MOOG INC.
Form 10-K
November 15, 2016
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UNITED STATES SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K
(Mark One)
ý ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended October 1, 2016
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 1-05129

Inc.

(Exact Name of Registrant as Specified in its Charter)

New York	16-0757636
(State or Other Jurisdiction of Incorporation or Organization)	(I.R.S. Employer Identification No.)
East Aurora, New York	14052-0018
(Address of Principal Executive Offices)	(Zip Code)

Registrant's Telephone Number, Including Area Code: (716) 652-2000
Securities registered pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Class A Common Stock, $1.00 Par Value	New York Stock Exchange
Class B Common Stock, $1.00 Par Value	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None
Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ý 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 ý
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 ý No ¨

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulations S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ý No ¨
Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of 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.ý

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Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See definitions of “large accelerated filer,” “accelerated filer” and “smaller reporting company” in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer ý Accelerated filer ¨ Non-accelerated filer ¨ Smaller reporting company ¨

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

Yes ¨ No ý

The aggregate market value of the common stock outstanding and held by non-affiliates (as defined in Rule 405 under the Securities Act of 1933) of the registrant, based upon the closing sale price of the common stock on the New York Stock Exchange on April 2, 2016, the last business day of the registrant’s most recently completed second fiscal quarter, was approximately $1,462 million.

The number of shares of common stock outstanding as of the close of business on November 8, 2016 was: Class A 32,144,998 Class B 3,717,259.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the Moog Inc. Proxy Statement for the Annual Meeting of Shareholders to be held on February 15, 2017 (“2016 Proxy”) are incorporated by reference into Part III of this Form 10-K.

Inc.

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Disclosure Regarding Forward-Looking Statements

Information included or incorporated by reference in this report that does not consist of historical facts, including statements accompanied by or containing words such as “may,” “will,” “should,” “believes,” “expects,” “expected,” “intends,” “projects,” “approximate,” “estimates,” “predicts,” “potential,” “outlook,” “forecast,” “anticipates,” “presume” and “assume,” a forward-looking statements. Such forward-looking statements are made pursuant to the safe harbor provisions of the Private Securities Litigation Reform Act of 1995. These statements are not guarantees of future performance and are subject to several factors, risks and uncertainties, the impact or occurrence of which could cause actual results to differ materially from the expected results described in the forward-looking statements. Certain of these factors, risks and uncertainties are discussed in the sections of this report entitled “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.” New factors, risks and uncertainties may emerge from time to time that may affect the forward-looking statements made herein. Given these factors, risks and uncertainties, investors should not place undue reliance on forward-looking statements as predictive of future results. We disclaim any obligation to update the forward-looking statements made in this report.

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PART I

The Registrant, Moog Inc., a New York corporation formed in 1951, is referred to in this report as “Moog” or in the nominative “we” or the possessive “our.”

Unless otherwise noted or the context otherwise requires, all references to years in this report are to fiscal years.

Item 1. Business.

Description of the Business. Moog is a worldwide designer, manufacturer and systems integrator of high performance precision motion and fluid controls and controls systems for a broad range of applications in aerospace and defense and industrial markets. We have four operating segments: Aircraft Controls, Space and Defense Controls, Industrial Systems and Components.

Additional information describing the business and comparative segment revenues, operating profits and related financial information for 2016, 2015 and 2014 are provided in Note 17 of Item 8, Financial Statements and Supplementary Data of this report.

Distribution. Our sales and marketing organization consists of individuals possessing highly specialized technical expertise. This expertise is required in order to effectively evaluate a customer’s precision control requirements and to facilitate communication between the customer and our engineering staff. Our sales staff is the primary contact with customers. Manufacturers’ representatives are used to cover certain domestic aerospace markets. Distributors are used selectively to cover certain industrial and medical markets.

Industry and Competitive Conditions. We experience considerable competition in our aerospace and defense and industrial markets. We believe that the principal points of competition in our markets are product quality, reliability, price, design and engineering capabilities, product development, conformity to customer specifications, timeliness of delivery, effectiveness of the distribution organization and quality of support after the sale. We believe we compete effectively on all of these bases. Competitors in our four operating segments include:

