribution to the plan in 2018. This stock contribution was cash-tax advantageous in 2018, over time will be largely reimbursable in accordance with government Cost Accounting Standards, and created a pre-funding credit that provides optionality, allowing us to use this in lieu of some future cash contributions, at our discretion.

AEROSPACE

The need to re-capitalize and modernize U.S. defense capabilities drove demand for our products and in 2018 our defense business continued to grow and innovate.

Through a series of successful tests, we demonstrated our continued progress in advancing our nation's missile defense. Our expansions in Camden, Huntsville, and Orange County, Virginia, improved our ability to meet future national security needs, including the Ground Based Strategic Deterrent system (GBSD).

The work on GBSD represents a generational opportunity for our company that we are ready to seize. We have made strategic decisions to position ourselves for a sizable share of this business, making significant investments in propulsion technology, manufacturing affordability, and facility modernization.

In 2018, we moved forward with a \$50 million expansion plan with state and local partners for our Solid Rocket Motor Center of Excellence in Camden, which will include significant infrastructure improvements and additional hiring. These investments will enable an increase in the volume of solid rocket motors produced at the site for tactical and missile defense systems.

This fall we announced a successful test of a new dual-mode ramjet/scramjet engine, which provides the potential to propel a vehicle from a standstill into hypersonic flight and back again. This was just our latest advancement in hypersonics, which the Pentagon has identified as its top technical priority. Not only has Aerojet Rocketdyne been a pioneer in the sector, our win rate on contracts for hypersonics with multiple customers has demonstrated our continued leadership.

We also continued to advance the state of the art in missile defense. We completed hot fire altitude testing of our Divert and Attitude Control System Center Manifold for the Missile Defense Agency's Redesigned Kill Vehicle. Our propulsion systems also supported key intercept tests of Raytheon's Standard Missile-3 Block IIA and IB.

During 2018 we achieved many important milestones in our space business and supported a number of pioneering missions.

We powered every phase of NASA's InSight lander's journey to Mars – launch, cruise, entry and landing – so that each of the nation's eight successful landings on Mars have relied on Aerojet Rocketdyne propulsion. Our engines also provided the power for eight successful launches, including five Atlas V, one Delta IV, the last Delta II flight and one Delta IV Heavy in which our RS-68A and RL10 engines launched NASA's Parker Solar Probe. On OSIRIS-REx, which is now mapping the surface of the asteroid Bennu, we provided launch vehicle propulsion and all 28 thrusters on the spacecraft.

In 2018 we continued to make progress toward the first launch of SLS, testing new RS-25 main engine components for the first four flights of SLS and beyond. In addition, we completed initial qualification testing of the jettison motor and reaction control system for the Orion spacecraft. For Boeing's Starliner crew module, designed to transport astronauts to low-Earth orbit, we delivered reusable MR-104J thrusters that will be used to orient the spacecraft during atmospheric re-entry.

We also announced several important contracts, including agreements that will ensure the RL10 cryogenic upper stage engine will continue flying for U.S. government and commercial customers for years to come supporting two next generation launch vehicles, the Vulcan and the Omega.

REAL ESTATE

In 2018, we continued to execute re-entitlement and pre-development activities on our 5,563 acres of prime property in the suburban Sacramento, California, area under the brand name Easton. This will continue going forward, and as we finish our CIP-related Sacramento relocation activities, more excess property will become available. The company also owns approximately 580 acres in Chino Hills, California. We are aggressively pursuing all options to monetize this real estate, including but not limited to, engagements with national brokers, outright land sales and/or joint ventures with developers and builders, or leasing arrangements for unoccupied office buildings or land.

SAFETY AND ENVIRONMENT

The safety of all our employees is paramount. I am proud to note that 2018 was the safest year in our company's history. This was a great accomplishment in a year of significant transition, consolidation and new construction at many of our facilities.

We maintained commendable safety records through the execution of our Aerojet Rocketdyne Safety, Health & Environmental (SH&E) Management System and the Aerojet Rocketdyne Business Operating System.

In 2018 we experienced an OSHA Recordable Injury Rate (ORIR) of 0.80, an improvement over an impressive 0.86 that we experienced in 2017. According to the 2017 U.S. Bureau of Labor Statistics comparable companies experienced a combined ORIR of 1.20.

While we are incredibly proud of this achievement we will never be satisfied until we achieve an injury-free workplace. In 2019, we'll continue to leverage our SH&E Management System and ARBOS in our relentless pursuit of achieving an injury-free workplace and absolute environmental regulatory compliance.

We continue to pump and treat groundwater near our Sacramento campus. In 2018, we remediated approximately 8.4 billion gallons of groundwater, met all local replacement water obligations, and received regulatory agency approval to reduce groundwater pumping from six extraction wells, further reducing cost without jeopardizing effectiveness.

OUR PEOPLE

The cornerstone of our success at Aerojet Rocketdyne is the strength of our incredible workforce. Our men and women across the country – more than 10% of whom are military veterans or active reservists – have the critical skills and commitment needed for 100% mission success. Equally impressive is their generosity to the communities in which they live and work. Last year, our employees dedicated thousands of volunteer hours in support of schools and nonprofit organizations and also contributed financially to local causes and national disaster relief efforts.

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Our company's philanthropic arm, the Aerojet Rocketdyne Foundation, donated more than \$450,000 to natural disaster relief, scholarships for high-achieving children of employees, and STEM initiatives that will inspire the next generation.

CONCLUSION

As I look back over 2018, I am honored to be surrounded by such dedicated and talented men and women. Among our 5,000 employees are the most talented engineers and scientists in the world. Every day they bring industry-leading expertise to the work of developing some of the world's most sophisticated products and technologies. I remain extremely proud of what our dedicated employees achieve and the vital contributions we make in defending our nation and assuring access to space.

I am also encouraged by the current Administration's continued commitment to American leadership in space and the emphasis they have placed on the importance of space to our economy and national security. The White House has now convened several meetings of the National Space Council, and has made it clear that they see the space industry as essential to sustaining American leadership.

With a revitalized national commitment to leadership in space, renewed investment in our national defense and particularly in sectors such as hypersonics and missile defense where we are leaders, Aerojet Rocketdyne is positioned to thrive. I like to say, for Aerojet Rocketdyne, the time is now! We have the opportunity to play a significant role in some of the most important space and defense franchises for the future – modernizing our Ground Based Strategic Deterrent, advancing hypersonic technologies, contributing to the next generation of American space exploration and promoting reusability and resilience in space. As proud as I am of 2018, I also look forward to what the future holds.

On behalf of our board of directors and management team, thank you for your continued support and confidence in our proven performance and the quality products we provide our customers and our country.

Sincerely,



Eileen P. Drake, Chief Executive Officer and President
Aerojet Rocketdyne Holdings, Inc.
March 15, 2019

**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 1-01520

Aerojet Rocketdyne Holdings, Inc.

(Exact name of registrant as specified in its charter)

Delaware
(State or Other Jurisdiction of
Incorporation or Organization)

34-0244000
(I.R.S. Employer
Identification No.)

222 N. Pacific Coast Highway, Suite 500
El Segundo, California
(Address of Principal Executive Offices)

90245
(Zip Code)

Registrant's telephone number, including area code
(310) 252-8100

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

Title of each class

Name of each exchange on which registered

Common Stock, \$0.10 par value per share

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 Section 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 for 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 (§232.405 of this chapter) is not contained herein, and will not be contained, to the best of the 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	<input checked="" type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input type="checkbox"/>	Smaller reporting company	<input type="checkbox"/>
Emerging growth company	<input type="checkbox"/>		

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 Exchange Act.) Yes No

The aggregate market value of the voting common equity held by nonaffiliates of the registrant as of June 30, 2018, was approximately \$2.2 billion.

As of February 12, 2019, there were 78,391,006 outstanding shares of the Company's common stock, including unvested common shares, \$0.10 par value.

Portions of the 2019 Proxy Statement of Aerojet Rocketdyne Holdings, Inc. relating to its annual meeting of stockholders scheduled to be held on May 9, 2019, are incorporated by reference into Part III of this Report.

Aerojet Rocketdyne Holdings, Inc.
Annual Report on Form 10-K
For the Year Ended December 31, 2018

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Part I

Item 1. Business

Unless otherwise indicated or required by the context, as used in this Annual Report on Form 10-K (“Report”), the terms “we,” “our,” “us,” and the “Company” refer to Aerojet Rocketdyne Holdings, Inc. and all of its subsidiaries that are consolidated in conformity with accounting principles generally accepted in the United States of America (“GAAP”).

All statements in this Report other than historical information should be considered “forward-looking statements” as defined by Section 21E of the Private Securities Litigation Reform Act of 1995. These statements present (without limitation) the expectations, beliefs, plans, and objectives of management and future financial performance and assumptions underlying, or judgments concerning, the matters discussed in the statements. The words “believe,” “estimate,” “anticipate,” “project,” “expect,” and “reliable” and similar expressions, are intended to identify forward-looking statements. Forward-looking statements involve certain risks, estimates, assumptions, and uncertainties, including with respect to future sales and activity levels, cash flows, contract performance, the outcome of litigation and contingencies, environmental remediation, availability of capital, and anticipated costs of capital. Important risk factors that could cause actual results or outcomes to differ from those expressed in the forward-looking statements are described in the section “Risk Factors” in Item 1A of this Report. Additional risk factors may be described from time to time in our future filings with the Securities and Exchange Commission (“SEC”).

Overview

Our operations are organized into two segments:

Aerospace and Defense — includes the operations of our wholly-owned subsidiary Aerojet Rocketdyne, Inc. (“Aerojet Rocketdyne”), a leading technology-based designer, developer and manufacturer of aerospace and defense products and systems for the United States (“U.S.”) government, including the Department of Defense (“DoD”), the National Aeronautics and Space Administration (“NASA”), and major aerospace and defense prime contractors.

Real Estate — includes the activities of our wholly-owned subsidiary Easton Development Company, LLC (“Easton”) related to the re-zoning, entitlement, sale, and leasing of our excess real estate assets. We currently are in the process of seeking zoning changes and other governmental approvals on our excess real estate assets to optimize their value.

The year of our subsidiary, Aerojet Rocketdyne, ends on the last Saturday in December. As a result of the 2016 calendar, Aerojet Rocketdyne had 53 weeks of operations in 2016 compared with 52 weeks of operations in 2018 and 2017. The additional week of operations, which occurred in the fourth quarter of 2016, accounted for \$32.2 million in additional net sales.

We were incorporated in Ohio in 1915 and reincorporated in the State of Delaware on April 11, 2014. Our principal executive offices are located at 222 N. Pacific Coast Highway, Suite 500, El Segundo, California 90245.

Our Internet website address is www.AerojetRocketdyne.com. We have made available through our Internet website, free of charge, our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 as soon as reasonably practicable after such materials were electronically filed with, or furnished to, the SEC. We also make available on our Internet website our corporate governance guidelines and the charters for each of the following committees of our Board of Directors: Audit; Corporate Governance & Nominating; and Organization & Compensation. Copies of the Code of Conduct and the Company’s Corporate Governance Guidelines are available on the Company’s web site at www.AerojetRocketdyne.com (copies are available in print to any stockholder or other interested person who requests them by writing to Secretary, Aerojet Rocketdyne Holdings, Inc., 222 N. Pacific Coast Highway, Suite 500, El Segundo, California 90245).

Aerospace and Defense

Aerojet Rocketdyne is a world-recognized technology-based engineering and manufacturing company that develops and produces specialized propulsion systems, as well as armament systems. We develop and manufacture all four propulsion types (liquid, solid, air-breathing, and electric) for space, defense, civil and commercial applications. Principal customers and end users include the DoD (including the U.S. Air Force, U.S. Army, Missile Defense Agency, and U.S. Navy), NASA, The Boeing Company (“Boeing”), Lockheed Martin Corporation (“Lockheed Martin”), Raytheon Company (“Raytheon”), and United Launch Alliance (“ULA”).

For over 70 years, we have demonstrated a legacy of successfully meeting the most challenging missions by producing some of the world’s most technologically advanced propulsion systems that are aligned with our nation’s critical needs. We believe Aerojet Rocketdyne maintains a unique competitive position due to a strategic focus on creating and maintaining a broad spectrum of propulsion and energetic products assisted by the growing market demand for its innovative energy management technologies. The highly reliable nature of our revenue comes from the long-term nature of the programs with which we are involved, our attractive contract base and our deep customer relationships. High renewal rates, supported by our market leading technology provide us with a highly stable business base from which to grow. As of December 31, 2018, our remaining performance obligations, also referred to as backlog, totaled \$4.1 billion and our funded backlog, which includes only amounts for which funding has been authorized by a customer and a purchase order has been received, totaled \$1.9 billion.

Primary Markets and Programs

The markets and key programs we serve are:

Aerospace. We specialize in the development and production of propulsion and power systems for space applications. Our products include a broad market offering of both electric and chemical propulsion (liquid propellant engines and solid rocket motors) required for launch vehicle and in-space applications supporting defense, civil and commercially based missions.

Our space launch products have a long, successful flight heritage with the DoD and NASA where we continue to project strong support related to National Security Space requirements enabling communications, navigation, intelligence, surveillance, and reconnaissance missions. We provide booster and upper stage propulsion for ULA's Delta IV launch vehicle and upper stage propulsion for the Atlas V ("Atlas") launch vehicle in support of the Evolved Expendable Launch Vehicle ("EELV") program, as well as a limited number of Delta II vehicles which are supporting commercial customers launching Earth Observation spacecraft. In 2018, we announced contract awards associated with two new rocket development efforts for the U.S. government and commercial customers that assure the continued flight of our RL-10 cryogenic upper stage engine, providing more than 50 years of flight heritage.

During 2018, we continued to make progress in moving toward first launch of NASA's Space Launch System ("SLS"). An inventory of 16 flight-ready RS-25 main engines are nearly complete and include newly upgraded flight controller to support the first four flights of the heavy-lift rocket. In parallel, we are modernizing our RS-25 components and preparing for production of the next generation of RS-25 engines.

We achieved several successful milestones in 2018 supporting NASA's scientific programs. Every phase of NASA's Mars InSight lander's journey to the red planet was supported by our products. All eight successful landings on Mars have relied on our propulsion. We also provided all 28 rocket engines on OSIRIS-REx, the asteroid sample-return probe that recently arrived at Asteroid Bennu. In addition to powering the launch vehicle's main and second stages, we are providing critical in-space propulsion. Our thrusters enabled braking maneuvers to support the arrival, and will maneuver the spacecraft during its year of close-proximity science operations, and enable its journey back to Earth's orbit. Also, NASA's Parker Solar Probe, launched with our RS-68A and RL-10 engines, is using our propulsion system to enable the probe's 7-year journey to within 6.2 million kilometers of the Sun's surface—eight times closer than the previous record.

We continued to mature critical technologies for our nation's next generation of advanced hydrocarbon engines for future high-performance booster systems with the ability to eliminate the U.S. dependence on Russian-provided booster systems for National Security Space Launches. In February 2016, pursuant to an Other Transaction Agreement ("OTA"), the U.S. Air Force selected Aerojet Rocketdyne and ULA to share in a public-private partnership to develop jointly the AR1 engine under an agreement valued at \$804.0 million with the U.S. Air Force investing two-thirds of the funding required to complete development of the AR1 engine by December 2019. In June 2018, the Company and the U.S. Air Force signed a modification to the existing OTA to modify the scope, funding, cost share, and period of performance of the AR1 engine. The modified OTA is valued at \$353.8 million with the U.S. Air Force investing five-sixths of the funding required to design, build, and assemble a single AR1 engine prototype by December 2019.

A subset of our key space programs include: RL-10, RS-68, and RS-25 engines/boosters that power EELV launch vehicles, propulsion for the Orion human space capsule and the Starliner Commercial Crew Transportation Capability capsule, AR1, and multiple in-space electric and chemical propulsion systems to provide orbit raising and satellite station positioning.

Defense. We specialize in the development and production of propulsion systems for defense applications including both solid and liquid propellant based systems, along with air-breathing (ramjet) systems for missile applications. The majority of these systems are the primary axial propulsion for missile systems. The breadth of our products includes tactical missiles, missile defense boosters and large solid-propellant boosters for a variety of applications.

We also develop and manufacture liquid and solid divert and attitude control ("DACs") propulsion systems for missile defense applications. These are complex systems that provide multi-directional thrust and variable thrust levels to steer or control an intercept missile. Additionally, we develop and manufacture post-boost propulsion systems for strategic missiles. These systems provide directional control for critical missile defense interceptors and for ground and sea-based strategic missiles.

We also design, develop, and produce warhead/lethality systems for tactical missiles. Our tactical armament products have been successfully fielded on multiple active U.S. and international weapon system platforms.

During 2018, we continued to expand our strong legacy propulsion franchises on the Standard Missile, Patriot Advanced Capability-3 ("PAC-3"), Terminal High Altitude Area Defense ("THAAD") and Guided Multiple Launch Rocket System ("GMLRS") missile propulsion systems. These franchise programs all experienced backlog growth during 2018, and continue to be globally deployed in support of U.S. and allied armed forces.

As part of our continuing Competitive Improvement Program, we built on the 2017 validation of activity to move energetic production of the Standard Missile-3 DACs and THAAD Boost Motor from our Sacramento, California facility to our Orange County, Virginia, and Camden, Arkansas, facilities. In 2018, we completed facility construction of a new Advanced Manufacturing Facility in Huntsville, Alabama, that will produce high-value non-energetic sub-assemblies for Standard Missile and THAAD; completing the transition of defense manufacturing out of the Sacramento facility. These production consolidation activities help to reduce costs and strengthen competitiveness.

In the advanced programs business arena, we initiated a full-scale engineering development of the advanced air-launched ("AAL") propulsion system that will transition to production. In the hypersonic propulsion technology area, we were

competitively selected for multiple key missile propulsion development programs including: Hypersonic Conventional Strike Weapon (“HCSW”) with Lockheed Martin and Operational Fires (“OpFires”) with the U.S. Defense Advanced Research Projects Agency (“DARPA”). Both of these systems use conventional solid rocket motors to achieve hypersonic missile velocities. Our work on complementary air-breathing propulsion (ramjet / scramjet) for hypersonic missile continued in 2018 with significant hardware testing and maturation.

Finally, our Aerojet Rocketdyne Coleman Aerospace (“Coleman”) business successfully completed development of the medium-range ballistic missile (“MRBM”) target that is C-17 aircraft deployed. The initial deployment of an inert MRBM system from a C-17 occurred in early 2019. Coleman also continued to expand its scope on the Missile Defense MRBM missile target program.

A subset of our key defense programs include: Boosters and Solid DACs for the Navy’s Standard Missile family, Booster and Liquid DACs for THAAD, PAC-3, GMLRS, Redesigned Exoatmospheric Kill Vehicle (“RKV”) Liquid DACs, Stinger, Javelin, Tactical Tomahawk, Army TACMs, Tube-launched Optically-tracked Wire-guided warhead, and HAWK.

Information concerning the percentage of net sales attributable to our significant programs appears in Part II, Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations under the caption “Major Customers.”

Competition

The competitive dynamics of our multi-faceted marketplace vary by product line and customer, but we experience many of the same influences felt by the broader aerospace and defense industry. The large majority of products we manufacture are highly complex, technically sophisticated and extremely hazardous to build, demanding rigorous manufacturing procedures and highly specialized manufacturing equipment. While historically these factors, posed substantial barriers to entry, modern design tools and manufacturing techniques (such as additive manufacturing) available to new entrants with the ability to self-fund start-up as well as development costs has led to increased competition in aerospace markets. To date, competition from new entrants has been limited to a few participants who tend to be narrowly focused on products that are sub-elements of our overall product portfolio. For example, entrepreneurs such as SpaceX and Blue Origin, who have been or are in the process of developing liquid fuel propulsion capabilities are primarily focused on the development of space propulsion systems for heavy lift launch vehicles and are not pursuing or participating in the missile defense or tactical propulsion products that make up a substantial portion of our overall business. These new entrepreneurs have signaled their intent to compete primarily on price and are therefore bringing pressure to bear on existing cost paradigms and manufacturing methodologies.

The following table lists the primary participants in the propulsion market (in alphabetical order):

Company	Parent	Propulsion Type
Aerojet Rocketdyne	Aerojet Rocketdyne Holdings, Inc.	Solid, liquid, air-breathing, electric
Airbus Defence and Space (formerly Astrium)	Airbus Group	Solid, liquid
Avio	Avio S.p.A	Solid, liquid
Blue Origin LLC	Blue Origin	Liquid
Electron Technologies, Inc.	L-3 Communications Corporation	Electric
General Dynamics OTS	General Dynamics	Solid
Moog Inc.	Moog Inc.	Liquid, electric
Nammo Talley	Nammo Talley	Solid
Northrop Grumman Innovation Systems	Northrop Grumman Corporation (“Northrop”)	Solid, liquid, air-breathing
Safran	Safran	Solid, liquid
SpaceX	SpaceX	Liquid

Industry Overview

Our primary aerospace and defense customers include the DoD and its agencies, NASA, and the prime contractors that supply products to these customers. Our backlog depends, in large part, on continued funding by the U.S. government for the programs in which we are involved. These funding levels are not generally correlated with any specific economic cycle, but rather follow the cycle of general public policy and political support for this type of funding. Moreover, although our contracts will be performed over a period of several years, the U.S. Congress must appropriate funds for a given program and the U.S. President must sign into law such appropriations legislation each government fiscal year (“GFY”) that may significantly increase, decrease or eliminate, funding for a program. A decrease in DoD and/or NASA expenditures, the elimination or curtailment of a material program in which we are or hope to be involved, or changes in payment patterns of our customers as a result of changes in U.S. government outlays, could have a material adverse effect on our operating results, financial condition, and/or cash flows.

In September 2018, the U.S. President signed into law H.R. 6157, which included two full-year appropriations bills for GFY 2019: (i) the DoD Appropriations Act and (ii) the Labor, Health and Human Services, Education and Related Agencies Appropriations Act. For Defense, the bill, now Public Law 115-245, includes \$606.5 billion in base budget funding and \$67.9 billion for Overseas Contingency Operations. On February 15, 2019, the U.S. President signed legislation to fund several U.S. government agencies, including NASA.

The SLS appears to remain a top Congressional priority as the CR included a provision to allow NASA the funding flexibility for SLS and deep exploration to remain on track. The SLS program also has enjoyed wide, bipartisan support in both chambers of Congress. We maintain a strong relationship with NASA and our propulsion systems have been powering NASA launch vehicles and spacecraft since the inception of the U.S. space program. Our booster, upper stage and Orion vehicle propulsion systems are currently baselined on the new SLS vehicle and both upper stage and booster engines are in development for future SLS variants. Due to the retirement of the space shuttle fleet, U.S. astronauts have been dependent on Russian Soyuz flights for access to and from the International Space Station (“ISS”) for the better part of this decade. NASA has been working to re-establish U.S. manned space capability as soon as possible through development of a new “space taxi” to ferry astronauts and cargo to the ISS. In 2014, Boeing’s CST-100 Starliner capsule, powered by Aerojet Rocketdyne propulsion, was selected by NASA to transport astronauts to and from the ISS. As Boeing’s business partner, Aerojet Rocketdyne will be providing the propulsion system for this new capsule, thereby supplementing its work for NASA on the SLS designed for manned deep space exploration. In both instances, we have significant propulsion content and we look forward to supporting these programs for NASA.

Major Customers

Information concerning major customers appears in Part II, Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations under the caption “Major Customers.”

Contract Types

Research and development contracts are awarded during the early stages of a program’s development. Production contracts provide for the production and delivery of mature products for operational use. Aerojet Rocketdyne’s contracts are largely categorized as either “fixed-price” (largely used by the U.S. government for production-type contracts) or “cost-reimbursable” (largely used by the U.S. government for development-type contracts). During 2018, approximately 63% of our net sales were from fixed-price contracts and 37% from cost-reimbursable contracts.

Fixed-price contracts are typically (i) firm fixed-price, (ii) fixed-price-incentive fee, or (iii) fixed-price level of effort contracts. For firm fixed-price contracts, Aerojet Rocketdyne performs work for a fixed price and realizes all of the profit or loss resulting from variations in costs during contract performance. For fixed-price-incentive fee contracts, Aerojet Rocketdyne receives increased or decreased fees (or profits) based upon actual performance against established targets or other criteria. For fixed-price level of effort contracts, Aerojet Rocketdyne generally receives a structured fixed price per labor hour, dependent upon the customer’s labor hour needs. All fixed-price contracts present the risk of unreimbursed cost overruns potentially resulting in lower than expected contract profit margin and losses.

Cost-reimbursable contracts are typically (i) cost plus fixed fee, (ii) cost plus incentive fee, or (iii) cost plus award fee contracts. For cost plus fixed fee contracts, Aerojet Rocketdyne typically receives reimbursement of its costs, to the extent the costs are allowable under contractual and regulatory provisions, in addition to receiving a fixed fee. For cost plus incentive fee contracts and cost plus award fee contracts, Aerojet Rocketdyne receives adjustments to the contract fee, within designated limits, based on actual results as compared with contractual targets for factors such as cost, performance, quality, and schedule.

In addition, OTA contracts are becoming more prevalent in the developmental stages of U.S. government procurements. An OTA is a special vehicle used by federal agencies for obtaining or advancing research and development or prototypes. The U.S. government’s procurement regulations and certain procurement statutes do not apply to OTAs, and accordingly, other transaction authority gives agencies the flexibility necessary to develop agreements tailored to a particular transaction. Our sales and backlog figures do not include work we have under contracts obligated by the customer under an OTA as our share of the contract costs are recognized as company-funded research and development.

Government Contracts and Regulations

U.S. government contracts generally are subject to Federal Acquisition Regulations (“FAR”), agency-specific regulations that supplement FAR, such as the DoD’s Defense Federal Acquisition Regulations, and other applicable laws and regulations. These regulations impose a broad range of requirements, many of which are unique to U.S. government contracting, including various procurement, import and export, security, contract pricing and cost, contract termination and adjustments, mandatory disclosure, and audit requirements. Our failure to comply with these regulations and requirements could result in reductions of the value of contracts, contract modifications or termination, inability to bill and collect receivables from customers, and the assessment of penalties and fines that could lead to suspension or debarment from U.S. government contracting or subcontracting. In addition, as a U.S. government contractor, we are subject to routine audits, reviews, and investigations by the Defense Contract Audit Agency (“DCAA”), the Defense Contract Management Agency, and other similar U.S. government agencies. Such reviews include but are not limited to our contract performance, compliance with applicable laws, regulations, and standards as well as the review of the adequacy of our accounting systems, purchasing systems, property management systems, estimating systems, earned value management systems, and material management and accounting systems.

The U.S. government’s ability to unilaterally modify or terminate a contract or to discontinue funding for a particular program at any time could have a material adverse effect on our operating results, financial condition, and/or cash flows. The cancellation of a contract, if terminated for cause, could also subject us to liability for the excess costs incurred by the U.S. government in procuring undelivered items from another source. If terminated for convenience, our recovery of costs would be limited to amounts already incurred or committed (including severance costs for terminated employees), and our profit would be limited based on the work completed prior to termination.

Additional information about the risks relating to government contracts and regulations appears in “Risk Factors” in Item 1A of this Report.

Backlog

Information concerning backlog appears in Part II, Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations under the caption “Backlog.”

Seasonality

Aerojet Rocketdyne’s business is not subject to predictable seasonality. Primary factors affecting the timing of our sales include the timing of U.S. government awards, the availability of U.S. government funding, contractual product delivery requirements, and customer acceptances.

Research and Development (“R&D”)

We view R&D efforts as critical to maintaining our leadership position in markets in which we compete. Our R&D is primarily supported by customer funding.

Our company-funded R&D efforts include expenditures for technical activities that are vital to the development of new products, services, processes or techniques, as well as those expenses for significant improvements to existing products or processes.

The following table summarizes our R&D expenditures:

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
Customer-funded	\$591.6	\$561.1	\$513.0
Company-funded	46.7	44.6	43.0
Total R&D expenditures	<u>\$638.3</u>	<u>\$605.7</u>	<u>\$556.0</u>

Suppliers and Raw Materials

The national aerospace supply base continues to consolidate due to economic, environmental, and marketplace circumstances beyond our control. The loss of key qualified suppliers of technologies, components, and materials can cause significant disruption to our program performance and cost.

Availability of raw materials and supplies has been generally sufficient. We sometimes are dependent, for a variety of reasons, upon sole-source or qualified suppliers and have, in some instances in the past, experienced difficulties meeting production and delivery obligations because of delays in delivery or reliance on such suppliers. Further, as a U.S. government contractor, we are often limited to procuring materials from certain suppliers capable of meeting rigorous customer and government specifications.

Additional information about the risks relating to suppliers and raw materials appears in “Risk Factors” in Item 1A of this Report.

Intellectual Property

Where appropriate, Aerojet Rocketdyne obtains patents in the U.S. and other countries for new and useful processes, machines, manufactures or compositions of matter, or any new and useful improvements thereof relating to its products and services. Our patents are maintained through the statutory limit of time, which is typically 20 years from the date of filing of the patent application, where the claimed invention has value in the markets in which we compete. We rely on trade secret protection for financial, technical and personnel information that provides an economic competitive advantage by virtue of not being known by the relevant public and ordinarily require employees to sign confidentiality agreements as a condition to employment. If properly protected, trade secrets can be maintained in perpetuity. Aerojet Rocketdyne takes reasonable steps to prevent disclosure of its trade secrets in order to maintain protection under applicable state and federal laws. As our products and services typically embody complex systems that include many technologies, we do not believe any single existing patent, license, or trade secret is material to our success.

Real Estate

We own 11,394 acres of land adjacent to U.S. Highway 50 between Rancho Cordova and Folsom, California east of Sacramento (“Sacramento Land”). Acquired in the early 1950s and historically used for our aerospace and defense operations, large portions were used solely to provide safe buffer zones around hazardous operations. Modern changes in propulsion technology coupled with the relocation of our propulsion operations led us to determine large portions of the Sacramento Land were no longer needed for operations. Consequently, our plan has been to re-entitle the Sacramento Land for new uses and explore various opportunities to optimize its value.

The Sacramento Land is made up of 5,203 acres used for our aerospace and defense operations, 628 acres available for future entitlement, and 5,563 acres for future development under the brand name “Easton”. Easton has 3,904 acres that are fully entitled. The term “entitlement” is generally used to denote the required set of regulatory approvals required to allow land to be zoned for new requested uses. Required regulatory approvals vary with each jurisdiction and each zoning proposal and may include permits, land use master plans, zoning designations, state and federal environmental documentation, and other regulatory approvals unique to the land. The entitlement and development process in California is long and uncertain with

approvals required from various authorities, including local jurisdictions, and in select projects, permits required by federal agencies such as the U.S. Army Corps of Engineers and the U.S. Department of Interior, Fish and Wildlife Service, and others prior to construction.

As Easton continues to execute re-entitlement and pre-development activities, we are pursuing all monetization options and are exploring how to maximize value from Easton. Value creation and monetization may include outright land sales and/or joint ventures with real estate developers, residential builders, and/or other third parties. We believe the long-term prospect for the Sacramento region represents an attractive and affordable alternative to the San Francisco Bay Area and other large metropolitan areas of California.

The following table summarizes the Sacramento Land (in acres):

	<u>Environmentally Unrestricted</u>	<u>Environmentally Restricted (1)</u>	<u>Total</u>	<u>Entitled</u>
Glenborough and Easton Place	1,043	349	1,392	1,392
Rio del Oro	1,818	491	2,309	2,309
Westborough	1,387	272	1,659	—
Hillsborough (2)	51	97	148	148
Office Park and Auto Mall	47	8	55	55
Total Easton acreage	<u>4,346</u>	<u>1,217</u>	<u>5,563</u>	<u>3,904</u>
Operations land	24	5,179	5,203	
Land available for future entitlement (3)	<u>386</u>	<u>242</u>	<u>628</u>	
Total Sacramento Land	<u><u>4,756</u></u>	<u><u>6,638</u></u>	<u><u>11,394</u></u>	

- (1) Indicates land subject to restrictions imposed by state and/or federal regulatory agencies because of our historical propulsion system testing and manufacturing activities. We are actively working with the various regulatory agencies to have the restrictions removed as early as practicable, and the solutions to use these lands within Easton have been accounted for in the various land use plans and granted entitlements. See Note 8(c) in the consolidated financial statements in Item 8 of this Report for a discussion of the federal and/or state environmental restrictions affecting portions of the Sacramento Land.
- (2) The remaining 148 acres designated in Hillsborough will be transferred, per the completed purchase and sale contract from 2015, when the required environmental remediation work is completed.
- (3) We believe it will be several years before any of this excess Sacramento Land is available for future change in entitlement. Some of this excess land is outside the current Urban Services Boundary established by the County of Sacramento and all of it is far from existing infrastructure, making it uneconomical to pursue entitlement for this land at this time.

Leasing & Other Real Estate

We currently lease approximately 0.5 million square feet of office space in Sacramento to various third parties. These leasing activities generated \$6.4 million in revenue in 2018.

We also own approximately 580 acres of land in Chino Hills, California. This property was used for the manufacture and testing of ordnance. With the sale of our ordnance business in the mid-1990s, we closed this facility and commenced clean-up of the site. We continue to work with state regulators and the City of Chino Hills to complete those efforts.

Environmental Matters

Our current and former business operations are subject to, and affected by, federal, state, local, and foreign environmental laws and regulations relating to the discharge, treatment, storage, disposal, investigation, and remediation of certain materials, substances, and wastes. Our policy is to conduct our business with due regard for the preservation and protection of the environment. We continually assess compliance with these regulations, and we believe our current operations are materially in compliance with all applicable environmental laws and regulations.

Under existing U.S. environmental laws, Potentially Responsible Parties (“PRPs”), are jointly and severally liable, and therefore we are potentially liable to the U.S. government or other third parties for the full cost of remediating the contamination at our facilities or former facilities or at third-party sites where we have been designated as a PRP by the Environmental Protection Agency or state environmental agencies. The nature of environmental investigation and cleanup activities requires significant management judgment to determine the timing and amount of any estimated future costs that may be required for remediation measures. Further, environmental standards change from time to time. However, we perform quarterly reviews of these matters and accrue for costs associated with environmental remediation when it becomes probable that a liability has been incurred and the amount of the liability, usually based on proportionate sharing, can be reasonably estimated. These liabilities have not been discounted to their present value as the amounts and timing of cash payments are not fixed or reliably determinable.

On January 12, 1999, we reached a settlement agreement (“Global Settlement”) with the U.S. government covering environmental costs associated with our Sacramento site and our former Azusa site. Pursuant to the Global Settlement, we can

recover up to 88% of our environmental remediation costs through the establishment of prices for Aerojet Rocketdyne's products and services sold to the U.S. government. Additionally, in conjunction with the sale of the Electronics and Information Systems business in 2001, Aerojet Rocketdyne entered into an agreement with Northrop (the "Northrop Agreement") whereby Aerojet Rocketdyne is reimbursed by Northrop for a portion of environmental expenditures eligible for recovery under the Global Settlement, subject to an annual billing limitation of \$6.0 million and a cumulative limitation of \$189.7 million.

Operation and maintenance costs associated with environmental compliance and management of contaminated sites are a normal, recurring part of operations. Most of our environmental costs are incurred by our Aerospace and Defense segment, and certain of these future costs are allowed to be included in our contracts with the U.S. government.

The inclusion of environmental costs in our contracts with the U.S. government impacts our competitive pricing; however, we believe that this impact is mitigated by driving improvements and efficiencies across our operations as well as our ability to deliver innovative and quality products to our customers.

We did not incur material capital expenditures for environmental control facilities in 2018 nor do we anticipate any material capital expenditures in 2019 and 2020. See Management's Discussion and Analysis in Part II, Item 7 "Environmental Matters" of this Report for additional information.

Additional information on the risks related to environmental matters can be found under "Risk Factors" in Item 1A of this Report, including the material effects on compliance with environmental regulations that may impact our competitive position and operating results.

Employees

As of December 31, 2018, 12% of our 5,004 employees were covered by collective bargaining agreements. We believe that our relations with our employees and unions are good.

Item 1A. Risk Factors

Reductions, delays or changes in U.S. government spending, including failure to timely appropriate funding, may reduce, delay or cancel certain programs in which we participate and as a result adversely affect our financial results.

Our primary aerospace and defense customers include the DoD and its agencies, NASA, and the prime contractors that supply products to these customers. We rely on particular levels of U.S. government spending on propulsion systems for defense, space and armament systems for precision tactical weapon systems and munitions applications, and our backlog depends, in a large part, on continued funding by the U.S. government for the programs in which we are involved. These spending levels are not generally correlated with any specific economic cycle, but rather follow the cycle of general public policy and political support for this type of spending. Moreover, although our contracts often contemplate that our services will be performed over a period of several years, the U.S. President must propose and Congress must appropriate funds for a given program each GFY and may significantly change, increase, reduce or eliminate, funding for a program. The failure by Congress to approve future budgets on a timely basis could delay procurement of our products and services and cause us to lose future revenues. If a prolonged government shutdown were to occur, it could result in program cancellations, disruptions and/or stop work orders and could limit the U.S. government's ability to make timely payments, and our ability to perform on our U.S. government contracts.

In addition, a decrease in DoD and/or NASA expenditures, the elimination or curtailment of a material program in which we are involved, or changes in payment patterns of our customers as a result of changes in U.S. government spending, could have a material adverse effect on our operating results, financial condition, and/or cash flows.

The cancellation or material modification of one or more significant contracts could adversely affect our financial results.

Sales, directly and indirectly, to the U.S. government and its agencies accounted for approximately 94% of our total net sales in 2018. Our contracts typically permit the U.S. government to unilaterally modify or terminate a contract or to discontinue funding for a particular program at any time. The cancellation of a contract, if terminated for cause, could also subject us to liability for the excess costs incurred by the U.S. government in procuring undelivered items from another source. If terminated for convenience, our recovery of costs would be limited to amounts already incurred or committed (including severance costs for terminated employees), and our profit would be limited based on the work completed prior to termination.

In addition, termination or suspension of any of our significant commercial contracts could result in the loss of future sales and unreimbursable expenses that could have a material adverse effect on our operating results, financial condition, and/or cash flows. Furthermore, the termination of any such contracts for default could also have a material adverse effect on our reputation and ability to obtain new business in the future.

If we experience cost overruns on our contracts, we would have to absorb the excess costs which could adversely affect our financial results and our ability to win new contracts.

In 2018, approximately 63% of our net sales were from fixed-price contracts, most of which are in mature production mode. Under fixed-price contracts, we agree to perform specified work for a fixed price and realize all of the profit or loss resulting from variations in the costs of performing the contract. As a result, all fixed-price contracts involve the inherent risk of unreimbursed cost overruns. To the extent we incur unanticipated cost overruns on a program or platform subject to a fixed-price contract, our profitability would be adversely affected. Future profitability is subject to risks including the ability of

suppliers to deliver components of acceptable quality on schedule and the successful implementation of automated tooling in production processes.

In 2018, approximately 37% of our net sales were from cost reimbursable contracts. Under cost reimbursable contracts, we agree to be reimbursed for allowable costs and paid a fee. If our costs are in excess of the final target cost, fees and our margin may be adversely affected. If our costs exceed authorized contract funding or do not qualify as allowable costs under applicable regulations, those costs are expensed, and we will not be reimbursed for those costs. Cost overruns may adversely affect our financial performance and our ability to win new contracts.

Also, certain costs such as those related to charitable contributions, advertising, interest expense, and public relations are generally not allowable, and therefore not recoverable through U.S. government contracts. Unexpected variances in unallowable costs may adversely affect our financial performance.

If our subcontractors or suppliers fail to perform their contractual obligations, our contract performance and our ability to win new contracts may be adversely affected.

We rely on subcontractors to perform a portion of the services we agree to provide our customers, and on suppliers to provide raw materials and component parts for our contract performance. A failure by one or more of our subcontractors or suppliers to satisfactorily provide on a timely basis the agreed-upon services or supplies may affect our ability to perform our contractual obligations. Deficiencies in the performance of our subcontractors and/or suppliers could result in liquidated damages or our customer terminating our contract for default. A termination for default could expose us to liability and adversely affect our financial performance and our ability to win new contracts.

Our success and growth in our Aerospace and Defense segment depends on our ability to execute long-standing programs and periodically secure new contracts in a competitive environment.

Aerojet Rocketdyne's revenue is primarily derived from long-standing contracts (often sole source) where Aerojet Rocketdyne is the long-term incumbent. The challenge for Aerojet Rocketdyne is to successfully utilize its technical, engineering, manufacturing, and management skills to execute these programs for the customer, to continue to innovate and refine its solutions, and to offer the customer increasing affordability in an era of fiscal restraint. If Aerojet Rocketdyne is unable to successfully execute these long-standing programs, our ability to retain existing customers and attract new customers may be impaired.

In addition, in sectors where there is competition, it can be intense. For example, we face increasing competition from entrepreneurs such as SpaceX and Blue Origin, who have been or are in the process of developing liquid fuel propulsion capabilities which are primarily focused on the development of space propulsion systems for heavy lift launch vehicles. These new entrepreneurs have signaled their intent to compete primarily on price and are therefore bringing pressure to bear on existing cost paradigms and our manufacturing methodologies. The U.S. government also has its own manufacturing capabilities in some areas. We may be unable to compete successfully with our competitors and our inability to do so could result in a decrease in sales, profits, and cash flows that we historically have generated from certain contracts. Further, the U.S. government may open to competition programs on which we are currently the sole supplier, which could have a material adverse effect on our operating results, financial condition, and/or cash flows.

Our Aerospace and Defense segment is subject to procurement and other related laws and regulations inherent in contracting with the U.S. government, and non-compliance could adversely affect our financial results.

In the performance of contracts with the U.S. government, we operate in a highly regulated environment and are routinely audited and reviewed by the U.S. government and its agencies, such as the DCAA. 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, and our compliance with, our internal control systems and policies. Systems that are subject to review include, but are not limited to, our accounting systems, purchasing systems, property management systems, estimating systems, earned value management systems, and material management and accounting system. Any 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 or suspension or debarment from doing business with the U.S. government. Whether or not illegal activities are alleged, the U.S. government also has the ability to decrease or withhold certain payments when it deems systems subject to its review to be inadequate. In addition, we could suffer serious reputational harm if allegations of impropriety were made against us. If such actions were to result in suspension or debarment, this could have a material adverse effect on our business.

These laws and regulations provide for ongoing audits and reviews of incurred costs as well as contract procurement, performance and administration. The U.S. government may, if it deems appropriate, conduct an investigation into possible illegal or unethical activity in connection with these contracts. Investigations of this nature are common in the aerospace and defense industry, and lawsuits may result. In addition, the U.S. government and its principal prime contractors periodically investigate the financial viability of their contractors and subcontractors as part of its risk assessment process associated with the award of new contracts. If the U.S. government or one or more prime contractors were to determine that we were not financially viable, our ability to continue to act as a U.S. government contractor or subcontractor would be impaired.

The release, unplanned ignition, explosion, or improper handling of dangerous materials used in our business could disrupt our operations and adversely affect our financial results.

Our business operations involve the handling, production, and disposition of potentially explosive and ignitable energetic materials and other dangerous chemicals, including motors and other materials used in rocket propulsion. The handling,

production, transport, and disposition of hazardous materials could result in incidents that temporarily shut down or otherwise disrupt our manufacturing operations and could cause production delays. It is possible that a release of these chemicals or an unplanned ignition or explosion could result in death or significant injuries to employees and others. Material property damage to us and third parties could also occur. The use of these products in applications by our customers could also result in liability if an explosion, unplanned ignition or fire were to occur. Extensive regulations apply to the handling of explosive and energetic materials, including but not limited to, regulations governing hazardous substances and hazardous waste. The failure to properly store and ultimately dispose of such materials could create significant liability and/or result in regulatory sanctions. Any release, unplanned ignition or explosion could expose us to adverse publicity or liability for damages or cause production delays, any of which could have a material adverse effect on our operating results, financial condition, and/or cash flows.

Our Competitive Improvement Program (“CIP”) may not be successful in aligning our operations to current market conditions.

During 2015, we initiated the first phase (“Phase I”) of our CIP comprised of activities and initiatives aimed at reducing costs in order for us to continue to compete successfully. Phase I is comprised of three major components: (i) facilities optimization and footprint reduction; (ii) product affordability; and (iii) reduced administrative and overhead costs. On April 6, 2017, the Board of Directors approved the second phase (“Phase II”) of our previously announced CIP. Pursuant to Phase II, we expanded CIP and further consolidated our Sacramento, California, and Gainesville, Virginia sites, while centralizing and expanding our existing presence in Huntsville, Alabama. We have incurred and will continue to incur significant expenditures to implement the CIP. The CIP may not be successful in achieving anticipated future cost savings and other benefits within the expected timeframes, may be insufficient to successfully restructure our operations through, among other ways, the relocation of programs or the inability to transition institutional program knowledge, to conform with the changes affecting our industry, may disrupt our operations, or may be more costly than currently anticipated. See additional information in Note 11 in the consolidated financial statements in Item 8 of this Report.

Our pension plans are currently underfunded and we expect to be required to make cash contributions in future periods, which may reduce the cash available for our businesses.

As of the last measurement date at December 31, 2018, the pension assets, projected benefit obligations, and unfunded pension obligation were \$894.8 million, \$1,288.7 million, and \$393.9 million, respectively. We expect to make cash contributions of approximately \$37.0 million to our tax-qualified defined benefit pension plan in 2019. During 2018, we made cash contributions of \$36.7 million to our tax-qualified defined benefit pension plan of which \$36.1 million was recoverable from our U.S. government contracts in 2018 with the remaining \$0.6 million expected to be recoverable from our U.S. government contracts in the future. We generally are able to recover cash contributions related to our tax-qualified defined benefit pension plan as allowable costs on our U.S. government contracts, but there can be differences between when we contribute cash to our tax-qualified defined benefit pension plan under pension funding rules and recover it under Cost Accounting Standards (“CAS”).

The funded status of our pension plans may be adversely affected by the investment experience of the plans’ assets, by any changes in U.S. law and by changes in the statutory interest rates used by tax-qualified pension plans in the U.S. to calculate funding requirements. Accordingly, if the performance of our plans’ assets does not meet our assumptions, if there are changes to the Internal Revenue Service (“IRS”) regulations or other applicable law or if other actuarial assumptions are modified, our future contributions to our underfunded pension plans could be higher than we expect.

Additionally, the level of returns on retirement benefit assets, changes in interest rates, increases in Pension Benefit Guaranty Corporations premiums, changes in regulations, changes in mortality rate assumptions, and other factors affect our financial results. The timing of recognition of retirement benefit expense or income in our financial statements differs from the timing of the required funding under the Pension Protection Act or the amount of funding that can be recorded in our overhead rates through our U.S. government contracting business. Significant cash contributions in future periods could materially adversely affect our business, operating results, financial condition, and/or cash flows.

The level of returns on retirement benefit assets, changes in interest rates, changes in legislation, and other factors affect our financial results.

Our earnings are positively or negatively impacted by the amount of expense or income we record for our employee retirement benefit plans. We calculate the expense for the plans based on actuarial valuations. These valuations are based on assumptions that we make relating to financial market and other economic conditions. Changes in key economic indicators result in changes in the assumptions we use. The key assumptions used to estimate retirement benefit expense for the following year are the discount rate and expected long-term rate of return on assets. Our pension expense or income can also be affected by legislation and other government regulatory actions.

We may expand our operations through acquisitions, which may divert management's attention and expose us to unanticipated liabilities and costs. Also, acquisitions may increase our non-reimbursable costs. We may experience difficulties integrating any acquired operations, and we may incur costs relating to acquisitions that are never consummated.

Our business strategy may lead us to expand our Aerospace and Defense segment through acquisitions. However, our ability to consummate any future acquisitions on terms that are favorable to us may be limited by U.S. government regulations, the number of attractive acquisition targets, internal demands on our resources, and our ability to obtain financing. Our success in integrating newly acquired businesses will depend upon our ability to retain key personnel, avoid diversion of management's attention from operational matters, implement internal controls, integrate general and administrative services and key information processing systems and, where necessary, re-qualify our customer programs. In addition, future acquisitions could result in the incurrence of additional debt, costs, and/or contingent liabilities. We may also incur costs and divert management attention to acquisitions that are never consummated. Integration of acquired operations may take longer, or be more costly or disruptive to our business, than originally anticipated.

Although we undertake a due diligence investigation of each business that we have acquired or may acquire, there may be liabilities of the acquired companies that we fail to, or were unable to, discover during the due diligence investigation and for which we, as a successor owner, may be responsible. Our efforts to minimize the impact of these types of potential liabilities through indemnities and warranties from sellers in connection with acquisitions may not fully cover the liabilities due to limitations in scope, amount or duration, financial limitations of the indemnitor or warrantor, or other reasons.

Cyber security incidents could disrupt business operations, result in the loss of critical and confidential information, and adversely impact our reputation and results of operations.

We routinely experience cyber security threats, threats to our information technology infrastructure and unauthorized attempts to gain access to our sensitive information, as do our customers, suppliers, subcontractors, and other partners. We may experience similar security threats at customer sites that we operate and manage as a contractual requirement. The threats we face vary from attacks common to most industries to more advanced and persistent, highly organized adversaries who target us and other defense and aerospace companies because we protect national security information. If we are unable to protect sensitive information, our customers or governmental authorities could question the adequacy of our threat mitigation and detection processes and procedures. The costs related to cyber or other security threats or disruptions may not be fully insured or indemnified by other means. The occurrence of any of these events could adversely affect our internal operations, the services we provide to our customers, our future financial results, our reputation or our stock price, or such events could result in the loss of competitive advantages derived from our research and development efforts or other intellectual property, early obsolescence of our products and services, or contractual penalties.

Due to the evolving nature of these security threats, the impact of any future incident cannot be predicted. Cyber security assessment analyses undertaken by us to identify and prioritize steps to enhance our cyber security safeguards, and our steps to implement such recommendations can be no assurance that we will adequately protect our information or that we will not experience any future successful attacks. Moreover, we may be required to expend significant additional resources to modify our cyber security protective measures, to investigate and remediate vulnerabilities or other exposures or to make required notifications, and we may be subject to litigation and financial losses.

Our business and operations could be adversely impacted in the event of a failure of our information technology infrastructure or failure to perform by our third party service providers.

We are dependent on various critical information technologies, including cyber security functions, administered and supported by third party service providers. The use of third party service providers can cause unexpected security vulnerabilities, loss of control and additional costs in the delivery of information services and data storage. Any disruption of our information technology infrastructure may cause operational stoppages, fines, penalties, diminished competitive advantages through reputational damages and increased operational costs. Additionally, we may incur additional costs to comply with our customers', including the U.S. government's, increased cyber security protections and standards in our products.

We may experience warranty claims for product failures, schedule delays or other problems with existing or new products and systems.

Many of the products we develop and manufacture are technologically advanced systems that must function under demanding operating conditions. Even though we believe that we employ sophisticated and rigorous design, manufacturing and testing processes and practices, we may not be able to successfully launch or manufacture our products on schedule or our products may not perform as intended.

If our products fail to perform adequately, some of our contracts require us to forfeit a portion of our expected profit, receive reduced payments, provide a replacement product or service or reduce the price of subsequent sales to the same customer. Performance penalties may also be imposed if we fail to meet delivery schedules or other measures of contract performance. We do not generally insure against potential costs resulting from any required remedial actions or costs or loss of sales due to postponement or cancellation of scheduled operations or product deliveries.

Disruptions in the supply of key raw materials, difficulties in the supplier qualification process or increases in prices of raw materials could adversely affect our financial results.

We use a significant quantity of raw materials that are subject to market fluctuations and government regulations. Further, as a U.S. government contractor, we are often required to procure materials from suppliers capable of meeting rigorous

customer and government specifications. As market conditions change for these companies, they often discontinue materials with low sales volumes or profit margins. We are often forced to either qualify new materials or pay higher prices to maintain the supply. We may be unable to establish replacement materials and secure customer funding to address specific qualification needs of the programs.

The supply of ammonium perchlorate, a principal raw material used in solid propellant, for many years, has been limited to a domestic independent single source that supplies the majority of the domestic solid propellant industry and actual pricing is based on the total industry demand. The completion of the Space Shuttle Program reduced demand, resulting in significant unit price increases. Although many of our contracts and proposals incorporate abnormal escalation pricing language, we may not be successful in passing the entire price increase on to the customer or may have a reduced profit margin as a result of any such price increase.

We are also impacted, as is the rest of the industry, by fluctuations in the sustained availability, prices and lead-times of raw materials used in production on various fixed-price contracts, particularly on multi-year programs. We continue to experience volatility in the price and lead-times of certain commodity metals, electronic components, and constituent chemicals. Additionally, we may not be able to continue to negotiate with our customers for economic and/or price adjustment clauses tied to obsolete materials and commodity indices to reduce program impact. The DoD also continues to rigorously enforce the provisions of the “Berry Amendment” which imposes a requirement to procure certain strategic materials critical to national security only from U.S. sources. Cost remains a concern as this industry continues to quote “price in effect” at time of shipment terms, increasing the cost risk to our programs. An emerging challenge to the extended supply chain is U.S. government contracting regulations to comply with stringent cyber security regulations that may influence the cost of material and services on U.S. government contracts. Further, a relatively recent Missile Defense Agency (“MDA”) requirement to pre-approve supplier background screening processes of personnel that will have access to “controlled unclassified information” and separately approve any supplier personnel with dual citizenship has been challenging due to delays at MDA in approving requests which will potentially impact the award of subcontracts while approval is pending. Cyber security requirements will prove to be a continuing challenge as some small key/critical suppliers do not have the capability or infrastructure to support the requirements.

We are monitoring for significant changes across our supply chain due to increased tariffs on materials imported directly, or significant effects on domestic materials indirectly, we are monitoring for increases in anticipation.

Prolonged disruptions in the supply of any of our key raw materials, difficulty qualifying new sources of supply, implementing use of replacement materials or new sources of supply, and/or a continuing volatility in the prices of raw materials could have a material adverse effect on our operating results, financial condition, and/or cash flows.

Our operations and properties are currently the subject of significant environmental liabilities, and the numerous environmental and other government requirements to which we are subject may become more stringent in the future.

We are subject to federal, state, local, and foreign environmental laws and regulations that, among other things, require us to obtain permits to operate and install pollution control equipment and regulate the generation, storage, handling, transportation, treatment, and disposal of hazardous and solid wastes. These requirements may become more stringent in the future. Additional regulations dictate how and to what level we remediate contaminated soils and the level to which we are required to clean contaminated groundwater. These requirements may also become more stringent in the future. We may also be subject to fines and penalties relating to the operation of our existing and formerly owned businesses. We have been and are subject to toxic tort and asbestos lawsuits as well as other third-party lawsuits, due to either our past or present use of hazardous substances or the alleged on-site or off-site contamination of the environment through past or present operations. We may incur material costs in defending these claims and lawsuits and any similar claims and lawsuits that may arise in the future. Contamination at our current and former properties is subject to investigation and remediation requirements under federal, state and local laws and regulations, and the full extent of the required remediation has not yet been determined. Any adverse judgment or cash outlay could have a significant adverse effect on our operating results, financial condition, and/or cash flows.

Although some of our environmental expenditures may be recoverable and we have established reserves, given the many uncertainties involved in assessing liability for environmental claims, our reserves may not be sufficient, which could adversely affect our financial results and cash flows.

As of December 31, 2018, the aggregate range of our estimated future environmental obligations was \$327.9 million to \$472.1 million and the accrued amount was \$327.9 million. In many cases the nature and extent of the required remediation has not yet been determined. Given the many uncertainties involved in assessing liability for environmental claims, our reserves may prove to be insufficient. For example, in 2016, we reached a decision with the U.S. government on the treatment of certain utility costs related to the Sacramento site resulting in a reserve increase of \$59.4 million. The reserves are based only on known sites and the known contamination at those sites. It is possible that additional sites needing remediation may be identified or that unknown contamination at previously identified sites may be discovered. It is also possible that the regulatory agencies may change clean-up standards for chemicals of concern such as ammonium perchlorate and trichloroethylene. This could lead to additional expenditures for environmental remediation in the future and, given the uncertainties involved in assessing liability for environmental claims, our reserves may prove to be insufficient.

Most of our environmental costs are incurred by our Aerospace and Defense segment, and certain of these future costs are allowable to be included in our contracts with the U.S. government. We currently estimate approximately 12% of our Aerospace and Defense segment environmental costs will not likely be reimbursable.

Our environmental expenses related to non-Aerojet Rocketdyne sites are generally not recoverable and a significant increase in these estimated environmental expenses could have a significant adverse effect on our operating results, financial condition, and/or cash flows.

We face certain significant risk exposures and potential liabilities that may not be adequately covered by indemnity or insurance.

A significant portion of our business relates to developing and manufacturing propulsion systems for defense and space applications, armament systems for precision tactical weapon systems, and munitions applications. New technologies may be untested or unproven. In addition, we may incur significant liabilities that are unique to our products and services. In some, but not all, circumstances, we may receive indemnification from the U.S. government but there is no guarantee such indemnification will sufficiently cover our liability. While we maintain insurance for certain risks, the amount of our insurance coverage may not be adequate to cover all claims or liabilities, and it is not possible to obtain insurance to protect against all operational risks and liabilities. Accordingly, we may be forced to bear substantial costs resulting from risks and uncertainties of our business, which could have a material adverse effect on our operating results, financial condition, and/or cash flows.

Our inability to protect our trade secrets, patents and proprietary rights could adversely affect our businesses' prospects and competitive positions.

We seek to protect proprietary technology and inventions through patents and other proprietary-right protection. If we are unable to obtain or maintain these protections, we may not be able to prevent third parties from using our proprietary rights. In addition, we may incur significant expense in protecting our intellectual property.

We also rely on trade secrets, proprietary know-how and continuing technological innovation to remain competitive. We have taken measures to protect our trade secrets and know-how, including the use of confidentiality agreements with our employees, consultants and advisors. These agreements may be breached and remedies for a breach may not be sufficient to compensate us for damages incurred. We generally control and limit access to our product documentation and other proprietary information. Other parties may independently develop our know-how or otherwise obtain access to our technology.

Business disruptions could seriously affect us.

Our business may be affected by disruptions including, but not limited to: threats to physical security of our facilities and employees, including senior executives; terrorist acts; information technology attacks or failures; damaging weather or other acts of nature; and pandemics or other public health crises. The costs related to these events may not be fully mitigated by insurance or other means. Disruptions could affect our internal operations or services provided to customers, which could have a material adverse effect on our operating results, financial condition, and/or cash flows.

If our operating subsidiaries do not generate sufficient cash flow or if they are not able to pay dividends or otherwise distribute their cash to us, or if we have insufficient funds on hand, we may not be able to service our debt.

All of the operations of our Aerospace and Defense and Real Estate segments are conducted through subsidiaries. Consequently, our cash flow and ability to service our debt obligations will be largely dependent upon the earnings and cash flows of our operating subsidiaries and the distribution of those earnings to us, or upon loans, advances or other payments made by these subsidiaries to us. The ability of our subsidiaries to pay dividends or make other payments or advances to us will depend upon their operating results and cash flows and will be subject to applicable laws and any contractual restrictions contained in the agreements governing their debt, if any.

We have a substantial amount of debt. Our ability to operate is limited by the agreements governing our debt.

We have a substantial amount of debt for which we are required to make interest and principal payments. Interest on long-term financing is not a recoverable cost under our U.S. government contracts. As of December 31, 2018, we had \$672.8 million of debt principal. Subject to the limits contained in some of the agreements governing our outstanding debt, we may incur additional debt in the future. Our maintenance of higher levels of indebtedness could have adverse consequences including impairing our ability to obtain additional financing in the future.

Our level of debt places significant demands on our cash resources, which could:

- make it more difficult to satisfy our outstanding debt obligations;
- require us to dedicate a substantial portion of our cash for payments related to our debt, reducing the amount of cash flow available for working capital, capital expenditures, entitlement of our real estate assets, contributions to our tax-qualified pension plan, and other general corporate purposes;
- limit our flexibility in planning for, or reacting to, changes in the industries in which we compete;
- place us at a competitive disadvantage with respect to our competitors, some of which have lower debt service obligations and greater financial resources than we do;
- limit our ability to borrow additional funds;
- limit our ability to expand our operations through acquisitions; and
- increase our vulnerability to general adverse economic and industry conditions.

If we are unable to generate sufficient cash flow to service our debt and fund our operating costs, our liquidity may be adversely affected.

We are obligated to comply with financial and other covenants outlined in our debt indentures and agreements that could restrict our operating activities. A failure to comply could result in a default which would, if not waived by the lenders, likely would come with substantial cost and accelerate the payment of our debt.

Our debt instruments generally contain various restrictive covenants which include, among others, provisions which may restrict our ability to:

- access the full amount of our revolving credit facility and/or incur additional debt;
- enter into certain leases;
- make certain distributions, investments, and other restricted payments;
- cause our restricted subsidiaries to make payments to us;
- enter into transactions with affiliates;
- create certain liens;
- purchase assets or businesses;
- sell assets and, if sold, retain excess cash flow from these sales; and
- consolidate, merge or sell all or substantially all of our assets.

Our secured debt also contains other customary covenants, including, among others, provisions restricting our ability to pledge assets or create other liens. In addition, certain covenants in our bank facility require that we maintain certain financial ratios.

Based on our existing debt agreements, we were in compliance with our financial and non-financial covenants as of December 31, 2018. Any of the covenants described in this risk factor may restrict our operations and our ability to pursue potentially advantageous business opportunities. Our failure to comply with these covenants could result in an event of default that, if not cured or waived, could result in the acceleration of our amended and restated senior credit facility entered into on September 20, 2018, (the “Senior Credit Facility”) with the lenders identified therein and Bank of America, N.A., as administrative agent and the 2.25% Convertible Senior Notes (“2 ¼% Notes”). In addition, our failure to pay principal and interest when due is a default under the Senior Credit Facility, and in certain cases, would cause cross defaults on the 2 ¼% Notes.

The real estate market involves significant risk, which could adversely affect our financial results.

Our real estate activities involve significant risks, which could adversely affect our financial results. We are subject to various risks, including the following:

- we may be unable to obtain, or suffer delays in obtaining, necessary re-zoning, land use, building, occupancy, and other required governmental permits and authorizations, which could result in increased costs or our abandonment of these projects;
- we may be unable to complete environmental remediation or to have state and federal environmental restrictions on our property lifted, which could cause a delay or abandonment of these projects;
- we may be unable to obtain sufficient water sources to service our projects, which may prevent us from executing our plans;
- our real estate activities may require significant expenditures and we may not be able to obtain financing on favorable terms, which may render us unable to proceed with our plans;
- economic and political uncertainties could have an adverse effect on consumer buying habits, construction costs, availability of labor and materials and other factors affecting us and the real estate industry in general;
- our property is subject to federal, state, and local regulations and restrictions that may impose significant limitations on our plans;
- much of our property is raw land that includes the natural habitats of various endangered or protected wildlife species requiring mitigation;
- if our land use plans are approved by the appropriate governmental authorities, we may face lawsuits from those who oppose such plans (such lawsuits and the costs associated with such opposition could be material and have an adverse effect on our ability to sell property or realize income from our projects); and
- the time frame required for approval of our plans means that we will have to wait years for a significant cash return.

Substantially all of our excess real estate, that we are in the process of entitling for new opportunities, is located in Sacramento County, California, making us vulnerable to changes in economic and other conditions in that particular market.

As a result of the geographic concentration of our properties, our long-term real estate performance and the value of our properties will depend upon conditions in the Sacramento region, including:

- the sustainability and growth of industries located in the Sacramento region;
- the financial strength and spending of the State of California;

- local real estate market conditions;
- changes in neighborhood characteristics;
- changes in interest rates; and
- real estate tax rates.

If unfavorable economic or other conditions continue in the region, our plans and business strategy could be adversely affected.

We may incur additional costs related to past or future divestitures, which could adversely affect our financial results.

In connection with our divestitures in prior periods, we have incurred and may incur additional costs. As part of our divestitures, we have provided customary indemnification to the purchasers for such matters as claims arising from the operation of the businesses prior to disposition, including income tax matters and the liability to investigate and remediate certain environmental contamination existing prior to disposition. These additional costs and the indemnification of the purchasers of our former or current businesses may require additional cash expenditures, which could have a material adverse effect on our operating results, financial condition, and/or cash flows.

In order to be successful, we must attract and retain key employees.

Our business has a continuing need to attract large numbers of skilled personnel, including personnel holding security clearances, to support the growth of the enterprise and to replace individuals who have terminated employment due to retirement or for other reasons. To the extent that the demand for qualified personnel exceeds supply, we could experience higher labor, recruiting, or training costs in order to attract and retain such employees, or could experience difficulties in performing under our contracts if our needs for such employees were unmet. In addition, our inability to appropriately plan for the transfer or replacement of appropriate intellectual capital and skill sets critical to us could result in business disruptions and impair our ability to achieve business objectives.

A strike or other work stoppage, or our inability to renew collective bargaining agreements on favorable terms, could adversely affect our financial results.

As of December 31, 2018, 12% of our 5,004 employees were covered by collective bargaining agreements. In the future, if we are unable to negotiate acceptable new agreements with the unions, upon expiration of the existing contracts, we could experience a strike or work stoppage. Even if we are successful in negotiating new agreements, the new agreements could call for higher wages or benefits paid to union members, which would increase our operating costs and could adversely affect our profitability. If our unionized workers were to engage in a strike or other work stoppage, or other non-unionized operations were to become unionized, we could experience a significant disruption of operations at our facilities or higher ongoing labor costs. A strike or other work stoppage in the facilities of any of our major customers or suppliers could also have similar effects on us.

Due to the nature of our business, our sales levels may fluctuate causing our quarterly operating results to fluctuate.

Our quarterly and annual sales are affected by a variety of factors that may lead to significant variability in our operating results. In our Aerospace and Defense segment, sales earned under long-term contracts are recognized either on a cost basis, when deliveries are made, or when contractually defined performance milestones are achieved. The timing of deliveries or milestones may fluctuate from quarter to quarter. In our Real Estate segment, sales of land may be made from time to time, which may result in variability in our operating results and cash flows.

Failure to maintain effective internal controls in accordance with the Sarbanes-Oxley Act could negatively impact the market price of our common stock.

Effective internal controls are necessary for us to provide reliable financial reports and to effectively prevent fraud. We rely on numerous manual processes to manage our business, which increases our risk of having an internal control failure. The SEC, as directed by Section 404 of the Sarbanes-Oxley Act of 2002, adopted rules requiring public companies to include a report by management on the effectiveness of our internal control over financial reporting in our Annual Reports on Form 10-K. In addition, our independent registered public accounting firm must report on the effectiveness of the internal control over financial reporting. Although we review our internal control over financial reporting in order to ensure compliance with the Section 404 requirements, if we or our independent registered public accounting firm is not satisfied with our internal control over financial reporting or the level at which these controls are documented, designed, operated or reviewed, or if our independent registered public accounting firm interprets the requirements, rules and/or regulations differently from our interpretation, then they may issue a report that is qualified. This could result in an adverse reaction in the financial marketplace due to a loss of investor confidence in the reliability of our financial statements, which ultimately could negatively impact our stock price.

In addition, we have in the past recorded, and may in the future record, revisions or out of period adjustments to our consolidated financial statements. In making such adjustments, we apply the analytical framework of SEC Staff Accounting Bulletin (“SAB”) No. 99, “Materiality” (“SAB 99”) and SEC SAB No. 108 “Considering the Effects of Prior Year Misstatements when Quantifying Misstatements in Current Year Financial Statements”, to determine whether the effect of any adjustment to our consolidated financial statements is material and whether such adjustments, individually or in the aggregate, would require us to restate our consolidated financial statements for previous periods. Under SAB 99, companies are required to apply quantitative and qualitative factors to determine the “materiality” of particular adjustments. In the future, we may identify further errors impacting our interim or annual consolidated financial statements. Depending upon the complete qualitative and quantitative analysis, this could result in us restating previously issued consolidated financial statements.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

Significant operating, manufacturing, research, design, and/or marketing locations are set forth below.

Facilities

Corporate Headquarters

Aerojet Rocketdyne Holdings, Inc.
222 N. Pacific Coast Highway, Suite 500
El Segundo, California 90245

Operating/Manufacturing/Research/Design/Marketing Locations

Aerospace and Defense

El Segundo, California*

Operating/Design/Manufacturing Facilities:

Camden, Arkansas (owned and leased);
Carlstadt, New Jersey*; Chatsworth,
California (owned and leased); Hancock
County, Mississippi*; Huntsville, Alabama*;
Jonesborough, Tennessee**; Orange,
Virginia; Orlando, Florida*; Rancho Cordova,
California; Redmond, Washington; West
Palm Beach, Florida*

Marketing/Sales Offices:

Arlington, Virginia*

Real Estate

Rancho Cordova, California

* Indicates a leased property.

** Owned and operated by Aerojet Ordnance Tennessee, Inc., a 100% owned subsidiary of Aerojet Rocketdyne.

We believe each of the facilities is suitable and adequate for the business conducted at that facility taking into account current and planned future needs.

Item 3. Legal Proceedings

The Company and its subsidiaries are subject to legal proceedings, including litigation in U.S. federal and state courts, which arise out of, and are incidental to, the ordinary course of the Company's on-going and historical businesses. The Company is also subject from time to time to suits under the federal False Claims Act, known as "qui tam" actions, and to governmental investigations by federal and state agencies. The Company cannot predict the outcome of such proceedings with any degree of certainty. Loss contingency provisions are recorded for probable losses at management's best estimate of a loss. When only a range of amounts can be reasonably estimated and no amount within the range is more likely than another, the low end of the range is recorded. These estimates are often initially developed substantially earlier than when the ultimate loss is known, and are refined each quarterly reporting period as additional information becomes available.

Asbestos Litigation

The Company has been, and continues to be, named as a defendant in lawsuits alleging personal injury or death due to exposure to asbestos in building materials, products, or in manufacturing operations. The majority of cases are pending in Illinois state courts. There were 60 asbestos cases pending as of December 31, 2018.

Given the lack of any significant consistency to claims (i.e., as to product, operational site, or other relevant assertions) filed against the Company, the Company is generally unable to make a reasonable estimate of the future costs of pending claims or unasserted claims. As of December 31, 2018, the Company has accrued an immaterial amount related to pending claims.

The aggregate settlement costs and legal and administrative fees associated with asbestos cases were immaterial for 2018, 2017, and 2016.

United States ex. rel. Markus vs. Aerojet Rocketdyne Holdings

The Company responded to a civil investigative demand issued by the Department of Justice ("DOJ") in the three months ended March 31, 2017, requesting information relating to allegations under the False Claims Act that the Company may have previously made false representations to the U.S. government regarding the Company's compliance with certain regulatory cybersecurity requirements. In the three months ended June 30, 2018, the DOJ completed its review and declined to intervene in a case filed against the Company and Aerojet Rocketdyne in the U.S. District Court, Eastern District of California, originally filed under seal on September 13, 2017. The case is captioned *United States ex. rel. Markus vs. Aerojet Rocketdyne Holdings, Inc. et al., Case No. 2:15-CV-02245-WBS-AC*. The complaint alleges causes of action based on false claims, retaliation, and wrongful termination of employment and seeks injunctive relief, civil penalties, and compensatory and punitive damages. The relator has continued to pursue the claim and the Company continues to vigorously contest the complaint's allegations. The Company has not recorded any liability for this matter as of December 31, 2018.

Item 4. Mine Safety Disclosures

None.

PART II

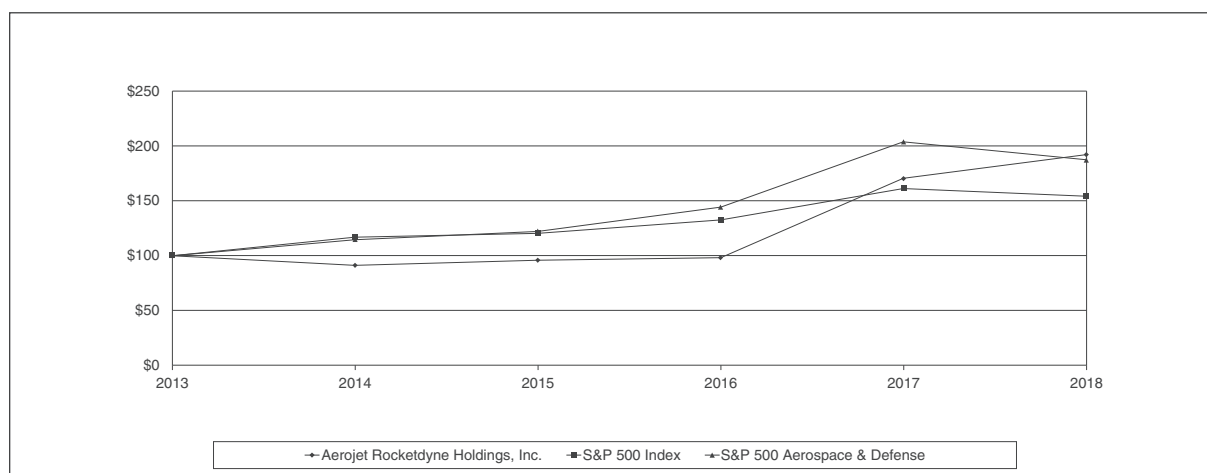
Item 5. *Market for Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities*

As of February 12, 2019, there were 5,820 holders of record of our common stock. Our common stock is listed on the New York Stock Exchange under the trading symbol “AJRD.” On February 12, 2019, the last reported sale price of our common stock on the New York Stock Exchange was \$40.28 per share.

Information concerning long-term debt appears in Part II, Item 7. Management’s Discussion and Analysis of Financial Condition and Results of Operations under the caption “Liquidity and Capital Resources” and in Part II, Item 8. Consolidated Financial Statements and Supplementary Data at Note 6 in the consolidated financial statements. Our Senior Credit Facility restricts the payment of dividends, and we do not anticipate paying cash dividends in the foreseeable future.

Information concerning securities authorized for issuance under our equity compensation plans appears in Part III, Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters under the caption “Equity Compensation Plan Information.” The following graph compares the cumulative total stockholder returns, calculated on a dividend reinvested basis, on \$100 invested in our common stock in November 2013 with the cumulative total return of (i) the Standard & Poor’s 500 Composite Stock Price Index (“S&P 500 Index”), and (ii) the Standard & Poor’s 500 Aerospace & Defense Index. The stock price performance shown on the graph is not necessarily indicative of future performance.

**Comparison of Cumulative Total Stockholder Return Among
Aerojet Rocketdyne, S&P 500 Index, and the S&P 500 Aerospace & Defense Index,
November 2013 through December 2018**



Company/Index	Base Year 2013	Year Ended				
		November 30, 2014	November 30, 2015	December 31, 2016	December 31, 2017	December 31, 2018
Aerojet Rocketdyne Holdings, Inc.	\$100.00	\$ 91.06	\$ 95.64	\$ 97.87	\$170.12	\$192.09
S&P 500 Index	100.00	116.86	120.07	132.31	161.20	154.13
S&P 500 Aerospace & Defense	100.00	114.50	122.08	144.02	203.61	187.18

Item 6. Selected Financial Data

The following selected financial data is qualified by reference to and should be read in conjunction with the consolidated financial statements, including the notes thereto in Item 8. Consolidated Financial Statements and Supplementary Data and Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

	Year Ended					One Month
	December 31, 2018	December 31, 2017	December 31, 2016	November 30, 2015	November 30, 2014	Ended December 31, 2015
	(In millions, except per share amounts)					
Net sales	\$1,895.9	\$1,877.2	\$1,761.3	\$1,708.3	\$1,602.2	\$ 96.3
Net income (loss)	137.3	(9.2)	18.0	(16.2)	(50.0)	7.0
Basic income (loss) per share of common stock	1.80	(0.13)	0.27	(0.27)	(0.86)	0.11
Diluted income (loss) per share of common stock	1.75	(0.13)	0.27	(0.27)	(0.86)	0.10
Supplemental statement of operations information:						
Net income (loss)	\$ 137.3	\$ (9.2)	\$ 18.0	\$ (16.2)	\$ (50.0)	\$ 7.0
Interest expense	34.4	30.9	32.5	50.4	52.7	3.8
Interest income	(10.0)	(3.5)	(0.6)	(0.3)	(0.1)	—
Income tax provision (benefit)	51.3	96.1	11.2	0.3	16.3	2.0
Depreciation and amortization	72.3	72.6	64.9	65.1	63.7	5.1
GAAP retirement benefits expense	57.6	73.2	68.9	67.6	36.5	5.6
CAS recoverable retirement benefits expense	(38.2)	(36.2)	(29.5)	(17.9)	(5.2)	(2.6)
Unusual items	0.2	(1.0)	34.5	51.9	61.7	0.4
Adjusted EBITDAP (Non-GAAP measure)*	<u>\$ 304.9</u>	<u>\$ 222.9</u>	<u>\$ 199.9</u>	<u>\$ 200.9</u>	<u>\$ 175.6</u>	<u>\$ 21.3</u>
Adjusted EBITDAP (Non-GAAP measure) as a percentage of net sales	16.1%	11.9%	11.3%	11.8%	11.0%	22.1%
Net income (loss) as percentage of net sales	7.2%	(0.5)%	1.0%	(0.9)%	(3.1)%	7.3%
Stock-based compensation expense (benefit)	\$ 20.5	\$ 22.0	\$ 12.9	\$ 8.6	\$ 5.7	\$ (0.4)
Environmental remediation provision adjustments	(36.9)	8.2	18.3	17.3	10.8	(0.1)
Cash flow information:						
Cash flow provided by operating activities	\$ 252.7	\$ 212.8	\$ 158.7	\$ 67.6	\$ 151.9	\$ 0.1
Capital Expenditures	(43.2)	(29.4)	(47.6)	(36.8)	(43.4)	(1.2)
Free Cash Flow*	<u>\$ 209.5</u>	<u>\$ 183.4</u>	<u>\$ 111.1</u>	<u>\$ 30.8</u>	<u>\$ 108.5</u>	<u>\$ (1.1)</u>
Balance Sheet information:						
Total assets	\$2,490.1	\$2,258.7	\$2,249.5	\$2,034.9	\$1,918.6	\$2,023.3
Total debt principal	672.8	670.9	725.6	652.0	782.2	650.6

* We provide Non-GAAP measures as a supplement to financial results presented in accordance with GAAP. A reconciliation of the Non-GAAP measures to the most directly comparable GAAP measures is presented later in the Management's Discussion and Analysis under the heading "Use of Non-GAAP Financial Measures."

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following discussion should be read in conjunction with the other sections of this Report, including the consolidated financial statements and notes thereto appearing in Item 8 of this Report, the risk factors appearing in Item 1A of this Report, and the disclaimer regarding forward-looking statements appearing at the beginning of Item 1 of this Report.

Overview

A summary of the significant financial highlights for 2018, which management uses to evaluate our operating performance and financial condition, is presented below.

- Net sales for 2018 totaled \$1,895.9 million compared with \$1,877.2 million for 2017.
- Net income for 2018 was \$137.3 million, or \$1.75 diluted income per share ("EPS"), compared with net loss of \$(9.2) million, or \$(0.13) diluted EPS for 2017.
- Adjusted Net Income (Non-GAAP measure*) for 2018 was \$151.5 million, or \$1.93 Adjusted EPS (Non-GAAP measure*), compared with \$76.0 million, or \$1.02 Adjusted EPS for 2017.
- Adjusted EBITDAP (Non-GAAP measure*) for 2018 was \$304.9 million compared with \$222.9 million for 2017.
- Segment performance before environmental remediation provision adjustments, retirement benefits, net, and unusual items (Non-GAAP measure*) was \$236.2 million for 2018, compared with \$202.9 million for 2017.
- Cash provided by operating activities in 2018 totaled \$252.7 million compared with \$212.8 million in 2017.
- Free cash flow (Non-GAAP measure*) in 2018 totaled \$209.5 million compared with \$183.4 million in 2017.
- Effective January 1, 2018, we adopted the new revenue recognition guidance. Consistent with the standard, net assets increased by \$37.6 million and \$578.0 million of net sales were recognized in the cumulative effect at January 1, 2018, with a corresponding reduction to backlog.
- Total backlog as of December 31, 2018, was \$4.1 billion compared with \$4.6 billion as of December 31, 2017.

* We provide Non-GAAP measures as a supplement to financial results presented in accordance with GAAP. A reconciliation of the Non-GAAP measures to the most directly comparable GAAP measures is presented later in the Management's Discussion and Analysis under the heading "Operating Segment Information" and "Use of Non-GAAP Financial Measures."

In May 2014, the Financial Accounting Standards Board ("FASB") amended the existing accounting standards for revenue recognition. The amendments are based on the principle that revenue should be recognized to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. We adopted the guidance effective January 1, 2018, using the modified retrospective method, with the cumulative effect recognized as of January 1, 2018. All applicable amounts and disclosures for 2018 reflect the impact of adoption. As we elected to use the modified retrospective method, prior periods presented have not been restated to reflect the impact of adoption. Reclassifications have been made where noted for conforming presentation only (see Notes 1(p) and 14 in the consolidated financial statements in Item 8 of this Report).

Our business outlook is affected by both increasing complexity in the global security environment and continuing worldwide economic pressures. A significant component of our strategy in this environment is to focus on delivering excellent performance to our customers, driving improvements and efficiencies across our operations, and creating value through the enhancement and expansion of our business.

Some of the significant challenges we face are as follows: dependence upon U.S. government programs and contracts, future reductions or changes in U.S. government spending in our markets, successful implementation of our cost reduction plans, environmental matters, capital structure, underfunded retirement benefit plans, and information technology and cyber security.

Major Customers

The principal end user customers of our products and technology are primarily agencies of the U.S. government. Since a majority of our sales are, directly or indirectly, to the U.S. government, funding for the purchase of our products and services generally follows trends in U.S. aerospace and defense spending. However, individual U.S. government agencies, which include the military services, NASA, the Missile Defense Agency, and the prime contractors that serve these agencies, exercise independent purchasing power within "budget top-line" limits. Therefore, sales to the U.S. government are not regarded as sales to one customer, but rather each contracting agency is viewed as a separate customer.

The following table summarizes net sales to the U.S. government and its agencies, including net sales to significant customers disclosed below:

<u>Year Ended December 31,</u>	<u>Percentage of Net Sales</u>
2018	94%
2017	92%
2016	91%

The following table summarizes net sales by principal end user in 2018:

NASA	25%
U.S. Air Force	18
U.S. Army	15
Missile Defense Agency	24
U.S. Navy	7
Other U.S. government	<u>5</u>
Total U.S. government customers	94
Other customers	<u>6</u>
Total	<u>100%</u>

The following table summarizes the percentages of net sales for significant programs, all of which are included in the U.S. government sales and are comprised of multiple contracts:

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
RS-25 program	14%	14%	12%
Standard Missile program	13	9	12
THAAD program	11	9	13

The following table summarizes customers that represented more than 10% of net sales, each of which involves sales of several product lines and programs:

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
Lockheed Martin	30%	24%	27%
Raytheon	19	17	20
NASA	18	17	13
ULA	17	22	21

Industry Update

Information concerning our industry appears in Part I, Item 1. Business under the caption “Industry Overview.”

Competitive Improvement Program

During 2015, we initiated Phase I of our CIP comprised of activities and initiatives aimed at reducing costs in order for us to continue to compete successfully. Phase I is comprised of three major components: (i) facilities optimization and footprint reduction; (ii) product affordability; and (iii) reduced administrative and overhead costs. On April 6, 2017, the Board of Directors approved Phase II of our previously announced CIP. Pursuant to Phase II, we expanded CIP and further consolidated our Sacramento, California, and Gainesville, Virginia sites, while centralizing and expanding our existing presence in Huntsville, Alabama. When fully implemented, we anticipate that the CIP will result in annual costs that are \$230 million below levels anticipated prior to CIP.

We currently estimate that we will incur restructuring and related costs of the Phase I and II programs of approximately \$210.0 million (including approximately \$60.5 million of capital expenditures). Our current estimate is down from the initial estimate of \$235.0 million primarily due to efficiencies in program transitions and lower than expected employee costs. We have incurred \$131.4 million of such costs through December 31, 2018, including \$48.1 million in capital expenditures.

Environmental Matters

Our current and former business operations are subject to, and affected by, federal, state, local, and foreign environmental laws and regulations relating to the discharge, treatment, storage, disposal, investigation, and remediation of certain materials, substances, and wastes. See Notes 8(c) and 8(d) in the consolidated financial statements in Item 8 of this Report and “Environmental Matters” below for summary of our environmental reserve activity.

Capital Structure

We have a substantial amount of debt for which we are required to make interest and principal payments. Interest on long-term financing is not a recoverable cost under our U.S. government contracts. As of December 31, 2018, we had \$625.4 million of debt outstanding. In 2018, we entered into an industrial bond transaction with a subsidiary to realize property tax savings.