- Aircraft Controls: Curtiss-Wright, Liebherr, Nabtesco, Parker Hannifin, UTC (Goodrich, Hamilton Sundstrand) and Woodward.
- Space and Defense Controls: Aeroflex, Airbus, ATA Engineering, BAE, Chess Dynamics, Cohu, Curtiss-Wright, ESW, Flowserve Limitorque, Honeywell, Marotta, RUAG, Lord Corp., Pelco, SABCA, Sargent Aerospace & Defense, SEAKR, Sierra Nevada Corp., Southwest Research Institute, UTC, Vacco, Valcor, Videotec, ValveTech and Woodward.
- Industrial Systems: Allen-Bradley, Bosch Rexroth, Danaher, DEIF Wind Power, KEB, MTS Systems Corp., Parker Hannifin, Siemens and SSB Wind Systems.
- Components: Allied Motion Technologies, Ametek, Cobham, CME Medical, General Dynamics Mission Systems, Kearfott, Kollmorgen, Medtronic, Pfizer, Schleifring, Smiths Medical, Stemmann, Woodward and Whippany Actuation Systems.

Government Contracts. All U.S. Government contracts are subject to termination by the U.S. Government. In 2016, sales under U.S. Government contracts represented 30% of total sales and were primarily within our Aircraft Controls, Space and Defense Controls and Components segments.

Backlog. Our twelve-month backlog represents confirmed orders we believe will be recognized as revenue within the next twelve months. As noted in Item 6, Selected Financial Data of this report, as of October 1, 2016, our twelve-month backlog was $1.2 billion, a decline of 4% compared to October 3, 2015. See Item 7, Management’s Discussion and Analysis of Financial Condition and Results of Operations of this report for a discussion on the various business drivers and conditions contributing to the twelve-month backlog change.

Raw Materials. Materials, supplies and components are purchased from numerous suppliers. We believe the loss of any one supplier, although potentially disruptive in the short-term, would not materially affect our operations in the long-term.

Working Capital. See the discussion on operating cycle in Note 1 of Item 8, Financial Statements and Supplementary Data of this report.

Seasonality. Our business is generally not seasonal; however, certain products and systems, such as those in the energy market of our Industrial Systems segment, do experience seasonal variations in sales levels.

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Patents. We maintain a patent portfolio of issued or pending patents and patent applications worldwide that generally includes the U.S., Europe, China, Japan and India. The portfolio includes patents that relate to electrohydraulic, electromechanical, electronics, hydraulics, components and methods of operation and manufacture as related to motion control and actuation systems. The portfolio also includes patents related to wind turbines, robotics, surveillance/security, vibration control and medical devices. We do not consider any one or more of these patents or patent applications to be material in relation to our business as a whole. The patent portfolio related to certain medical devices is significant to our position in this market as several of these products work exclusively together, and provide us future revenue opportunities.

Research Activities. Research and development activity has been, and continues to be, significant for us. Research and development expense was at least $130 million in each of the last three years and represented over 6% of sales in 2016.

Employees. On October 1, 2016, we employed 10,497 full-time employees.

Customers. Our principal customers are Original Equipment Manufacturers, or OEMs, and end users for whom we provide aftermarket support. Aerospace and defense OEM customers collectively represented 52% of 2016 sales. The majority of these sales are to a small number of large companies. Due to the long-term nature of many of the programs, many of our relationships with aerospace and defense OEM customers are based on long-term agreements. Our industrial OEM sales, which represented 31% of 2016 sales, are to a wide range of global customers and are normally based on lead times of 90 days or less. We also provide aftermarket support, consisting of spare and replacement parts and repair and overhaul services, for all of our products. Our major aftermarket customers are the U.S. Government and commercial airlines. In 2016, aftermarket sales accounted for 17% of total sales.

Significant customers in our four operating segments include:

- Aircraft Controls: Boeing, Airbus, Lockheed Martin, Japan Aerospace, United Technologies, Honeywell, Goodrich, Gulfstream, Bombardier, Embraer and the U.S. Government.
- Space and Defense Controls: Lockheed Martin, Raytheon, Aerojet Rocketdyne, Boeing, Airbus, General Dynamics, Orbital ATK, United Launch Alliance, Northrup Grumman and the U.S. Government.
- Industrial Systems: CAE, Alstom, FlightSafety, Senvion, Rockwell Automation, Japan Aerospace, Arburg, Schuler, Husky Energy and Doosan.
- Components: Philips Healthcare, Northrup Grumman, Nestle, Raytheon, Lockheed Martin, Nutricia, Turbo Chef Technologies, MacArtney, Boeing, General Dynamics and the U.S. Government.