Retirement Benefits

As of the last measurement date at December 31, 2018, the pension assets, projected benefit obligations, and unfunded pension obligation were \$894.8 million, \$1,288.7 million, and \$393.9 million, respectively. We estimate that 82% of our unfunded pension obligation as of December 31, 2018, is related to our U.S. government contracting business, Aerojet Rocketdyne.

On September 10, 2018, we made a discretionary contribution of 2.7 million treasury stock, or \$95.0 million, of our common stock to our tax-qualified defined benefit pension plan. This voluntary contribution will help address the current underfunding of the tax-qualified defined benefit pension plan. This contribution was tax deductible in the current period and will be used as a pre-funding credit.

We expect to make cash contributions of approximately \$37.0 million to our tax-qualified defined benefit pension plan in 2019. We generally are able to recover cash contributions related to our tax-qualified defined benefit pension plan as allowable costs on our U.S. government contracts, but there can be differences between when we contribute cash to our tax-qualified defined benefit pension plan under pension funding rules and recover it under CAS.

Information Technology and Cyber Security

We routinely experience cyber security threats, threats to our information technology infrastructure and unauthorized attempts to gain access to our sensitive information, as do our customers, suppliers, subcontractors, and other partners. In 2017, we outsourced certain information technology and cyber security functions to third-party contractors in order to take advantage of advanced cyber security technologies. The visibility provided by the additional cyber security technologies identified vulnerabilities and resulted in additional costs to remediate throughout 2018. The transition to the outsourced provider impacted our level of control over the performance and delivery of such service to the business.

We continue to assess our information technology systems and are engaged in cooperative efforts with our customers, suppliers, and subcontractors to seek to minimize the impact of cyber threats, other security threats or business disruptions.

Results of Operations:

Net Sales:

	<u>Year Ended December 31,</u>		<u>Change*</u>	<u>Year Ended December 31,</u>		<u>Change**</u>
	<u>2018</u>	<u>2017</u>		<u>2017</u>	<u>2016</u>	
				<u>(In millions)</u>		
Net sales:	\$1,895.9	\$1,877.2	\$18.7	\$1,877.2	\$1,761.3	\$115.9

* *Primary reason for change.* Net sales were impacted by the adoption of new revenue recognition guidance effective January 1, 2018, using the modified retrospective method. The primary impact of the new guidance was a change in the timing of revenue recognition on certain long-term contracts. Under this new guidance, we discontinued the use of the unit-of-delivery method on certain customer contracts and re-measured the performance obligations using the cost-to-cost method. Net sales in 2018 would have been \$1,910.0 million under the previous revenue recognition guidance which is \$32.8 million higher than net sales reported in 2017, resulting from an increase of \$126.0 million in defense programs primarily driven by increased deliveries on the Standard Missile and PAC-3 programs. The increase in net sales was partially offset by a decrease of \$94.6 million in space programs primarily driven by cost growth and performance issues on the Commercial Crew Development program and lower deliveries on the Atlas V program as this program winds down. The Atlas V program contributed sales of \$42.6 million under the new revenue recognition guidance in 2018, and sales of \$89.1 million under the previous revenue recognition guidance in 2018.

** *Primary reason for change.* The increase in net sales was primarily due to an increase of \$158.0 million in space programs primarily driven by the following (i) the RS-25 program development and integration effort in support of the SLS development program; (ii) increased development effort and volume on the Commercial Crew Development program; and (iii) increased deliveries on the Atlas V program. The increase in net sales was partially offset by a decrease of \$36.5 million in defense programs primarily driven by the timing of deliveries on the THAAD and Standard Missile programs partially offset by the net sales generated from the Coleman Aerospace acquisition. Further, as a result of the 2016 calendar, Aerojet Rocketdyne had 53 weeks of operations in 2016 compared with 52 weeks of operations in 2017. The additional week of operations, which occurred in the fourth quarter of 2016 and accounted for \$32.2 million in additional net sales, is included in the above discussion of program changes.

Cost of Sales (exclusive of items shown separately below):

	Year Ended December 31,			Year Ended December 31,		
	2018	2017	Change*	2017	2016	Change**
	(In millions, except percentage amounts)					
Cost of sales (exclusive of items shown separately below)	\$1,549.4	\$1,562.2	\$(12.8)	\$1,562.2	\$1,477.4	\$84.8
Percentage of net sales	81.7%	83.2%		83.2%	83.9%	

* *Primary reason for change.* The decrease in cost of sales as a percentage of net sales was primarily due to the following: (i) risk retirements on the RS-68 program, (ii) favorable overhead rate performance, and (iii) cost growth and manufacturing inefficiencies in 2017 on electric propulsion contracts. These factors were partially offset by cost growth and performance issues in the current period on the Commercial Crew Development program and favorable contract performance on the THAAD program in 2017 as a result of risk retirements and cost reductions. The same factors drove the decrease in cost of sales as a percentage of net sales under the previous revenue recognition guidance.

** *Primary reason for change.* The decrease in cost of sales as a percentage of net sales was primarily due to favorable contract performance on numerous programs as a result of overhead cost reductions and reduced program risks, most notably on the THAAD program, partially offset by cost growth and manufacturing inefficiencies in 2017 on electric propulsion contracts.

Selling, General and Administrative Expense (“SG&A”):

	Year Ended December 31,			Year Ended December 31,		
	2018	2017	Change*	2017	2016	Change**
	(In millions, except percentage amounts)					
Components of SG&A:						
SG&A excluding stock-based compensation	\$23.3	\$25.0	\$(1.7)	\$25.0	\$21.8	\$ 3.2
Stock-based compensation	20.5	22.0	(1.5)	22.0	12.9	9.1
SG&A	\$43.8	\$47.0	\$(3.2)	\$47.0	\$34.7	\$12.3
Percentage of net sales	2.3%	2.5%		2.5%	2.0%	
Percentage of net sales excluding stock-based compensation	1.2%	1.3%		1.3%	1.2%	

* *Primary reason for change.* The decrease in SG&A expense was primarily driven by (i) a decrease of \$1.5 million in stock-based compensation primarily as a result of decreases in the fair value of the stock appreciation rights in the current period and accelerated vesting of stock awards to a former executive officer in 2017 and (ii) a decrease in legal and professional services expenses.

** *Primary reason for change.* The increase in SG&A expense was primarily driven by an increase of \$9.1 million in stock-based compensation primarily as a result of increases in the fair value of stock appreciation rights, the accelerated vesting of stock awards to a former executive officer, and the August 2016 stock award granted to the Executive Chairman that vested according to the attainment of share prices ranging from \$22 per share to \$27 per share of our common stock.

Depreciation and Amortization:

	Year Ended December 31,			Year Ended December 31,		
	2018	2017	Change*	2017	2016	Change**
	(In millions)					
Components of depreciation and amortization:						
Depreciation	\$56.1	\$56.7	\$(0.6)	\$56.7	\$49.6	\$7.1
Amortization	13.7	13.7	—	13.7	13.3	0.4
Accretion	2.5	2.2	0.3	2.2	2.0	0.2
Depreciation and amortization	\$72.3	\$72.6	\$(0.3)	\$72.6	\$64.9	\$7.7

* *Primary reason for change.* Depreciation and amortization expense did not change significantly in 2018 compared with 2017.

** *Primary reason for change.* The increase in depreciation expense was primarily the result of increased accelerated depreciation associated with changes in the estimated useful lives of long-lived assets and capital projects being placed in service to support the cost saving initiatives of the CIP.

Other (Income) Expense, Net and Loss On Debt:

	Year Ended December 31,			Year Ended December 31,		
	2018	2017	Change*	2017	2016	Change**
	(In millions)					
Other (income) expense, net and loss on debt:	\$(40.2)	\$7.9	\$(48.1)	\$7.9	\$54.3	\$(46.4)

* *Primary reason for change.* The increase in other income, net was primarily due to a one-time benefit of \$43.0 million in environmental remediation provision adjustments as a result of reaching a determination with the U.S. government that certain environmental expenditures are reimbursable under the Global Settlement (see discussion of “Environmental Matters” below).

** *Primary reason for change.* The decrease in other expense, net was primarily due to a decrease of \$35.5 million in unusual items (discussed below) and a decrease of \$10.1 in environmental remediation expenses (see discussion of “Environmental Matters” below).

The following table summarizes unusual items, comprised of a component of other (income) expense, net and loss on debt in the consolidated statements of operations:

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
Aerospace and Defense:			
Gain on legal matters (1)	\$—	\$(2.0)	\$—
Aerospace and defense unusual items	—	(2.0)	—
Corporate:			
Loss on debt repurchased (2)	—	—	34.4
Acquisition costs (1)	—	1.0	—
Loss on bank amendment (1)	0.2	—	0.1
Corporate unusual items	0.2	1.0	34.5
Total unusual items	\$ 0.2	\$(1.0)	\$34.5

(1) Operating expense (income)

(2) Non-operating expense

2018 Activity:

We recorded a charge of \$0.2 million associated with an amendment to the Senior Credit Facility.

2017 Activity:

We recorded \$2.0 million of realized gains, net of interest associated with the failure to register with the SEC the issuance of certain of our common shares under the defined contribution 401(k) employee benefit plan. On May 30, 2017, we made a registered rescission offer to buy back unregistered shares from eligible Plan participants at the original purchase price plus interest, or to reimburse eligible Plan participants for losses they may have incurred if their shares had been sold. The actual cost of the registered rescission offer was less than the previously estimated costs. The registered rescission offer expired on June 30, 2017, and settlement payments of \$3.5 million under the offer were completed in the third quarter of 2017.

We recorded \$1.0 million of costs related to the acquisition of Coleman Aerospace from L3 Technologies, Inc.

2016 Activity:

On July 18, 2016, we redeemed \$460.0 million principal amount of our 7.125% Second-Priority Senior Secured Notes (“7 1/8% Notes”), representing all of the outstanding 7 1/8% Notes, at a redemption price equal to 105.344% of the principal amount, plus accrued and unpaid interest. We incurred a pre-tax charge of \$34.1 million in 2016 associated with the extinguishment of the 7 1/8% Notes. The \$34.1 million pre-tax charge was the result of the \$24.6 million paid in excess of the par value and \$9.5 million associated with the write-off of unamortized deferred financing costs.

We retired \$13.0 million principal amount of our delayed draw term loan resulting in a loss of \$0.3 million.

We recorded a charge of \$0.1 million associated with an amendment to the Senior Credit Facility.

Interest Income:

	Year Ended December 31,			Year Ended December 31,		
	2018	2017	Change*	2017	2016	Change*
	(In millions)					
Interest income:	\$10.0	\$3.5	\$6.5	\$3.5	\$0.6	\$2.9

* *Primary reason for change.* The increase in interest income was primarily due to higher average cash balances and interest rates for both period comparisons.

Interest Expense:

	Year Ended December 31,			Year Ended December 31,		
	2018	2017	Change*	2017	2016	Change**
	(In millions)					
Components of interest expense:						
Contractual interest and other	\$25.5	\$22.4	\$3.1	\$22.4	\$30.2	\$(7.8)
Amortization of debt discount and deferred financing costs	8.9	8.5	0.4	8.5	2.3	6.2
Interest expense	<u>\$34.4</u>	<u>\$30.9</u>	<u>\$3.5</u>	<u>\$30.9</u>	<u>\$32.5</u>	<u>\$(1.6)</u>

* *Primary reason for change.* The increase in interest expense was primarily due to a higher variable interest rate on our Senior Credit Facility partially offset by a lower principal balance on the Senior Credit Facility. The Senior Credit Facility variable interest rate was 4.52% as of December 31, 2018, compared with 3.82% as of December 31, 2017.

** *Primary reason for change.* The decrease in interest expense was primarily due to the retirement of the principal amount of our delayed draw term loan in the first quarter of 2016, the redemption of the 7 1/8% Notes in the third quarter of 2016, and the conversion of 41/16% Convertible Subordinated Debentures to common shares. The decrease was partially offset by interest expense on the debt incurred on the Senior Credit Facility at a variable interest rate of 3.82% as of December 31, 2017, and the issuance of the 2 1/4% Notes in December 2016 at an effective interest rate of 5.8%.

Income Tax Provision:

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
Income tax provision	\$51.3	\$96.1	\$11.2

In 2018, our effective tax rate was 27.2%. Our effective tax rate differed from the 21% statutory federal income tax rate primarily due to an increase from state income taxes and unfavorable adjustments to uncertain tax positions partially offset by R&D credits.

In 2017, our effective tax rate was 110.6%. Our effective tax rate differed from the 35.0% statutory federal income tax rate primarily due to the change in the federal statutory tax rate from 35% to 21% under Tax Cuts and Jobs Act ("Tax Act"). The one time reduction to deferred tax assets due to the Tax Act was \$64.6 million or a 74.4% increase to the effective tax rate. Before applying the effects of the Tax Act, the effective tax rate was 36.2%. This rate differs from the 35% federal income tax rate due to an increase from state income taxes partially offset by R&D credits and favorable adjustments to uncertain tax positions.

In 2016, the income tax provision recorded differs from the expected tax that would be calculated by applying the federal statutory rate to our income before income taxes primarily due to the impacts from state income taxes, and certain expenditures which are permanently not deductible for tax purposes, partially offset by the impact of R&D credits.

We recorded an initial estimate of our current tax payable of \$127.7 million during the first quarter ended March 31, 2018, based on our best estimate of the impact of the adoption of new revenue recognition guidance and the enactment of certain provisions of tax reform under the Tax Act, both effective on January 1, 2018. Subsequently, guidance was issued by federal taxing authorities providing clarification on provisions within the Tax Act. This new clarification allows us to spread the impact of adoption of the new revenue recognition guidance over a four-year period, reducing the single-year impact in 2018. The current tax payable of \$19.8 million as of December 31, 2018, reflects this reduction as well as other refinements to the estimated impacts from both the new revenue recognition guidance and the Tax Act.

As of December 31, 2018, the liability for uncertain income tax positions was \$5.9 million. Due to the uncertainty regarding the timing of potential future cash flows associated with these liabilities, we are unable to make a reasonably reliable estimate of the amount and period in which these liabilities might be paid.

Retirement Benefit Expense:

	Year Ended December 31,		Change*	Year Ended December 31,		Change
	2018	2017		2017	2016	
	(In millions)					
Components of retirement benefits expense:						
Interest cost on benefit obligation	\$ 50.9	\$ 59.1	\$ (8.2)	\$ 59.1	\$ 66.0	\$(6.9)
Assumed return on assets	(60.1)	(49.5)	(10.6)	(49.5)	(56.1)	6.6
Amortization of prior service credits	(0.1)	(0.1)	—	(0.1)	(1.1)	1.0
Amortization of net losses	66.9	63.7	3.2	63.7	60.1	3.6
Retirement benefits expense	<u>\$ 57.6</u>	<u>\$ 73.2</u>	<u>\$(15.6)</u>	<u>\$ 73.2</u>	<u>\$ 68.9</u>	<u>\$ 4.3</u>

* *Primary reason for change.* The decrease in retirement benefits expense was primarily due to better than expected investment returns on our pension plan assets and lower interest costs on the benefit obligation.

We estimate that our retirement benefits expense will be approximately \$26 million in 2019.

See “Critical Accounting Policies—Retirement Benefit Plans” for more information about our accounting practices with respect to retirement benefits.

Operating Segment Information:

We evaluate our operating segments based on several factors, of which the primary financial measure is segment performance. Segment performance represents net sales less applicable costs, expenses and provisions for unusual items relating to the segment. Excluded from segment performance are: corporate income and expenses, interest expense, interest income, income taxes, legacy income or expenses, and unusual items not related to the segment. We believe that segment performance provides information useful to investors in understanding our underlying operational performance. In addition, we provide the Non-GAAP financial measure of our operational performance called segment performance before environmental remediation provision adjustments, retirement benefits, and segment unusual items. We believe the exclusion of the items listed above permits an evaluation and a comparison of results for ongoing business operations, and it is on this basis that management internally assesses operational performance.

Aerospace and Defense Segment

	Year Ended December 31,		Change*	Year Ended December 31,		Change**
	2018	2017		2017	2016	
	(In millions, except percentage amounts)					
Net sales	\$1,888.1	\$1,870.8	\$17.3	\$1,870.8	\$1,753.9	\$116.9
Segment performance	264.6	177.9	86.7	177.9	143.3	34.6
Segment margin	14.0%	9.5%		9.5%	8.2%	
Segment margin before environmental remediation provision adjustments, retirement benefits, net, and unusual items (Non-GAAP measure)	12.4%	10.7%		10.7%	10.4%	
Components of segment performance:						
Aerospace and Defense before environmental remediation provision adjustments, retirement benefits, net, and unusual items (Non-GAAP measure)	\$ 233.4	\$ 200.4	\$33.0	\$ 200.4	\$ 182.1	\$ 18.3
Environmental remediation provision adjustments	37.2	(7.5)	44.7	(7.5)	(18.3)	10.8
GAAP/CAS retirement benefits expense difference	(6.0)	(17.0)	11.0	(17.0)	(20.5)	3.5
Unusual items	—	2.0	(2.0)	2.0	—	2.0
Aerospace and Defense total	<u>\$ 264.6</u>	<u>\$ 177.9</u>	<u>\$86.7</u>	<u>\$ 177.9</u>	<u>\$ 143.3</u>	<u>\$ 34.6</u>

Net sales were impacted by the adoption of new revenue recognition guidance effective January 1, 2018, using the modified retrospective method. The primary impact of the new guidance was a change in the timing of revenue recognition on certain long-term contracts. Under this new guidance, we discontinued the use of the unit-of-delivery method on certain customer contracts and re-measured the performance obligations using the cost-to-cost method.

Segment performance during 2018 was significantly impacted by a one-time benefit of \$43.0 million as a result of reaching a determination with the U.S. government that certain environmental expenditures are reimbursable under the Global Settlement. See Note 8(d) in the consolidated financial statements in Item 8 of this Report for additional information.

* *Primary reason for change.* Net sales in 2018 would have been \$1,902.2 million under the previous revenue recognition guidance which is \$31.4 million higher than net sales reported in 2017, resulting from an increase of \$126.0 million in defense programs primarily driven by increased deliveries on the Standard Missile and PAC-3 programs. The increase in net sales was partially offset by a decrease of \$94.6 million in space programs primarily driven by cost growth and performance issues on the Commercial Crew Development program and lower deliveries on the Atlas V program as this program winds down. The Atlas V program contributed sales of \$42.6 million under the new revenue recognition guidance in 2018, and sales of \$89.1 million under the previous revenue recognition guidance in 2018.

The increase in the segment margin before environmental remediation provision adjustments, retirement benefits, net and unusual items was primarily due to the following: (i) risk retirements on the RS-68 program, (ii) favorable overhead rate performance, and (iii) cost growth and manufacturing inefficiencies in 2017 on electric propulsion contracts. These factors were partially offset by cost growth and performance issues in the current period on the Commercial Crew Development program and favorable contract performance on the THAAD program in 2017 as a result of risk retirements and cost reductions.

During 2018, we had \$59.1 million of favorable changes in contract estimates on operating results before income taxes compared with favorable changes of \$37.2 million during 2017.

** *Primary reason for change.* The increase in net sales was primarily due to an increase of \$158.0 million in space programs primarily driven by the following (i) the RS-25 program development and integration effort in support of the SLS development program; (ii) increased development effort and volume on the Commercial Crew Development program; and (iii) increased deliveries on the Atlas V program. The increase in net sales was partially offset by a decrease of \$36.5 million in defense programs primarily driven by the timing of deliveries on the THAAD and Standard Missile programs partially offset by the net sales generated from the Coleman Aerospace acquisition. Further, as a result of the 2016 calendar, Aerojet Rocketdyne had 53 weeks of operations in 2016 compared with 52 weeks of operations in 2017. The additional week of operations, which occurred in the fourth quarter of 2016 and accounted for \$32.2 million in additional net sales, is included in the above discussion of program changes.

Segment margin before environmental remediation provision adjustments, retirement benefits, net, and unusual items in 2017 compared with 2016 was up 30 basis points. Items that had a significant impact were favorable contract performance on numerous programs as a result of overhead cost reductions and reduced program risks, most notably on the THAAD program, partially offset by cost growth and manufacturing inefficiencies in 2017 on electric propulsion contracts.

Real Estate Segment

	<u>Year Ended December 31,</u>		<u>Change</u>	<u>Year Ended December 31,</u>		<u>Change</u>
	<u>2018</u>	<u>2017</u>		<u>2017</u>	<u>2016</u>	
	(In millions)					
Net sales	\$7.8	\$6.4	\$1.4	\$6.4	\$7.4	\$(1.0)
Segment performance	2.8	2.5	0.3	2.5	4.3	(1.8)

In 2018, we recognized net sales of \$1.4 million from a land sale of 57 acres of the Sacramento Land. During 2017 and 2016, net sales and segment performance consisted primarily of rental property operations.

Backlog:

As of December 31, 2018, our total remaining performance obligations, also referred to as backlog, totaled \$4.1 billion. We expect to recognize approximately 45%, or \$1.8 billion, of the remaining performance obligations as sales over the next twelve months, an additional 29% the following twelve months, and 26% thereafter. The following table summarizes backlog:

	<u>As of December 31,</u>	
	<u>2018</u>	<u>2017</u>
	(In billions)	
Funded backlog	\$1.9	\$2.1
Unfunded backlog	2.2	2.5
Total backlog	<u>\$4.1</u>	<u>\$4.6</u>

Our adoption of the new revenue recognition guidance accelerated the timing of revenue recognition on some of our contracts which resulted in a \$0.6 billion reduction in our backlog as of December 31, 2017. Total backlog includes both funded backlog (unfilled orders for which funding is authorized, appropriated and contractually obligated by the customer) and unfunded backlog (firm orders for which funding has not been appropriated). Indefinite delivery and quantity contracts and unexercised options are not reported in total backlog. Backlog is subject to funding delays or program restructurings/cancellations which are beyond our control.

Use of Non-GAAP Financial Measures:

In addition to segment performance (discussed above), we provide the Non-GAAP financial measures of our performance called Adjusted EBITDAP, Adjusted Net Income, and Adjusted EPS. We use these metrics to measure our operating and total Company performance. We believe that for management and investors to effectively compare core performance from period to period, the metrics should exclude items that are not indicative of, or are unrelated to, results from our ongoing business operations such as retirement benefits (pension and postretirement benefits), significant non-cash expenses, the impacts of financing decisions on earnings, and items incurred outside the ordinary, on-going and customary course of our business. Accordingly, we define Adjusted EBITDAP as GAAP net income (loss) adjusted to exclude interest expense, interest income, income taxes, depreciation and amortization, retirement benefits net of amounts that are recoverable under our U.S. government contracts, and unusual items which we do not believe are reflective of such ordinary, on-going and customary activities. Adjusted Net Income and Adjusted EPS exclude retirement benefits net of amounts that are recoverable under our U.S. government contracts and unusual items which we do not believe are reflective of such ordinary, on-going and customary activities. Adjusted Net Income and Adjusted EPS do not represent, and should not be considered an alternative to, net income (loss) or diluted EPS as determined in accordance with GAAP.

	Year Ended December 31,		
	2018	2017	2016
	(In millions, except per share and percentage amounts)		
Net income (loss)	\$137.3	\$ (9.2)	\$ 18.0
Interest expense	34.4	30.9	32.5
Interest income	(10.0)	(3.5)	(0.6)
Income tax provision	51.3	96.1	11.2
Depreciation and amortization	72.3	72.6	64.9
GAAP retirement benefits expense	57.6	73.2	68.9
CAS recoverable retirement benefits expense	(38.2)	(36.2)	(29.5)
Unusual items	0.2	(1.0)	34.5
Adjusted EBITDAP	<u>\$304.9</u>	<u>\$222.9</u>	<u>\$199.9</u>
Adjusted EBITDAP as a percentage of net sales	16.1%	11.9%	11.3%
Net income (loss) as a percentage of net sales	7.2%	(0.5)%	1.0%
Net income (loss)	\$137.3	\$ (9.2)	\$ 18.0
GAAP retirement benefits expense	57.6	73.2	68.9
CAS recoverable retirement benefits expense	(38.2)	(36.2)	(29.5)
Unusual items	0.2	(1.0)	34.5
Income tax impact of adjustments (1)	(5.4)	(15.4)	(34.0)
One-time reduction in deferred tax assets due to the Tax Act	—	64.6	—
Adjusted Net Income	<u>\$151.5</u>	<u>\$ 76.0</u>	<u>\$ 57.9</u>
Diluted EPS	\$ 1.75	\$ (0.13)	\$ 0.27
Adjustments	0.18	1.15	0.54
Adjusted EPS	<u>\$ 1.93</u>	<u>\$ 1.02</u>	<u>\$ 0.81</u>
Diluted weighted average shares, as reported	76.8	73.0	65.7
Adjustments	—	0.1	7.1
Diluted weighted average shares, as adjusted	<u>76.8</u>	<u>73.1</u>	<u>72.8</u>

(1) The income tax impact is calculated using the federal and state statutory rates in the corresponding year.

We also provide the Non-GAAP financial measure of Free Cash Flow. Free Cash Flow, a Non-GAAP financial measure, is defined as cash flow from operating activities less capital expenditures. Free Cash Flow should not be considered in isolation, as a measure of residual cash flow available for discretionary purposes, or as an alternative to cash flows from operations presented in accordance with GAAP. We use Free Cash Flow, both in presenting our results to stakeholders and the investment community, and in our internal evaluation and management of the business. Management believes that this financial measure is useful because it provides supplemental information to assist investors in viewing the business using the same tools that management uses to evaluate progress in achieving our goals (including under our annual cash and long-term compensation incentive plans). The following table summarizes Free Cash Flow:

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
	(In millions)		
Net cash provided by operating activities	\$252.7	\$212.8	\$158.7
Capital expenditures	(43.2)	(29.4)	(47.6)
Free cash flow (1)	<u>\$209.5</u>	<u>\$183.4</u>	<u>\$111.1</u>

(1) Free Cash Flow, a Non-GAAP financial measure, is defined as cash flow from operating activities less capital expenditures.

Because our method for calculating these Non-GAAP measures may differ from other companies' methods, the Non-GAAP measures presented above may not be comparable to similarly titled measures reported by other companies. These measures are not recognized in accordance with GAAP, and we do not intend for this information to be considered in isolation or as a substitute for GAAP measures.

Environmental Matters:

Our policy is to conduct our businesses with due regard for the preservation and protection of the environment. We devote a significant amount of resources and management attention to environmental matters and actively manage our ongoing processes to comply with environmental laws and regulations. We are involved in the remediation of environmental conditions that resulted from generally accepted manufacturing and disposal practices at certain plants in the 1950s and 1960s. In addition, we have been designated a PRP with other companies at third party sites undergoing investigation and remediation.

Estimating environmental remediation costs is difficult due to the significant uncertainties inherent in these activities, including the extent of remediation required, changing governmental regulations and legal standards regarding liability, evolving technologies and the long period of time over which most remediation efforts take place. We:

- accrue for costs associated with the remediation of environmental pollution when it becomes probable that a liability has been incurred and when our proportionate share of the costs can be reasonably estimated; and
- record related estimated recoveries when such recoveries are deemed probable.

In addition to the costs associated with environmental remediation discussed above, we incur expenditures for recurring costs associated with managing hazardous substances or pollutants in ongoing operations which were immaterial for 2018, 2017, and 2016.

The following table summarizes our recoverable amounts, environmental reserves, and range of liability, as of December 31, 2018:

	<u>Recoverable Amount (1)</u>	<u>Reserve</u>	<u>Estimated Range of Liability</u>
	(In millions)		
Aerojet Rocketdyne—Sacramento	\$182.5	\$207.4	\$207.4 - \$311.7
Aerojet Rocketdyne—Baldwin Park Operable Unit (“BPOU”)	91.3	103.8	103.8 - 132.6
Other Aerojet Rocketdyne sites	11.1	12.4	12.4 - 22.0
Other sites	0.7	4.3	4.3 - 5.8
Total	<u>\$285.6</u>	<u>\$327.9</u>	<u>\$327.9 - \$472.1</u>

(1) Excludes the receivable from Northrop of \$58.5 million as of December 31, 2018, related to environmental costs already paid (and therefore not reserved) by us in prior years and reimbursable under our agreement with Northrop.

Environmental Reserves

We review on a quarterly basis estimated future remediation costs and have an established practice of estimating environmental remediation costs over a fifteen year period, except for those environmental remediation costs with a specific contractual term. Environmental liabilities at the BPOU site are currently estimated through the term of the new project agreement, which expires in May 2027. As the period for which estimated environmental remediation costs lengthens, the reliability of such estimates decreases. These estimates consider the investigative work and analysis of engineers, outside environmental consultants, and the advice of legal staff regarding the status and anticipated results of various administrative and legal proceedings. In most cases, only a range of reasonably possible costs can be estimated. In establishing our reserves, the most probable estimate is used when determinable; otherwise, the minimum amount is used when no single amount in the range is more probable. Accordingly, such estimates can change as we periodically evaluate these estimates when new information becomes available. We cannot predict whether new information gained as projects progress will affect the estimated liability accrued. The timing of payment for estimated future environmental costs is influenced by a number of factors, such as the regulatory approval process and the time required designing, constructing, and implementing the remedy.

The following tables summarizes our environmental reserve activity:

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
	(In millions)		
Balance at beginning of year	\$341.4	\$349.7	\$302.3
Additions	23.3	31.3	87.4
Expenditures	(36.8)	(39.6)	(40.0)
Balance at end of year	<u>\$327.9</u>	<u>\$341.4</u>	<u>\$349.7</u>

The \$23.3 million of environmental reserve additions in 2018 was primarily due to the following items: (i) \$8.8 million of additional operations and maintenance for treatment facilities; (ii) \$4.6 million of regulatory oversight costs and fees; (iii) \$3.8 million of remediation related to operable treatment units; (iv) \$2.2 million of sampling analysis costs; and (v) \$3.9 million related to other environmental clean-up matters.

The \$31.3 million of environmental reserve additions in 2017 was primarily due to the following items: (i) \$13.4 million of additional operations and maintenance for treatment facilities; (ii) \$6.7 million of additional estimated costs related to the Camden, Arkansas site; (iii) \$2.3 million associated with water replacement; and (iv) \$8.9 million related to other environmental clean-up matters.

The \$87.4 million of environmental reserve additions in 2016 was primarily due to the following items: (i) in 2016, we reached a decision with the U.S. government on the treatment of certain utility costs related to the Sacramento site resulting in a reserve increase of \$59.4 million for the estimated impact over the current period and a fifteen year reserve period; (ii) \$10.4 million of additional operations and maintenance for treatment facilities; (iii) \$5.9 million of remediation related to inactive test sites and landfill clean-up; (iv) \$2.7 million of remediation related to operable treatment units; and (v) \$9.0 million related to other environmental clean-up matters.

The effect of the final resolution of environmental matters and our obligations for environmental remediation and compliance cannot be accurately predicted due to the uncertainty concerning both the amount and timing of future expenditures and due to regulatory or technological changes. We continue our efforts to mitigate past and future costs through pursuit of claims for recoveries from our insurance carriers and other PRPs and continued investigation of new and more cost effective remediation alternatives and associated technologies.

Estimated Recoveries

Environmental remediation costs are primarily incurred by our Aerospace and Defense segment, and certain of these costs are recoverable from our contracts with the U.S. government. We currently estimate approximately 12% of our future Aerospace and Defense segment environmental remediation costs will not likely be reimbursable and are expensed.

Allowable environmental remediation costs are charged to our contracts as the costs are incurred. Because these costs are recovered through forward-pricing arrangements, the ability of Aerojet Rocketdyne to continue recovering these costs from the U.S. government depends on Aerojet Rocketdyne's sustained business volume from U.S. government contracts and programs.

While we are currently seeking an arrangement with the U.S. government to recover environmental expenditures in excess of the reimbursement ceiling identified in the Global Settlement, there can be no assurances that such a recovery will be obtained, or if not obtained, that such unreimbursed environmental expenditures will not have a materially adverse effect on our operating results, financial condition, and/or cash flows.

The following table summarizes the activity in the current and non-current recoverable amounts from the U.S. government and Northrop:

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
	(In millions)		
Balance at beginning of year	\$321.2	\$333.0	\$300.4
Additions	18.2	21.4	67.3
Reimbursements	(28.1)	(31.5)	(35.1)
Other adjustments (1)	32.8	(1.7)	0.4
Balance at end of year	<u>\$344.1</u>	<u>\$321.2</u>	<u>\$333.0</u>

(1) The adjustment in 2018 was primarily a result of reaching a determination with the U.S. government that certain environmental expenditures are reimbursable under the Global Settlement. See Note 8(d) in the consolidated financial statements in Item 8 of this Report for additional information.

The activity for recoveries is commensurate with the activity associated with the environmental reserve activity.

Environmental reserves and recoveries impact on the consolidated statements of operations

The expenses associated with adjustments to the environmental reserves are recorded as a component of other (income) expense, net in the consolidated statements of operations. The following table summarizes the impact of environmental reserves and recoveries to the consolidated statements of operations:

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
(Benefit) expense to consolidated statement of operations	\$(36.9)	\$8.2	\$18.3

Recently Adopted Accounting Pronouncements:

See Note 1(v) in the consolidated financial statements in Item 8 of this Report for information relating to our discussion of the effects of recent accounting pronouncements.

Liquidity and Capital Resources:

Net Cash Provided By (Used In) Operating, Investing, and Financing Activities

The following table summarizes the change in cash, cash equivalents and restricted cash:

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
Net Cash Provided by Operating Activities	\$252.7	\$212.8	\$158.7
Net Cash Used in Investing Activities	(20.9)	(66.4)	(47.1)
Net Cash (Used in) Provided by Financing Activities	(26.5)	(21.7)	90.2
Net Increase in Cash, Cash Equivalents and Restricted Cash	<u>\$205.3</u>	<u>\$124.7</u>	<u>\$201.8</u>

Net Cash Provided by Operating Activities

The \$39.9 million increase in cash provided by operating activities in 2018 compared with 2017 was primarily driven by improved operating results and a reduction of \$39.7 million in retirement benefit cash funding partially offset by cash usage from working capital. The increased cash usage from working capital was primarily due to (i) an increase of \$47.3 million in accounts receivable primarily due to the timing of cash receipts; (ii) an increase of \$38.7 million in net income tax payments; and (iii) a decrease of \$39.4 million in accounts payable due to vendor payment schedules. These factors were partially offset by improved cash flow from contracts of \$39.7 million primarily due to the timing of contract performance payments.

The \$54.1 million increase in cash provided by operating activities in 2017 compared with 2016 was primarily driven by improved operating results and cash generation from working capital partially offset by \$43.0 million of increased retirement benefit funding. The improved cash generation from working capital was primarily due to (i) a decrease in inventories on the Atlas V and PAC-3 contracts and (ii) an increase in customer advances partially offset by an increase in accounts receivables due to the timing of sales and milestone billings on a space program contract.

Net Cash Used in Investing Activities

During 2018, 2017, and 2016, we had capital expenditures of \$43.2 million, \$29.4 million, and \$47.6 million. The higher capital expenditures in 2016 compared with 2018 and 2017 was primarily related to construction projects associated with supporting our CIP.

During the 2018, we received insurance proceeds of \$1.9 million and received net proceeds of \$20.4 million in marketable securities.

During 2017, we purchased Coleman Aerospace for \$17.0 million and we made a net cash investment of \$20.0 million in marketable securities.

Net Cash (Used in) Provided by Financing Activities

During 2018, we had debt cash payments of \$25.3 million. During 2017, we had debt cash payments of \$20.0 million. During 2016, we had \$700.6 million in debt cash payments and borrowings of \$800.0 million.

Debt Activity

The following table summarizes our debt principal activity:

	<u>December 31, 2017</u>	<u>Cash Payments</u>	<u>Non-cash Activity</u>	<u>December 31, 2018</u>
		(In millions)		
Term loan	\$370.0	\$(24.4)	\$ —	\$345.6
2 ¼% Notes	300.0	—	—	300.0
Capital lease obligations	0.9	(0.9)	27.2	27.2
Total Debt Activity	<u>\$670.9</u>	<u>\$(25.3)</u>	<u>\$27.2</u>	<u>\$672.8</u>

On September 20, 2018, we amended our Senior Credit Facility to a \$1.0 billion commitment (see Note 6 in the consolidated financial statements in Item 8 of this Report).

Outlook

Short-term liquidity requirements consist primarily of recurring operating expenses, including but not limited to costs related to our capital and environmental expenditures, company-funded R&D expenditures, debt service requirements, and retirement benefit plans. We believe that our existing cash and cash equivalents and availability under the Senior Credit Facility coupled with cash generated from our future operations will provide sufficient funds to meet our operating plan for the next twelve months. The operating plan for this period provides for full operation of our businesses, including interest and debt payments. As of December 31, 2018, we had \$735.3 million of cash and cash equivalents as well as \$620.6 million of available borrowings under our Senior Credit Facility. Based on our existing debt agreements, we were in compliance with our financial and non-financial covenants as of December 31, 2018. Our failure to comply with these covenants could result in an event of default that, if not cured or waived by the lenders, could result in the acceleration of the Senior Credit Facility and 2 ¼% Notes. In addition, our failure to pay principal and interest when due is a default under the Senior Credit Facility, and in certain cases, would cause a cross default on the 2 ¼% Notes.

We are committed to a cash management strategy that maintains liquidity to adequately support the operation of the business, our growth strategy and to withstand unanticipated business volatility. Our cash management strategy includes maintaining the flexibility to pay down debt and/or repurchase shares depending on economic and other conditions. In connection with the implementation of our cash management strategy, our management may seek to retire or purchase our outstanding debt through cash purchases and/or exchanges for equity securities, in open market purchases, privately negotiated transactions or otherwise if we believe that it is in our best interests. Such repurchases or exchanges, if any, will depend on prevailing market conditions, our liquidity requirements, contractual restrictions and other factors. The amounts involved may be material.

Potential future acquisitions depend, in part, on the availability of financial resources at an acceptable cost of capital. We expect to utilize cash on hand and cash generated by operations, as well as cash available under our Senior Credit Facility, which may involve renegotiation of credit limits to finance any future acquisitions. Other sources of capital could include the issuance of common and/or preferred stock, and the placement of debt. We periodically evaluate capital markets and may access such markets when circumstances appear favorable. We believe that sufficient capital resources will be available from one or several of these sources to finance any future acquisitions. However, no assurances can be made that acceptable financing will be available, or that acceptable acquisition candidates will be identified, or that any such acquisitions will be accretive to earnings.

As disclosed in Notes 8(b) and 8(c) in the consolidated financial statements in Item 8 of this Report, we have exposure for certain legal and environmental matters. We believe that it is currently not possible to estimate the impact, if any, that the ultimate resolution of certain of these matters will have on our financial position, results of operations, or cash flows.

Major factors that could adversely impact our forecasted operating cash flows and our financial condition are described in Part I, Item 1A. Risk Factors. In addition, our liquidity and financial condition will continue to be affected by changes in prevailing interest rates on the portion of debt that bears interest at variable interest rates.

Contractual Obligations:

We have contractual obligations and commitments in the form of debt obligations, operating leases, certain other liabilities, and other commitments. The following table summarizes our contractual obligations as of December 31, 2018:

	Payments due by period				
	Total	Less than 1 year	1-3 years	3-5 years	After 5 years
	(In millions)				
Long-term debt:					
Senior debt	\$ 345.6	\$ 17.5	\$ 46.0	\$282.1	\$ —
Convertible senior notes (1)	300.0	300.0	—	—	—
Capital lease obligations	27.2	0.8	1.9	1.4	23.1
Interest on long-term debt (2)	93.4	23.9	31.4	23.8	14.3
Huntsville building commitments (3)	32.2	1.6	3.2	3.2	24.2
Postretirement medical and life insurance benefits (4)	29.4	4.4	7.8	6.4	10.8
Operating leases	79.4	15.9	29.6	19.5	14.4
Purchase obligations (5)	927.7	600.1	326.3	1.2	0.1
Conditional asset retirement obligations (6)	46.0	—	4.3	17.6	24.1
Total	<u>\$1,880.9</u>	<u>\$964.2</u>	<u>\$450.5</u>	<u>\$355.2</u>	<u>\$111.0</u>

- (1) Holders may convert their 2 ¼% Notes at their option from January 1, 2019, through March 31, 2019, because our closing stock price exceeded \$33.80 for at least 20 days in the 30 day period prior to December 31, 2018. We have a stated intention to cash settle the principal amount of the 2 ¼% Notes with the conversion premium to be settled in common shares. Accordingly, the 2 ¼% Notes are classified as a current liability as of December 31, 2018. The classification of the 2 ¼% Notes as current or noncurrent on the balance sheet is evaluated at each reporting date and may change depending on whether the sale price contingency has been met. See Note 6 in the consolidated financial statements in Item 8 of this Report for additional information.
- (2) Includes interest on variable debt calculated based on interest rates at December 31, 2018.
- (3) See Note 6(c) in the consolidated financial statements in Item 8 of this Report for additional information.
- (4) The payments presented above are expected payments for the next 10 years. The payments for postretirement medical and life insurance benefits reflect the estimated benefit payments of the plans using the provisions currently in effect. The obligation related to postretirement medical and life insurance benefits is actuarially determined on an annual basis. A substantial portion of these amounts are recoverable through our contracts with the U.S. government.
- (5) Purchase obligations represent open purchase orders and other commitments to suppliers, subcontractors, and other outsourcing partners for equipment, materials, and supplies in the normal course of business. These amounts are based on volumes consistent with anticipated requirements to fulfill purchase orders or contracts for product deliveries received, or expected to be received, from customers. A substantial portion of these amounts are recoverable through our contracts with the U.S. government.
- (6) The conditional asset retirement obligations presented are related to our Aerospace and Defense segment and are allowable costs under our contracts with the U.S. government.

We expect to make cash contributions of approximately \$37.0 million to our tax-qualified defined benefit pension plan in 2019. We generally are able to recover cash contributions related to our tax-qualified defined benefit pension plan as allowable costs on our U.S. government contracts, but there can be differences between when we contribute cash to our tax-qualified defined benefit pension plan under pension funding rules and recover it under CAS.

Arrangements with Off-Balance Sheet Risk:

See Note 8(e) in the consolidated financial statements in Item 8 of this Report for information relating to our off-balance sheet risk.

Critical Accounting Policies:

Our financial statements are prepared in accordance with GAAP that offer acceptable alternative methods for accounting for certain items affecting our financial results, such as determining inventory cost, depreciating long-lived assets, and recognizing revenues.

The preparation of financial statements requires the use of estimates, assumptions, judgments, and interpretations that can affect the reported amounts of assets, liabilities, revenues, and expenses, the disclosure of contingent assets and liabilities and other supplemental disclosures. The development of accounting estimates is the responsibility of our management. Although we believe that the positions we have taken with regard to uncertainties are reasonable, others might reach different

conclusions and our positions can change over time as more information becomes available. If an accounting estimate changes, its effects are accounted for prospectively and, if significant, disclosed in notes of the consolidated financial statements.

The areas most affected by our accounting policies and estimates are revenue recognition, other contract considerations, goodwill, retirement benefit plans, litigation, environmental remediation costs and recoveries, and income taxes. Except for income taxes, which are not allocated to our operating segments, these areas affect the financial results of our business segments.

For a discussion of all of our accounting policies, including the accounting policies discussed below, see Note 1 in the consolidated financial statements in Item 8 of this Report.

Revenue Recognition

In our Aerospace and Defense segment, the majority of our revenue is earned from long-term contracts to design, develop, and manufacture aerospace and defense products, and provide related services, for our customers, including the U.S. government, major aerospace and defense prime contractors, and the commercial sector. Each customer contract defines our distinct performance obligations and the associated transaction price for each obligation. A contract may contain one or multiple performance obligations. In certain circumstances, multiple contracts with a customer are required to be combined in determining the distinct performance obligation. For contracts with multiple performance obligations, we allocate the contracted transaction price to each performance obligation based upon the relative standalone selling price, which represents the price at which we would sell the promised good or service separately to the customer. We determine the standalone selling price based upon the facts and circumstances of each obligated good or service. The majority of our contracts have no observable standalone selling price since the associated products and services are customized to customer specifications. As such, the standalone selling price generally reflects our forecast of the total cost to satisfy the performance obligation plus an appropriate profit margin.

Contract modifications are routine in the performance of our long-term contracts. Contracts are often modified to account for changes in contract specifications or requirements. In most instances, contract modifications are for goods or services that are not distinct, and, therefore, are accounted for as part of the existing contract.

We recognize revenue as each performance obligation is satisfied. The majority of our aerospace and defense performance obligations are satisfied over time either as the service is provided, or as control transfers to the customer. Transfer of control is evidenced by our contractual right to payment for work performed to date plus a reasonable profit on contracts with highly customized products that we have no alternative use for. We measure progress on substantially all our performance obligations using the cost-to-cost method, which we believe best depicts the transfer of control of goods and services to the customer. Under the cost-to-cost method, we record revenues based upon costs incurred to date relative to the total estimated cost at completion. Contract costs include labor, material, overhead, and general and administrative expenses, as appropriate.

Recognition of revenue and profit on long-term contracts requires the use of assumptions and estimates related to the total contract value, the total cost at completion, and the measurement of progress towards completion for each performance obligation. Due to the nature of the programs, developing the estimated total contract value and total cost at completion for each performance obligation requires the use of significant judgment.

The contract value of long-term contracts may include variable consideration, such as incentives, awards, or penalties. The value of variable consideration is generally determined by contracted performance metrics, which may include targets for cost, performance, quality, and schedule. We include variable consideration in the transaction price for the respective performance obligation at either estimated value, or most likely amount to be earned, based upon our assessment of expected performance. We record these amounts only to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved.

We evaluate the contract value and cost estimates for performance obligations at least quarterly and more frequently when circumstances significantly change. Factors considered in estimating the work to be completed include, but are not limited to: labor productivity, the nature and technical complexity of the work to be performed, availability and cost volatility of materials, subcontractor and vendor performance, warranty costs, volume assumptions, anticipated labor agreements, inflationary trends, schedule and performance delays, availability of funding from the customer, and the recoverability of costs incurred outside the original contract included in any estimates to complete. When our estimate of total costs to be incurred to satisfy a performance obligation exceeds the expected revenue, we recognize the loss immediately. When we determine that a change in estimates has an impact on the associated profit of a performance obligation, we record the cumulative positive or negative adjustment to the statement of operations. Changes in estimates and assumptions related to the status of certain long-term contracts may have a material effect on our operating results. The following table summarizes the impact of the changes in significant contract accounting estimates on our Aerospace and Defense segment operating results:

	Year Ended December 31,		
	2018	2017	2016
	(In millions, except per share amounts)		
Net favorable effect of the changes in contract estimates on net sales	\$68.2	\$33.7	\$ 2.7
Favorable effect of the changes in contract estimates on income before income taxes	59.1	37.2	14.1
Favorable effect of the changes in contract estimates on net income (loss)	43.1	22.3	8.5
Favorable effect of the changes in contract estimates on basic net income (loss) per share	0.56	0.31	0.13
Favorable effect of the changes in contract estimates on diluted net income (loss) per share	0.55	0.31	0.11

See Note 1(p) in the consolidated financial statements in Item 8 of this Report for additional information.

Other Contract Considerations

The majority of Aerospace and Defense segment sales are driven by pricing based on costs incurred to produce products and perform services under contracts with the U.S. government. Cost-based pricing is determined under the FAR and CAS. The FAR and CAS provide guidance on the types of costs that are allowable and allocable in establishing prices for goods and services from U.S. government contracts. For example, costs such as charitable contributions, advertising, interest expense, and public relations are unallowable, and therefore not recoverable through sales. In addition, we may enter into agreements with the U.S. government that address the subjects of allowability and allocability of costs to contracts for specific matters.

We closely monitor compliance with and the consistent application of our critical accounting policies related to contract accounting. We review the status of contracts through periodic contract status and performance reviews. Also, regular and recurring evaluations of contract cost, scheduling and technical matters are performed by management personnel independent from the business segment performing work under the contract. Costs incurred and allocated to contracts with the U.S. government are reviewed for compliance with regulatory standards by our personnel, and are subject to audit by the DCAA. Accordingly, we record an allowance on our unbilled receivables for amounts of potential contract overhead costs which may not be successfully negotiated and collected.

Goodwill

Goodwill represents the excess of the purchase price of an acquired enterprise or assets over the fair values of the identifiable assets acquired and liabilities assumed. All of our recorded goodwill resides in the Aerospace and Defense reporting unit. Tests for impairment of goodwill are performed on an annual basis, or at any other time if events occur or circumstances indicate that the carrying amount of goodwill may not be recoverable. Circumstances that could trigger an impairment test include but are not limited to: a significant adverse change in the business climate or legal factors; adverse cash flow trends; an adverse action or assessment by a regulator; unanticipated competition; loss of key personnel; decline in stock price; and results of testing for recoverability of a significant asset group within a reporting unit.

We evaluate qualitative factors (including macroeconomic conditions, industry and market considerations, cost factors, and overall financial performance) to determine whether it is necessary to perform the first step of the goodwill test. This step is referred to as the “Step Zero” analysis. If it is determined that it is more likely than not (a likelihood of more than 50%) that the fair value of a reporting unit is less than its carrying amount, we will proceed to the quantitative (“Step One”) analysis to determine the existence and amount of any goodwill impairment. We may also perform a Step One analysis from time to time to augment our qualitative assessment. We evaluated goodwill using a “Step One” analysis as of October 1, 2018, and determined that goodwill was not impaired. We evaluated goodwill using a “Step Zero” analysis as of October 1, 2017, and determined that goodwill was not impaired.

There can be no assurance that our estimates and assumptions made for purposes of our goodwill impairment testing will prove to be accurate predictions of the future. If our assumptions and estimates are incorrect, we may be required to record goodwill impairment charges in future periods.

Retirement Benefit Plans

We discontinued future benefit accruals for our defined benefit pension plans in 2009. We provide medical and life insurance benefits to certain eligible retired employees, with varied coverage by employee group. Annual charges are made for the cost of the plans, including interest costs on benefit obligations, and net amortization and deferrals, increased or reduced by the return on assets. We also sponsor a defined contribution 401(k) plan and participation in the plan is available to all employees.

Retirement benefits are a significant cost of doing business and represent obligations that will be ultimately settled far in the future and therefore are subject to estimates. We generally are able to recover cash contributions related to our tax-qualified defined benefit pension plan as allowable costs on our U.S. government contracts, but there is a lag between when we contribute cash to our tax-qualified defined benefit pension plan under pension funding rules and recover it under our U.S. government contracts. Our pension and medical and life insurance benefit obligations and related costs are calculated

using actuarial concepts in accordance with GAAP. We are required to make assumptions regarding such variables as the expected long-term rate of return on assets and the discount rate applied to determine the retirement benefit obligations and expense (income) for the year.

The following table presents the assumptions to determine the benefit obligations:

	<u>Pension Benefits</u>		<u>Medical and Life Insurance Benefits</u>	
	<u>As of December 31,</u>		<u>As of December 31,</u>	
	<u>2018</u>	<u>2017</u>	<u>2018</u>	<u>2017</u>
Discount rate	4.27%	3.59%	4.09%	3.37%

The following table presents the assumptions to determine the retirement benefits expense (income):

	<u>Pension Benefits</u>			<u>Medical and Life Insurance Benefits</u>		
	<u>Year Ended December 31,</u>			<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>	<u>2018</u>	<u>2017</u>	<u>2016</u>
Discount rate	3.59%	4.02%	4.36%	3.37%	3.68%	3.99%
Expected long-term rate of return on assets	7.00%	7.00%	7.00%	*	*	*

* Not applicable as our medical and life insurance benefits are unfunded.

The discount rate represents the current market interest rate used to determine the present value of future cash flows currently expected to be required to settle pension obligations. Based on market conditions, discount rates can experience significant variability. Changes in discount rates can significantly change the liability and, accordingly, the funded status of the pension plan. The assumed discount rate represents the market rate available for investments in high-quality fixed income instruments with maturities matched to the expected benefit payments for pension and medical and life insurance benefit plans.

The expected long-term rate of return on assets represents the rate of earnings expected in the funds invested, and funds to be invested, to provide for anticipated benefit payments to plan participants. We evaluated the historical investment performance, current and expected asset allocation, and, with input from our external advisors, developed best estimates of future investment performance.

Market conditions and interest rates significantly affect assets and liabilities of our pension plans. Pension accounting permits market gains and losses to be deferred and recognized over a period of years. This “smoothing” results in the creation of other accumulated income or loss which will be amortized to pension costs in future years. The accounting method we utilize recognizes one-fifth of the unamortized gains and losses in the market-related value of pension assets and all other gains and losses including changes in the discount rate used to calculate the benefit obligation each year. Investment gains or losses for this purpose are the difference between the expected return and the actual return on the market-related value of assets which smooths asset values over three years. Although the smoothing period mitigates some volatility in the calculation of annual pension costs, future pension costs are impacted by changes in the market value of assets and changes in interest rates.

The following table summarizes the effects of a one-percentage-point change in key assumptions on the projected benefit obligations as of December 31, 2018, and on retirement benefits expense for 2018:

	<u>Pension Benefits and Medical and Life Insurance Benefits Discount Rate</u>		<u>Expected Long-term Rate of Return</u>	<u>Assumed Healthcare Cost Trend Rate</u>	
	<u>Net Periodic Benefit Expense</u>	<u>Projected Benefit Obligation</u>	<u>Net Periodic Pension Benefit Expense</u>	<u>Net Periodic Medical and Life Insurance Benefit Expense</u>	<u>Accumulated Benefit Obligation</u>
			(In millions)		
1% decrease	\$ 20.5	\$ 128.0	\$ 8.6	\$(0.2)	\$(0.5)
1% increase	(17.5)	(108.5)	(8.6)	0.2	0.6

Contingencies and Litigation

We are currently involved in certain legal proceedings and, as required, have accrued our estimate of the probable costs and recoveries for resolution of these claims. These estimates are based upon an analysis of potential results, assuming a combination of litigation and settlement strategies. It is possible, however, that future results of operations for any particular quarterly or annual period could be materially affected by changes in assumptions or the effectiveness of strategies related to these proceedings. See Notes 8(b) and 8(c) in the consolidated financial statements in Item 8 of this Report for more detailed information on litigation exposure.

Environmental Reserves and Estimated Recoveries

For a discussion of our accounting for environmental remediation obligations and costs and related legal matters, see “Environmental Matters” above and Notes 8(c) and 8(d) in the consolidated financial statements in Item 8 of this Report.

We accrue for costs associated with the remediation of environmental contamination when it becomes probable that a liability has been incurred, and when our costs can be reasonably estimated. In most cases, only a range of reasonably probable costs can be estimated. In establishing the reserves, the most probable estimated amount is used when determinable, and the minimum amount is used when no single amount in the range is more probable. Environmental reserves include the costs of completing remedial investigation and feasibility studies, remedial and corrective actions, regulatory oversight costs, the cost of operation and maintenance of the remedial action plan, and employee compensation costs for employees who are expected to devote a significant amount of time to remediation efforts. Calculation of environmental reserves is based on the evaluation of currently available information with respect to each individual environmental site and considers factors such as existing technology, presently enacted laws and regulations, and prior experience in remediation of contaminated sites. Such estimates are based on the expected costs of investigation and remediation and the likelihood that other potentially responsible parties will be able to fulfill their commitments at sites where we may be jointly or severally liable.

At the time a liability is recorded for future environmental costs, we record an asset for estimated future recoveries that are estimable and probable. Some of our environmental costs are eligible for future recovery in the pricing of our products and services to the U.S. government and under existing third party agreements. We consider the recovery probable based on the Global Settlement, U.S. government contracting regulations, and our long history of receiving reimbursement for such costs.

Income Taxes

We file a consolidated U.S. federal income tax return for the Company and our 100% owned consolidated subsidiaries. The deferred tax assets and/or liabilities are determined by multiplying the differences between the financial reporting and tax reporting bases for assets and liabilities by the enacted tax rates expected to be in effect when such differences are recovered or settled. The effect on deferred taxes of a change in tax rates is recognized in the period of the enactment date of the change.

The carrying value of our deferred tax assets is dependent upon our ability to generate sufficient taxable income in the future. A valuation allowance is required when it is more likely than not that all or a portion of a deferred tax asset will not be realized. A review of all available positive and negative evidence is considered, including our past and future performance, the market environment in which we operate, the utilization of tax attributes in the past, the length of carryback and carryforward periods, and evaluation of potential tax planning strategies.

Despite our belief that our tax return positions are consistent with applicable tax laws, we believe that certain positions are likely to be challenged by taxing authorities. Settlement of any challenge can result in no change, a complete disallowance, or some partial adjustment reached through negotiations or litigation. Our tax reserves reflect the difference between the tax benefit claimed on tax returns and the amount recognized in the financial statements. The accounting standards provide guidance for the recognition and measurement in financial statements of uncertain tax positions taken or expected to be taken in a tax return. The evaluation of a tax position is a two-step process, the first step being recognition. We determine whether it is more likely than not that a tax position will be sustained upon tax examination, including resolution of any related appeals or litigation, based on only the technical merits of the position. The technical merits of a tax position are derived from both statutory and judicial authority (legislation and statutes, legislative intent, regulations, rulings, and case law) and their applicability to the facts and circumstances of the tax position. If a tax position does not meet the more likely than not recognition threshold, the benefit of that position is not recognized in the financial statements. The second step is measurement. A tax position that meets the more likely than not recognition threshold is measured to determine the amount of benefit to recognize in the financial statements. The tax position is measured as the largest amount of benefit that is greater than 50% likely of being realized upon ultimate resolution with a taxing authority. As the examination process progresses with tax authorities, adjustments to tax reserves may be necessary to reflect taxes payable upon settlement. Tax reserve adjustments related to positions impacting the effective tax rate affect the provision for income taxes. Tax reserve adjustments related to positions impacting the timing of deductions impact deferred tax assets and liabilities.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

Policies and Procedures

As an element of our normal business practice, we have established policies and procedures for managing our exposure to changes in interest rates.

The objective in managing exposure to interest rate changes is to limit the impact of interest rate changes on earnings and cash flow and to make overall borrowing costs more predictable. To achieve this objective, we may use interest rate hedge transactions or other interest rate hedge instruments to manage the net exposure to interest rate changes related to our portfolio of borrowings and to balance our fixed rate compared with variable rate debt. We did not enter into any interest rate hedge transactions or instruments during the past three years.

Interest Rate Risk

We are exposed to market risk principally due to changes in interest rates. Debt with interest rate risk includes borrowings under our Senior Credit Facility. Other than pension assets and liabilities, we do not have any significant exposure to interest rate risk related to our investments. The interest rate risk related to our tax-qualified pension plan assets and liabilities can be found in the “Retirement Benefit Plans” discussion above.

As of December 31, 2018, our debt principal amounts excluding capital lease obligations totaled \$645.6 million: \$300.0 million, or 46%, was at an average fixed rate of 2.25%; and \$345.6 million, or 54%, was at a variable rate of 4.52%.

The following table summarizes the estimated fair value and principal amount for outstanding debt obligations excluding capital lease obligations:

	<u>Fair Value</u>		<u>Principal Amount</u>	
	<u>As of December 31,</u>		<u>As of December 31,</u>	
	<u>2018</u>	<u>2017</u>	<u>2018</u>	<u>2017</u>
	(In millions)			
Term loan	\$345.6	\$370.0	\$345.6	\$370.0
2 ¼% Notes	441.1	415.3	300.0	300.0
	<u>\$786.7</u>	<u>\$785.3</u>	<u>\$645.6</u>	<u>\$670.0</u>

The fair value of the 2 ¼% Notes was determined using broker quotes that are based on open markets for our debt securities (Level 2 securities). The term loan bore interest at variable rates, which adjusted based on market conditions, and its carrying value approximates fair value.

Item 8. Consolidated Financial Statements and Supplementary Data

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Stockholders of Aerojet Rocketdyne Holdings, Inc.

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Aerojet Rocketdyne Holdings, Inc. and its subsidiaries (the “Company”) as of December 31, 2018 and 2017, and the related consolidated statements of operations, of comprehensive income (loss), of stockholders’ equity (deficit), and of cash flows for each of the three years in the period ended December 31, 2018, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Company’s internal control over financial reporting 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 consolidated financial statements referred to above 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. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control — Integrated Framework* (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 1 to the consolidated financial statements, the Company changed the manner in which it accounts for revenue from contracts with customers in 2018.

Basis for Opinions

The Company’s management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management’s Report on Internal Control Over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company’s consolidated financial statements and on the Company’s internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (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 audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated 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 consolidated 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 consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

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 (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) 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 (iii) 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/ PricewaterhouseCoopers LLP

Sacramento, California

February 19, 2019

We have served as the Company’s auditor since 2006.

Aerojet Rocketdyne Holdings, Inc.
Consolidated Statements of Operations

	Year Ended December 31,		
	2018	2017	2016
	(In millions, except per share amounts)		
Net sales	\$1,895.9	\$1,877.2	\$1,761.3
Operating costs and expenses:			
Cost of sales (exclusive of items shown separately below)	1,549.4	1,562.2	1,477.4
Selling, general and administrative expense	43.8	47.0	34.7
Depreciation and amortization	72.3	72.6	64.9
Other (income) expense, net:			
Environmental remediation provision adjustments	(36.9)	8.2	18.3
Other	(3.3)	(0.3)	1.5
Total operating costs and expenses	1,625.3	1,689.7	1,596.8
Operating income	270.6	187.5	164.5
Non-operating:			
Retirement benefit expense	57.6	73.2	68.9
Loss on debt	—	—	34.5
Interest income	(10.0)	(3.5)	(0.6)
Interest expense	34.4	30.9	32.5
Total non-operating expense, net	82.0	100.6	135.3
Income before income taxes	188.6	86.9	29.2
Income tax provision	51.3	96.1	11.2
Net income (loss)	<u>\$ 137.3</u>	<u>\$ (9.2)</u>	<u>\$ 18.0</u>
Income (loss) per share of common stock			
Basic:			
Net income (loss) per share	<u>\$ 1.80</u>	<u>\$ (0.13)</u>	<u>\$ 0.27</u>
Diluted:			
Net income (loss) per share	<u>\$ 1.75</u>	<u>\$ (0.13)</u>	<u>\$ 0.27</u>
Weighted average shares of common stock outstanding, basic	<u>74.8</u>	<u>73.0</u>	<u>65.6</u>
Weighted average shares of common stock outstanding, diluted	<u>76.8</u>	<u>73.0</u>	<u>65.7</u>

See Notes to Consolidated Financial Statements.

Aerojet Rocketdyne Holdings, Inc.
Consolidated Statements of Comprehensive Income

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
Net income (loss)	\$137.3	\$ (9.2)	\$18.0
Other comprehensive income:			
Amortization of net actuarial losses, net of \$16.8 million, \$24.5 million, and \$23.2 million of income taxes in 2018, 2017, and 2016, respectively	49.7	39.0	37.1
Actuarial (losses) gains, net of \$5.5 million, \$2.9 million, and \$4.8 million of income taxes in 2018, 2017, and 2016, respectively	(16.4)	(8.5)	7.5
Amortization of prior service credits, net of \$0.0 million, \$0.0 million, and \$0.4 million of income taxes in 2018, 2017, and 2016, respectively	(0.1)	(0.1)	(0.6)
Other comprehensive income, net of income taxes	33.2	30.4	44.0
Comprehensive income	\$170.5	\$21.2	\$62.0

See Notes to Consolidated Financial Statements.

Aerojet Rocketdyne Holdings, Inc.
Consolidated Balance Sheets

	As of December 31,	
	2018	2017
	(In millions, except per share amounts)	
ASSETS		
Current Assets		
Cash and cash equivalents	\$ 735.3	\$ 535.0
Restricted cash	5.0	—
Marketable securities	—	20.0
Accounts receivable, net	141.2	64.5
Contract assets	235.1	268.1
Other current assets, net	117.7	129.1
Total Current Assets	1,234.3	1,016.7
Noncurrent Assets		
Property, plant and equipment, net	399.7	359.0
Recoverable environmental remediation costs	251.1	231.1
Deferred income taxes	116.9	145.8
Goodwill	161.3	161.3
Intangible assets	71.8	85.5
Other noncurrent assets, net	255.0	259.3
Total Noncurrent Assets	1,255.8	1,242.0
Total Assets	\$2,490.1	\$2,258.7
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current Liabilities		
Current portion of long-term debt	\$ 273.1	\$ 25.0
Accounts payable	88.7	100.9
Reserves for environmental remediation costs	39.8	35.2
Contract liabilities	272.6	276.8
Other current liabilities	204.1	156.9
Total Current Liabilities	878.3	594.8
Noncurrent Liabilities		
Long-term debt	352.3	591.4
Reserves for environmental remediation costs	288.1	306.2
Pension benefits	376.7	492.8
Other noncurrent liabilities	173.4	171.1
Total Noncurrent Liabilities	1,190.5	1,561.5
Total Liabilities	2,068.8	2,156.3
Commitments and contingencies (Note 8)		
Stockholders' Equity		
Preference stock, par value of \$1.00; 15.0 million shares authorized; none issued or outstanding	—	—
Common stock, par value of \$0.10; 150.0 million shares authorized; 76.8 million shares issued and outstanding as of December 31, 2018; 73.6 million shares issued and outstanding as of December 31, 2017	7.7	7.4
Other capital	561.8	503.1
Treasury stock at cost, 0.8 million shares as of December 31, 2018; 3.5 million shares as of December 31, 2017	(12.7)	(64.5)
Retained earnings (accumulated deficit)	103.9	(71.0)
Accumulated other comprehensive loss, net of income taxes	(239.4)	(272.6)
Total Stockholders' Equity	421.3	102.4
Total Liabilities and Stockholders' Equity	\$2,490.1	\$2,258.7

See Notes to Consolidated Financial Statements.

Aerojet Rocketdyne Holdings, Inc.
Consolidated Statements of Stockholders' Equity (Deficit)

	<u>Common Stock</u>		<u>Other</u>	<u>Treasury</u>	<u>(Accumulated</u>	<u>Accumulated</u>	<u>Total</u>
	<u>Shares</u>	<u>Amount</u>	<u>Capital</u>	<u>Stock</u>	<u>Deficit)</u>	<u>Other</u>	<u>Stockholders'</u>
					<u>Retained</u>	<u>Comprehensive</u>	<u>Equity</u>
					<u>Earnings</u>	<u>Loss</u>	<u>(Deficit)</u>
	(In millions)						
December 31, 2015	62.9	\$ 6.5	\$ 342.6	\$ (64.5)	\$ (79.8)	\$(347.0)	\$(142.2)
Net income	—	—	—	—	18.0	—	18.0
Other comprehensive income, net of income taxes	—	—	—	—	—	44.0	44.0
Reclassification of redeemable common stock	—	—	0.5	—	—	—	0.5
Tax benefit from shares issued under equity plans	—	—	0.3	—	—	—	0.3
Equity component of convertible debt	—	—	54.5	—	—	—	54.5
Conversion of debt to common stock	5.4	0.4	48.6	—	—	—	49.0
Repurchase of shares for option cost and to satisfy tax withholding obligations	(0.3)	—	(3.9)	—	—	—	(3.9)
Stock-based compensation and shares issued under equity plans, net	<u>1.2</u>	<u>—</u>	<u>14.3</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>14.3</u>
December 31, 2016	69.2	6.9	456.9	(64.5)	(61.8)	(303.0)	34.5
Net loss	—	—	—	—	(9.2)	—	(9.2)
Other comprehensive income, net of income taxes	—	—	—	—	—	30.4	30.4
Reclassification of redeemable common stock	0.1	—	0.9	—	—	—	0.9
Cumulative effect of change in accounting guidance	—	—	0.3	—	—	—	0.3
Conversion of debt to common stock	3.9	0.4	35.2	—	—	—	35.6
Repurchase of shares for option cost and to satisfy tax withholding obligations	—	—	(6.2)	—	—	—	(6.2)
Stock-based compensation and shares issued under equity plans, net	<u>0.4</u>	<u>0.1</u>	<u>16.0</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>16.1</u>
December 31, 2017	73.6	7.4	503.1	(64.5)	(71.0)	(272.6)	102.4
Net income	—	—	—	—	137.3	—	137.3
Other comprehensive income, net of income taxes	—	—	—	—	—	33.2	33.2
Cumulative effect of change in accounting guidance (see Note 14)	—	—	—	—	37.6	—	37.6
Contribution of treasury stock to retirement benefit plan	2.7	0.3	42.9	51.8	—	—	95.0
Repurchase of shares for option cost and to satisfy tax withholding obligations	—	—	(3.3)	—	—	—	(3.3)
Stock-based compensation and shares issued under equity plans, net	<u>0.5</u>	<u>—</u>	<u>19.1</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>19.1</u>
December 31, 2018	<u>76.8</u>	<u>\$ 7.7</u>	<u>\$ 561.8</u>	<u>\$ (12.7)</u>	<u>\$103.9</u>	<u>\$(239.4)</u>	<u>\$ 421.3</u>

See Notes to Consolidated Financial Statements.

Aerojet Rocketdyne Holdings, Inc.
Consolidated Statements of Cash Flows

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
Operating Activities			
Net income (loss)	\$137.3	\$ (9.2)	\$ 18.0
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization	72.3	72.6	64.9
Amortization of debt discount and deferred financing costs	8.9	8.5	2.3
Stock-based compensation	20.5	22.0	12.9
Retirement benefits, net	15.9	(8.2)	30.5
Loss on debt repurchased	—	—	34.4
Other, net	(2.2)	0.7	0.6
Changes in assets and liabilities, net of effects from acquisition in 2017:			
Accounts receivable, net	(47.3)	5.6	57.9
Contract assets	10.5	(20.5)	(54.6)
Other current assets, net	21.5	8.9	(22.9)
Recoverable for environmental remediation costs	(20.0)	8.7	(32.6)
Other noncurrent assets	5.8	(31.4)	(12.6)
Accounts payable	(39.4)	1.6	27.0
Contract liabilities	29.2	30.7	(13.6)
Other current liabilities	40.9	(6.5)	(32.9)
Deferred income taxes	4.7	125.7	4.8
Reserves for environmental remediation costs	(13.5)	(8.3)	47.4
Other noncurrent liabilities and other	7.6	11.9	27.2
Net Cash Provided by Operating Activities	252.7	212.8	158.7
Investing Activities			
Purchases of marketable securities	(47.7)	(24.0)	—
Sale of marketable securities	68.1	4.0	—
Purchase of Coleman Aerospace	—	(17.0)	—
Insurance proceeds	1.9	—	—
Proceeds from sale of technology	—	—	0.5
Capital expenditures	(43.2)	(29.4)	(47.6)
Net Cash Used in Investing Activities	(20.9)	(66.4)	(47.1)
Financing Activities			
Proceeds from issuance of debt	—	—	800.0
Debt issuance costs including equity component of convertible debt	(3.3)	—	(9.5)
Debt repayments/repurchases	(25.3)	(20.0)	(700.6)
Proceeds from shares issued under equity plans	5.4	4.5	4.2
Repurchase of shares for withholding taxes and option costs under employee equity plans	(3.3)	(6.2)	(3.9)
Net Cash (Used in) Provided by Financing Activities	(26.5)	(21.7)	90.2
Net Increase in Cash, Cash Equivalents and Restricted Cash	205.3	124.7	201.8
Cash, Cash Equivalents and Restricted Cash at Beginning of Year	535.0	410.3	208.5
Cash, Cash Equivalents and Restricted Cash at End of Year	\$740.3	\$535.0	\$ 410.3
Supplemental disclosures of cash flow information			
Cash paid for interest	\$ 25.3	\$ 22.2	\$ 39.0
Cash paid for income taxes	24.0	3.0	31.2
Cash refund for income taxes	5.2	22.9	0.1
Capital leases	26.8	0.9	—
Conversion of debt to common stock	—	35.6	49.0
Contribution of treasury stock to retirement benefit plans	95.0	—	—

See Notes to Consolidated Financial Statements.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements

Note 1. Summary of Significant Accounting Policies

a. Basis of Presentation and Nature of Operations

The consolidated financial statements of Aerojet Rocketdyne Holdings, Inc. (“Aerojet Rocketdyne Holdings” or the “Company”) include the accounts of the Company and its 100% owned and majority owned subsidiaries. All significant intercompany accounts and transactions have been eliminated in consolidation. Certain reclassifications have been made to financial information for prior years to conform to the current year’s presentation.

The Company’s operations are organized into two segments:

Aerospace and Defense — includes the operations of the Company’s wholly-owned subsidiary Aerojet Rocketdyne, Inc. (“Aerojet Rocketdyne”), a leading technology-based designer, developer and manufacturer of aerospace and defense products and systems for the United States (“U.S.”) government, including the Department of Defense (“DoD”), the National Aeronautics and Space Administration (“NASA”), and major aerospace and defense prime contractors.

Real Estate — includes the activities of the Company’s wholly-owned subsidiary Easton Development Company, LLC (“Easton”) related to the re-zoning, entitlement, sale, and leasing of the Company’s excess real estate assets. The Company is currently in the process of seeking zoning changes and other governmental approvals on its excess real estate assets to optimize their value.

The year of the Company’s subsidiary, Aerojet Rocketdyne, ends on the last Saturday in December. As a result of the 2016 calendar, Aerojet Rocketdyne had 53 weeks of operations in 2016 compared with 52 weeks of operations in 2018 and 2017. The additional week of operations, which occurred in the fourth quarter of 2016, accounted for \$32.2 million in additional net sales.

The preparation of the consolidated financial statements in conformity with accounting principles generally accepted in the United States of America (“GAAP”) requires the Company to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and accompanying notes. Actual results could differ from those estimates.

b. Cash and Cash Equivalents

All highly liquid debt instruments purchased with a remaining maturity at the date of purchase of three months or less are considered to be cash equivalents. The Company aggregates its cash balances by bank, and reclassifies any negative balances, if applicable, to accounts payable.

As of December 31, 2018, the Company designated \$5.0 million as restricted cash to satisfy indemnification obligations for environmental remediation coverage.

c. Fair Value of Financial Instruments

Financial instruments are classified using a three-tiered fair value hierarchy, which prioritizes the inputs used in measuring fair value. These tiers include: Level 1, defined as observable inputs such as quoted prices in active markets; Level 2, defined as inputs other than quoted prices in active markets that are either directly or indirectly observable; and Level 3, defined as unobservable inputs in which little or no market data exists, therefore requiring an entity to develop its own assumptions.

Fair value measurement as of December 31, 2018

	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Other Observable Inputs (Level 2)	Unobservable Inputs (Level 3)
(In millions)				
Money market funds	\$186.3	\$186.3	\$ —	\$—
Commercial paper	154.7	—	154.7	—
Total	\$341.0	\$186.3	\$154.7	\$—

Fair value measurement as of December 31, 2017

	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Other Observable Inputs (Level 2)	Unobservable Inputs (Level 3)
(In millions)				
Money market funds	\$155.0	\$155.0	\$ —	\$—
Commercial paper	135.6	—	135.6	—
U.S. treasury notes	4.1	—	4.1	—
Total	\$294.7	\$155.0	\$139.7	\$—

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

The carrying amounts of certain of the Company's financial instruments, including cash and cash equivalents, restricted cash, accounts receivable, accounts payable, accrued compensation, and other accrued liabilities, approximate fair value because of their short maturities.

The following table summarizes the estimated fair value and principal amount for outstanding debt obligations excluding capital lease obligations:

	Fair Value		Principal Amount	
	As of December 31,		As of December 31,	
	2018	2017	2018	2017
	(In millions)			
Term loan	\$345.6	\$370.0	\$345.6	\$370.0
2.25% Convertible Senior Notes ("2 1/4% Notes")	441.1	415.3	300.0	300.0
	\$786.7	\$785.3	\$645.6	\$670.0

The fair value of the 2 1/4% Notes was determined using broker quotes that are based on open markets for the Company's debt securities (Level 2 securities). The term loan bore interest at variable rates, which adjusted based on market conditions, and its carrying value approximates fair value.

d. Accounts Receivable, net

Accounts Receivable represent our unconditional right to consideration under the contract and include amounts billed and currently due from long-term contract customers. The amounts are stated at their net estimated realizable value.

Other receivables represent amounts billed for sales not derived from long-term contracts.

e. Inventories

Inventories are stated at cost (generally using the average cost method) or net realizable value. The Company capitalizes costs incurred in advance of contract award or funding in inventories if it determines that contract award or funding is probable. Amounts previously capitalized are expensed when changes in facts and circumstances indicate that a contract award or funding is no longer probable.

f. Income Taxes

The Company files a consolidated U.S. federal income tax return with its 100% owned consolidated subsidiaries. The deferred tax assets and/or liabilities are determined by multiplying the differences between the financial reporting and tax reporting bases for assets and liabilities by the enacted tax rates expected to be in effect when such differences are recovered or settled. The effect on deferred taxes of a change in tax rates is recognized in the period of the enactment date of the change.

The carrying value of the Company's deferred tax assets is dependent upon its ability to generate sufficient taxable income in the future. A valuation allowance is required when it is more likely than not that all or a portion of a deferred tax asset will not be realized. A review of all available positive and negative evidence is considered, including the Company's past and future performance, the market environment in which it operates, the utilization of tax attributes in the past, the length of carryback and carryforward periods, and evaluation of potential tax planning strategies.

g. Property, Plant and Equipment, net

Property, plant and equipment are recorded at cost. Refurbishment costs that extend the life or increase the value of an asset are capitalized in the property accounts, whereas ordinary maintenance and repair costs are expensed as incurred. Depreciation is computed principally by accelerated methods based on the following useful lives:

Buildings and improvements	9 - 40 years
Machinery and equipment	6 - 10 years

Costs related to software acquired, developed or modified solely to meet the Company's internal requirements and for which there are no substantive plans to market for sale are capitalized and depreciated over 3 to 7 years. Only costs incurred after the preliminary planning stage of the project and after management has authorized and committed funds to the project are eligible for capitalization.

h. Real Estate Held for Entitlement and Leasing

The Company capitalizes all costs associated with the real estate entitlement and leasing process. The Company classifies activities related to the entitlement, sale, and leasing of its excess real estate assets as operating activities in the consolidated statements of cash flows. Real estate held for entitlement and leasing is included as a component of other noncurrent assets.

i. Goodwill

Goodwill represents the excess of the purchase price of an acquired enterprise or assets over the fair values of the identifiable assets acquired and liabilities assumed. All of the Company's recorded goodwill resides in the Aerospace and Defense reporting unit. Tests for impairment of goodwill are performed on an annual basis, or at any other time if events occur or circumstances indicate that the carrying amount of goodwill may not be recoverable. Circumstances that could trigger an

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

impairment test include but are not limited to: a significant adverse change in the business climate or legal factors; adverse cash flow trends; an adverse action or assessment by a regulator; unanticipated competition; loss of key personnel; decline in stock price; and results of testing for recoverability of a significant asset group within a reporting unit.

The Company evaluates qualitative factors (including macroeconomic conditions, industry and market considerations, cost factors, and overall financial performance) to determine whether it is necessary to perform the first step of the goodwill test. This step is referred to as the “Step Zero” analysis. If it is determined that it is more likely than not (a likelihood of more than 50%) that the fair value of a reporting unit is less than its carrying amount, the Company will proceed to the quantitative (“Step One”) analysis to determine the existence and amount of any goodwill impairment. The Company may also perform a Step One analysis from time to time to augment its qualitative assessment. The Company evaluated goodwill using a “Step One” analysis as of October 1, 2018, and determined that goodwill was not impaired. The Company evaluated goodwill using a “Step Zero” analysis as of October 1, 2017, and determined that goodwill was not impaired.

There can be no assurance that the Company’s estimates and assumptions made for purposes of its goodwill impairment testing will prove to be accurate predictions of the future. If the Company’s assumptions and estimates are incorrect, the Company may be required to record goodwill impairment charges in future periods.

j. Intangible Assets

Identifiable intangible assets, such as patents, trademarks, and licenses are recorded at cost or when acquired as part of a business combination at estimated fair value. Identifiable intangible assets are amortized based on when they provide the Company economic benefit, or using the straight-line method, over their estimated useful life. Amortization periods for identifiable intangible assets range from 7 years to 30 years.

k. Environmental Remediation

The Company expenses, on a current basis, recurring costs associated with managing hazardous substances and contamination in ongoing operations. The Company accrues for costs associated with the remediation of environmental contamination when it becomes probable that a liability has been incurred, and the amount can be reasonably estimated. In most cases only a range of reasonably possible costs can be estimated. In establishing reserves, the most probable estimated amount is used when determinable, and the minimum amount is used when no single amount in the range is more probable. Environmental reserves include the costs of completing remedial investigation and feasibility studies, remedial and corrective actions, regulatory oversight costs, the cost of operation and maintenance of the remedial action plan, and employee compensation costs for employees who are expected to devote a significant amount of time to remediation efforts. Calculation of environmental reserves is based on the evaluation of currently available information with respect to each individual environmental site and considers factors such as existing technology, presently enacted laws and regulations, and prior experience in remediation of contaminated sites. Such estimates are based on the expected costs of investigation and remediation and the likelihood that other potentially responsible parties will be able to fulfill their commitments at sites where the Company may be jointly or severally liable.

At the time a liability is recorded for future environmental costs, the Company records an asset for estimated future recoveries that are estimable and probable. Some of the Company’s environmental costs are eligible for future recovery in the pricing of its products and services to the U.S. government and under existing third party agreements. The Company considers the recovery probable based on the Global Settlement, U.S. government contracting regulations, and its long history of receiving reimbursement for such costs (see Notes 8(c) and 8(d)).

l. Retirement Benefits

The Company discontinued future benefit accruals for the defined benefit pension plans in 2009. The Company provides medical and life insurance benefits (“postretirement benefits”) to certain eligible retired employees, with varied coverage by employee group. Annual charges are made for the cost of the plans, including interest costs on benefit obligations, and net amortization and deferrals, increased or reduced by the return on assets. The Company also sponsors a defined contribution 401(k) plan and participation in the plan is available to all employees (see Note 7).

m. Conditional Asset Retirement Obligations

Conditional asset retirement obligations (“CAROs”) are legal obligations associated with the retirement of long-lived assets. These liabilities are initially recorded at fair value and the expected asset retirement costs are capitalized by increasing the carrying amount of the related assets by the same amount as the liability. Asset retirement costs are subsequently depreciated over the useful lives of the related assets. Subsequent to initial recognition, the Company records period-to-period changes in the CARO liability resulting from the passage of time and revisions to either the timing or the amount of the estimate of the undiscounted cash flows.

CAROs associated with owned properties are based on estimated costs necessary for the legally required removal or remediation of various regulated materials, primarily asbestos disposal and radiological decontamination of an ordnance manufacturing facility. For leased properties, CAROs are based on the estimated cost of contractually required property restoration.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

The following table summarizes the changes in the carrying amount of CAROs:

	Year Ended December 31,		
	2018	2017	2016
		(In millions)	
Balance at beginning of year	\$44.0	\$30.6	\$29.5
Additions and other, net	(0.5)	11.2	(0.9)
Accretion	2.5	2.2	2.0
Balance at end of year	\$46.0	\$44.0	\$30.6

n. Loss Contingencies

The Company is currently involved in certain legal proceedings and has accrued its estimate of the probable costs and recoveries (in relation to environmental costs) for resolution of these claims. These estimates are based upon an analysis of potential results, assuming a combination of litigation and settlement strategies. It is possible, however, that future results of operations or cash flows for any particular period could be materially affected by changes in estimates or the effectiveness of strategies related to these proceedings.

o. Warranties

The Company provides product warranties in conjunction with certain product sales. The majority of the Company's warranties are a one-year standard warranty for parts, workmanship, and compliance with specifications. On occasion, the Company has made commitments beyond the standard warranty obligation. While the Company has contracts with warranty provisions, there is not a history of any significant warranty claims experience. A reserve for warranty exposure is made on a product by product basis when it is both estimable and probable. These costs are included in the program's estimate at completion and are expensed in accordance with the Company's revenue recognition methodology for that particular contract.

p. Revenue Recognition

In the Company's Aerospace and Defense segment, the majority of the Company's revenue is earned from long-term contracts to design, develop, and manufacture aerospace and defense products, and provide related services, for the Company's customers, including the U.S. government, major aerospace and defense prime contractors, and the commercial sector. Each customer contract defines the Company's distinct performance obligations and the associated transaction price for each obligation. A contract may contain one or multiple performance obligations. In certain circumstances, multiple contracts with a customer are required to be combined in determining the distinct performance obligation. For contracts with multiple performance obligations, the Company allocates the contracted transaction price to each performance obligation based upon the relative standalone selling price, which represents the price at which the Company would sell the promised good or service separately to the customer. The Company determines the standalone selling price based upon the facts and circumstances of each obligated good or service. The majority of the Company's contracts have no observable standalone selling price since the associated products and services are customized to customer specifications. As such, the standalone selling price generally reflects the Company's forecast of the total cost to satisfy the performance obligation plus an appropriate profit margin.

Contract modifications are routine in the performance of the Company's long-term contracts. Contracts are often modified to account for changes in contract specifications or requirements. In most instances, contract modifications are for goods or services that are not distinct, and, therefore, are accounted for as part of the existing contract.