International Operations. Our operations outside the United States are conducted through wholly-owned foreign subsidiaries and are located predominantly in Europe and the Asia-Pacific region. See Note 17 of Item 8, Financial Statements and Supplementary Data of this report for information regarding sales by geographic area and Exhibit 21 of Item 15, Exhibits and Financial Statement Schedules of this report for a list of subsidiaries. Our international operations are subject to the usual risks inherent in international trade, including currency fluctuations, local government contracting regulations, local governmental restrictions on foreign investment and repatriation of profits, exchange controls, regulation of the import and distribution of foreign goods, as well as changing economic and social conditions in countries in which our operations are conducted.

Environmental Matters. See the discussion in Note 18 of Item 8, Financial Statements and Supplementary Data of this report.

Website Access to Information. Our internet address is www.moog.com. We make our annual reports on Form 10 K, quarterly reports on Form 10-Q, current reports on Form 8-K and, if applicable, amendments to those reports, available on the investor relations portion of our website. The reports are free of charge and are available as soon as reasonably practicable after they are filed with the Securities and Exchange Commission. We have posted our corporate governance guidelines, Board committee charters and code of ethics to the investor relations portion of our website. This information is available in print to any shareholder upon request. All requests for these documents should be made to Moog’s Manager of Investor Relations by calling 716-687-4225.

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Executive Officers of the Registrant. Other than the changes noted below, the principal occupations of our executive officers for the past five years have been their employment with us in the same positions they currently hold.
On August 11, 2015, Maureen M. Athoe was named Vice President and President, Space and Defense Group. Previously, she was a Group Vice President, Group General Manager and Site Manager.
On August 11, 2015, R. Eric Burghardt was named Vice President and President, Aircraft Group. Previously, he was a Group Vice President and Financial Director.
On August 11, 2015, Mark J. Trabert was named Vice President and President, Aircraft Group. Previously, he was a Group Vice President and Deputy General Manager.
On September 1, 2012, Patrick J. Roche was named Vice President. Previously, he was a Group Vice President and General Manager of the Moog Ireland operation.

Executive Officers	Age	Year First Elected Officer
John R. Scannell Chairman of the Board; Chief Executive Officer Director	53	2006
Richard A. Aubrecht Vice Chairman of the Board; Vice President - Strategy and Technology; Director	72	1980
Donald R. Fishback Director; Vice President; Chief Financial Officer	60	1985
Lawrence J. Ball Vice President	62	2004
Harald E. Seiffer Vice President	57	2005
Gary A. Szakmary Vice President	65	2011
Patrick J. Roche Vice President	53	2012
Maureen M. Athoe Vice President	58	2015
R. Eric Burghardt Vice President	57	2015
Mark J. Trabert Vice President	57	2015
Jennifer Walter Controller; Principal Accounting Officer	45	2008
Timothy P. Balkin Treasurer; Assistant Secretary	57	2000

In addition to the executive officers noted above, Robert J. Olivieri, 66, was elected Secretary in 2014. Mr. Olivieri's principal occupation is partner in the law firm of Hodgson Russ LLP.

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Item 1A. Risk Factors.

The markets we serve are cyclical and sensitive to domestic and foreign economic conditions and events, which may cause our operating results to fluctuate. The markets we serve are sensitive to fluctuations in general business cycles as well as domestic and foreign economic conditions and events. For example, our defense programs are largely contingent on U.S. Department of Defense funding. In addition, our space programs rely on the same governmental funding as well as investment for commercial and exploration activities. Our aerospace programs are dependent on the highly cyclical commercial airline industry, driven by fuel price increases, demand for travel and economic conditions. Demand for our industrial products is dependent upon several factors, including capital investment, product innovations, economic growth, the price of oil and natural gas, cost-reduction efforts and technology upgrades. Our sales and operating profit have been affected by the continued low rates of recovery in the economies in which we conduct business. If these economic conditions continue or deteriorate, our operations could be negatively impacted through declines in our sales, profitability and cash flows due to lower orders, payment delays and price pressures for our products.

We operate in highly competitive markets with competitors who may have greater resources than we possess. Many of our products are sold in highly competitive markets. Some of our competitors, especially in our industrial markets and medical markets, are larger, more diversified and have greater financial, marketing, production and research and development resources. As a result, they may be better able to withstand the effects of periodic economic downturns. Our sales and operating margins will be negatively impacted if our competitors:

- develop products that are superior to our products,
- develop products of comparable quality and performance that are more competitively priced than our products,
- develop methods of more efficiently and effectively providing products and services, or
- adapt more quickly than we do to new technologies or evolving customer requirements.