The Company recognizes revenue as each performance obligation is satisfied. The majority of the Company's aerospace and defense performance obligations are satisfied over time either as the service is provided, or as control transfers to the customer. Transfer of control is evidenced by the Company's contractual right to payment for work performed to date plus a reasonable profit on contracts with highly customized products that have no alternative use to the Company. The Company measures progress on substantially all its performance obligations using the cost-to-cost method, which the Company believes best depicts the transfer of control of goods and services to the customer. Under the cost-to-cost method, the Company records revenues based upon costs incurred to date relative to the total estimated cost at completion. Contract costs include labor, material, overhead, and general and administrative expenses, as appropriate.

Recognition of revenue and profit on long-term contracts requires the use of assumptions and estimates related to the total contract value, the total cost at completion, and the measurement of progress towards completion for each performance obligation. Due to the nature of the programs, developing the estimated total contract value and total cost at completion for each performance obligation requires the use of significant judgment.

The contract value of long-term contracts may include variable consideration, such as incentives, awards, or penalties. The value of variable consideration is generally determined by contracted performance metrics, which may include targets for cost, performance, quality, and schedule. The Company includes variable consideration in the transaction price for the respective performance obligation at either estimated value, or most likely amount to be earned, based upon the Company's assessment of expected performance. The Company records these amounts only to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved.

The Company evaluates the contract value and cost estimates for performance obligations at least quarterly and more frequently when circumstances significantly change. Factors considered in estimating the work to be completed include, but are

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

not limited to: labor productivity, the nature and technical complexity of the work to be performed, availability and cost volatility of materials, subcontractor and vendor performance, warranty costs, volume assumptions, anticipated labor agreements, inflationary trends, schedule and performance delays, availability of funding from the customer, and the recoverability of costs incurred outside the original contract included in any estimates to complete. When the Company's estimate of total costs to be incurred to satisfy a performance obligation exceeds the expected revenue, the Company recognizes the loss immediately. When the Company determines that a change in estimates has an impact on the associated profit of a performance obligation, the Company records the cumulative positive or negative adjustment to the statement of operations. Changes in estimates and assumptions related to the status of certain long-term contracts may have a material effect on the Company's operating results. The following table summarizes the impact of the changes in significant contract accounting estimates on the Company's Aerospace and Defense segment operating results:

	Year Ended December 31,		
	2018	2017	2016
	(In millions, except per share amounts)		
Net favorable effect of the changes in contract estimates on net sales	\$68.2	\$33.7	\$ 2.7
Favorable effect of the changes in contract estimates on income before income taxes	59.1	37.2	14.1
Favorable effect of the changes in contract estimates on net income (loss)	43.1	22.3	8.5
Favorable effect of the changes in contract estimates on basic net income (loss) per share	0.56	0.31	0.13
Favorable effect of the changes in contract estimates on diluted net income (loss) per share	0.55	0.31	0.11

The 2018 net favorable changes in contract estimates on income before income taxes were primarily driven by risk retirements on the Terminal High Altitude Area Defense ("THAAD"), RS-68, and RL-10 programs and favorable overhead rate performance, partially offset by cost growth and performance issues on the Commercial Crew Development program. The 2017 net favorable changes in contract estimates were primarily driven by improved performance on numerous programs as a result of overhead cost reductions and reduced program risks, most notably on the THAAD program, partially offset by cost growth and manufacturing inefficiencies in 2017 on electric propulsion contracts. The 2016 net favorable changes in contract estimates were primarily driven by improved performance on space launch systems primarily due to affordability initiatives and lower overhead costs, partially offset by cost growth and manufacturing inefficiencies on electric propulsion contracts.

In the Company's Aerospace and Defense segment, the timing of revenue recognition, customer invoicing, and collections produces accounts receivable, contract assets, and contract liabilities on the Company's Consolidated Balance Sheet. The Company invoices in accordance with contract payment terms either based upon a recurring contract payment schedule, or as contract milestones are achieved. Customer invoices, net of reserves, represent an unconditional right of consideration. When revenue is recognized in advance of customer invoicing, a contract asset is recorded. Conversely, when customers are invoiced in advance of revenue recognition, a contract liability is recorded. Unpaid customer invoices are reflected as accounts receivable. Amounts for overhead disallowances or billing decrements are reflected in contract assets and primarily represent estimates of potential overhead costs which may not be successfully negotiated and collected. The following table summarizes contract assets and liabilities:

	As of December 31,	
	2018	2017
	(In millions)	
Contract assets	\$278.0	\$310.9
Reserve for overhead rate disallowance	(42.9)	(42.8)
Contract assets, net of reserve	235.1	268.1
Contract liabilities	272.6	276.8
Net contract liabilities, net of reserve	\$ (37.5)	\$ (8.7)

Net contract liabilities increased by \$28.8 million, primarily due to the timing of contract performance payments. During 2018, the Company recognized sales of \$209.6 million that were included in the Company's contract liabilities as of January 1, 2018. Contract assets included unbilled receivables of \$263.7 million and \$195.5 million as of December 31, 2018 and 2017, respectively. As of December 31, 2018, unbilled receivables expected to be collected after one year was \$193.0 million. Net contract liabilities included an allocation of general and administrative costs incurred throughout 2018 and 2017 amounting to \$248.8 million and \$238.4 million, respectively, and the cumulative amount of general and administrative costs in long-term contract inventories was estimated to be \$2.7 million and \$11.4 million as of December 31, 2018 and 2017, respectively.

As of December 31, 2018, the Company's total remaining performance obligations, also referred to as backlog, totaled \$4.1 billion. The Company expects to recognize approximately 45%, or \$1.8 billion, of the remaining performance obligations as sales over the next twelve months, an additional 29% the following twelve months, and 26% thereafter.

The Company's contracts are largely categorized as either "fixed-price" (largely used by the U.S. government for production-type contracts) or "cost-reimbursable" (largely used by the U.S. government for development-type contracts).

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

Fixed-price contracts present the risk of unreimbursed cost overruns, potentially resulting in lower than expected contract profits and margins. This risk is generally lower for cost-reimbursable contracts which, as a result, generally have a lower margin. The following table summarizes the percentages of net sales by contract type:

	Year Ended December 31,		
	2018	2017	2016
Fixed-price	63%	64%	68%
Cost-reimbursable	37	36	32

Revenue from real estate asset sales is recognized when a sufficient down-payment has been received, financing has been arranged and title, possession and other attributes of ownership have been transferred to the buyer. The allocation to cost of sales on real estate asset sales is based on a relative fair market value computation of the land sold which includes the basis on the Company's book value, capitalized entitlement costs, and an estimate of the Company's continuing financial commitment.

q. Research and Development ("R&D")

Company-funded R&D expenses (reported as a component of cost of sales) were \$46.7 million, \$44.6 million, and \$43.0 million in 2018, 2017, and 2016, respectively. Company-funded R&D expenses include the costs of technical activities that are useful in developing new products, services, processes, or techniques, as well as expenses for technical activities that may significantly improve existing products or processes. These expenses are generally allocated among all contracts and programs in progress under U.S. government contractual arrangements. From time to time, the Company believes it is in its best interests to self-fund and not allocate costs for certain R&D activities to the U.S. government contracts and the Company had \$32.1 million of such costs in 2015 related to the AR1 engine, see discussion below.

Customer-funded R&D expenditures, which are funded from U.S. government contracts, totaled \$591.6 million, \$561.1 million, and \$513.0 million in 2018, 2017, and 2016, respectively. Expenditures under customer-funded R&D U.S. government contracts are accounted for as sales and cost of products sold.

AR1 Research and Development

Company-funded research and development ("R&D") expenses (reported as a component of cost of sales) are generally reimbursed via allocation of such expenses among all contracts and programs in progress under U.S. government contractual arrangements. The Company's large liquid booster engine development project, the AR1, accounted for \$56.1 million of such reimbursable costs from its inception through December 31, 2018. In February 2016, pursuant to an Other Transaction Agreement ("OTA"), the U.S. Air Force selected Aerojet Rocketdyne and United Launch Alliance ("ULA") to share in a public-private partnership to develop jointly the AR1 engine under an agreement valued at \$804.0 million with the U.S. Air Force investing two-thirds of the funding required to complete development of the AR1 engine by December 2019. In June 2018, the Company and the U.S. Air Force signed a modification to the existing OTA to modify the scope, funding, cost share, and period of performance of the AR1 engine. The modified OTA is valued at \$353.8 million with the U.S. Air Force investing five-sixths of the funding required to design, build, and assemble a single AR1 engine prototype by December 2019. The U.S. Air Force contributions are recognized proportionately as an offset to R&D expenses. The following table summarizes the AR1 inception-to-date project costs through December 31, 2018 (in millions):

AR1 R&D costs incurred	\$ 331.2
Less amounts funded by the U.S. Air Force	(233.4)
Less amounts funded by ULA	(9.6)
AR1 R&D costs net of reimbursements	\$ 88.2

Of the \$88.2 million AR1 investment, \$32.1 million was expensed and \$56.1 million was applied to the Company's contracts. No costs have been applied to the Company's contracts during 2018. The Company's cash contributions to this OTA are now complete.

r. Stock-based Compensation

The Company recognizes stock-based compensation in the statements of operations at the grant-date fair value of stock awards issued to employees and directors over the vesting period. The Company also grants Stock Appreciation Rights ("SARs") awards which are similar to the Company's employee stock options, but are settled in cash rather than in shares of common stock, and are classified as liability awards. Compensation cost for these awards is determined using a fair-value method and remeasured at each reporting date until the date of settlement. The Company accounts for forfeitures when they occur for consistency with the U.S. government recovery accounting practice.

s. Impairment or Disposal of Long-Lived Assets

Impairment of long-lived assets is recognized when events or circumstances indicate that the carrying amount of the asset, or related groups of assets, may not be recoverable. Circumstances which could trigger a review include, but are not limited to: significant decreases in the market price of the asset; significant adverse changes in the business climate or legal factors; accumulation of costs significantly in excess of the amount originally expected for the acquisition or construction of the asset; current period cash flow or operating losses combined with a history of losses or a forecast of continuing losses

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

associated with the use of the asset; or a current expectation that the asset will more likely than not be sold or disposed of significantly before the end of its estimated useful life. The carrying amount of a long-lived asset is not recoverable if it exceeds the sum of the undiscounted cash flows expected to result from the use and eventual disposition of the asset. If the Company determines that an asset is not recoverable, then the Company would record an impairment charge if the carrying value of the asset exceeds its fair value.

A long-lived asset classified as “held for sale” is initially measured at the lower of its carrying amount or fair value less costs to sell. In the period that the “held for sale” criteria are met, the Company recognizes an impairment charge for any initial adjustment of the long-lived asset amount. Gains or losses not previously recognized resulting from the sale of a long-lived asset are recognized on the date of sale.

t. Concentrations

Dependence upon U.S. Government Programs and Contracts

The principal end user customers of our products and technology are primarily agencies of the U.S. government. The following table summarizes the percentages of net sales by principal end user:

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
U.S. government	94%	92%	91%
Non U.S. government customers	6	8	9

The following table summarizes the percentages of net sales for significant programs, all of which are included in the U.S. government sales and are comprised of multiple contracts:

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
RS-25 program	14%	14%	12%
Standard Missile program	13	9	12
THAAD program	11	9	13

Major Customers

The following table summarizes the customers that represented more than 10% of net sales, each of which involves sales of several product lines and programs:

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
Lockheed Martin Corporation (“Lockheed Martin”)	30%	24%	27%
Raytheon Company (“Raytheon”)	19	17	20
NASA	18	17	13
ULA	17	22	21

Credit Risk

Aside from investments held in the Company’s retirement benefit plans, financial instruments that could potentially subject the Company to concentration of credit risk consist primarily of cash, cash equivalents, and trade receivables. The Company’s cash and cash equivalents are held and managed by recognized financial institutions and are subject to the Company’s investment policy. The investment policy outlines minimum acceptable credit ratings for each type of investment and limits the amount of credit exposure to any one security issue. The Company does not believe significant concentration of credit risk exists with respect to these investments.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

The following table summarizes customers that represented more than 10% of accounts receivable, including unbilled receivables which are a component of contract assets:

	As of December 31,	
	2018	2017
Raytheon	29%	16%
Lockheed Martin	18	12
The Boeing Company	17	35
NASA	10	11
ULA	*	11

* Less than 10%

Dependence on Single Source and Other Third Party Suppliers

The Company uses a significant quantity of raw materials that are highly dependent on market fluctuations and government regulations. Further, as a U.S. government contractor, the Company is often required to procure materials from suppliers capable of meeting rigorous customer and government specifications. As market conditions change for these companies, they often discontinue materials with low sales volumes or profit margins. The Company is often forced to either qualify new materials or pay higher prices to maintain the supply. To date the Company has been successful in establishing replacement materials and securing customer funding to address specific qualification needs of the programs. Prolonged disruptions in the supply of any of the Company's key raw materials, difficulty qualifying new sources of supply, implementing use of replacement materials or new sources of supply, and/or a continuing volatility in the prices of raw materials could have a material adverse effect on the Company's operating results, financial condition, and/or cash flows.

Workforce

As of December 31, 2018, 12% of the Company's employees were covered by collective bargaining agreements.

u. Related Parties

Warren G. Lichtenstein, the Executive Chairman of the Company is also the Executive Chairman of Steel Partners Holdings L.P. ("Steel Holdings") and the Chief Executive Officer of Steel Partners Ltd. ("SPL"). The Company received services of \$0.6 million, \$0.6 million, and \$0.9 million in 2018, 2017, and 2016, respectively, from Steel Holdings and SPL, which primarily included administrative services and the use of an aircraft for business travel. As of December 31, 2018 and 2017, the Company had liabilities due to such entities of \$0.4 million and \$0.2 million, respectively.

Lucas-Milhaupt, Inc., an indirect wholly-owned subsidiary of Steel Holdings, sold \$0.3 million and \$0.2 million in raw materials to the Company for the manufacture of its products in 2018 and 2017, respectively.

GAMCO Investors, Inc. ("GAMCO") owned 10% and 12% of the Company's common stock at December 31, 2018 and 2017, respectively. The Company received services of \$1.7 million, \$1.1 million, and \$1.1 million in 2018, 2017, and 2016, respectively, from GAMCO for investment management fees of the Company's defined benefit pension plan assets.

Martin Turchin, a member of the Board of Directors of the Company is also a non-executive Vice Chairman of CB Richard Ellis ("CBRE"). The Company received services of \$0.4 million from CBRE for lease commissions in 2018.

BlackRock, Inc. ("BlackRock") owned 16% and 15% of the Company's common stock at December 31, 2018 and 2017, respectively. The Company invests in money market funds managed by BlackRock.

The Vanguard Group, Inc. ("Vanguard") owned 10% of the Company's common stock at December 31, 2018 and 2017, respectively. Certain of the investment alternatives offered through the Company's 401(k) plan include funds managed by Vanguard.

v. Accounting Pronouncements

Recently Adopted Accounting Pronouncements

In March 2016, the Financial Accounting Standards Board ("FASB") amended the existing accounting guidance related to stock compensation. The amendment requires all income tax effects of awards to be recognized in the income statement when awards vest and allows a choice to account for forfeitures on an estimated or actual basis. There is also a requirement to present excess income tax benefits as an operating activity on the statement of cash flows. Effective January 1, 2017, the Company adopted the amendment requiring recognition of excess tax benefits and tax deficiencies in the income statement prospectively. In addition, the Company elected to change its accounting policy to account for forfeitures when they occur for consistency with the U.S. government recovery accounting practices on a modified retrospective basis. The Company also elected to adopt the amendment related to the presentation of excess tax benefits within operating activities on the statement of cash flows, retrospectively.

In January 2017, the FASB issued an amendment to the accounting guidance related to goodwill impairment. The update eliminates "Step 2" which involves determining the implied fair value of goodwill and comparing it to the carrying amount of goodwill to measure the goodwill impairment loss, if any. The quantitative assessment "Step 1" will be used to determine both

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

the existence and amount of goodwill impairment. The standard should be applied on a prospective basis and is effective for annual or any interim goodwill impairment tests in fiscal years beginning after December 15, 2019, with early adoption permitted. The Company adopted this new accounting guidance in conjunction with its annual impairment test on October 1, 2017. The adoption did not have an impact on the Company's financial position, results of operations, or cash flows.

In August 2016, the FASB issued an amendment to the accounting guidance related to classification of certain cash receipts and cash payments in the statement of cash flows. The standard provides guidance for eight targeted changes with respect to how cash receipts and cash payments are classified in the statement of cash flows, with the objective of reducing diversity in practice. The Company adopted this new accounting guidance on December 31, 2017. The adoption did not have an impact on the Company's financial position, results of operations, or cash flows.

In November 2016, the FASB issued an amendment to the accounting guidance for the presentation of restricted cash in the statement of cash flows. The new guidance requires that the statement of cash flows explain the difference during the period in total cash, cash equivalents, and restricted cash. Also, when cash, cash equivalents, and restricted cash are presented on more than one line item within the statement of financial position, a reconciliation of those line items to the total cash, cash equivalents, and restricted cash presented on the statement of cash flows must be disclosed. The Company adopted this new accounting guidance on December 31, 2017. The adoption did not have an impact on the Company's financial position, results of operations, or cash flows.

In December 2017, Staff Accounting Bulletin No. 118 ("SAB 118") was issued to address the application of GAAP in situations when a registrant does not have the necessary information available, prepared, or analyzed in reasonable detail to complete the accounting for certain income tax effects of the Tax Cuts and Jobs Act ("Tax Act"). In accordance with SAB 118, the Company recorded \$64.6 million of deferred tax expense in connection with the remeasurement of certain deferred tax assets and liabilities in the three months ended December 31, 2017. As of December 31, 2018, the Company completed its accounting for the effects of the Tax Act by recording a deferred expense of \$1.2 million.

In May 2014, the FASB amended the existing accounting standards for revenue recognition. The amendments are based on the principle that revenue should be recognized to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The Company adopted the guidance effective January 1, 2018, using the modified retrospective method, with the cumulative effect recognized as of January 1, 2018. All applicable amounts and disclosures for 2018 reflect the impact of adoption. As the Company elected to use the modified retrospective method, prior periods presented have not been restated to reflect the impact of adoption unless otherwise noted (see Notes 1(p) and 14).

In March 2017, the FASB amended the existing accounting guidance relating to the presentation of net periodic pension cost and net periodic postretirement benefit cost (the "NPPC") in the income statement. The amended guidance requires the service cost component to be presented in the same line item or items as other compensation arising from the services rendered by the pertinent employees during the period, and other components of the NPPC to be presented in the statement of operations separately from service cost components and outside a subtotal of income from operations. The Company adopted the guidance effective January 1, 2018. The adoption resulted in an increase in operating income of \$73.2 million and \$68.9 million for 2017 and 2016, respectively, and a corresponding increase in total non-operating expense, net for the period. The adoption did not impact segment performance, net income, or cash flows.

Recently Issued Accounting Pronouncements

In February 2016, the FASB issued guidance requiring lessees to recognize a right-of-use asset and a lease liability on the balance sheet for all leases with the exception of short-term leases. For lessees, leases will continue to be classified as either operating or finance leases in the income statement. Lessor accounting is similar to the current model but updated to align with certain changes to the lessee model. Lessors will continue to classify leases as operating, direct financing or sales-type leases. The effective date of the new standard is for fiscal years beginning after December 15, 2018, and interim periods within those fiscal years. Early adoption is permitted. The new standard allows for application of the standard on the adoption date without restatement of prior comparative periods presented or a modified retrospective transition method which requires application of the new guidance at the beginning of the earliest comparative period presented. The Company intends to adopt this new standard as of January 1, 2019, without restating prior comparative periods and expects as a result of the adoption to record a material right-of-use asset and lease liability on the consolidated balance sheet.

In February 2018, the FASB issued guidance that permits the reclassification of the income tax effects of the Tax Act on items within accumulated other comprehensive loss to retained earnings. The guidance refers to these amounts as "stranded tax effects." The amended guidance also requires certain new disclosures. The new guidance is effective for financial statements issued for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years. The Company is evaluating the impact of adopting this new accounting guidance on its financial position, results of operations, or cash flows.

In August 2018, the FASB issued guidance that modifies the disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans. The new guidance is effective for financial statements issued for fiscal years ending after December 15, 2020. Early adoption is permitted and requires adoption on a retrospective basis to all periods presented. As the new guidance only impacts presentation, the Company does not expect the guidance to have an impact on its financial position, results of operations, or cash flows.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

Note 2. Income (Loss) Per Share of Common Stock

The following table reconciles the numerator and denominator used to calculate basic and diluted income (loss) per share of common stock (“EPS”):

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
	(In millions, except per share amounts)		
Numerator:			
Net income (loss)	\$137.3	\$ (9.2)	\$18.0
Income allocated to participating securities	(2.9)	—	(0.4)
Net income (loss) for basic and diluted EPS	<u>\$134.4</u>	<u>\$ (9.2)</u>	<u>\$17.6</u>
Denominator:			
Basic weighted average shares	74.8	73.0	65.6
Effect of:			
2 ¼% Notes	1.9	—	—
Employee stock options and stock purchase plan	0.1	—	0.1
Diluted weighted average shares	<u>76.8</u>	<u>73.0</u>	<u>65.7</u>
Basic:			
Net income (loss) per share	<u>\$ 1.80</u>	<u>\$(0.13)</u>	<u>\$0.27</u>
Diluted:			
Net income (loss) per share	<u>\$ 1.75</u>	<u>\$(0.13)</u>	<u>\$0.27</u>

The following table sets forth the potentially dilutive securities excluded from the computation because their effect would have been anti-dilutive:

	<u>Year Ended</u> <u>December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
	(In millions)		
4 ½% Convertible Subordinated Debentures	—	0.1	7.1
Employee stock options and stock purchase plan	—	0.1	—
Unvested restricted shares	<u>1.5</u>	<u>1.6</u>	<u>1.6</u>
Total potentially dilutive securities	<u>1.5</u>	<u>1.8</u>	<u>8.7</u>

The Company’s 2 ¼% Notes were not included in the computation of diluted EPS for 2017 and 2016 because the average market price of the common stock did not exceed the conversion price and the Company only expects the conversion premium for the 2 ¼% Notes to be settled in common shares.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

Note 3. Balance Sheet Accounts and Supplemental Disclosures

a. Marketable Securities

The following table summarizes short-term available-for-sale investments as of December 31, 2018:

	<u>Amortized Cost</u>	<u>Gross Unrealized Gains</u>	<u>Gross Unrealized Losses</u>	<u>Estimated Fair Value</u>
	(In millions)			
Commercial paper	\$154.7	\$—	\$—	\$154.7
Marketable securities	<u>\$154.7</u>	<u>\$—</u>	<u>\$—</u>	<u>\$154.7</u>

As of December 31, 2018, the total estimated fair value for commercial paper of \$154.7 million was classified as cash and cash equivalents as the remaining maturity at date of purchase was less than three months.

The following table summarizes short-term available-for-sale investments as of December 31, 2017:

	<u>Amortized Cost</u>	<u>Gross Unrealized Gains</u>	<u>Gross Unrealized Losses</u>	<u>Estimated Fair Value</u>
	(In millions)			
Commercial paper	\$135.6	\$—	\$—	\$135.6
U.S. treasury notes	4.1	—	—	4.1
Marketable securities	<u>\$139.7</u>	<u>\$—</u>	<u>\$—</u>	<u>\$139.7</u>

As of December 31, 2017, of the total estimated fair value, \$119.7 million was classified as cash and cash equivalents as the remaining maturity at date of purchase was less than three months, and \$20.0 million was classified as marketable securities. At December 31, 2017, the contractual maturities of the Company's available-for-sale marketable securities were less than one year.

b. Accounts Receivable, net

	<u>As of December 31,</u>	
	<u>2018</u>	<u>2017</u>
	(In millions)	
Billed	\$147.3	\$64.5
Reserve on billed trade receivables	(6.6)	(0.7)
Other trade receivables	0.5	0.7
Accounts receivable, net	<u>\$141.2</u>	<u>\$64.5</u>

The Company made certain reclassifications to the December 31, 2017, balance sheet to conform to the current year's presentation as a result of adopting the new revenue recognition guidance effective January 1, 2018. Accordingly, the Company reclassified \$151.0 million of unbilled receivables, net of reserves for disallowances, to contract assets as of December 31, 2017 (see Notes 1(p) and 14).

c. Other Current Assets, net

	<u>As of December 31,</u>	
	<u>2018</u>	<u>2017</u>
	(In millions)	
Recoverable from the U.S. government for acquisition integration costs	\$ —	\$ 10.9
Recoverable from the U.S. government and other third parties for environmental remediation costs	34.5	25.6
Receivable from Northrop Grumman Corporation ("Northrop") for environmental remediation costs	6.0	6.0
Prepaid expenses	14.4	19.2
Cost-share and other receivables, net	10.5	7.5
Inventories	14.9	19.3
Recoverable from the U.S. government for competitive improvement program obligations	18.1	14.9
Income tax receivable	14.9	20.5
Other	4.4	5.2
Other current assets, net	<u>\$117.7</u>	<u>\$129.1</u>

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

The Company made certain reclassifications to the December 31, 2017, balance sheet to conform to the current year's presentation as a result of adopting the new revenue recognition guidance effective January 1, 2018. Accordingly, the Company reclassified \$117.1 million of inventories to contract assets as of December 31, 2017 (see Notes 1(p) and 14).

d. Property, Plant and Equipment, net

	As of December 31,	
	2018	2017
	(In millions)	
Land	\$ 71.2	\$ 71.2
Buildings and improvements	408.6	368.3
Machinery and equipment, including capitalized software	499.5	493.2
Construction-in-progress	63.1	30.3
	1,042.4	963.0
Less: accumulated depreciation	(642.7)	(604.0)
Property, plant and equipment, net	\$ 399.7	\$ 359.0

The cost and accumulated depreciation of property, plant and equipment that the Company is leasing under capital lease arrangements was \$27.7 million and \$1.7 million, respectively, as of December 31, 2018. Depreciation expense for 2018, 2017, and 2016 was \$56.1 million, \$56.7 million, and \$49.6 million, respectively. The Company had \$27.2 million of non-cash property, plant and equipment additions as of December 31, 2018.

e. Goodwill.

The goodwill balance as of December 31, 2018 and 2017 relates to the Company's Aerospace and Defense segment. The change of \$3.2 million in the carrying amount of goodwill in 2017 was due to the Coleman Aerospace acquisition (see Note 4).

f. Intangible Assets

	As of December 31, 2018		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
	(In millions)		
Customer related	\$ 87.2	\$56.4	\$30.8
Intellectual property\trade secrets	34.2	14.5	19.7
Trade name	21.0	3.9	17.1
Acquired technology	19.2	15.0	4.2
Intangible assets	\$161.6	\$89.8	\$71.8

	As of December 31, 2017		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
	(In millions)		
Customer related	\$ 87.2	\$46.9	\$40.3
Intellectual property\trade secrets	34.2	11.8	22.4
Trade name	21.0	3.1	17.9
Acquired technology	19.2	14.3	4.9
Intangible assets	\$161.6	\$76.1	\$85.5

The intangible asset balances as of December 31, 2018 and 2017, relates to the Company's Aerospace and Defense segment. Amortization expense related to intangible assets was \$13.7 million, \$13.7 million, and \$13.3 million in 2018, 2017, and 2016, respectively.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

Future amortization expense for the five succeeding years is estimated to be as follows:

<u>Year Ending December 31,</u>	<u>Future Amortization Expense</u> (In millions)
2019	\$13.6
2020	13.4
2021	9.9
2022	6.6
2023	6.1
	<u>\$49.6</u>

g. Other Noncurrent Assets, net

	<u>As of December 31,</u>	
	<u>2018</u>	<u>2017</u>
	(In millions)	
Real estate held for entitlement and leasing	\$ 96.3	\$ 94.0
Receivable from Northrop for environmental remediation costs	52.5	58.5
Recoverable from the U.S. government for conditional asset retirement obligations	28.8	22.7
Recoverable from the U.S. government for competitive improvement program obligations	2.8	18.4
Recoverable from the U.S. government for restructuring costs	24.8	25.5
Grantor trust	26.0	24.2
Note receivable, net	9.8	9.0
Other	14.0	7.0
Other noncurrent assets, net	<u>\$255.0</u>	<u>\$259.3</u>

h. Other Current Liabilities

	<u>As of December 31,</u>	
	<u>2018</u>	<u>2017</u>
	(In millions)	
Accrued compensation and employee benefits	\$116.4	\$113.4
Other program liabilities	29.8	6.6
Income taxes payable	19.8	0.8
Competitive improvement program obligations	20.4	15.0
Postretirement medical and life insurance benefits	4.4	4.8
Other	13.3	16.3
Other current liabilities	<u>\$204.1</u>	<u>\$156.9</u>

The Company made certain reclassifications to the December 31, 2017, balance sheet to conform to the current year's presentation as a result of adopting the new revenue recognition guidance effective January 1, 2018. Accordingly, the Company reclassified \$39.0 million of other current liabilities to contract liabilities as of December 31, 2017 (see Notes 1(p) and 14).

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

i. Other Noncurrent Liabilities

	<u>As of December 31,</u>	
	<u>2018</u>	<u>2017</u>
	(In millions)	
Conditional asset retirement obligations	\$ 46.0	\$ 44.0
Pension benefits, non-qualified	15.9	17.6
Deferred compensation	32.3	29.4
Deferred revenue	12.1	12.7
Postretirement medical and life insurance benefits	26.9	32.7
Advanced manufacturing facility construction costs	19.3	—
Competitive improvement program obligations	2.8	18.4
Uncertain income tax positions	5.9	2.8
Other	12.2	13.5
Other noncurrent liabilities	<u>\$173.4</u>	<u>\$171.1</u>

j. Accumulated Other Comprehensive Loss, Net of Income Taxes

The following table presents the changes in accumulated other comprehensive loss by components, net of income taxes:

	<u>Actuarial Losses, Net</u>	<u>Prior Service Credits, Net</u>	<u>Total</u>
	(In millions)		
December 31, 2016	\$(303.2)	\$ 0.2	\$(303.0)
Actuarial losses, net of income taxes	(8.5)	—	(8.5)
Amortization of actuarial losses and prior service credits, net of income taxes	<u>39.0</u>	<u>(0.1)</u>	<u>38.9</u>
December 31, 2017	(272.7)	0.1	(272.6)
Actuarial losses, net of income taxes	(16.4)	—	(16.4)
Amortization of actuarial losses and prior service credits, net of income taxes	<u>49.7</u>	<u>(0.1)</u>	<u>49.6</u>
December 31, 2018	<u>\$(239.4)</u>	<u>\$—</u>	<u>\$(239.4)</u>

The following table presents the estimated amounts that will be amortized from accumulated other comprehensive loss into net periodic benefit expense in 2019:

	<u>Pension Benefits</u>	<u>Medical and Life Insurance Benefits</u>
	(In millions)	
Actuarial losses (gains), net	\$40.9	\$(3.8)
Prior service costs (credits), net	<u>0.1</u>	<u>(0.2)</u>
	<u>\$41.0</u>	<u>\$(4.0)</u>

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

Note 4. Acquisition

On February 24, 2017, the Company closed on an agreement to purchase substantially all of the assets of Coleman Aerospace, a systems engineering and integration provider, from L3 Technologies, Inc. (“L3”). Coleman Aerospace operates now as a subsidiary of Aerojet Rocketdyne and was renamed Aerojet Rocketdyne Coleman Aerospace, Inc. (“Coleman”). The acquisition builds upon and expands the Company’s capabilities in mission analysis and systems engineering, and increases its product portfolio to include vehicle integration for small-, medium- and intermediate-range ballistic missile targets and other small launch vehicles.

The aggregate consideration paid to L3 for the purchase of Coleman was \$17.0 million, which included \$15.0 million of cash paid at closing and a \$2.0 million working capital adjustment paid in the third quarter of 2017. The Company incurred \$1.0 million of expenses related to the acquisition of Coleman.

The purchase price allocation has been developed based on estimates of the fair value of the assets and liabilities of Coleman that the Company acquired. In addition, the allocation of the purchase price to acquired intangible assets is based on fair value estimates.

The following table summarizes the estimated fair values of the assets acquired and liabilities assumed at the acquisition date (in millions):

Current assets	\$12.0
Property, plant and equipment	1.9
Total tangible assets acquired	13.9
Intangible assets acquired	4.8
Deferred income taxes	0.3
Total assets acquired	19.0
Liabilities assumed, current	(5.2)
Total identifiable net assets acquired	13.8
Goodwill (consideration less total identifiable net assets acquired)	<u>\$ 3.2</u>

The purchase price allocation resulted in the recognition of \$3.2 million in goodwill, all of which is deductible for tax purposes and included within the Company’s Aerospace and Defense segment. Goodwill recognized from the acquisition primarily relates to the expected contributions of Coleman to the Company’s overall corporate strategy.

The following table summarizes the estimated fair value of Coleman’s intangible assets acquired:

	<u>Gross Carrying Amount (in millions)</u>	<u>Amortization Period (years)</u>
Trade name	\$0.5	8
Customer related	3.4	7
Acquired technology	0.9	10
Total intangible assets	<u>\$4.8</u>	

The acquisition of Coleman was not considered a significant business combination.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

Note 5. Income Taxes

The Company files a consolidated U.S. federal income tax return with its wholly-owned subsidiaries. The following table presents the components of the Company's income tax provision:

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
	(In millions)		
Current			
U.S. federal	\$35.1	\$ (30.6)	\$ 3.2
State and local	11.5	1.0	3.2
	<u>46.6</u>	<u>(29.6)</u>	<u>6.4</u>
Deferred			
U.S. federal	0.9	116.0	2.8
State and local	3.8	9.7	2.0
	<u>4.7</u>	<u>125.7</u>	<u>4.8</u>
Income tax provision	<u>\$51.3</u>	<u>\$ 96.1</u>	<u>\$11.2</u>

The following table presents the reconciling items between the income tax provision using the U.S. federal statutory rate and the Company's reported income tax provision.

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
	(In millions)		
Statutory U.S. federal income tax	\$39.6	\$30.4	\$10.2
State income taxes	12.1	7.0	3.2
Reserve adjustments	2.7	(4.6)	(0.3)
Non-deductible convertible subordinated notes interest	—	—	0.8
R&D credits	(3.7)	(1.2)	(4.1)
Benefit of manufacturing deductions	—	—	0.5
Lobbying costs	0.4	0.7	0.8
Deferred tax adjustment	(0.6)	(0.1)	(0.4)
Stock compensation excess tax benefits	(0.4)	(1.4)	—
Other, net	1.2	0.7	0.5
New legislation — tax rate changes	—	64.6	—
Income tax provision	<u>\$51.3</u>	<u>\$96.1</u>	<u>\$11.2</u>

The following table presents a reconciliation of the U.S. federal statutory income tax rate to the Company's effective income tax rate on earnings in percentages.

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
Statutory U.S. federal income tax rate	21.0%	35.0%	35.0%
State income taxes	6.4	8.0	11.0
Reserve adjustments	1.4	(5.3)	(1.0)
Non-deductible convertible subordinated notes interest	—	—	2.7
R&D credits	(2.0)	(1.4)	(14.0)
Benefit of manufacturing deductions	—	—	1.7
Lobbying costs	0.2	0.8	2.7
Deferred tax adjustment	(0.3)	(0.1)	(1.4)
Stock compensation excess tax benefits	(0.2)	(1.6)	—
Other, net	0.7	0.8	1.7
New legislation — tax rate changes	—	74.4	—
Effective income tax rate	<u>27.2%</u>	<u>110.6%</u>	<u>38.4%</u>

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

In 2018, the Company's effective tax rate was 27.2%. The Company's effective tax rate differed from the 21% statutory federal income tax rate primarily due to state income taxes and unfavorable adjustments to uncertain tax positions partially offset by R&D credits.

In 2017, the Company's effective tax rate was 110.6%. The Company's effective tax rate differed from the 35.0% statutory federal income tax rate primarily due to the change in the federal statutory tax rate from 35% to 21% under the Tax Act. In accordance with the rate reduction, the Company wrote down its net deferred tax assets by \$64.6 million which unfavorably affected the effective tax rate by 74.4%. The effective tax rate also includes an increase from state income taxes partially offset by favorable adjustments to the Company's uncertain tax positions and R&D credits.

In 2016, the Company's effective tax rate was 38.4%. The Company's effective tax rate differed from the 35.0% statutory federal income tax rate due largely to state income taxes and certain expenditures which are permanently not deductible for tax purposes, partially offset by the impact of R&D credits.

The Company is routinely examined by domestic tax authorities. While it is difficult to predict the outcome or timing of a particular tax matter, the Company believes it has adequately provided reserves for any reasonable foreseeable outcome related to these matters.

In the second quarter of 2018, the Internal Revenue Service notified the Company that its federal income tax return for the year ended November 30, 2015, was selected for audit. The Company is unable to determine the outcome of the audit at this time.

In the fourth quarter of 2018, the California Franchise Tax Board notified the Company that its California tax returns for the years ended November 30, 2014, and November 30, 2015, were selected for audit. The Company is unable to determine the outcome of the audit at this time.

Tax returns for the years ended November 30, 2015, through December 31, 2017, remain open to examination for U.S. federal tax jurisdiction. Tax returns for the years ended November 30, 2014, through December 31, 2017, remain open to examination for state income tax jurisdictions.

The following table presents a reconciliation of unrecognized tax benefits:

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
Balances at beginning of year	\$ 4.4	\$ 29.5	\$ 7.1
Increases based on tax positions in prior years	0.3	1.0	25.8
Decreases based on tax position in prior years	(0.1)	(25.1)	(1.2)
Increases based on tax positions in current year	3.5	0.4	0.7
Lapse of statute of limitations	(0.7)	(1.4)	(2.9)
Balances at end of year	<u>\$ 7.4</u>	<u>\$ 4.4</u>	<u>\$29.5</u>

As of December 31, 2018, the total amount of unrecognized tax benefits is \$7.4 million. Of the \$7.4 million of unrecognized tax benefits, \$7.0 million would affect the effective tax rate. The Company recognizes interest and penalties related to uncertain tax positions in income tax expense. As of December 31, 2018, the Company's accrued interest and penalties related to uncertain tax positions was \$0.3 million. It is reasonably possible that a reduction of up to \$0.9 million of unrecognized tax benefits and related interest and penalties may occur within the next 12 months as a result of the expiration of certain statutes of limitations.

Deferred Income Taxes

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of the Company's assets and liabilities for financial reporting and income tax purposes. Deferred tax assets and liabilities are determined by multiplying such differences by the enacted tax rates expected to be in effect when such differences are recovered or settled. In December 2017, as a result of the Tax Act, the Company remeasured its federal deferred tax assets and liabilities from 35% to 21%.

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The following table presents the deferred tax assets and liabilities:

	As of December 31,	
	2018	2017
	(In millions)	
Deferred Tax Assets		
Accrued estimated costs	\$ 48.3	\$ 56.1
Basis difference in assets and liabilities	63.8	2.1
Tax losses and credit carryforwards	3.2	12.9
Net cumulative defined benefit pension plan losses	87.0	114.7
Retiree medical and life insurance benefits	7.5	9.2
Valuation allowance	—	(1.7)
Total deferred tax assets	209.8	193.3
Deferred Tax Liabilities		
Revenue recognition differences	84.9	40.4
Basis differences in intangible assets	8.0	7.1
Total deferred tax liabilities	92.9	47.5
Total net deferred tax assets	\$116.9	\$145.8

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 its deferred tax assets, net of valuation allowances, will be realized. The Company's valuation allowance of \$1.7 million as of December 31, 2017, was in connection with a net operating loss of a foreign subsidiary that dissolved in 2018. Accordingly, the valuation allowance was written off with no net income tax expense impact. The following table presents the changes in the Company's valuation allowance:

Year Ended December 31,	Balance at Beginning of Year	Tax Valuation Allowance Charged to Income Tax Provision	Tax Valuation Allowance Credited to Income Tax Provision	Balance at End of Year
	(In millions)			
2018	\$ 1.7	\$ —	\$(1.7)	\$—
2017	1.7	—	—	1.7
2016	1.2	0.5	—	1.7

The Company expects to fully utilize its federal net operating loss carryforwards and income tax credits in 2018 due to sufficient taxable income. The Company expects to fully utilize its state net operating loss carryforwards in 2018 due to sufficient taxable income. The Company's California income tax credit carryovers are \$3.2 million as of December 31, 2018, and have no expiration date.

Note 6. Long-Term Debt

	As of December 31,	
	2018	2017
	(In millions)	
Senior debt	\$ 343.3	\$368.3
Convertible senior notes	254.9	247.2
Capital lease obligations	27.2	0.9
Total debt, carrying amount	625.4	616.4
Less: Amounts due within one year	(273.1)	(25.0)
Total long-term debt, carrying amount	\$ 352.3	\$591.4

The following table presents as of December 31, 2018, the earlier of the Company's contractual debt principal maturities excluding capital lease obligations or the next debt redemption date that could be exercised at the option of the debt holder by year excluding capital lease obligations:

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Notes to Consolidated Financial Statements—(Continued)

	<u>Total</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
	(In millions)					
Senior debt	\$345.6	\$ 17.5	\$ 19.7	\$ 26.3	\$ 28.4	\$ 253.7
Convertible senior notes	300.0	300.0	—	—	—	—
	<u>\$645.6</u>	<u>\$ 317.5</u>	<u>\$ 19.7</u>	<u>\$ 26.3</u>	<u>\$ 28.4</u>	<u>\$ 253.7</u>

See a summary of the minimum payments under capital lease obligations in Note 6(c).

The Company amortizes deferred financing costs over the estimated life of the related debt (a portion of which is classified as a contra liability). Amortization of deferred financing costs was \$1.8 million, \$1.8 million, and \$2.0 million in 2018, 2017, and 2016, respectively.

a. Senior Debt:

	<u>As of December 31,</u>	
	<u>2018</u>	<u>2017</u>
	(In millions)	
Term loan, bearing interest at variable rates (rate of 4.52% as of December 31, 2018), maturing in September 2023	\$ 345.6	\$370.0
Unamortized deferred financing costs	(2.3)	(1.7)
Total senior debt	<u>\$ 343.3</u>	<u>\$368.3</u>

On September 20, 2018, the Company amended the senior secured Senior Credit Facility (the “Senior Credit Facility”) to a \$1.0 billion commitment with the lenders named therein and Bank of America Merrill Lynch as joint lead arranger and administrative agent. The Senior Credit Facility matures on September 20, 2023, and consists of (i) a \$650.0 million revolving line of credit (the “Revolver”) and (ii) a \$350.0 million term loan (the “Term Loan”). The Senior Credit Facility amended the prior \$750.0 million credit facility which was set to mature in June 2021 and is intended to provide available funds for the Company’s short-term liquidity needs from time to time.