We believe that the principal points of competition in our markets are product quality, reliability, price, design and engineering capabilities, product development, conformity to customer specifications, timeliness of delivery, effectiveness of the distribution organization and quality of support after the sale. Maintaining or improving our competitive position requires continued investment in manufacturing, engineering, quality standards, marketing, customer service and support and our distribution networks. If we do not maintain sufficient resources to make these investments or are not successful in maintaining our competitive position, we could face pricing pressures or loss in market share, causing our operations and financial performance to suffer.

We depend heavily on government contracts that may not be fully funded or may be terminated, and the failure to receive funding or the termination of one or more of these contracts could reduce our sales and increase our costs. Sales to the U.S. Government and its prime contractors and subcontractors represent a significant portion of our business. In 2016, sales under U.S. Government contracts represented 30% of our total sales, primarily within Aircraft Controls, Space and Defense Controls and Components. Sales to foreign governments represented 7% of our total sales. Funding for government programs can be structured into a series of individual contracts and depend on annual congressional appropriations, which are subject to change. Additionally, the 2011 Budget Control Act reduced the Department of Defense spending (or sequestration) by approximately $500 billion over the next decade. The Bipartisan Budget Act of 2013 and the Bipartisan Budget Act of 2015 provided stability and modest growth in the Department of Defense spending through 2017. However, future budgets beyond 2017 are uncertain with respect to the overall levels of defense spending. As a result of this uncertainty, we expect we will continue to face significant challenges over the next decade. Any reduction in future Department of Defense spending levels could adversely impact our sales, operating profit and our cash flow. We have resources applied to specific government contracts and if any of those contracts are rescheduled or terminated, we may incur substantial costs redeploying those resources.

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We make estimates in accounting for long-term contracts, and changes in these estimates may have significant impacts on our earnings. We have long-term contracts with some of our customers. These contracts are predominantly within Aircraft Controls and Space and Defense Controls. Revenue representing 34% of 2016 sales was accounted for using the percentage of completion, cost-to-cost method of accounting. Under this method, we recognize revenue as work progresses toward completion as determined by the ratio of cumulative costs incurred to date to estimated total contract costs at completion, multiplied by the total estimated contract revenue, less cumulative revenue recognized in prior periods. Changes in these required estimates could have a material adverse effect on sales and profits. Any adjustments are recognized in the period in which the change becomes known using the cumulative catch-up method of accounting. For contracts with anticipated losses at completion, we establish a provision for the entire amount of the estimated remaining loss and charge it against income in the period in which the loss becomes known. Amounts representing performance incentives, penalties, contract claims or impacts of scope change negotiations are considered in estimating revenues, costs and profits when they can be reliably estimated and realization is considered probable. Due to the substantial judgments involved with this process, our actual results could differ materially or could be settled unfavorably from our estimates.

We enter into fixed-price contracts, which could subject us to losses if we have cost overruns. In 2016, fixed-price contracts represented 94% of our sales that were accounted for using the percentage of completion, cost-to-cost method of accounting. On fixed-price contracts, we agree to perform the scope of work specified in the contract for a predetermined price. Depending on the fixed price negotiated, these contracts may provide us with an opportunity to achieve higher profits based on the relationship between our total contract costs and the contract's fixed price. However, we bear the risk that increased or unexpected costs may reduce our profit or cause us to incur a loss on the contract, which would reduce our net earnings. Loss reserves are most commonly associated with fixed-price contracts that involve the design and development of new and unique controls or control systems to meet the customer's specifications.

We may not realize the full amounts reflected in our backlog as revenue, which could adversely affect our future revenue and growth prospects. As of October 1, 2016, our twelve-month backlog was $1.2 billion, which represents confirmed orders we believe will be recognized as revenue within the next twelve months. There is no assurance that our customers will purchase all the orders represented in our backlog, due in part to the U.S. Government's ability not to exercise contract options or to modify, curtail or terminate major programs. Due to the uncertain nature of our contracts with the U.S. Government, we may never realize revenue from some of the orders that are included in our backlog. A portion of our backlog also relates to commercial aircraft programs. If there are entry into service delays or lower than anticipated deliveries due to production issues, we may never realize the full amounts included in our backlog. If this occurs, our future revenue and growth prospects may be adversely affected.

If our subcontractors or suppliers fail to perform their contractual obligations, our prime contract performance and our ability to obtain future business could be materially and adversely impacted. We rely on subcontracts with other companies to perform a portion of the service we provide to our customers on many of our contracts. There is a risk that we may have disputes with our subcontractors, including disputes regarding the quality and timeliness of work performed by the subcontractor, customer concerns about the subcontractor, our failure to extend existing task orders or issue new task orders under a subcontract or our hiring of personnel of a subcontractor. Failure by our subcontractors to satisfactorily provide on a timely basis the agreed-upon supplies or perform the agreed-upon services may materially and adversely impact our ability to perform our obligations as the prime contractor. Subcontractor performance deficiencies could result in a customer terminating our contract for default. A default termination could expose us to liability and substantially impair our ability to compete for future contracts and orders. In addition, a delay or failure in our ability to obtain components and equipment parts from our suppliers may adversely affect our ability to perform our obligations to our customers.