As of December 31, 2018, the Company had zero borrowings under the Revolver and had issued \$29.4 million letters of credit.

The Term Loan and any borrowings under the Revolver bear interest at LIBOR plus an applicable margin ranging from 175 to 250 basis points based on the Company’s leverage ratio (the “Consolidated Net Leverage Ratio”) measured at the end of each quarter. In addition to interest, the Company must pay certain fees including (i) letter of credit fees ranging from 175 to 250 basis points per annum on the amount of issued but undrawn letters of credit and eurocurrency rate loans and (ii) commitment fees ranging from 30 to 45 basis points per annum on the unused portion of the Revolver.

The Term Loan amortizes at a rate of 5.0% per annum of the original drawn amount starting on December 31, 2018, increasing to 7.5% per annum on December 31, 2020, and increasing to 10.0% per annum from December 31, 2022, to be paid in equal quarterly installments with any remaining amounts, along with outstanding borrowings under the Revolver, due on the maturity date. Outstanding borrowings under the Revolver and the Term Loan may be voluntarily repaid at any time, in whole or in part, without premium or penalty.

Subject to certain restrictions, all the obligations under the Senior Credit Facility will be guaranteed by the Company and the existing and future material domestic subsidiaries, other than Easton (the “Guarantors”).

The Senior Credit Facility contains financial covenants requiring the Company to (i) maintain an interest coverage ratio (the “Consolidated Interest Coverage Ratio”) of not less than 3.00 to 1.00 and (ii) maintain a Consolidated Net Leverage Ratio not to exceed (a) 4.00 to 1.00 through September 30, 2020; (b) 3.75 to 1.00 from October 1, 2020, through September 30, 2021; and (c) 3.50 to 1.00 from October 1, 2021, thereafter, provided that the maximum leverage ratio for all periods shall be increased by 0.50 to 1.00 for two consecutive quarters after consummation of a qualified acquisition.

The Company may generally make certain investments, redeem debt subordinated to the Senior Credit Facility and make certain restricted payments (such as stock repurchases and dividends) if the Company’s Consolidated Net Leverage Ratio does not exceed 3.25 to 1.00 pro forma for such transaction. The Company is otherwise subject to customary covenants including limitations on asset sales, incurrence of additional debt, and limitations on certain investments and restricted payments.

The Company was in compliance with its financial and non-financial covenants as of December 31, 2018.

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b. Convertible Senior Notes:

	As of December 31,	
	2018	2017
	(In millions)	
Senior convertible notes, bearing interest at 2.25% per annum, interest payments due in June and December, maturing in December 2023	\$ 300.0	\$300.0
Unamortized discount and deferred financing costs	(45.1)	(52.8)
Total convertible senior notes	\$ 254.9	\$247.2

On December 14, 2016, the Company issued \$300.0 million aggregate principal amount of 2 ¼% Notes in a private placement to qualified institutional buyers pursuant to Rule 144A under the Securities Act of 1933, as amended (the “Securities Act”). The 2 ¼% Notes bear cash interest at a rate of 2.25% per annum on the principal amount of the 2 ¼% Notes from December 14, 2016, payable semi-annually in arrears on June 15 and December 15 of each year, beginning June 15, 2017. The 2 ¼% Notes will mature on December 15, 2023, subject to earlier repurchase, redemption or conversion in certain circumstances described below.

The 2 ¼% Notes are general unsecured senior obligations, which (i) rank senior in right of payment to all of the Company’s existing and future senior indebtedness that is expressly subordinated in right of payment to the 2 ¼% Notes; (ii) rank equal in right of payment with all of the Company’s existing and future unsecured indebtedness that is not so subordinated; (iii) rank effectively junior in right of payment to any of the Company’s secured indebtedness to the extent of the value of the assets securing such indebtedness; and (iv) rank structurally junior to all indebtedness and other liabilities (including trade payables) of the Company’s subsidiaries.

The 2 ¼% Notes may be converted into cash, shares of the Company’s common stock or a combination thereof initially at a conversion rate of 38.4615 shares of common stock per \$1,000 principal amount of 2 ¼% Notes (equivalent to a conversion price of approximately \$26.00 per share of common stock), subject to adjustment from time to time as described in the indenture governing the 2 ¼% Notes. Holders may convert their 2 ¼% Notes at their option (i) at any time prior to the close of business on the business day immediately preceding September 15, 2023, under certain circumstances and (ii) at any time on or after September 15, 2023, until the close of business on the business day immediately preceding the maturity date, irrespective of such circumstances. In addition, if holders of the 2 ¼% Notes elect to convert their 2 ¼% Notes in connection with the occurrence of a make-whole fundamental change, as defined in the indenture governing the 2 ¼% Notes, such holders will be entitled to an increase in the conversion rate upon conversion in certain circumstances.

Holders may convert their 2 ¼% Notes at their option from January 1, 2019, through March 31, 2019, because the Company’s closing stock price exceeded \$33.80 for at least 20 days in the 30 day period prior to December 31, 2018. The Company has a stated intention to cash settle the principal amount of the 2 ¼% Notes with the conversion premium to be settled in common shares. Accordingly, the net balance of the 2 ¼% Notes of \$254.9 million is classified as a current liability as of December 31, 2018. The classification of the 2 ¼% Notes as current or noncurrent on the balance sheet is evaluated at each reporting date and may change depending on whether the sale price contingency (discussed below) has been met.

As more fully described in the indenture governing the 2 ¼% Notes, the holders of the 2 ¼% Notes may surrender all or any portion of its 2 ¼% Notes for conversion at any time during any calendar quarter commencing after the calendar quarter ending on March 31, 2017, (and only during such calendar quarter), if the last reported sale price of the Company’s common stock for at least 20 trading days (whether or not consecutive) during the period of 30 consecutive trading days ending on the last trading day of the immediately preceding calendar quarter is greater than or equal to 130% (\$33.80) of the conversion price on each applicable trading day.

The Company may redeem for cash all or any portion of the 2 ¼% Notes, at its option, on or after December 21, 2020, if the last reported sale price of the Company’s common stock has been at least 150% of the conversion price then in effect for at least 20 trading days (whether or not consecutive) during any 30 consecutive trading day period (including the last trading day of such period) ending on, and including, the trading day immediately preceding the date on which the Company provides notice of redemption at a redemption price equal to 100% of the principal amount of the 2 ¼% Notes to be redeemed, plus accrued and unpaid interest to, but excluding, the redemption date.

If a fundamental change, as defined in the indenture governing the 2 ¼% Notes, occurs prior to maturity, subject to certain conditions, holders of the 2 ¼% Notes will have the right to require the Company to repurchase all or part of their 2 ¼% Notes for cash at a fundamental change repurchase price equal to 100% of their principal amount, plus accrued and unpaid interest, if any, up to, but excluding, the fundamental change repurchase date.

The 2 ¼% Notes contain customary events of default, including, among other things, payment default, covenant default and certain cross-default provisions linked to the payment of other indebtedness of the Company or its significant subsidiaries.

Issuance of the 2 ¼% Notes generated proceeds of \$294.2 million net of debt issuance costs, which were used to repurchase long-term debt and for working capital and other general corporate purposes.

The Company separately accounted for the liability and equity components of the 2 ¼% Notes. The initial liability component of the 2 ¼% Notes was valued based on the present value of the future cash flows using an estimated borrowing rate at the date of the issuance for similar debt instruments without the conversion feature, which equals the effective interest

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rate of 5.8% on the liability component. The equity component, or debt discount, was initially valued equal to the principal value of the 2 ¼% Notes, less the liability component. The debt discount is being amortized as a non-cash charge to interest expense over the period from the issuance date through December 15, 2023.

The debt issuance costs of \$5.8 million incurred in connection with the issuance of the 2 ¼% Notes were capitalized and bifurcated into deferred financing costs of \$4.7 million and equity issuance costs of \$1.1 million. The deferred financing costs are being amortized to interest expense from the issuance date through December 15, 2023.

The following table summarizes the 2 ¼% Notes information (in millions, except years, percentages, conversion rate, and conversion price):

	<u>As of December 31,</u>	
	<u>2018</u>	<u>2017</u>
Carrying value, long-term	\$ 254.9	\$ 247.2
Unamortized discount and deferred financing costs	45.1	52.8
Principal amount	\$ 300.0	\$ 300.0
Carrying amount of equity component, net of equity issuance costs	\$ 54.5	\$ 54.5
Remaining amortization period (years)	5.0	6.0
Effective interest rate	5.8%	5.8%
Conversion rate (shares of common stock per \$1,000 principal amount)	38.4615	38.4615
Conversion price (per share of common stock)	\$ 26.00	\$ 26.00

Based on the Company's closing stock price of \$35.23 on December 31, 2018, the if-converted value of the 2 ¼% Notes exceeded the aggregate principal amount of the 2 ¼% Notes by \$106.5 million.

The following table presents the interest expense components for the 2 ¼% Notes:

	<u>Year Ended December 31,</u>		
	<u>2018</u>	<u>2017</u>	<u>2016</u>
	(In millions)		
Interest expense-contractual interest	\$6.8	\$6.8	\$0.3
Interest expense-amortization of debt discount	7.1	6.7	0.3
Interest expense-amortization of deferred financing costs (1)	0.6	0.6	—

(1) Less than \$0.1 million in 2016.

c. Capital Lease Obligations:

	<u>As of December 31,</u>	
	<u>2018</u>	<u>2017</u>
	(In millions)	
Capital lease obligations	\$27.2	\$0.9
Total capital lease obligations	<u>\$27.2</u>	<u>\$0.9</u>

As of December 31, 2018, the Company has capital lease obligations for certain information technology equipment and 122,000-square feet of office space in Huntsville, Alabama. The following table presents the future minimum rental commitments under non-cancelable capital leases as of December 31, 2018 (in millions):

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Notes to Consolidated Financial Statements—(Continued)

<u>Year ending December 31,</u>	
2019	\$ 2.6
2020	2.6
2021	2.7
2022	2.5
2023	2.1
Thereafter	<u>37.4</u>
Total minimum rentals	49.9
Less: imputed interest	<u>(22.7)</u>
Present value of minimum capital lease payments	<u>\$ 27.2</u>

In October 2017, the Company entered into an agreement to lease a new 136,000-square-foot advanced manufacturing facility located in Huntsville, Alabama. The term of the lease is thirty-one years and is expected to commence in the first quarter of 2019 resulting in an estimated remaining financial commitment as of December 31, 2018, of \$32.2 million representing a present value of \$21.0 million. The liability has not been recorded as of December 31, 2018, and the payments over the next five years are \$1.6 million each year.

Note 7. Retirement Benefits

a. Plan Descriptions

Pension Benefits

The Company's defined benefit pension plan future benefit accrual was discontinued in 2009. As of December 31, 2018, the assets, projected benefit obligations, and unfunded pension obligation were \$894.8 million, \$1,288.7 million, and \$393.9 million, respectively.

The Company expects to make cash contributions of approximately \$37.0 million to its tax-qualified defined benefit pension plan in 2019. The Company is generally able to recover these contributions related to its tax-qualified defined benefit pension plan as allowable costs on its U.S. government contracts, but there is a lag between when the Company contributes cash to its tax-qualified defined benefit pension plan under pension funding rules and recovers the cash under the U.S. government Cost Accounting Standards. During 2018, the Company made cash contributions of \$36.7 million to its tax-qualified defined benefit pension plan of which \$36.1 million was recoverable from the Company's U.S. government contracts in 2018 with the remaining \$0.6 million expected to be recoverable from the Company's U.S. government contracts in the future.

The funded status of the Company's tax-qualified pension plan may be adversely affected by the investment experience of the plan's assets, by any changes in U.S. law and by changes in the statutory interest rates used by tax-qualified pension plans in the U.S. to calculate funding requirements. Accordingly, if the performance of the plan's assets does not meet assumptions, if there are changes to income tax regulations or other applicable law, or if other actuarial assumptions are modified, future contributions to the underfunded pension plans could be higher than the Company expects.

Medical and Life Insurance Benefits

The Company provides medical and life insurance benefits to certain eligible retired employees, with varied coverage by employee group. Generally, employees hired after January 1, 1997, are not eligible for retiree medical and life insurance benefits. The medical benefit plan provides for cost sharing between the Company and its retirees in the form of retiree contributions, deductibles, and coinsurance. Medical and life insurance benefit obligations are unfunded. Medical and life insurance benefit cash payments for eligible retired employees are recoverable from the Company's U.S. government contracts.

Defined Contribution 401(k) Benefits

The Company sponsors a defined contribution 401(k) plan and participation in the plan is available to all employees. The Company makes matching contributions in cash equal to 100% of the first 3% of the participants' compensation contributed and 50% of the next 3% of the compensation contributed. The cost of the 401(k) plan was \$22.2 million, \$21.2 million, and \$20.7 million in 2018, 2017, and 2016, respectively.

b. Plan Results

The following table summarizes the balance sheet impact of the Company's pension benefits and medical and life insurance benefits. Pension benefits include the consolidated tax-qualified plan and the unfunded non-qualified plan for benefits provided to employees beyond those provided by the Company's tax-qualified plan. Assets, benefit obligations, and the funded status of the plans were determined at December 31, 2018 and 2017.

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Notes to Consolidated Financial Statements—(Continued)

	Pension Benefits		Medical and Life Insurance Benefits	
	As of December 31,			
	2018	2017	2018	2017
	(In millions)			
Change in fair value of assets:				
Fair value — beginning of year	\$ 931.2	\$ 925.1	\$ —	\$ —
(Loss) gain on assets	(57.8)	82.3	—	—
Employer contributions (1)	133.1	77.2	3.6	4.2
Benefits paid (2)	(111.7)	(118.7)	(3.6)	(4.2)
Settlements (3)	—	(34.7)	—	—
Fair value — end of year	<u>\$ 894.8</u>	<u>\$ 931.2</u>	<u>\$ —</u>	<u>\$ —</u>
Change in benefit obligation:				
Benefit obligation — beginning of year	\$ 1,442.9	\$ 1,492.1	\$ 37.5	\$ 42.6
Interest cost	49.7	57.6	1.2	1.5
Actuarial (gains) losses	(92.2)	46.6	(3.8)	(2.4)
Benefits paid	(111.7)	(118.7)	(3.6)	(4.2)
Settlements (3)	—	(34.7)	—	—
Benefit obligation and accumulated benefit obligation — end of year (4)	<u>\$ 1,288.7</u>	<u>\$ 1,442.9</u>	<u>\$ 31.3</u>	<u>\$ 37.5</u>
Funded status of the plans	<u>\$ (393.9)</u>	<u>\$ (511.7)</u>	<u>\$ (31.3)</u>	<u>\$ (37.5)</u>
Amounts recognized in the consolidated balance sheets:				
Postretirement medical and life insurance benefits, current	\$ —	\$ —	\$ (4.4)	\$ (4.8)
Postretirement medical and life insurance benefits, noncurrent	—	—	(26.9)	(32.7)
Pension liability, non-qualified current (component of other current liabilities)	(1.3)	(1.3)	—	—
Pension liability, non-qualified (component of other noncurrent liabilities)	(15.9)	(17.6)	—	—
Pension benefits, noncurrent	<u>(376.7)</u>	<u>(492.8)</u>	<u>—</u>	<u>—</u>
Net liability recognized in the consolidated balance sheets	<u>\$ (393.9)</u>	<u>\$ (511.7)</u>	<u>\$ (31.3)</u>	<u>\$ (37.5)</u>

- (1) On September 10, 2018, the Company made a discretionary contribution of 2.7 million treasury stock, or \$95.0 million, of its common stock to the tax-qualified defined benefit pension plan which is expected to be recoverable in future periods as allowable costs on its U.S. government contracts.
- (2) Benefits paid for medical and life insurance benefits are net of the Medicare Part D Subsidy of \$0.1 million received in both 2018 and 2017.
- (3) On October 17, 2017, the Company's tax-qualified defined benefit pension plan purchased non-participating annuity contracts in the amount of \$34.7 million for approximately 2,800 participants.
- (4) Pension benefit obligation includes \$17.2 million and \$18.9 million as of December 31, 2018 and 2017, respectively, for the non-qualified plan.

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Notes to Consolidated Financial Statements—(Continued)

The following table presents the components of retirement benefit expense (income):

	Pension Benefits			Medical and Life Insurance Benefits		
	Year Ended December 31,			Year Ended December 31,		
	2018	2017	2016	2018	2017	2016
	(In millions)					
Interest cost on benefit obligation	\$ 49.7	\$ 57.6	\$ 64.1	\$ 1.2	\$ 1.5	\$ 1.9
Assumed return on assets (1)	(60.1)	(49.5)	(56.1)	—	—	—
Amortization of prior service costs (credits)	0.1	0.1	0.1	(0.2)	(0.2)	(1.2)
Amortization of net losses (gains)	70.7	67.8	63.7	(3.8)	(4.1)	(3.6)
	<u>\$ 60.4</u>	<u>\$ 76.0</u>	<u>\$ 71.8</u>	<u>\$(2.8)</u>	<u>\$(2.8)</u>	<u>\$(2.9)</u>

(1) The following table presents the actual return and rate of return on assets:

	Year Ended December 31,		
	2018	2017	2016
	(In millions, except rate of return)		
Actual (loss) gain on assets	\$(57.8)	\$96.8	\$93.7
Actual rate of (loss) return on assets	(5.2)%	10.8%	11.0%

Service costs represent the annual growth in benefits earned by participants during the year. Since the Company's defined benefit pension plan future benefit accrual is discontinued for all participants, the Company has determined in connection with the adoption of accounting guidance on presentation of service cost and other components of retirement benefits expense that the service cost is zero for all periods presented. Historically, the Company has included expenses paid from the tax-qualified defined benefit pension plan trust, including Pension Benefit Guaranty Corporation, audit, actuarial, legal and administrative fees, as service costs in the presentation of the components of retirement benefits expense (income). The Company determined that the vast majority of these types of expenses reflect a reduction to the assumed return on plan assets because they reduce the expected growth of the plan assets. As such, the Company has elected to reclassify the trust-paid expenses related to the tax-qualified defined benefit pension plan as a reduction to assumed return on plan assets for all periods presented. For 2017 and 2016, the Company has reclassified expenses of \$15.0 million and \$14.0 million, respectively, from service cost to assumed return on plan assets in the table above. This change in presentation had no impact on net retirement benefits expense (income).

Market conditions and interest rates significantly affect assets and liabilities of the pension plans. Pension accounting permits market gains and losses to be deferred and recognized over a period of years. This "smoothing" results in the creation of other accumulated income or loss which will be amortized to pension costs in future years. The accounting method the Company utilizes recognizes one-fifth of the unamortized gains and losses in the market-related value of pension assets and all other gains and losses including changes in the discount rate used to calculate the benefit obligation each year. Investment gains or losses for this purpose are the difference between the expected return and the actual return on the market-related value of assets which smoothes asset values over three years. Although the smoothing period mitigates some volatility in the calculation of annual retirement benefit expense, future expenses are impacted by changes in the market value of assets and changes in interest rates.

c. Plan Assumptions

The following table presents the assumptions, calculated based on a weighted-average, to determine the benefit obligations:

	Pension Benefits		Medical and Life Insurance Benefits	
	As of December 31,		As of December 31,	
	2018	2017	2018	2017
Discount rate	4.27%	3.59%	4.09%	3.37%
Discount rate (non-qualified plan)	4.27%	3.62%	*	*
Ultimate healthcare trend rate	*	*	4.50%	5.00%
Initial healthcare trend rate (pre 65/post 65)	*	*	6.00%	6.50%
Year ultimate rate attained (pre 65/post 65)	*	*	2022	2021

* Not applicable

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Notes to Consolidated Financial Statements—(Continued)

The following table presents the assumptions, calculated based on a weighted-average, to determine the retirement benefit expense (income):

	Pension Benefits			Medical and Life Insurance Benefits		
	Year Ended December 31,			Year Ended December 31,		
	2018	2017	2016	2018	2017	2016
Discount rate	3.59%	4.02%	4.36%	3.37%	3.68%	3.99%
Discount rate (non-qualified plan)	3.62%	4.07%	4.41%	*	*	*
Expected long-term rate of return on assets	7.00%	7.00%	7.00%	*	*	*
Ultimate healthcare trend rate	*	*	*	5.00%	5.00%	5.00%
Initial healthcare trend rate (pre 65/post 65)	*	*	*	6.50%	7.00%	7.00%
Year ultimate rate attained (pre 65/post 65)	*	*	*	2021	2021	2021

* Not applicable

Certain actuarial assumptions, such as assumed discount rate, long-term rate of return, and assumed healthcare cost trend rates can have a significant effect on amounts reported for periodic cost of pension benefits and medical and life insurance benefits, as well as respective benefit obligation amounts. The assumed discount rate represents the market rate available for investments in high-quality fixed income instruments with maturities matched to the expected benefit payments for pension and medical and life insurance benefit plans.

The expected long-term rate of return on assets represents the rate of earnings expected in the funds invested, and funds to be invested, to provide for anticipated benefit payments to plan participants. The Company evaluated historical investment performance, current and expected asset allocation, and, with input from the Company's external advisors, developed best estimates of future investment performance. Based on this analysis, the Company assumed a long-term expected rate of return of 7.0% in 2018.

The Company reviews external data and its own historical trends for healthcare costs to determine the healthcare cost trend rates for the medical benefit plans. For 2018 medical benefit obligations, the Company assumed a 6.0% annual rate of increase for pre and post 65 participants in the per capita cost of covered healthcare claims with the rate decreasing over three years until reaching 4.5%.

The following table summarizes the effects of a one-percentage-change in key assumptions on the projected benefit obligations as of December 31, 2018, and on retirement benefits expense for 2018:

	Pension Benefits and Medical and Life Insurance Benefits Discount Rate		Expected Long-term Rate of Return	Assumed Healthcare Cost Trend Rate	
	Net Periodic Benefit Expense	Projected Benefit Obligation	Net Periodic Pension Benefit Expense	Net Periodic Medical and Life Insurance Benefit Expense	Accumulated Benefit Obligation
			(In millions)		
1% decrease	\$ 20.5	\$ 128.0	\$ 8.6	\$(0.2)	\$(0.5)
1% increase	(17.5)	(108.5)	(8.6)	0.2	0.6

d. Plan Assets and Investment Policy

The Company's investment policy is to maximize the total rate of return within a prudent risk framework, while maintaining adequate liquidity throughout volatile market cycles to meet benefit obligations when due. The Company's strategies employ active management and are generally focused on minimizing the permanent loss of capital. The Company's asset diversification objectives target a global portfolio that invests across the capital structure via strategies with complimentary risk and return profiles. Diversification is achieved by investing in various asset types, which may include cash, fixed income, equities, private assets, credit holdings, and future contracts. Further, the Company's strategy allows for diversification as to the types of investment vehicle structures, investment and redemption periods, and the number of investment managers used to carry out its strategy. Allocations between asset types, structures and managers may change as a result of changing market conditions, tactical investment opportunities, planned Company contributions, and cash obligations of the plan.

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Notes to Consolidated Financial Statements—(Continued)

The following table presents the asset allocations by asset category:

	As of December 31,	
	2018	2017
Cash and cash equivalents	4%	6%
Equity securities	43	52
Fixed income	18	15
Registered investment companies	1	1
Private assets	14	10
Hedge funds	20	16
Total	100%	100%

The following tables present the fair value by asset category and by level:

	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Other Observable Inputs (Level 2)	Unobservable Inputs (Level 3)
		(In millions)		
December 31, 2018				
Cash and cash equivalents	\$ 0.6	\$ 0.6	\$ —	\$ —
Equity securities:				
Domestic equity securities	345.7	340.8	—	4.9
International equity securities	36.9	36.8	—	0.1
Fixed income:				
Corporate debt securities	104.8	—	93.7	11.1
Asset-backed securities	28.1	—	28.1	—
U.S. government securities	24.6	—	24.6	—
Foreign bonds	0.1	—	0.1	—
Registered investment companies	9.6	9.6	—	—
Private assets	1.3	—	—	1.3
Total	551.7	\$387.8	\$146.5	\$17.4
Investment measured at Net Asset Value (“NAV”)				
Private assets	125.3			
Hedge funds	173.9			
Common/collective trusts (“CCTs”)	52.0			
Total investments measured at NAV	351.2			
Receivables	1.4			
Payables	(9.5)			
Total assets	\$894.8			

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

	<u>Total</u>	<u>Quoted Prices in Active Markets for Identical Assets (Level 1)</u>	<u>Other Observable Inputs (Level 2)</u>	<u>Unobservable Inputs (Level 3)</u>
		(In millions)		
December 31, 2017				
Cash and cash equivalents	\$ 28.2	\$ 28.2	\$ —	\$ —
Equity securities:				
Domestic equity securities	440.9	437.1	—	3.8
International equity securities	39.9	39.9	—	—
Fixed income:				
Corporate debt securities	87.1	—	75.8	11.3
Asset-backed securities	33.8	—	33.8	—
Foreign bonds	0.1	—	0.1	—
U.S. government securities	10.7	—	10.7	—
Registered investment companies	10.5	10.5	—	—
Private assets	25.7	—	—	25.7
Total	<u>676.9</u>	<u>\$515.7</u>	<u>\$120.4</u>	<u>\$40.8</u>
Investment measured at NAV				
Private assets	69.0			
Hedge funds	153.7			
CCTs	39.3			
Total investments measured at NAV	262.0			
Receivables	1.0			
Payables	(8.7)			
Total assets	<u>\$931.2</u>			

Below is a description of the significant investment strategies and valuation methodologies used for the investments measured at fair value, including the general classification of such investments pursuant to the valuation hierarchy. There have been no changes in the methodologies used at December 31, 2018 and 2017.

Cash and cash equivalents

Cash and cash equivalents are held in money market accounts or invested in Short-Term Investment Funds (“STIFs”). Cash and cash equivalents held in money market accounts are classified as Level 1 investments. STIFs are measured at NAV and included in CCTs as a reconciling item to the fair value tables above.

Equity securities

Equity securities are invested broadly in U.S. and non-U.S. companies in a variety of sectors and market capitalizations. These investments are comprised of common stocks, CCTs, and other investment vehicles. Common stocks are stated at fair value as quoted on a recognized securities exchange and are valued at the last reported sales price on the last business day of the year and are classified as Level 1 investments. Equity securities that are invested in common stock of private companies and priced using unobservable inputs are classified as Level 3 investments. CCTs invested in equity securities are measured at NAV and included as a reconciling item to the fair value tables above.

Fixed income securities

Fixed income securities are invested in a variety of instruments, including, but not limited to, corporate debt securities, CCTs, asset-backed securities, foreign bonds, and other investment vehicles. Corporate debt securities are invested in corporate bonds, and term loans. Corporate bonds are valued at bid evaluations using observable and market-based inputs and are classified as Level 2 investments. Term loans are priced using unobservable inputs and are classified as Level 3 investments. Asset-backed securities, including government-backed mortgage securities, commercial mortgage-backed securities, auto receivable backed securities, and other asset-backed securities, are valued at bid evaluations and are classified as Level 2 investments. CCTs invested in fixed income securities are measured at NAV and included as a reconciling item to the fair value tables above.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

Registered investment companies

Registered investment companies are invested in corporate bonds, senior secured loans, and other fixed income. Registered investment companies are transacted at NAV published daily and are classified as Level 1 investments.

Private assets

Private assets are primarily limited partnerships that mainly invest in U.S. and non-U.S. leveraged buyout, venture capital and special situation strategies. Generally, the individual investments within the partnerships or funds are valued at public market, private market, or appraised value. Private assets are valued by investment managers using unobservable inputs such as extrapolated data, proprietary data, or indicative quotes. The majority of the private assets are valued at NAV and included as a reconciling item to the fair value tables above. Private assets for which there is no NAV are classified as Level 3 investments. Valuations of certain assets were based on the NAV or market value three months prior to the year-end. The Company made adjustments amounting to an increase of \$9.7 million and \$0.3 million for 2018 and 2017, respectively, to account for changes since the valuation date.

Hedge funds

Hedge funds primarily consist of multi-strategy hedge funds that invest across a range of equity and debt securities in a variety of industry sectors. Hedge funds are valued at NAV calculated by investment managers using unobservable inputs such as extrapolated data, proprietary data, or indicative quotes and are included as a reconciling item to the fair value tables above. Valuations of certain assets were based on the NAV or total market value three months prior to the year-end. The Company made adjustments amounting to an increase of \$0.3 million for 2017 to account for changes since the valuation date.

The following tables present the changes in the fair value of the Level 3 investments:

	December 31, 2017	Unrealized Gains (Losses)	Realized Gains	Purchases, Sales, and Settlements, net	Transfers out of Level 3	December 31, 2018
	(In millions)					
Equity securities:						
Domestic equity securities	\$ 3.8	\$(0.3)	\$—	\$ 1.4	\$ —	\$ 4.9
International equity securities	—	0.1	—	—	—	0.1
Corporate debt securities	11.3	(0.3)	0.4	(0.3)	—	11.1
Private assets	25.7	—	—	1.3	(25.7)	1.3
Total	<u>\$40.8</u>	<u>\$(0.5)</u>	<u>\$ 0.4</u>	<u>\$ 2.4</u>	<u>\$(25.7)</u>	<u>\$17.4</u>

	December 31, 2016	Unrealized Gains	Purchases, Sales, and Settlements, net	December 31, 2017
	(In millions)			
Domestic equity securities	\$ 2.2	\$ 2.9	\$(1.3)	\$ 3.8
Corporate debt securities	6.8	2.0	2.5	11.3
Real estate investments	0.5	—	(0.5)	—
Private assets	—	1.2	24.5	25.7
Total	<u>\$ 9.5</u>	<u>\$ 6.1</u>	<u>\$25.2</u>	<u>\$40.8</u>

e. Benefit Payments

The following table presents estimated future benefit payments:

<u>Year Ending December 31,</u>	<u>Medical and Life Insurance Benefits</u>			
	<u>Pension Benefit Payments</u>	<u>Gross Benefit Payments</u>	<u>Medicare D Subsidy</u>	<u>Net Benefit Payments</u>
	(In millions)			
2019	\$111.0	\$ 4.5	\$0.1	\$ 4.4
2020	108.6	4.2	0.1	4.1
2021	105.5	3.8	0.1	3.7
2022	102.4	3.5	0.1	3.4
2023	99.3	3.1	0.1	3.0
Years 2024 - 2028	445.3	11.1	0.3	10.8

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

Note 8. Commitments and Contingencies

a. Operating Lease Commitments and Income

The Company and its subsidiaries lease certain facilities, machinery and equipment, and office buildings under long-term, non-cancelable operating leases. The leases generally provide for renewal options ranging from one to five years and in some cases require the Company to pay for utilities, insurance, taxes, and maintenance which are included in the future minimum rental commitments reported below. Rent expense was \$17.2 million, \$20.7 million, and \$21.2 million in 2018, 2017, and 2016, respectively.

The Company also leases certain surplus facilities to third parties. The Company recorded lease income of \$6.4 million, \$6.4 million, and \$6.5 million in 2018, 2017 and 2016, respectively, related to these arrangements, which have been included in net sales.

The following table presents the future minimum rental commitments under non-cancelable operating leases with initial or remaining terms of one year or more and lease revenue in effect as of December 31, 2018:

<u>Year Ending December 31,</u>	<u>Future Minimum Rental Commitments</u>	<u>Future Minimum Rental Income</u>
	(In millions)	
2019	\$15.9	\$ 4.9
2020	15.0	0.9
2021	14.6	1.4
2022	13.1	1.3
2023	6.4	0.6
Thereafter	14.4	7.1
	<u>\$79.4</u>	<u>\$16.2</u>

b. Legal Matters

The Company and its subsidiaries are subject to legal proceedings, including litigation in U.S. federal and state courts, which arise out of, and are incidental to, the ordinary course of the Company's on-going and historical businesses. The Company is also subject from time to time to governmental investigations by federal and state agencies. The Company cannot predict the outcome of such proceedings with any degree of certainty. Loss contingency provisions are recorded for probable losses at management's best estimate of a loss. When only a range of amounts can be reasonably estimated and no amount within the range is more likely than another, the low end of the range is recorded. These estimates are often initially developed substantially earlier than when the ultimate loss is known, and are refined each quarterly reporting period as additional information becomes available.

Asbestos Litigation

The Company has been, and continues to be, named as a defendant in lawsuits alleging personal injury or death due to exposure to asbestos in building materials, products, or in manufacturing operations. The majority of cases are pending in Illinois state courts. There were 60 asbestos cases pending as of December 31, 2018.

Given the lack of any significant consistency to claims (i.e., as to product, operational site, or other relevant assertions) filed against the Company, the Company is generally unable to make a reasonable estimate of the future costs of pending claims or unasserted claims. As of December 31, 2018, the Company has accrued an immaterial amount related to pending claims.

United States ex. rel. Markus vs. Aerojet Rocketdyne Holdings

The Company responded to a civil investigative demand issued by the Department of Justice ("DOJ") in the three months ended March 31, 2017, requesting information relating to allegations under the False Claims Act that the Company may have previously made false representations to the U.S. government regarding the Company's compliance with certain regulatory cybersecurity requirements. In the three months ended June 30, 2018, the DOJ completed its review and declined to intervene in a case filed against the Company and Aerojet Rocketdyne in the U.S. District Court, Eastern District of California, originally filed under seal on September 13, 2017. The case is captioned *United States ex. rel. Markus vs. Aerojet Rocketdyne Holdings, Inc. et al., Case No. 2:15-CV-02245-WBS-AC*. The complaint alleges causes of action based on false claims, retaliation, and wrongful termination of employment and seeks injunctive relief, civil penalties, and compensatory and punitive damages. The relator has continued to pursue the claim and the Company continues to vigorously contest the complaint's allegations. The Company has not recorded any liability for this matter as of December 31, 2018.

c. Environmental Matters

The Company is involved in approximately forty environmental matters under the Comprehensive Environmental Response Compensation and Liability Act, the Resource Conservation Recovery Act, and other federal, state, local, and foreign laws relating to soil and groundwater contamination, hazardous waste management activities, and other environmental matters at some of its current and former facilities. The Company is also involved in a number of remedial activities at third party sites, not owned by the Company, where it is designated a potentially responsible party ("PRP") by either the U.S. Environmental Protection Agency ("EPA") and/or a state agency. In many of these matters, the Company is involved with other PRPs. In some instances, the Company's liability and proportionate share of costs have not been determined largely due

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

to uncertainties as to the nature and extent of site conditions and the Company's involvement. While government agencies frequently claim PRPs are jointly and severally liable at such sites, in the Company's experience, interim and final allocations of liability and costs are generally made based on relative contributions of waste or contamination. Anticipated costs associated with environmental remediation that are probable and estimable are accrued. In cases where a date to complete remedial activities at a particular site cannot be determined by reference to agreements or otherwise, the Company projects costs over an appropriate time period not exceeding fifteen years. In such cases, generally the Company does not have the ability to reasonably estimate environmental remediation costs that are beyond this period. Factors that could result in changes to the Company's estimates include completion of current and future soil and groundwater investigations, new claims, future agency demands, discovery of more or less contamination than expected, discovery of new contaminants, modification of planned remedial actions, changes in estimated time required to remediate, new technologies, and changes in laws and regulations.

As of December 31, 2018, the aggregate range of these anticipated environmental costs was \$327.9 million to \$472.1 million and the accrued amount was \$327.9 million. See Note 8(d) for a summary of the environmental reserve activity. Of these accrued liabilities, approximately 99% relates to the Company's U.S. government contracting business and a portion of this liability is recoverable. The significant environmental sites are discussed below. The balance of the accrued liabilities, which are not recoverable from the U.S. government, relate to other sites for which the Company's obligations are probable and estimable.

Sacramento, California Site

In 1989, a federal district court in California approved a Partial Consent Decree ("PCD") requiring Aerojet Rocketdyne, among other things, to conduct a Remedial Investigation and Feasibility Study to determine the nature and extent of impacts due to the release of chemicals from the Sacramento, California site, monitor the American River and offsite public water supply wells, operate Groundwater Extraction and Treatment facilities that collect groundwater at the site perimeter, and pay certain government oversight costs. The primary chemicals of concern for both on-site and off-site groundwater are trichloroethylene, perchlorate, and n-nitrosodimethylamine. The 2002 PCD revision (a) separated the Sacramento site into multiple operable units to allow quicker implementation of remedy for critical areas; (b) required the Company to guarantee up to \$75 million (in addition to a prior \$20 million guarantee) to assure that Aerojet Rocketdyne's Sacramento remediation activities are fully funded; and (c) removed approximately 2,600 acres of non-contaminated land from the EPA superfund designation.

Aerojet Rocketdyne is involved in various stages of soil and groundwater investigation, remedy selection, design, construction, operation and maintenance associated with the operable units, all of which are conducted under the direction and oversight of the EPA, including unilateral administrative orders, and the California Department of Toxic Substances Control ("DTSC") and Regional Water Quality Control Board, Central Valley Region ("RWQCB"). On September 22, 2016, the EPA completed its first five-year remedy review of the Sacramento superfund site. The five-year review required by statute and regulation applies to all remedial actions which result in hazardous substances above levels that allow unlimited use and unrestricted exposure. The Company is working with the EPA to address the findings of the five-year remedy review. On June 20, 2018, the EPA issued the Company a Unilateral Administrative Order ("UAO") for the Boundary Operable Unit. Issuance of the UAO is the next step in the Superfund process for the Boundary Operable Unit.

The entire southern portion of the site known as Rio Del Oro was under state orders issued in the 1990s from DTSC and the RWQCB to investigate and remediate soil and groundwater contamination. In 2008, the DTSC released all but approximately 400 acres of the Rio Del Oro property from DTSC's environmental orders regarding soil contamination although the property remains subject to the RWQCB's orders to investigate and remediate groundwater environmental contamination emanating offsite from the property.

As of December 31, 2018, the estimated range of anticipated costs discussed above for the Sacramento, California site was \$207.4 million to \$311.7 million and the accrued amount was \$207.4 million included as a component of the Company's environmental reserves. Expenditures associated with this matter are partially recoverable. See Note 8(d) below for further discussion on recoverability.

Baldwin Park Operable Unit ("BPOU")

As a result of its former Azusa, California operations, in 1994 Aerojet Rocketdyne was named a PRP by the EPA in the area of the San Gabriel Valley Basin superfund site known as the BPOU. In 2002, Aerojet Rocketdyne, along with seven other PRPs (the "Cooperating Respondents") signed a project agreement in late March 2002 with the San Gabriel Basin Water Quality Authority, the Main San Gabriel Basin Watermaster, and five water companies. The 2002 project agreement terminated in 2017 and the parties executed a new project agreement which became operational on May 9, 2017. The new agreement has a ten-year term and requires the Cooperating Respondents to fund through an escrow account the ongoing operation, maintenance, and administrative costs of certain treatment and water distribution facilities owned and operated by the water companies. There are also provisions in the project agreement for maintaining financial assurance.

Pursuant to an agreement with the remaining Cooperating Respondents, Aerojet Rocketdyne's current share of future BPOU costs will be approximately 74%.

As part of Aerojet Rocketdyne's sale of its Electronics and Information Systems ("EIS") business to Northrop in October 2001, the EPA approved a prospective purchaser agreement with Northrop to absolve it of pre-closing liability for contamination caused by the Azusa, California operations, which liability remains with Aerojet Rocketdyne. As part of that agreement, the Company agreed to provide a \$25 million guarantee of its obligations under the project agreement.

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Notes to Consolidated Financial Statements—(Continued)

As of December 31, 2018, the estimated range of anticipated costs was \$103.8 million to \$132.6 million and the accrued amount was \$103.8 million included as a component of the Company’s environmental reserves. Expenditures associated with this matter are partially recoverable. See Note 8(d) below for further discussion on recoverability.

d. Environmental Reserves and Estimated Recoveries

Environmental Reserves

The Company reviews on a quarterly basis estimated future remediation costs and has an established practice of estimating environmental remediation costs over a fifteen year period, except for those environmental remediation costs with a specific contractual term. Environmental liabilities at the BPOU site are currently estimated through the term of the new project agreement, which expires in May 2027. As the period for which estimated environmental remediation costs lengthens, the reliability of such estimates decreases. These estimates consider the investigative work and analysis of engineers, outside environmental consultants, and the advice of legal staff regarding the status and anticipated results of various administrative and legal proceedings. In most cases, only a range of reasonably possible costs can be estimated. In establishing the Company’s reserves, the most probable estimate is used when determinable; otherwise, the minimum amount is used when no single amount in the range is more probable. Accordingly, such estimates can change as the Company periodically evaluates and revises these estimates as new information becomes available. The Company cannot predict whether new information gained as projects progress will affect the estimated liability accrued. The timing of payment for estimated future environmental costs is influenced by a number of factors, such as the regulatory approval process and the time required designing, constructing, and implementing the remedy.

The following table summarizes the Company’s environmental reserve activity:

	<u>Aerojet Rocketdyne- Sacramento</u>	<u>Aerojet Rocketdyne- BPOU</u>	<u>Other Aerojet Rocketdyne Sites</u>	<u>Total Aerojet Rocketdyne</u>	<u>Other</u>	<u>Total Environmental Reserve</u>
	(In millions)					
December 31, 2015	\$152.6	\$136.7	\$ 7.8	\$297.1	\$ 5.2	\$302.3
Additions	80.0	3.5	3.9	87.4	—	87.4
Expenditures	(22.5)	(13.4)	(3.2)	(39.1)	(0.9)	(40.0)
December 31, 2016	210.1	126.8	8.5	345.4	4.3	349.7
Additions	19.2	3.3	8.0	30.5	0.8	31.3
Expenditures	(22.8)	(13.7)	(2.8)	(39.3)	(0.3)	(39.6)
December 31, 2017	206.5	116.4	13.7	336.6	4.8	341.4
Additions	20.1	2.3	0.6	23.0	0.3	23.3
Expenditures	(19.2)	(14.9)	(1.9)	(36.0)	(0.8)	(36.8)
December 31, 2018	<u>\$207.4</u>	<u>\$103.8</u>	<u>\$12.4</u>	<u>\$323.6</u>	<u>\$ 4.3</u>	<u>\$327.9</u>

The effect of the final resolution of environmental matters and the Company’s obligations for environmental remediation and compliance cannot be accurately predicted due to the uncertainty concerning both the amount and timing of future expenditures and due to regulatory or technological changes. The Company continues its efforts to mitigate past and future costs through pursuit of claims for recoveries from insurance coverage and other PRPs and continued investigation of new and more cost effective remediation alternatives and associated technologies.

As part of the acquisition of the Atlantic Research Corporation (“ARC”) propulsion business in 2003, Aerojet Rocketdyne entered into an agreement with ARC pursuant to which Aerojet Rocketdyne is responsible for up to \$20.0 million of costs (“Pre-Close Environmental Costs”) associated with environmental issues that arose prior to Aerojet Rocketdyne’s acquisition of the ARC propulsion business. ARC is responsible for any cleanup costs relating to the ARC acquired businesses in excess of \$20.0 million. Pursuant to a separate agreement with the U.S. government which was entered into prior to the completion of the ARC acquisition, these costs are recovered through the establishment of prices for Aerojet Rocketdyne’s products and services sold to the U.S. government. The Company reached the \$20.0 million cap on cleanup costs in the three months ended March 31, 2017, and expects that additional costs will be incurred due to contamination existing at the time of the acquisition and still requiring remediation and monitoring. On May 6, 2016, ARC informed Aerojet Rocketdyne that it was disputing certain costs that Aerojet Rocketdyne attributed to the \$20.0 million Pre-Close Environmental Costs (“ARC Claim”). The Company responded to the ARC Claim on June 23, 2017, and subsequently continues to communicate with ARC. Certain costs related to the ARC Claim will be determined in conjunction with the Company’s evaluation and ultimate resolution of the ARC Claim.

Estimated Recoveries

On January 12, 1999, Aerojet Rocketdyne and the U.S. government reached a settlement agreement (“Global Settlement”) covering environmental costs associated with the Company’s Sacramento site and its former Azusa site. Pursuant to the Global Settlement, the Company can recover up to 88% of its environmental remediation costs through the establishment of prices for Aerojet Rocketdyne’s products and services sold to the U.S. government. Additionally, in conjunction with the sale of the EIS business in 2001, Aerojet Rocketdyne entered into an agreement with Northrop (the “Northrop Agreement”) whereby Aerojet Rocketdyne is reimbursed by Northrop for a portion of environmental expenditures

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Notes to Consolidated Financial Statements—(Continued)

eligible for recovery under the Global Settlement, subject to an annual billing limitation of \$6.0 million and a cumulative limitation of \$189.7 million. The following table summarizes the Northrop Agreement activity (in millions):

Total reimbursable costs under the Northrop Agreement	\$ 189.7
Amount reimbursed to the Company through December 31, 2018	(131.2)
Receivable from Northrop included in the balance sheet at December 31, 2018	<u>\$ 58.5</u>

The cumulative expenditure limitation of \$189.7 million under the Northrop Agreement was reached in June 2017. At that time, the Company was uncertain of the allowability and allocability of additional expenditures above that cumulative limitation and therefore did not recognize a recoverable asset for such amounts. During 2018, the Company and the U.S. government reached a determination that these expenditures are reimbursable under the Global Settlement and therefore recorded a one-time benefit of \$43.0 million to recognize the recoverability of environmental expenditures at a rate of 88%.

Environmental remediation costs are primarily incurred by the Company's Aerospace and Defense segment, and certain of these costs are recoverable from the Company's contracts with the U.S. government. The Company currently estimates approximately 12% of its future Aerospace and Defense segment environmental remediation costs will not likely be reimbursable and are expensed. Allowable environmental remediation costs are charged to the Company's contracts with the U.S. government as the costs are incurred. Because these costs are recovered through forward-pricing arrangements, the ability of Aerojet Rocketdyne to continue recovering these costs from the U.S. government depends on Aerojet Rocketdyne's sustained business volume from U.S. government contracts and programs.

While the Company is currently seeking an arrangement with the U.S. government to recover environmental expenditures in excess of the reimbursement ceiling identified in the Global Settlement, there can be no assurances that such a recovery will be obtained, or if not obtained, that such unreimbursed environmental expenditures will not have a materially adverse effect on the Company's operating results, financial condition, and/or cash flows.

Environmental reserves and estimated recoveries impact on the consolidated statements of operations

The expenses associated with adjustments to the environmental reserves are recorded as a component of other (income) expense, net in the consolidated statements of operations. The following table summarizes the financial information for the impact of environmental reserves and recoveries to the consolidated statements of operations were as follows:

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
(Benefit) expense to consolidated statement of operations	\$(36.9)	\$8.2	\$18.3

e. Arrangements with Off-Balance Sheet Risk

As of December 31, 2018, arrangements with off-balance sheet risk consisted of:

- \$29.4 million in outstanding commercial letters of credit, the majority of which may be renewed, primarily to collateralize obligations for environmental remediation and insurance coverage.
- \$53.2 million in outstanding surety bonds to primarily satisfy indemnification obligations for environmental remediation coverage.
- Up to \$120.0 million aggregate in guarantees by the Company of Aerojet Rocketdyne's obligations to U.S. government agencies for environmental remediation activities.
- \$32.2 million in commitments associated with the Company's manufacturing facility located in Huntsville, Alabama.
- Guarantees, jointly and severally, by the Company's material domestic subsidiaries of their obligations under the Senior Credit Facility.

In addition to the items discussed above, the Company has and will from time to time enter into certain types of contracts that require the Company to indemnify parties against potential third-party and other claims. These contracts primarily relate to: (i) divestiture agreements, under which the Company may provide customary indemnification to purchasers of its businesses or assets including, for example, claims arising from the operation of the businesses prior to disposition, and liability to investigate and remediate environmental contamination existing prior to disposition; (ii) certain real estate leases, under which the Company may be required to indemnify property owners for claims arising from the use of the applicable premises; and (iii) certain agreements with officers and directors, under which the Company may be required to indemnify such persons for liabilities arising out of their relationship with the Company. The terms of such obligations vary. Generally, a maximum obligation is not explicitly stated.

Additionally, the Company has open purchase orders and other commitments to suppliers, subcontractors, and other outsourcing partners for equipment, materials, and supplies in the normal course of business. These amounts are based on volumes consistent with anticipated requirements to fulfill purchase orders or contracts for product deliveries received, or expected to be received, from customers. A substantial portion of these amounts are recoverable through the Company's contracts with the U.S. government.

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Notes to Consolidated Financial Statements—(Continued)

The Company provides product warranties in conjunction with certain product sales. The majority of the Company's warranties are a one-year standard warranty for parts, workmanship, and compliance with specifications. On occasion, the Company has made commitments beyond the standard warranty obligation. While the Company has contracts with warranty provisions, there is not a history of any significant warranty claims experience. A reserve for warranty exposure is made on a product by product basis when it is both estimable and probable. These costs are included in the program's estimate at completion and are expensed in accordance with the Company's revenue recognition methodology as allowed under GAAP for that particular contract.

Note 9. Stockholders' Equity

a. Preference Stock

As of December 31, 2018 and 2017, 15.0 million shares of preferred stock were authorized and none were issued or outstanding.

b. Common Stock

As of December 31, 2018, the Company had 150.0 million authorized shares of common stock, par value \$0.10 per share, of which 76.8 million shares were issued and outstanding, and 23.5 million shares were reserved for future issuance for the exercise of stock options (seven and ten year contractual life) and restricted stock (no maximum contractual life), payment of awards under stock-based compensation plans, and conversion of the Company's convertible debt.

c. Treasury Stock

As of December 31, 2018, the Company had 0.8 million of its common shares classified as treasury stock. On September 10, 2018, the Company made a discretionary contribution of 2.7 million treasury stock, or \$95.0 million, of its common stock to the Aerojet Rocketdyne Master Retirement Trust, which is a trust maintained in connection with the Aerojet Rocketdyne (GenCorp) Consolidated Pension Plan. Treasury stock is stated at cost (first-in, first-out basis). The Company reflects stock repurchases in its financial statements on a "settlement" basis.

d. Stock-based Compensation

The following table summarizes stock-based compensation expense by type of award:

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
SARs	\$ 6.2	\$ 9.3	\$ 2.2
Restricted stock, service based	4.5	4.1	3.6
Restricted stock, performance based	9.1	6.8	5.7
Employee stock purchase plan ("ESPP")	0.6	0.6	0.5
Stock options	0.1	1.2	0.9
Total stock-based compensation expense	<u>\$20.5</u>	<u>\$22.0</u>	<u>\$12.9</u>

Stock Appreciation Rights: As of December 31, 2018, a total of 1.1 million SARs were outstanding under the 1999 Equity and Performance Incentive Plan ("1999 Plan"), 2009 Equity and Performance Incentive Plan ("2009 Plan"), and 2018 Equity and Performance Incentive Plan ("2018 Plan"). SARs granted to employees generally vest in one-third increments at one year, two years, and three years from the date of grant and have a ten year contractual life under the 1999 Plan and a seven year contractual life under the 2009 Plan and 2018 Plan. SARs granted to directors of the Company typically vest over a one year service period (half after six months and half after one year) and have a ten year contractual life under the 1999 Plan and a seven year contractual life under the 2009 Plan. These awards are similar to the Company's employee stock options, but are settled in cash rather than in shares of common stock, and are classified as liability awards. Compensation cost for these awards is determined using a fair-value method and remeasured at each reporting date until the date of settlement.

The following table summarizes the status of the Company's SARs:

	SARs (In millions)	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (years)	Aggregate Intrinsic Value (In millions)
Outstanding at December 31, 2017	1.0	\$16.62		
Granted	0.4	27.53		
Exercised	(0.1)	6.99		
Canceled	(0.2)	21.17		
Outstanding at December 31, 2018	<u>1.1</u>	<u>\$21.15</u>	<u>4.9</u>	<u>\$15.2</u>
Exercisable at December 31, 2018	<u>0.1</u>	<u>\$ 9.82</u>	<u>0.8</u>	<u>\$ 2.3</u>

Aerojet Rocketdyne Holdings, Inc.

Notes to Consolidated Financial Statements—(Continued)

The weighted average grant date fair value for SARs granted in 2017 and 2016 was \$22.35 and \$15.41, respectively. The total intrinsic value for SARs liabilities paid in 2018, 2017, and 2016 was \$3.5 million, \$4.9 million, and \$2.3 million, respectively. As of December 31, 2018, there was \$7.3 million of total stock-based compensation related to nonvested SARs. That cost is expected to be recognized over an estimated weighted-average amortization period of twenty-one months.

Restricted Stock, service-based: As of December 31, 2018, a total of 0.3 million shares of service-based restricted stock were outstanding which vest based on years of service. Restricted shares are granted to key employees and directors of the Company. The fair value of the restricted stock awards was based on the closing market price of the Company's common stock on the date of award and is being amortized on a straight line basis over the service period.

The following table summarizes the status of the Company's service-based restricted stock:

	Service Based Restricted Stock (In millions)	Weighted Average Grant Date Fair Value
Outstanding at December 31, 2017	0.4	\$20.14
Granted	0.2	29.74
Exercised	<u>(0.3)</u>	<u>21.32</u>
Outstanding at December 31, 2018	<u>0.3</u>	<u>\$24.76</u>
Expected to vest at December 31, 2018	<u>0.3</u>	<u>\$24.76</u>

As of December 31, 2018, there was \$5.4 million of total stock-based compensation related to nonvested service-based restricted stock. That cost is expected to be recognized over an estimated weighted-average amortization period of eighteen months. At December 31, 2018, the intrinsic value of the service-based restricted stock outstanding and expected to vest was \$11.1 million. The weighted average grant date fair values for service-based restricted stock granted in 2017 and 2016 was \$24.98 and \$17.65, respectively.

Restricted Stock, performance-based Company metrics: As of December 31, 2018, a total of 1.2 million shares of performance-based restricted shares were outstanding. The performance-based restricted stock vests if the Company meets various operations and earnings targets set by the Organization & Compensation Committee of the Board of Directors. The fair value of the performance-based restricted stock awards was based on the closing market price of the Company's common stock on the date of award and is being amortized over the estimated service period to achieve the operations and earnings targets.

The following table summarizes the status of the Company's performance-based restricted stock:

	Performance Based Restricted Stock (In millions)	Weighted Average Grant Date Fair Value
Outstanding at December 31, 2017	1.0	\$19.73
Granted	0.6	26.36
Exercised	(0.2)	21.46
Canceled	<u>(0.2)</u>	<u>22.50</u>
Outstanding at December 31, 2018	<u>1.2</u>	<u>\$22.05</u>
Expected to vest at December 31, 2018	<u>0.9</u>	<u>\$21.60</u>

As of December 31, 2018, there was \$8.5 million of total stock-based compensation related to nonvested performance-based restricted stock. That cost is expected to be recognized over an estimated weighted-average amortization period of eighteen months. At December 31, 2018, the intrinsic value of the performance-based restricted stock outstanding was \$42.2 million and the intrinsic value of the performance-based restricted stock expected to vest was \$33.1 million. The weighted average grant date fair values for performance-based restricted stock granted in 2017 and 2016 was \$22.35 and \$15.97, respectively.

Employee Stock Purchase Plan: The ESPP enables eligible employees the opportunity to purchase the Company's common stock at a price not less than 85% of the fair market value of the common stock on the last day of the respective offering period. A maximum of 1.5 million shares are authorized for issuance. During 2018, 0.1 million were issued under the ESPP at an average price of \$32.11. During 2017, 0.1 million shares were issued under the ESPP at an average price of \$25.43 per share. During 2016, 0.2 million shares were issued under the ESPP at an average price of \$18.11 per share.

Stock Options: As of December 31, 2018, a total of 0.3 million stock options were outstanding under the 1999 Plan and 2009 Plan. The stock options granted in 2016 related to an award granted to the Executive Chairman, see the discussion below.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

The following table summarizes the status of the Company's stock options:

	<u>Stock Options (In millions)</u>	<u>Weighted Average Exercise Price</u>	<u>Weighted Average Remaining Contractual Life (years)</u>	<u>Intrinsic Value (In millions)</u>
Outstanding at December 31, 2017	0.4	\$18.86		
Exercised	<u>(0.1)</u>	<u>18.95</u>		
Outstanding and exercisable at December 31, 2018	<u>0.3</u>	<u>\$18.82</u>	<u>3.8</u>	<u>\$5.7</u>

The total intrinsic value for options exercised in 2018, 2017, and 2016 was \$0.9 million, \$2.9 million, and \$2.1 million, respectively. The weighted average grant date fair value for stock options granted in 2016 was \$18.01. The Company did not grant stock options in 2018 and 2017.

The following table summarizes the range of exercise prices and weighted-average exercise prices for options outstanding as of December 31, 2018, under the Company's stock option plans:

<u>Year Granted</u>	<u>Range of Exercise Prices</u>	<u>Outstanding</u>		
		<u>Stock Options Outstanding (In millions)</u>	<u>Weighted Average Exercise Price</u>	<u>Weighted Average Remaining Contractual Life (years)</u>
2015	\$23.06	0.1	\$23.06	3.2
2016	\$18.01	<u>0.2</u>	\$18.01	4.6
		<u>0.3</u>		

Common Shares and Stock Options, performance-based: In August 2016, the Company granted the Executive Chairman 0.2 million performance-based common shares and 0.2 million performance-based stock options that vest according to the attainment of share prices ranging from \$22.00 per share to \$27.00 per share of the Company's stock. The performance-based common shares were valued at a weighted average price of \$12.99 using a Monte Carlo model. The performance-based stock options were valued at a weighted average price of \$5.81 using a Monte Carlo model. The Company recognized the grant-date fair value of these awards as stock-based compensation expense ratably over the estimated vesting period based on the number of awards expected to vest at each reporting date or earlier if the market condition was satisfied. All of the performance based awards vested during 2017 as a result of the attainment of share prices. The following table presents the weighted average assumptions used to value the awards for 2016:

	<u>Performance- based common shares</u>	<u>Performance- based stock options</u>
Expected life (in years)	1.04	0.99
Volatility	32.97%	39.58%
Risk-free interest rate	1.17%	1.43%

In February 2018, the Company granted senior executives 0.1 million performance-based common shares that vest according to the attainment of share prices ranging from \$34.00 per share to \$42.00 per share of the Company's stock. The performance-based common shares were valued at a weighted average price of \$18.67 using a Monte Carlo model. The Company recognized the grant-date fair value of these awards as stock-based compensation expense ratably over the estimated vesting period based on the number of awards expected to vest at each reporting date or earlier if the market condition was satisfied. The following table presents the weighted average assumptions to value the awards for 2018:

	<u>Performance- based common shares</u>
Expected life (in years)	1.25
Volatility	31.52%
Risk-free interest rate	2.65%

The Monte Carlo model requires a single expected dividend yield as an input. The Senior Credit Facility restricts the payment of dividends and the Company does not anticipate paying cash dividends in the foreseeable future. Accordingly, the Company did not apply an expected dividend yield to the Monte Carlo model.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

Valuation Assumptions: The following table presents the weighted average assumptions used to value the SARs:

	Year Ended December 31,		
	2018	2017	2016
Expected life (in years)	4.9	4.8	4.0
Volatility	35.10%	34.00%	36.00%
Risk-free interest rate	2.51%	2.23%	1.65%

Expected Term: The Company's expected term represents the period that the Company's stock-based awards are expected to be outstanding and was determined based on historical experience of similar awards, giving consideration to the contractual terms of the stock-based awards and vesting schedules.

Expected Volatility: The fair value of stock-based payments was determined using the Black-Scholes model with a volatility factor based on the Company's historical stock prices. The range of expected volatility used in the Black-Scholes model was 33.05% to 47.85% as of December 31, 2018.

Expected Dividend: The Black-Scholes model requires a single expected dividend yield as an input. The Senior Credit Facility restricts the payment of dividends and the Company does not anticipate paying cash dividends in the foreseeable future. Accordingly, the Company did not apply an expected dividend yield to the Black-Scholes model for all periods presented.

Risk-Free Interest Rate: The Company bases the risk-free interest rate used in the Black-Scholes model on the implied yield currently available on U.S. Treasury zero-coupon issues with an equivalent remaining term. The range of risk-free interest rates used in the Black-Scholes model was 2.41% to 2.65% as of December 31, 2018.

Note 10. Operating Segments and Related Disclosures

The Company's operations are organized into two operating segments based on different products and customer bases: Aerospace and Defense, and Real Estate. Sales to significant customers and other concentrations information is presented in Notes 1(p) and 1(t). The accounting policies of the operating segments are the same as those described in the summary of significant accounting policies (see Note 1).

The Company evaluates its operating segments based on several factors, of which the primary financial measure is segment performance. Segment performance represents net sales less applicable costs, expenses and unusual items relating to the segment operations. Segment performance excludes corporate income and expenses, unusual items not related to the segment operations, interest expense, interest income, and income taxes.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

The following table presents selected financial information for each reportable segment:

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
Net Sales:			
Aerospace and Defense	\$ 1,888.1	\$ 1,870.8	\$ 1,753.9
Real Estate	7.8	6.4	7.4
Total Net Sales	\$ 1,895.9	\$ 1,877.2	\$ 1,761.3
Segment Performance:			
Aerospace and Defense	\$ 233.4	\$ 200.4	\$ 182.1
Environmental remediation provision adjustments	37.2	(7.5)	(18.3)
GAAP/Cost Accounting Standards retirement benefits expense difference	(6.0)	(17.0)	(20.5)
Unusual items	—	2.0	—
Aerospace and Defense Total	264.6	177.9	143.3
Real Estate	2.8	2.5	4.3
Total Segment Performance	\$ 267.4	\$ 180.4	\$ 147.6
Reconciliation of segment performance to income (loss) before income taxes:			
Segment performance	\$ 267.4	\$ 180.4	\$ 147.6
Interest expense	(34.4)	(30.9)	(32.5)
Interest income	10.0	3.5	0.6
Stock-based compensation	(20.5)	(22.0)	(12.9)
Corporate retirement benefits	(13.4)	(20.0)	(18.9)
Corporate and other	(20.3)	(23.1)	(20.2)
Unusual items	(0.2)	(1.0)	(34.5)
Income (loss) before income taxes	\$ 188.6	\$ 86.9	\$ 29.2
Aerospace and Defense	\$ 42.2	\$ 29.3	\$ 46.4
Real Estate	—	—	—
Corporate	1.0	0.1	1.2
Capital Expenditures	\$ 43.2	\$ 29.4	\$ 47.6
Aerospace and Defense	\$ 71.1	\$ 71.6	\$ 64.2
Real Estate	0.9	0.7	0.6
Corporate	0.3	0.3	0.1
Depreciation and Amortization	\$ 72.3	\$ 72.6	\$ 64.9
		As of December 31,	
		2018	2017
		(In millions)	
Assets:			
Aerospace and Defense		\$1,551.7	\$1,477.8
Real Estate		128.4	125.9
Operating segment assets		1,680.1	1,603.7
Corporate		810.0	655.0
Total Assets		\$2,490.1	\$2,258.7

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

Note 11. Cost Reduction Plans

During 2015, the Company initiated the first phase (“Phase I”) of the competitive improvement program (the “CIP”) comprised of activities and initiatives aimed at reducing costs in order for the Company to continue to compete successfully. Phase I is comprised of three major components: (i) facilities optimization and footprint reduction; (ii) product affordability; and (iii) reduced administrative and overhead costs. On April 6, 2017, the Board of Directors approved the second phase (“Phase II”) of the Company’s previously announced CIP. Pursuant to Phase II, the Company expanded its CIP and further consolidated its Sacramento, California, and Gainesville, Virginia sites, while centralizing and expanding its existing presence in Huntsville, Alabama. The Company currently estimates that it will incur restructuring and related costs of the Phase I and II programs of approximately \$210.0 million (including approximately \$60.5 million of capital expenditures). The Company has incurred \$131.4 million of such costs through December 31, 2018, including \$48.1 million in capital expenditures. The following table summarizes the Company’s severance and retention liabilities related to Phase I and II activity:

	<u>Severance</u>	<u>Retention</u>	<u>Total</u>
	(In millions)		
December 31, 2015	\$ 10.9	\$ 1.7	\$ 12.6
Accrual	—	2.3	2.3
Payments	(0.9)	(1.9)	(2.8)
Adjustments	<u>(3.2)</u>	<u>—</u>	<u>(3.2)</u>
December 31, 2016	6.8	2.1	8.9
Accrual	26.1	2.2	28.3
Payments	<u>(2.9)</u>	<u>(0.9)</u>	<u>(3.8)</u>
December 31, 2017	30.0	3.4	33.4
Accrual	0.2	5.7	5.9
Payments	<u>(12.1)</u>	<u>(4.0)</u>	<u>(16.1)</u>
December 31, 2018	<u>\$ 18.1</u>	<u>\$ 5.1</u>	<u>\$ 23.2</u>

The costs associated with Phase I and II are included as a component of the Company’s U.S. government forward-pricing rates, and therefore, are recovered through the pricing of the Company’s products and services to the U.S. government. In addition to the employee-related CIP obligations, the Company incurred non-cash accelerated depreciation expense of \$1.3 million, \$3.9 million and \$0.7 million in 2018, 2017, and 2016, respectively, associated with changes in the estimated useful life of long-lived assets impacted by the CIP.

Note 12. Quarterly Financial Data (Unaudited)

	<u>First</u>	<u>Second</u>	<u>Third</u>	<u>Fourth</u>
	(In millions, except per share amounts)			
	Quarter	Quarter	Quarter	Quarter
2018				
Net sales	\$ 492.0	\$467.2	\$498.8	\$437.9
Cost of sales (exclusive of items shown separately on Statement of Operations)	426.8	369.5	400.7	352.4
Income before income taxes	18.7	47.3	87.6	35.0
Net income	14.0	34.8	65.0	23.5
Basic net income per share	0.19	0.46	0.85	0.30
Diluted net income per share	0.18	0.45	0.82	0.29

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

First Quarter	Second Quarter	Third Quarter	Fourth Quarter
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(In millions, except per share amounts)

2017				
Net sales	\$405.3	\$459.6	\$484.1	\$528.2
Cost of sales (exclusive of items shown separately on Statement of Operations)	339.4	370.6	403.8	448.4
Income before income taxes	9.2	36.2	18.6	22.9
Net income (loss)	5.9	24.3	12.6	(52.0)
Basic and Diluted net income (loss) per share	0.08	0.32	0.17	(0.71)

Note 13. Unusual Items

The following table presents total unusual items, comprised of a component of other (income) expense, net and loss on debt in the consolidated statements of operations:

	Year Ended December 31,		
	2018	2017	2016
	(In millions)		
Aerospace and Defense:			
Gain on legal matters (1)	\$—	\$(2.0)	\$—
Aerospace and defense unusual items	—	(2.0)	—
Corporate:			
Loss on debt repurchased (2)	—	—	34.4
Acquisition costs (1)	—	1.0	—
Loss on bank amendment (1)	0.2	—	0.1
Corporate unusual items	0.2	1.0	34.5
Total unusual items	\$ 0.2	\$(1.0)	\$34.5

(1) Operating expense (income)

(2) Non-operating expense

Note 14. Adoption of Revenue Recognition Guidance

The Company adopted the new revenue recognition guidance effective January 1, 2018, using the modified retrospective method, with the cumulative effect recognized as of January 1, 2018. The primary impact of the new guidance was a change in the timing of revenue recognition on certain long-term contracts in the Company's Aerospace and Defense segment. The adoption of the new revenue recognition guidance did not impact revenue recognized within the Company's Real Estate segment. The new guidance does not change the total sales or operating income on the related customer contracts, only the timing of when sales and operating income are recognized. Under this new guidance, the Company discontinued the use of the unit-of-delivery revenue recognition method on certain customer contracts and re-measured the performance obligations using the cost-to-cost method. The unit-of-delivery method was utilized for 48% of net sales for the year ended December 31, 2017. The cumulative favorable impact of the adoption was \$37.6 million of net income which was recorded to stockholders' equity.

Further, as the Company's adoption of the guidance accelerated the timing of revenue recognition on some of the Company's contracts, the adoption resulted in a \$0.6 billion reduction in the Company's remaining performance obligations, also referred to as backlog, as of December 31, 2017.

The following tables summarize the effect of adoption of the new revenue recognition standard on the Company's consolidated financial statements for 2018.

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)
Condensed Consolidated Statement of Operations

	Year Ended December 31, 2018		
	As Reported	Effect of Adoption	Amounts Excluding Effect of Adoption
	(In millions, except per share amounts)		
Net sales	\$1,895.9	\$ 14.1	\$1,910.0
Operating costs and expenses:			
Cost of sales (exclusive of items shown separately below)	1,549.4	27.2	1,576.6
Selling, general and administrative expense	43.8	—	43.8
Depreciation and amortization	72.3	—	72.3
Other income, net	(40.2)	—	(40.2)
Total operating costs and expenses	1,625.3	27.2	1,652.5
Operating income	270.6	(13.1)	257.5
Non-operating (income) expense:			
Retirement benefits expense	57.6	—	57.6
Interest income	(10.0)	—	(10.0)
Interest expense	34.4	—	34.4
Total non-operating expense, net	82.0	—	82.0
Income before income taxes	188.6	(13.1)	175.5
Income tax provision	51.3	(3.5)	47.8
Net income	\$ 137.3	\$ (9.6)	\$ 127.7
Earnings Per Share of Common Stock			
Basic			
Basic net income per share	\$ 1.80	\$(0.13)	\$ 1.67
Diluted			
Diluted net income per share	\$ 1.75	\$(0.12)	\$ 1.63
Weighted average shares of common stock outstanding, basic	74.8	—	74.8
Weighted average shares of common stock outstanding, diluted	76.8	—	76.8

Condensed Consolidated Statement of Comprehensive Income

	Year Ended December 31, 2018		
	As Reported	Effect of Adoption	Amounts Excluding Effect of Adoption
	(In millions)		
Net income	\$137.3	\$(9.6)	\$127.7
Other comprehensive income:			
Actuarial losses and amortization of actuarial losses, net of income taxes	33.2	—	33.2
Comprehensive income	<u>\$170.5</u>	<u>\$(9.6)</u>	<u>\$160.9</u>

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)
Condensed Consolidated Balance Sheet

	As of December 31, 2018		
	As Reported	Effect of Adoption	Amounts Excluding Effect of Adoption
		(In millions)	
ASSETS			
Current Assets			
Cash and cash equivalents	\$ 735.3	\$ —	\$ 735.3
Restricted cash	5.0	—	5.0
Accounts receivable, net	141.2	(86.5)	54.7
Contract assets	235.1	21.3	256.4
Other current assets, net	117.7	(2.0)	115.7
Total Current Assets	1,234.3	(67.2)	1,167.1
Noncurrent Assets			
Property, plant and equipment, net	399.7	—	399.7
Recoverable environmental remediation costs	251.1	—	251.1
Deferred income taxes	116.9	(20.5)	96.4
Goodwill	161.3	—	161.3
Intangible assets	71.8	—	71.8
Other noncurrent assets, net	255.0	—	255.0
Total Noncurrent Assets	1,255.8	(20.5)	1,235.3
Total Assets	\$2,490.1	\$(87.7)	\$2,402.4
LIABILITIES AND STOCKHOLDERS' EQUITY			
Current Liabilities			
Current portion of long-term debt	\$ 273.1	\$ —	\$ 273.1
Accounts payable	88.7	—	88.7
Reserves for environmental remediation costs	39.8	—	39.8
Contract liabilities	272.6	(8.8)	263.8
Other current liabilities	204.1	(31.7)	172.4
Total Current Liabilities	878.3	(40.5)	837.8
Total Noncurrent Liabilities	1,190.5	—	1,190.5
Total Liabilities	2,068.8	(40.5)	2,028.3
Stockholders' Equity			
Common stock	7.7	—	7.7
Other capital	561.8	—	561.8
Treasury stock at cost	(12.7)	—	(12.7)
Retained earnings	103.9	(47.2)	56.7
Accumulated other comprehensive loss, net of income taxes	(239.4)	—	(239.4)
Total Stockholders' Equity	421.3	(47.2)	374.1
Total Liabilities and Stockholders' Equity	\$2,490.1	\$(87.7)	\$2,402.4

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)
Condensed Consolidated Statement of Cash Flows

	Year Ended December 31, 2018		
	As Reported	Effect of Adoption (In millions)	Amounts Excluding Effect of Adoption
Operating Activities			
Net income	\$137.3	\$ (9.6)	\$127.7
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	72.3	—	72.3
Amortization of debt discount and deferred financing costs	8.9	—	8.9
Stock-based compensation	20.5	—	20.5
Retirement benefits, net	15.9	—	15.9
Other, net	(2.2)	—	(2.2)
Changes in assets and liabilities:			
Accounts receivable, net	(47.3)	57.1	9.8
Contract assets	10.5	1.2	11.7
Other current assets, net	21.5	(8.1)	13.4
Recoverable environmental remediation costs	(20.0)	—	(20.0)
Other noncurrent assets	5.8	—	5.8
Accounts payable	(39.4)	—	(39.4)
Contract liabilities	29.2	(42.2)	(13.0)
Other current liabilities	40.9	(31.8)	9.1
Deferred income taxes	4.7	33.4	38.1
Reserves for environmental remediation costs	(13.5)	—	(13.5)
Other noncurrent liabilities and other	7.6	—	7.6
Net Cash Provided by Operating Activities	<u>252.7</u>	<u>—</u>	<u>252.7</u>
Investing Activities			
Net Cash Used in Investing Activities	(20.9)	—	(20.9)
Financing Activities			
Net Cash Used in Financing Activities	<u>(26.5)</u>	<u>—</u>	<u>(26.5)</u>
Net Increase in Cash, Cash Equivalents and Restricted Cash	205.3	—	205.3
Cash, Cash Equivalents and Restricted Cash at Beginning of Year	<u>535.0</u>	<u>—</u>	<u>535.0</u>
Cash, Cash Equivalents and Restricted Cash at End of Year	<u>\$740.3</u>	<u>\$ —</u>	<u>\$740.3</u>

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

The following table summarizes the reclassifications to the December 31, 2017, balance sheet to conform to the current year's presentation.

	<u>As Reported</u>	<u>Reclassifications due to Adoption</u> (In millions)	<u>As Adjusted</u>
ASSETS			
Current Assets			
Cash and cash equivalents	\$ 535.0	\$ —	\$ 535.0
Marketable securities	20.0	—	20.0
Accounts receivable, net	215.5	(151.0)	64.5
Inventories	136.4	(136.4)	—
Contract assets	—	268.1	268.1
Other current assets, net	109.8	19.3	129.1
Total Current Assets	<u>1,016.7</u>	<u>—</u>	<u>1,016.7</u>
Total Noncurrent Assets	<u>1,242.0</u>	<u>—</u>	<u>1,242.0</u>
Total Assets	<u>\$2,258.7</u>	<u>\$ —</u>	<u>\$2,258.7</u>
LIABILITIES AND STOCKHOLDERS' EQUITY			
Current Liabilities			
Current portion of long-term debt	\$ 25.0	\$ —	\$ 25.0
Accounts payable	100.9	—	100.9
Reserves for environmental remediation costs	35.2	—	35.2
Contract liabilities	—	276.8	276.8
Advance payments on contracts	237.8	(237.8)	—
Other current liabilities	195.9	(39.0)	156.9
Total Current Liabilities	<u>594.8</u>	<u>—</u>	<u>594.8</u>
Total Noncurrent Liabilities	<u>1,561.5</u>	<u>—</u>	<u>1,561.5</u>
Total Liabilities	<u>2,156.3</u>	<u>—</u>	<u>2,156.3</u>
Stockholders' Equity			
Total Stockholders' Equity	<u>102.4</u>	<u>—</u>	<u>102.4</u>
Total Liabilities and Stockholders' Equity	<u>\$2,258.7</u>	<u>\$ —</u>	<u>\$2,258.7</u>

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

The following table summarizes the reclassifications to the 2017 statement of cash flows to conform to the current year's presentation.

	As Reported	Reclassifications due to Adoption	As Adjusted
	(In millions)		
Operating Activities			
Net income	\$ (9.2)	\$ —	\$ (9.2)
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	72.6	—	72.6
Amortization of debt discount and deferred financing costs	8.5	—	8.5
Stock-based compensation	22.0	—	22.0
Retirement benefits, net	(8.2)	—	(8.2)
Other, net	0.7	—	0.7
Changes in assets and liabilities, net of effects from acquisition in 2017:			
Accounts receivable, net	(67.6)	73.2	5.6
Inventories	48.6	(48.6)	—
Contract assets	—	(20.5)	(20.5)
Other current assets, net	13.0	(4.1)	8.9
Recoverable environmental remediation costs	8.7	—	8.7
Other noncurrent assets	(31.4)	—	(31.4)
Accounts payable	1.6	—	1.6
Contract liabilities	—	30.7	30.7
Advance payments on contracts	16.0	(16.0)	—
Other current liabilities	8.2	(14.7)	(6.5)
Deferred income taxes	125.7	—	125.7
Reserves for environmental remediation costs	(8.3)	—	(8.3)
Other noncurrent liabilities and other	11.9	—	11.9
Net Cash Provided by Operating Activities	212.8	—	212.8
Investing Activities			
Net Cash Used in Investing Activities	(66.4)	—	(66.4)
Financing Activities			
Net Cash Used in Financing Activities	(21.7)	—	(21.7)
Net Increase in Cash and Cash Equivalents	124.7	—	124.7
Cash and Cash Equivalents at Beginning of Year	410.3	—	410.3
Cash and Cash Equivalents at End of Year	\$535.0	\$ —	\$535.0

Aerojet Rocketdyne Holdings, Inc.
Notes to Consolidated Financial Statements—(Continued)

The following table summarizes the reclassifications to the 2016 statement of cash flows to conform to the current year's presentation.

	<u>As Reported</u>	<u>Reclassifications due to Adoption</u> (In millions)	<u>As Adjusted</u>
Operating Activities			
Net income	\$ 18.0	\$ —	\$ 18.0
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	64.9	—	64.9
Amortization of debt discount and deferred financing costs	2.3	—	2.3
Stock-based compensation	12.9	—	12.9
Retirement benefits, net	30.5	—	30.5
Other, net	35.0	—	35.0
Changes in assets and liabilities:			
Accounts receivable, net	33.1	24.8	57.9
Inventories	(28.9)	28.9	—
Contract assets	—	(54.6)	(54.6)
Other current assets, net	(23.8)	0.9	(22.9)
Recoverable environmental remediation costs	(32.6)	—	(32.6)
Other noncurrent assets	(12.6)	—	(12.6)
Accounts payable	27.0	—	27.0
Contract liabilities	—	(13.6)	(13.6)
Advance payments on contracts	(9.1)	9.1	—
Other current liabilities	(37.4)	4.5	(32.9)
Deferred income taxes	4.8	—	4.8
Reserves for environmental remediation costs	47.4	—	47.4
Other noncurrent liabilities and other	27.2	—	27.2
Net Cash Provided by Operating Activities	<u>158.7</u>	<u>—</u>	<u>158.7</u>
Investing Activities			
Net Cash Provided by Investing Activities	(47.1)	—	(47.1)
Financing Activities			
Net Cash Used in Financing Activities	90.2	—	90.2
Net Increase in Cash and Cash Equivalents	201.8	—	201.8
Cash and Cash Equivalents at Beginning of Year	208.5	—	208.5
Cash and Cash Equivalents at End of Year	<u>\$410.3</u>	<u>\$ —</u>	<u>\$410.3</u>

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

None.

Item 9A. *Controls and Procedures*

Disclosure Controls and Procedures

As of December 31, 2018, we conducted an evaluation under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures. The term “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (“Exchange Act”), means controls and other procedures of a company that are designed to provide reasonable assurance that information required to be disclosed by the Company in the reports it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC’s rules and forms. Disclosure controls and procedures are also designed to provide reasonable assurance that such information is accumulated and communicated to the Company’s management, including its Chief Executive Officer and Chief Financial Officer, to allow timely decisions regarding required disclosure. Based on this evaluation, our Chief Executive Officer and Chief Financial Officer concluded as of December 31, 2018, that our disclosure controls and procedures were effective at the reasonable assurance level.

Management’s Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. The rules define internal control over financial reporting as a process designed by, or under the supervision of, the Company’s Chief Executive Officer and Chief Financial Officer, 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. Our internal control over financial reporting includes those policies and procedures that:

- Pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company;
- 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
- 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. In addition, 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.

With the participation of the Chief Executive Officer and the Chief Financial Officer, our management conducted an evaluation of the effectiveness of our internal control over financial reporting based on the criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (“COSO”). Based on this evaluation, our management has concluded that our internal control over financial reporting was effective as of December 31, 2018.

The effectiveness of our internal control over financial reporting as of December 31, 2018, has been audited by PricewaterhouseCoopers LLP, our independent registered public accounting firm. Their report appears in Item 8 of this Form 10-K.

Changes in Internal Control Over Financial Reporting

There were no changes in internal control over financial reporting that occurred during the most recent quarter that have materially affected, or are reasonably likely to materially affect, the effectiveness of our internal control over financial reporting.

Item 9B. *Other Information*

None.

PART III

Item 10. *Directors, Executive Officers and Corporate Governance*

Directors of the Registrant

Information with respect to directors of the Company who will stand for election at the 2019 Annual Meeting of Stockholders is set forth under the heading “PROPOSAL 1 — ELECTION OF DIRECTORS” in our 2019 Proxy Statement for our 2019 Annual Meeting of Stockholders (“2019 Proxy Statement”), which will be filed with the SEC within 120 days after the close of our year. Such information is incorporated herein by reference.

The information in our 2019 Proxy Statement set forth under the caption “Section 16(a) Beneficial Ownership Reporting Compliance” is incorporated herein by reference. Information regarding stockholder communications with our Board of Directors may be found under the caption “Communications with Directors” in our 2019 Proxy Statement and is incorporated herein by reference.

Executive Officers of the Registrant

The following information is given as of December 31, 2018.

Name	Other Business Experience
Warren G. Lichtenstein Executive Chairman (since June 2016) Age: 53	Chairman, March 2013 — June 2016 (Director since 2008); Executive Chairman of Steel Partners Holdings GP Inc., the general partner of SPLP February 2013 — Present; Chairman and CEO of general partner of SPLP July 2009 — February 2013; Chairman, Handy & Harman Ltd. (formerly known as WHX Corporation) July 2005 — Present; Executive Chairman, Steel Connect, Inc. June 2016 — Present; Interim CEO, Steel Connect, Inc. March 2016 — June 2016; Chairman, Steel Connect, Inc. March 2013 — June 2016. Chairman Steel Excel May 2011 — Present (director since 2010); Director SLI March 2010 — Present; Director (formerly Chairman) SLI January 2002 — May 2008; CEO SLI February 2002 — August 2005.
Eileen P. Drake Chief Executive Officer and President (since June 2015) Age: 52	Chief Operating Officer, March 2015 — June 2015; Director, Woodward, Inc. February 2017 — Present; President of Pratt & Whitney AeroPower’s auxiliary power unit and small turbojet propulsion business, UTC 2012 — 2015; Vice President (“VP”) of Operations, UTC 2009 — 2012; VP of Quality, Environmental Health & Safety, and Achieving Competitive Excellence, UTC 2003 — 2009; Product Line Manager and Plant Manager, Ford Motor Company 1996 — 2003; United States Army 1989 — 1996.
Mark A. Tucker Chief Operating Officer (since June 2015) Age: 60	Senior VP, Enterprise Operations and Engineering, Aerojet Rocketdyne, Inc. October 2013 — June 2015; VP Special Programs, Aerospace Systems Sector, Northrop Grumman 1983 — 2013.
Paul R. Lundstrom Vice President, Chief Financial Officer (since November 2016) Age: 43	VP, Investor Relations, UTC 2014 — 2016; VP, Chief Financial Officer, Building & Industrial Systems — North Asia (a UTC division) 2013 — 2014; VP, Chief Financial Officer, Climate/Controls/Security — Asia (a UTC division) 2011 — 2013; VP, Chief Financial Officer, Carrier Building Systems and Services, Carrier Corporation (a UTC division) 2009 — 2011.
John D. Schumacher Senior Vice President, Washington Operations (since August 2018) Age: 64	VP, Washington Operations June 2015 — August 2018; VP, Business Relations April 2013 — June 2015; President, Aerojet Rocketdyne Foundation since October 2013; President, Astrium Americas and VP, Space, EADS North America April 2011 — April 2013; VP, Washington Operations, Aerojet May 2006 — April 2011; Director, Whitney, Bradley & Brown Consulting September 2005 - May 2006; Chief of Staff, National Aeronautics and Space Administration (“NASA”) May 2003 — September 2005; Associate Administrator for External Relations, NASA 1994 — 2003; Deputy Associate Administrator, NASA 1990 — 1994; Advisor to the Administrator, NASA 1989 — 1990; Associate, Rogers & Wells, NY, 1987 — 1989; Captain, Naval Reserve 1984 — 2006; Active Duty U.S. Navy 1972 — 1984.

Name	Other Business Experience
Arjun L. Kampani Vice President, General Counsel and Secretary (since April 2016) Age: 47	VP, General Counsel and Corporate Secretary, General Dynamics Land Systems, Inc. 2010 — 2016; Director & Assistant General Counsel, Mergers and Acquisitions, General Dynamics Corporation 2006 — 2009; Assistant General Counsel and Assistant Corporate Secretary, Anteon International Corporation 2004 — 2006; Attorney, Business and Finance Department, Thelen Reid & Priest, LLP 1999 — 2004.

The Company's executive officers generally hold terms of office of one year and/or until their successors are elected and serve at the discretion of the Board.

Code of Ethics and Corporate Governance Guidelines

The Company has adopted a code of ethics known as the Code of Conduct that applies to the Company's employees including the principal executive officer and principal financial officer. Amendments to the Code of Conduct and any grant of a waiver from a provision of the Code of Conduct requiring disclosure under applicable SEC rules will be disclosed on the Company's website at www.AerojetRocketdyne.com. Copies of the Code of Conduct and the Company's Corporate Governance Guidelines are available on the Company's web site at www.AerojetRocketdyne.com (copies are available in print to any stockholder or other interested person who requests them by writing to Secretary, Aerojet Rocketdyne Holdings, Inc., 222 N. Pacific Coast Highway, Suite 500, El Segundo, California 90245).

Audit Committee and Audit Committee Financial Expert

Information regarding the Audit Committee and the Audit Committee's Financial Expert is set forth under the heading "Board Committees" in our 2019 Proxy Statement and is incorporated herein by reference.

Item 11. Executive Compensation

Information concerning executive compensation may be found under the captions "Executive Compensation," "2018 Director Compensation Table," "Compensation Discussion and Analysis," "Summary Compensation Table," "2018 Grants of Plan-Based Awards," "Outstanding Equity Awards at 2018 Year End," "2018 Option/SAR Exercises and Stock Vested," "2018 Pension Benefits," "2018 Non-Qualified Deferred Compensation," "Potential Payments upon Termination of Employment or Change in Control," "Employment Agreement and Indemnity Agreements," "Director Compensation," "Organization & Compensation Committee Report" and "Compensation Committee Interlocks and Insider Participation" of our 2019 Proxy Statement. Such information is incorporated herein by reference.

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

The information under the headings "Security Ownership of Certain Beneficial Owners" and "Security Ownership of Officers and Directors" in our 2019 Proxy Statement is incorporated herein by reference.

Equity Compensation Plan Information

The table below sets forth certain information regarding the following equity compensation plans of the Company, pursuant to which we have made equity compensation available to eligible persons, as of December 31, 2018: (i) 1999 Equity and Performance Incentive Plan; (ii) 2009 Equity and Performance Incentive Plan; and (iii) 2018 Equity and Performance Incentive Plan. All three plans were approved by our stockholders.

<u>Plan Category</u>	<u>Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights</u>	<u>Weighted-Average Exercise Price of Outstanding Options, Warrants and Rights</u>	<u>Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column (a))</u>
	(a)	(b)	(c)
Equity compensation plans approved by stockholders			
Stock options	345,623	\$18.82	
Restricted shares (2)	—		
Performance shares (3)			
Total	345,623	\$18.82	3,964,055 (1)
Equity compensation plans not approved by stockholders (4)			
Total	—	N/A	—
Total	345,623	\$18.82	3,964,055

(1) As of December 31, 2018, there are no more shares available to be issued under any type of incentive award under the 1999 Equity and Performance Incentive Plan and the 2009 Equity and Performance Incentive Plan (the "Prior Plan"). The

number of shares approved for issuance to participants under the 2018 Equity and Performance Incentive Plan (the “Plan”) is 3,900,000 shares plus shares issued under the Prior Plan that are forfeited or withheld to settle income tax obligations, all of which may be awarded as incentive stock options. Subject to the total shares available to be issued under the plan, the following specific limits apply: (A) the maximum aggregate dollar of equity based awards and cash compensation granted under the Plan or otherwise during any Plan Year to any nonemployee director shall not exceed \$400,000 (\$800,000 for a nonemployee director designated as Chairman of the Board); (B) no more than 200,000 shares subject to stock options, including incentive stock options, may be granted to any participant in any year; (C) no more than 200,000 shares subject to stock appreciation rights may be granted to any participant in any year; (D) no more than 200,000 shares may be granted to any participant in any fiscal year pursuant to an award of restricted stock or restricted stock units; (E) no more than 200,000 shares may be granted to any participant in any fiscal year pursuant to an award of performance shares or performance units; and (F) no more than 100,000 shares may be granted to any participant in any fiscal year pursuant to a stock-based award other than described above.

- (2) As of December 31, 2018, 315,222 shares had been granted as restricted shares that had not yet vested.
- (3) As of December 31, 2018, 1,198,563 shares had been granted as performance shares that had not yet vested.
- (4) The Company also maintains the Aerojet Rocketdyne Holdings, Inc. and Participating Subsidiaries Deferred Bonus Plan. Prior to 2016, this plan allowed participating employees to defer a portion of their compensation for future distribution. All or a portion of such deferrals made prior to November 30, 2009, could be allocated to an account based on the Company’s common stock and does permit limited distributions in the form of Company common shares. However, distributions in the form of common shares are permitted only at the election of the Organization & Compensation Committee of the Board of Directors and, according to the terms of the plan, individuals serving as officers or directors of the Company are not permitted to receive distributions in the form of Company common shares until at least six months after such individual ceases to be an officer or director of the Company. The table does not include information about this plan because no options, warrants or rights are available under this plan and no specific number of shares is set aside under this plan as available for future issuance. Based upon the price of Company common shares on December 31, 2018, the maximum number of shares that could be distributed to employees not subject to the restrictions on officers and directors (if permitted by the Organization & Compensation Committee) would be 1,184. This plan was amended effective November 30, 2009, to prevent the application of future deferrals to the Company common stock investment program.

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

Information regarding certain transactions and employment agreements with management is set under the headings “Employment Agreement and Indemnity Agreements,” “Related Person Transaction Policy” and “Potential Payments upon Termination of Employment or Change in Control” in our 2019 Proxy Statement and is incorporated herein by reference. Information regarding director independence is set forth under the heading “Determination of Independence of Directors” in our 2019 Proxy Statement and is incorporated herein by reference.

Item 14. *Principal Accountant Fees and Services*

The information in our 2019 Proxy Statement set forth under the captions “Proposal 3 — Ratification of the Appointment of Independent Auditors,” “Audit Fees and All Other Fees,” and “Policy on Audit Committee Pre-Approval of Audit and Permissible Non-Audit Services of the Company’s Independent Auditors” is incorporated herein by reference.

Part IV

Item 15. Exhibits and Financial Statement Schedules

(a) The following documents are filed as part of this report:

(1) FINANCIAL STATEMENTS

	Page Number
Report of Independent Registered Public Accounting Firm	37
Consolidated Statements of Operations for the years ended December 31, 2018, 2017, and 2016	38
Consolidated Statements of Comprehensive Income for the years ended December 31, 2018, 2017, and 2016	39
Consolidated Balance Sheets as of December 31, 2018 and 2017	40
Consolidated Statements of Stockholders' Equity (Deficit) for the years ended December 31, 2018, 2017, and 2016	41
Consolidated Statements of Cash Flows for the years ended December 31, 2018, 2017, and 2016	42
Notes to Consolidated Financial Statements	43

(b) EXHIBITS

Refer to Exhibit Index.

Item 16. Form 10-K Summary

This summary provides an overview of the Company. It does not contain all of the information that you should consider. Please read the entire Annual Report on Form 10-K carefully before making a voting or investment decision.



Headquarters:

222 N. Pacific Coast Highway, Suite 500
El Segundo, California 90245

Common Stock:

New York Stock Exchange
Ticker Symbol: AJRD

Leadership Team:

Warren G. Lichtenstein, Executive Chairman

Eileen P. Drake, Chief Executive Officer and President

Mark A. Tucker, Chief Operating Officer

Paul R. Lundstrom, Vice President, Chief Financial Officer

John D. Schumacher, Vice President, Washington Operations

Arjun L. Kampani, General Counsel and Secretary

Website:

www.AerojetRocketdyne.com

Independent Auditors:

PricewaterhouseCoopers LLP

Business

Aerojet Rocketdyne Holdings, Inc. is an innovative technology-based manufacturer of aerospace and defense products and systems, with a real estate segment that includes activities related to the entitlement, sale, and leasing of our excess real estate assets.

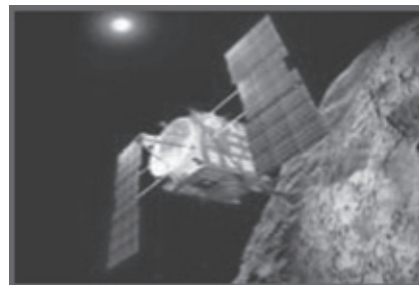
Aerospace

Supporting re-establishment of U.S. human space and military space capabilities

- Domestic portfolio of space propulsion and power systems
- NASA's new Space Launch System and Orion programs are expected to restore U.S. deep space exploration



Space Launch System



In-space Propulsion

Defense

Our products play a major role in providing national and global security

- Liquid, solid, air-breathing propulsion systems and components for strategic, tactical and precision missile strikes, missile defense systems, maneuvering propulsion systems, precision warfighting systems
- Strong, well-funded portfolio of programs with strategically important next generation programs in development and on the horizon



Missile Defense



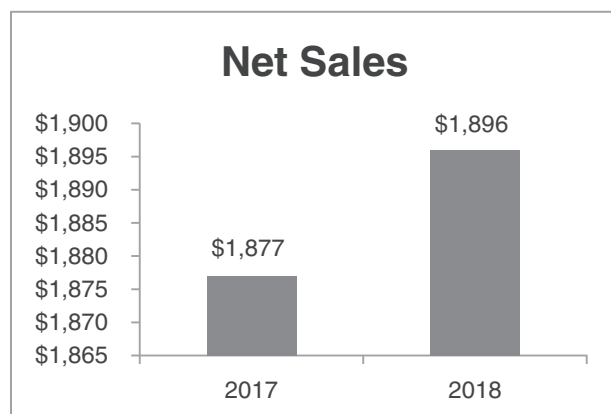
Tactical Systems

Competitive Strengths

- High visibility of revenue with a strong backlog in a diverse set of products
- Advanced propulsion technology base, aligned with our nation's critical needs
- Proven manufacturing capability and expertise
- Driving continuous improvement and operational excellence

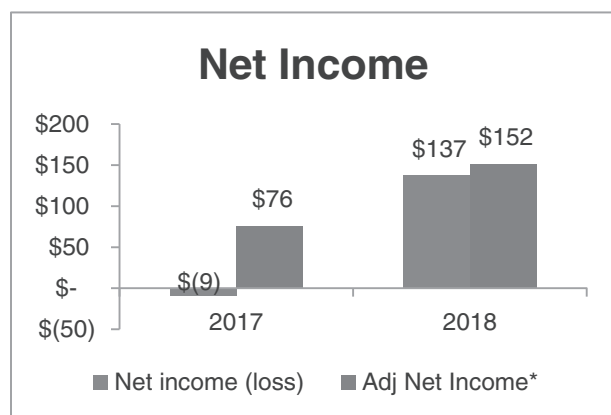
For additional information regarding these topics, please see Part I, Item 1. Business and Part III, Item 10. Directors, Executive Officers and Corporate Governance.

Performance Highlights
(In millions)



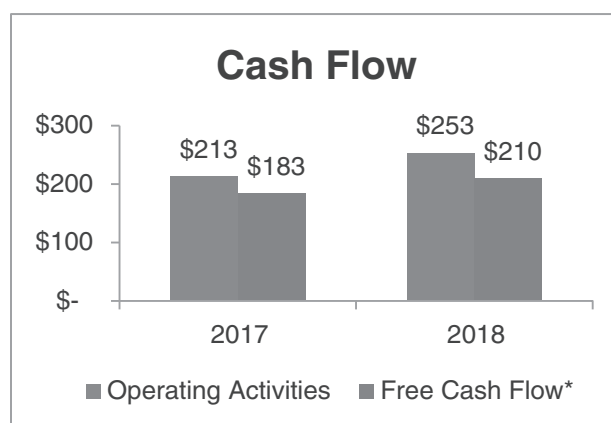
Net sales were impacted by the adoption of new revenue recognition guidance effective January 1, 2018.

- Net sales in 2018 would have been \$1,910 million under the previous revenue guidance.
- Increase of \$126 million in defense programs primarily driven by increased deliveries on the Standard Missile and PAC-3 programs.
- Decrease of \$95 million in space programs primarily driven by cost growth and performance issues on the Commercial Crew Development program and lower deliveries on the Atlas V program.



Net income increased primarily due to:

- Decrease of \$45 million in income taxes.
- One-time benefit of \$43 million from increased recoverability of environmental remediation costs.
- Improved contract performance resulting in an increase of \$22 million in favorable changes in contract estimates.
- Decrease of \$16 million in retirement benefits expense.



Cash flow provided by operating activities increased primarily due to:

- Improved operating results.
- Decrease in retirement benefit cash funding.

* We provide Non-GAAP measures as a supplement to financial results presented in accordance with GAAP. A reconciliation of the Non-GAAP measures to the most directly comparable GAAP measures is presented in Item 1. Management's Discussion and Analysis under the heading "Use of Non-GAAP Financial Measures."

Risks:

Some important risk factors include, but are not limited to, the following:

- future reductions or changes in U.S. government spending;
- cancellation or material modification of one or more significant contracts;
- the funded status of our defined benefit pension plan;
- environmental remediation activities that impact our established reserves;
- failure to implement our cost reduction plans as expected; and
- risks detailed in Item 1A of this Form 10-K.

For additional information regarding these topics, please see Part I, Item 1A. Risk Factors and Part II, Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

February 19, 2019

Aerojet Rocketdyne Holdings, Inc.

By: /s/ EILEEN P. DRAKE
 Eileen P. Drake
 Chief Executive Officer and President

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ EILEEN P. DRAKE</u> Eileen P. Drake	Chief Executive Officer, President and Director (Principal Executive Officer)	February 19, 2019
<u>/s/ PAUL R. LUNDSTROM</u> Paul R. Lundstrom	Vice President, Chief Financial Officer (Principal Financial Officer)	February 19, 2019
<u>/s/ DANIEL L. BOEHLE</u> Daniel L. Boehle	Vice President, Controller (Principal Accounting Officer)	February 19, 2019
* <u>Warren G. Lichtenstein</u>	Executive Chairman	February 19, 2019
* <u>Kevin P. Chilton</u>	Director	February 19, 2019
* <u>Thomas A. Corcoran</u>	Director	February 19, 2019
* <u>James R. Henderson</u>	Director	February 19, 2019
* <u>Lance W. Lord</u>	Director	February 19, 2019
* <u>Merrill A. McPeak</u>	Director	February 19, 2019
* <u>Martin Turchin</u>		
* By: <u>/s/ PAUL R. LUNDSTROM</u> Paul R. Lundstrom	Attorney-in-Fact pursuant to Power of Attorney	February 19, 2019

EXHIBIT INDEX

Table Item No.	Exhibit Description
2.1	Amended and Restated Stock and Asset Purchase Agreement, dated as of June 12, 2013, by and between United Technologies Corporation and GenCorp Inc. was filed as Exhibit 2.1 to GenCorp Inc.'s Current Report on Form 8-K dated June 14, 2013 (File No. 1-01520), and is incorporated herein by reference.**
2.2	Plan of Conversion, dated April 11, 2014 was filed as Exhibit 2.1 to GenCorp Inc.'s Current Report on Form 8-K dated April 11, 2014 (File No. 1-01520), and is incorporated herein by reference.
3.1	Certificate of Conversion, as filed with the Secretary of State of the State of Ohio on April 11, 2014 was filed as Exhibit 3.1 to GenCorp Inc.'s Current Report on Form 8-K dated April 11, 2014 (File No. 1-01520), and is incorporated herein by reference.
3.2	Certificate of Conversion, was filed as Exhibit 3.2 to GenCorp Inc.'s Current Report on Form 8-K dated April 11, 2014 (File No. 1-01520), and is incorporated herein by reference.
3.3	Certificate of Incorporation, as of April 11, 2014, as amended on April 27, 2015 was filed as Exhibit 3.3 to Aerojet Rocketdyne Holdings, Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 2015 (File No. 1-01520), and is incorporated herein by reference.
3.4	Aerojet Rocketdyne Holdings, Inc. Second Amended and Restated Bylaws was filed as Exhibit 3.1 to Aerojet Rocketdyne Holdings, Inc.'s Current Report on Form 8-K dated January 20, 2016 (File No. 1-01520), and is incorporated herein by reference.
4.1	GenCorp Retirement Savings Plan was filed as Exhibit 4.1 to GenCorp Inc.'s Registration Statement on Form S-8 filed on June 30, 2008 (File No. 333-0152032) and incorporated herein by reference.
4.2	Form of Common Stock Certificate was filed as Exhibit 4.1 to GenCorp Inc.'s Current Report on Form 8-K dated April 11, 2014 (File No. 1-01520), and is incorporated herein by reference.
4.3	GenCorp Inc. Amended and Restated 2009 Equity and Performance Incentive Plan was filed as Exhibit 4.1 to GenCorp Inc.'s Registration Statement on Form S-8 dated April 9, 2015 (File No. 333-203319), and is incorporated herein by reference.
4.4	Indenture, dated as of December 14, 2016, between Aerojet Rocketdyne Holdings, Inc. and The Bank of New York Mellon Trust Company, N.A., as trustee, relating to Aerojet Rocketdyne Holdings, Inc.'s 2.25% Convertible Senior Notes due 2023 was filed as Exhibit 4.1 to Aerojet Rocketdyne Holding, Inc.'s Current Report on Form 8-K dated December 14, 2016 (File No. 1-01520), and is incorporated herein by reference.
4.5	Form of 2.25% Convertible Senior Note due 2023 was filed as Exhibit 4.2 to Aerojet Rocketdyne Holdings, Inc.'s Current Report on Form 8-K dated December 14, 2016 (File No. 1-01520), and is incorporated herein by reference.
4.6	2018 Equity and Performance Incentive Plan was filed as Exhibit A of the Registrant's Definitive Proxy Statement on Schedule 14A filed on March 29, 2018 (File No. 1-01520), and is incorporated herein by reference.
10.1	Amended and Restated Environmental Agreement by and between Aerojet and Northrop Grumman, dated October 19, 2001 was filed as Exhibit 2.4 to the Company's Current Report on Form 8-K dated November 5, 2001 (File No. 1-01520), and is incorporated herein by reference.
10.2†	GenCorp 1996 Supplemental Retirement Plan for Management Employees effective March 1, 1996 was filed as Exhibit B to GenCorp Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 1996 (File No. 1-01520), and is incorporated herein by reference.
10.3†	2009 Benefit Restoration Plan for the GenCorp Inc. Pension Plan was filed as Exhibit 10.1 to GenCorp Inc.'s Current Report on Form 8-K filed on January 7, 2009 (File No. 1-01520), and is incorporated herein by reference.
10.4†	2009 Benefit Restoration Plan for the GenCorp Inc. 401(k) Plan was filed as Exhibit 10.2 to GenCorp Inc.'s Current Report on Form 8-K filed on January 7, 2009 (File No. 1-01520), and is incorporated herein by reference.
10.5†	Deferred Bonus Plan of GenCorp Inc. and Participating Subsidiaries was filed as Exhibit 10.6 to GenCorp Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 2008 (File No. 1-01520), and is incorporated herein by reference.
10.6†	GenCorp Inc. Deferred Compensation Plan for Nonemployee Directors, as amended was filed as Exhibit 10.7 to GenCorp Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 2008 (File No. 1-01520), and is incorporated herein by reference.
10.7†	GenCorp Inc. 1999 Equity and Performance Incentive Plan as amended was filed as Exhibit 10.11 to GenCorp Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 2007 (File No. 1-01520), and is incorporated herein by reference.
10.8†	Form of Restricted Stock Agreement between the Company and Nonemployee Directors providing for payment of part of Directors' compensation for service on the Board of Directors in Company stock was filed as Exhibit 10.1 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the fiscal quarter ended February 28, 1998 (File No. 1-01520), and is incorporated herein by reference.
10.9†	Form of Restricted Stock Agreement between the Company and Nonemployee Directors providing for payment of part of Directors' compensation for service on the Board of Directors in Company stock was filed as Exhibit 10.1 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the fiscal quarter ended February 28, 1999 (File No. 1-01520), and is incorporated herein by reference.

Table Item No.	Exhibit Description
10.10†	Form of Restricted Stock Agreement between the Company and Directors or Employees for grants of time- based vesting of restricted stock under the GenCorp Inc. 1999 Equity and Performance Incentive Plan was filed as Exhibit 10.26 to GenCorp Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 2004 (File No. 1-01520), and is incorporated herein by reference.
10.11†	Form of Stock Appreciation Rights Agreement between the Company and Employees for grants of stock appreciation rights under the GenCorp Inc. 1999 Equity and Performance Incentive Plan was filed as Exhibit 10.27 to GenCorp Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 2004 (File No. 1-01520), and is incorporated herein by reference.
10.12†	Form of Stock Appreciation Rights Agreement between the Company and Directors for grants of stock appreciation rights under the GenCorp Inc. 1999 Equity and Performance Incentive Plan was filed as Exhibit 10.28 to GenCorp Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 2004 (File No. 1-01520), and is incorporated herein by reference.
10.13†	Form of Restricted Stock Agreement between the Company and Employees for grants of performance-based vesting of restricted stock under the GenCorp Inc. 1999 Equity and Performance Incentive Plan was filed as Exhibit 10.29 to GenCorp Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 2004 (File No. 1-01520), and is incorporated herein by reference.
10.14†	Form of Director Nonqualified Stock Option Agreement between the Company and Nonemployee Directors providing for annual grant of nonqualified stock options prior to February 28, 2002, valued at \$30,000 was filed as Exhibit 10.1 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the fiscal quarter ended May 31, 2002 (File No. 1-01520), and is incorporated herein by reference.
10.15†	Form of Director Nonqualified Stock Option Agreement between the Company and Nonemployee Directors providing for an annual grant of nonqualified stock options on or after February 28, 2002, valued at \$30,000 in lieu of further participation in Retirement Plan for Nonemployee Directors was filed as Exhibit 10.2 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the fiscal quarter ended May 31, 2002 (File No. 1-01520), and is incorporated herein by reference.
10.16†	Form of Restricted Stock Agreement Version 2 between the Company and Employees for grants of performance-based vesting of restricted stock under the GenCorp Inc. 1999 Equity and Performance Incentive Plan was filed as Exhibit 10.33 to GenCorp Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 2005 (File No. 1-01520) and is incorporated herein by reference.
10.17	Second Amended and Restated Shareholder Agreement dated as of March 5, 2008, by and between GenCorp Inc. and Steel Partners II L.P. was filed as Exhibit 10.1 to GenCorp Inc.'s Current Report on Form 8-K filed on March 10, 2008 (File No. 1-01520), and is incorporated herein by reference.
10.18†	Director Stock Appreciation Rights Agreement between GenCorp Inc. and Directors for grants of stock appreciation rights under the GenCorp Inc. 2009 Equity and Performance Incentive Plan was filed as Exhibit 10.4 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the third quarter ended August 31, 2009 (File No. 1-01520), and is incorporated herein by reference.
10.19†	Amendment to the Benefits Restoration Plan for Salaried Employees of GenCorp Inc. and Certain Subsidiary Companies, effective October 6, 2009 was filed as Exhibit 10.5 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the third quarter ended August 31, 2009 (File No. 1-01520), and is incorporated herein by reference.
10.20†	Amendment to the 2009 Benefit Restoration Plan for the GenCorp Inc. 401(k) Plan, effective October 6, 2009 was filed as Exhibit 10.6 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the third quarter ended August 31, 2009 (File No. 1-01520), and is incorporated herein by reference.
10.21†	Amendment to the 2009 Benefits Restoration Plan for the GenCorp Inc. Pension Plan, effective October 6, 2009 was filed as Exhibit 10.7 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the third quarter ended August 31, 2009 (File No. 1-01520), and is incorporated herein by reference.
10.22†	Amendment to the Deferred Bonus Plan of GenCorp Inc. and Participating Subsidiaries, effective October 6, 2009 was filed as Exhibit 10.8 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the third quarter ended August 31, 2009 (File No. 1-01520), and is incorporated herein by reference.
10.23†	Amendment to the GenCorp Inc. Deferred Compensation Plan for Nonemployee Directors, as amended, effective October 6, 2009 was filed as Exhibit 10.9 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the third quarter ended August 31, 2009 (File No. 1-01520), and is incorporated herein by reference.
10.24†	Amendment to the GenCorp Inc. 1996 Supplemental Retirement Plan for Management Employees, effective October 6, 2009 was filed as Exhibit 10.10 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the third quarter ended August 31, 2009 (File No. 1-01520), and is incorporated herein by reference.
10.25	Settlement Agreement by and between Aerojet and United States of America, dated November 29, 1992, was filed as Exhibit 10.52 to GenCorp Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 2009 (File No. 1-01520), and is incorporated herein by reference.
10.26	Modification No. 1 to the November 29, 1992 Settlement Agreement by and between Aerojet and United States of America, dated October 27, 1998, was filed as Exhibit 10.53 to GenCorp Inc.'s Annual Report on Form 10-K for the fiscal year ended November 30, 2009 (File No. 1-01520), and is incorporated herein by reference.
10.27†	Form of Restricted Stock Agreement between the Company and Employees for grants of time-based vesting of restricted stock under the GenCorp Inc. Amended and Restated 2009 Equity and Performance Incentive Plan was filed as Exhibit 10.1 to GenCorp Inc.'s Current Report on Form 8-K dated May 13, 2013 (File No. 1-1520), and is incorporated herein by reference.
10.28†	Amendment to the GenCorp Inc. Deferred Compensation Plan for Nonemployee Directors, as amended, effective April 11, 2013 was filed as Exhibit 10.1 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the second quarter ended May 31, 2013 (File No. 1-01520), and is incorporated herein by reference.

Table Item No.	Exhibit Description
10.29†	Stock Option Cancellation Agreement, dated July 9, 2013, between GenCorp Inc. and Kathleen E. Redd was filed as Exhibit 10.1 to GenCorp Inc.'s Current Report on Form 8-K dated July 12, 2013 (File No. 1-01520), and is incorporated herein by reference.
10.30	Form of Indemnification Agreement was filed as Exhibit 10.1 to GenCorp Inc.'s Current Report on Form 8-K dated April 11, 2014 (File No. 1-01520), and is incorporated herein by reference.
10.31	Amended and Restated 2013 Employee Stock Purchase Plan, dated as of June 24, 2014 was filed as Exhibit 10.1 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the fiscal quarter ended August 31, 2014 (File No. 1-01520), and is incorporated herein by reference.
10.32†	Amended and Restated Deferred Compensation Plan for Nonemployee directors, dated as of June 24, 2014 was filed as Exhibit 10.2 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the fiscal quarter ended August 31, 2014 (File No. 1-01520), and is incorporated herein by reference.
10.33†	Amended and Restated 2009 Equity and Performance Incentive Plan, dated as of June 24, 2014, was filed as Exhibit 10.3 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the fiscal quarter ended August 31, 2014 (File No. 1-01520) and is incorporated herein by reference.
10.34†	Form of Restricted Stock Agreement between the Company and Directors for grants of time-based vesting of restricted stock under the GenCorp Inc. Amended and Restated 2009 Equity and Performance Incentive Plan was filed as Exhibit 10.4 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the fiscal quarter ended August 31, 2014 (File No. 1-01520), and is incorporated herein by reference.
10.35†	Form of Unrestricted Stock Agreement between the Company and Directors for grants of common stock under the GenCorp Inc. Amended and Restated 2009 Equity and Performance Incentive Plan was filed as Exhibit 10.5 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the fiscal quarter ended August 31, 2014 (File No. 1-01520), and is incorporated herein by reference.
10.36†	Form of Director Nonqualified Stock Option Agreement between the Company and Directors for grants of nonqualified stock options under the GenCorp Inc. Amended and Restated 2009 Equity and Performance Incentive Plan was filed as Exhibit 10.6 to GenCorp Inc.'s Quarterly Report on Form 10-Q for the fiscal quarter ended August 31, 2014 (File No. 1-01520), and is incorporated herein by reference.
10.37†	Offer letter between GenCorp and Eileen Drake, dated March 2, 2015 was filed as Exhibit 10.1 to GenCorp Inc.'s Current Report on Form 8-K dated March 2, 2015 (File No. 1-01520), and is incorporated herein by reference.
10.38†	Executive Employment Agreement, dated as of November 23, 2015, between Aerojet Rocketdyne Holdings, Inc. and Eileen Drake was filed as Exhibit 10.1 to Aerojet Rocketdyne Holdings, Inc.'s Current Report on Form 8-K dated November 23, 2015 (File No. 1-01520), and is incorporated herein by reference.
10.39†	Amended and Restated Employment Agreement, dated as of March 13, 2018, between Aerojet Rocketdyne Holdings, Inc. and Eileen Drake was filed as Exhibit 10.1 to Aerojet Rocketdyne Holdings, Inc.'s Current Report on Form 8-K dated March 16, 2018 (File No. 1-01520), and is incorporated herein by reference.
10.40†	Amended and Restated Deferred Compensation Plan for Directors, dated August 17, 2016 was filed as Exhibit 10.1 to Aerojet Rocketdyne Holdings, Inc.'s Current Report on Form 8-K dated August 17, 2016 (File No. 1-01520), and is incorporated herein by reference.
10.41†	Offer Letter between Aerojet Rocketdyne Holdings, Inc. and Paul R. Lundstrom, dated September 27, 2016 was filed as Exhibit 10.1 to Aerojet Rocketdyne Holdings, Inc.'s Current Report on Form 8-K dated October 25, 2016 (File No. 1-01520), and is incorporated herein by reference.
10.42†	Transition and General Release Agreement between Aerojet Rocketdyne Holdings, Inc. and Kathleen E. Redd, dated December 20, 2016 was filed as Exhibit 10.1 to Aerojet Rocketdyne Holdings, Inc.'s Current Report on Form 8-K dated December 20, 2016 (File No. 1-01520), and is incorporated herein by reference.
10.43†	Amended and Restated Deferred Compensation Plan for Directors, dated as of February 22, 2017 was filed as Exhibit 10.1 to Aerojet Rocketdyne Holdings, Inc.'s Current Report on Form 10-Q dated May 8, 2017 (File No. 1-01520), and is incorporated herein by reference.
10.44†	Aerojet Rocketdyne Holdings, Inc. Executive Change in Control Severance Policy was filed as Exhibit 10.1 to Aerojet Rocketdyne Holdings, Inc.'s Current Report on Form 10-Q dated November 2, 2017 (File No. 1-01520), and is incorporated herein by reference.
10.45†	Form of Restricted Stock Agreement between the Company and Employees for time-based grants under the 2018 Equity and Performance Incentive Plan was filed as Exhibit 99.2 of the Registrant's Registration Statement on Form S-8 filed on May 10, 2018 (File No. 333-224823), and is incorporated herein by reference.
10.46†	Form of Restricted Stock Agreement between the Company and Employees for performance-based grants under the 2018 Equity and Performance Incentive Plan was filed as Exhibit 99.3 of the Registrant's Registration Statement on Form S-8 filed on May 10, 2018 (File No. 333-224823), and is incorporated herein by reference.
10.47†	Form of Unrestricted Stock Agreement between the Company and Directors for grants under the 2018 Equity and Performance Incentive Plan was filed as Exhibit 99.4 of the Registrant's Registration Statement on Form S-8 filed on May 10, 2018 (File No. 333-224823), and is incorporated herein by reference.
10.48†	Form of Restricted Stock Agreement between the Company and Directors for matching share grants under the 2018 Equity and Performance Incentive Plan was filed as Exhibit 99.5 of the Registrant's Registration Statement on Form S-8 filed on May 10, 2018 (File No. 333-224823), and is incorporated herein by reference.
10.49†	Form of Restricted Stock Agreement between the Company and Directors for annual share grants under the 2018 Equity and Performance Incentive Plan was filed as Exhibit 99.6 of the Registrant's Registration Statement on Form S-8 filed on May 10, 2018 (File No. 333-224823), and is incorporated herein by reference.

Table Item No.	Exhibit Description
10.50†	Form of Stock Appreciation Rights Agreement between the Company and Employees for grants under the 2018 Equity and Performance Incentive Plan was filed as Exhibit 99.7 of the Registrant's Registration Statement on Form S-8 filed on May 10, 2018 (File No. 333-224823), and is incorporated herein by reference.
10.51	First Amendment to Fourth Amended and Restated Credit Agreement with Bank of America, N.A., dated as of September 20, 2018, filed as Exhibit 10.1 to Aerojet Rocketdyne Holdings, Inc.'s Current Report on Form 8-K dated September 20, 2018 (File No. 1-01520) and incorporated herein by reference.
10.52†	Retention Agreement, dated December 6, 2018, by and between Aerojet Rocketdyne Holdings, Inc. and Mark A. Tucker was filed as Exhibit 10.1 to Aerojet Rocketdyne Holdings, Inc.'s Current Report on Form 8-K dated December 6, 2018 (File No. 1-01520), and is incorporated herein by reference.
21.1*	Subsidiaries of the Company.
23.1*	Consent of Independent Registered Public Accounting Firm.
24.1*	Power of Attorney
31.1*	Certification of Principal Executive Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended.
31.2*	Certification of Principal Financial Officer pursuant to Rule 13a-14(a) of the Securities Exchange Act of 1934, as amended.
32.1*	Certification of Principal Executive Officer and Principal Financial Officer pursuant to Rule 13a-14(b) under the Securities Exchange Act of 1934 as amended, and 18 U.S.C. 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document
101.SCH	XBRL Taxonomy Extension Schema
101.CAL	XBRL Taxonomy Extension Calculation Linkbase
101.DEF	XBRL Taxonomy Extension Definition Linkbase
101.LAB	XBRL Taxonomy Extension Label Linkbase
101.PRE	XBRL Taxonomy Extension Presentation Linkbase

* Filed herewith. All other exhibits have been previously filed.

** Schedules and Exhibits have been omitted, but will be furnished to the SEC upon request.

† Management contract or compensatory plan or arrangement.

Board of Directors

General Kevin P. Chilton

USAF (Ret.)
President, Chilton & Associates LLC
Director since 2018

Thomas A. Corcoran

President of Corcoran Enterprises, LLC
Director since 2008

Eileen P. Drake

Chief Executive Officer and President
Aerojet Rocketdyne Holdings, Inc.
Director since 2015

James R. Henderson

CEO of Armor Express
Director since 2008

Warren G. Lichtenstein

Executive Chairman
Aerojet Rocketdyne Holdings, Inc.
Director since 2008

General Lance W. Lord

USAF (Ret.)
Senior Associate
The Four Star Group, LLC
HF GlobalNet, LLC
Director since 2015

General Merrill A. McPeak¹

USAF (Ret.)
President, McPeak and Associates
Director since 2013

Martin Turchin

Vice Chairman
CB Richard Ellis
Director since 2008

Executive Officers

Warren G. Lichtenstein

Executive Chairman of the Board

Eileen P. Drake

Chief Executive Officer and President

Mark A. Tucker

Chief Operating Officer

Paul R. Lundstrom

Vice President, Chief Financial Officer

John D. Schumacher

Senior Vice President, Washington Operations

Arjun L. Kampani

Vice President, General Counsel and Secretary

Address

Aerojet Rocketdyne Holdings, Inc.

222 N. Pacific Coast Highway
Suite 500
El Segundo, California 90245
310-252-8100

¹Gen. McPeak is not standing for re-election at the Annual meeting.

Shareholder Information

Common Stock

Exchange Listings:
New York Stock Exchange
Ticker Symbol: AJRD

Transfer Agent and Registrar

Computershare
Toll Free – Domestic Callers: 877-889-2023
International Callers: 201-680-6578

Address for Regular Mail
Computershare
C/O Computershare Shareholder Services
P.O. Box 505000
Louisville, Kentucky 40233-5000

Address for Overnight Carriers
Computershare
C/O Computershare Shareholder Services
462 South 4th Street
Suite 1600
Louisville, Kentucky 40202

Website

www.computershare.com/investor

Shareholder Online Inquiries

<https://www-us.computershare.com/investor/contact>

BuyDIRECT

A direct purchase and sale plan, BuyDIRECT, is available to shareholders and interested first-time investors, offering a convenient method of increasing investment in Aerojet Rocketdyne Holdings, Inc. The Company pays all brokerage commissions and bank service fees incurred on behalf of the participant in connection with stock purchases. Subject to terms and conditions of the plan, investments of up to \$120,000 per year are used to buy more shares of the Company's Common Stock.

For additional information, or to participate, contact:
Computershare Trust Company, N.A.
P.O. Box 505000
Louisville, Kentucky 40233-5000

Independent Auditors

PricewaterhouseCoopers LLP
Los Angeles, California

Investor Information

Security analysts and institutional investors seeking additional information about Aerojet Rocketdyne Holdings should contact:

Kelly Anderson
Senior Director, FP&A and Investor Relations
310-252-8155
IR@AerojetRocketdyne.com

PondelWilkinson Inc.
Laurie Berman
310-279-5980
lberman@pondel.com

Board of Directors Communications

Correspondence to members of the Aerojet Rocketdyne Holdings Board of Directors should be addressed to:

Chair, Corporate Governance & Nominating Committee
c/o Aerojet Rocketdyne Holdings, Inc.
Arjun L. Kampani
Vice President, General Counsel and Secretary
222 N. Pacific Coast Highway
Suite 500
El Segundo, California 90245

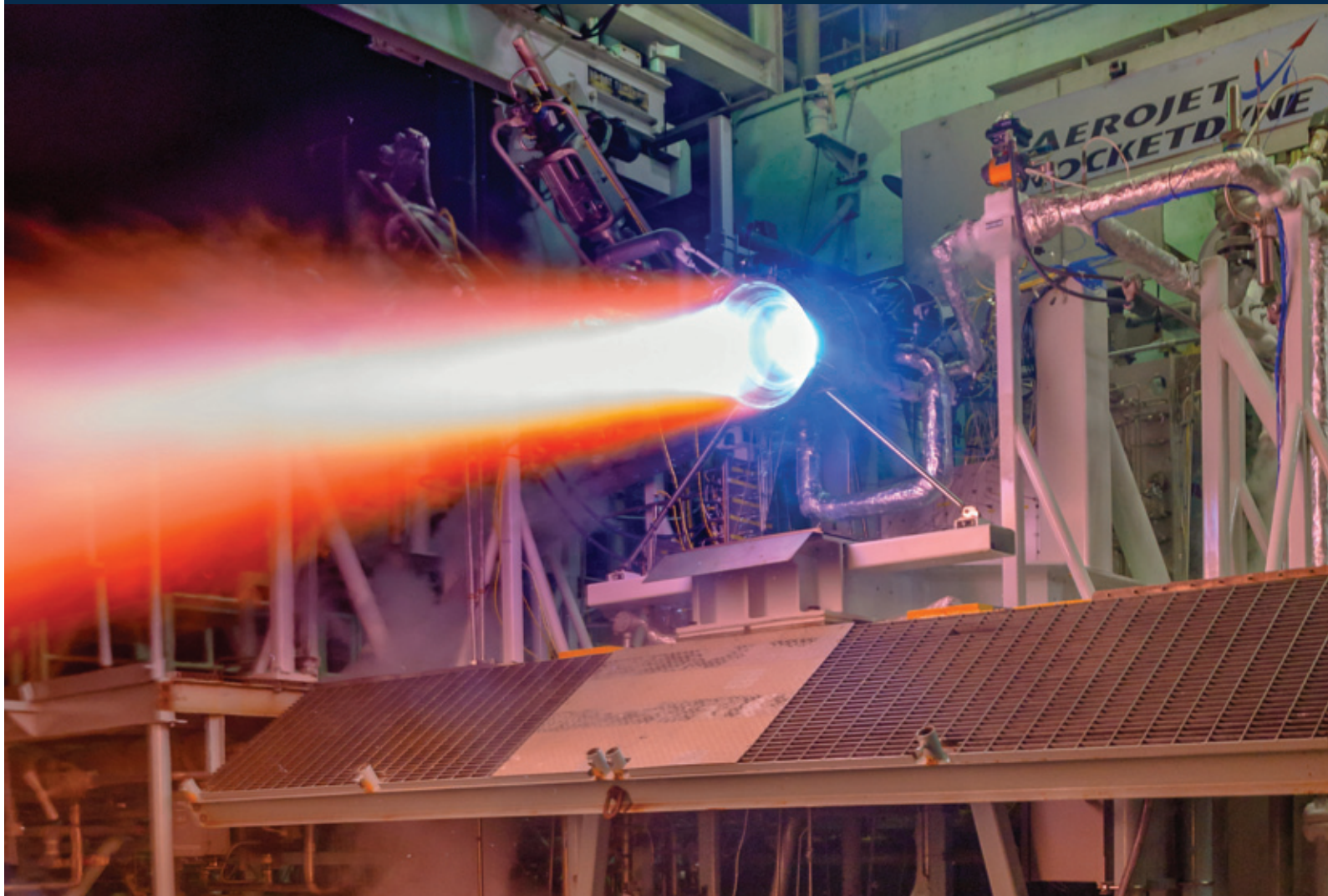
Corporate Communications

For inquiries about Aerojet Rocketdyne Holdings contact:

Steven H. Warren
Vice President and Chief Communications Officer
703-650-0278

Additional information about Aerojet Rocketdyne Holdings including recent news, can be found at <http://www.aerojetrocketdyne.com>

A copy of the Company's Form 10-K as filed with the Securities and Exchange Commission (SEC) for 2018, which includes as Exhibits the Chief Executive Officer and Chief Financial Officer Certifications required to be filed with the SEC pursuant to Section 302 of the Sarbanes-Oxley Act, is included in this annual report and may also be obtained by shareholders without charge upon written request to Aerojet Rocketdyne Holdings, Inc., P.O. Box 537012, Sacramento, CA 95853-7012. Attn: Investor Relations. The Form 10-K is also available on the Company's web site at <http://www.AerojetRocketdyne.com>. During the Company's year ended December 31, 2018, the Company filed with the New York Stock Exchange (NYSE) the Certification of its Chief Executive Officer confirming that the Chief Executive Officer was not aware of any violations by the Company of the NYSE's corporate governance listing standards.



A re-generatively cooled, 3-D printed thrust chamber assembly for the next generation of RL10 rocket engines undergoes hot-fire testing at Aerojet Rocketdyne's facility in West Palm Beach, Florida.



AEROJET
ROCKETDYNE
Holdings, Inc.

Corporate Headquarters
222 N. Pacific Coast Highway., Suite 500
El Segundo, CA 90245

WWW.AEROJETROCKETDYNE.COM