Contracting on government programs is subject to significant regulation, including rules related to bidding, billing and accounting kickbacks and false claims, and any non-compliance could subject us to fines and penalties or possible debarment. Like all government contractors, we are subject to risks associated with this contracting, including substantial civil and criminal fines and penalties. These fines and penalties could be imposed for failing to follow procurement integrity and bidding rules, employing improper billing practices or otherwise failing to follow cost

accounting standards, receiving or paying kickbacks or filing false claims. We have been, and expect to continue to be, subjected to audits and investigations by U.S. and foreign government agencies and authorities. The failure to comply with the terms of our government contracts could harm our business reputation. It could also result in our progress payments being withheld or our suspension or debarment from future government contracts, which could have a material affect on our operational and financial results.

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The loss of The Boeing Company as a customer or a significant reduction in sales to The Boeing Company could adversely impact our operating results. We provide The Boeing Company, or Boeing, with controls for both military and commercial applications, which, in total, were 14% of our 2016 sales. Sales to Boeing's commercial airplane group are generally made under a long-term supply agreement through 2021 for the Boeing 787 and through 2019 for other commercial airplanes. The loss of Boeing as a customer or a significant reduction in sales to Boeing could reduce our sales and earnings.

Our new product research and development efforts may not be successful which could reduce our sales and earnings. Technologies related to our products have undergone, and in the future may undergo, significant changes. We have incurred, and we expect to continue to incur, expenses associated with research and development activities and the introduction of new products in order to succeed in the future. Our technology has been developed through customer-funded and internally-funded research and development, as well as through business acquisitions. If we fail to predict customers' preferences or fail to provide viable technological solutions, we may experience difficulties that could delay or prevent the acceptance of new products or product enhancements. Also, the research and development expenses we incur may exceed our cost estimates and new products we develop may not generate sales sufficient to offset our costs. Additionally, our competitors may develop technologies and products that have more competitive advantages than ours and render our technology uncompetitive or obsolete.

Our inability to adequately enforce and protect our intellectual property or defend against assertions of infringement could prevent or restrict our ability to compete. In order to maintain a competitive advantage, we rely on internally developed and acquired patents, trademarks and proprietary knowledge and technologies. Our inability to defend against the unauthorized use of these rights and assets could have an adverse effect on our competitive position and on our results of operations and financial condition. Litigation may be necessary to protect our intellectual property rights or defend against claims of infringement. This litigation could result in significant costs and divert management's focus away from operations.

Our business operations may be adversely affected by information systems interruptions, intrusions or new software implementations. We are dependent on various information technologies throughout our company to administer, store and support multiple business activities. Disruptions, equipment failures or cybersecurity attacks, such as unauthorized access, malicious software and other intrusions, may lead to potential data corruption and exposure of proprietary and confidential information. Any intrusion may cause operational stoppages, diminished competitive advantages through reputational damages and increased operational costs. In addition, we are in the early stages of a multi-year business information system transformation and standardization project. This endeavor will occupy additional resources, diverting attention from other operational activities, and may cause our information systems to perform unexpectedly. While we expect to invest significant resources throughout the planning and project management process, unanticipated delays could occur.

Our indebtedness and restrictive covenants under our credit facilities could limit our operational and financial flexibility. We have incurred significant indebtedness, and may incur additional debt for acquisitions, operations, research and development and capital expenditures. Our ability to make interest and scheduled principal payments and meet restrictive covenants could be adversely impacted by changes in the availability, terms and cost of capital, changes in interest rates or changes in our credit ratings or our outlook. These changes could increase our cost of business, limiting our ability to pursue acquisition opportunities, react to market conditions and meet operational and capital needs, thereby placing us at a competitive disadvantage.

Significant changes in discount rates, rates of return on pension assets, mortality tables and other factors could adversely affect our earnings and equity and increase our pension funding requirements. Pension costs and obligations are determined using actual results as well as actuarial valuations that involve several assumptions. The most critical assumptions are the discount rate, the long-term expected return on assets and mortality tables. Other assumptions include salary increases and retirement age. Some of these assumptions, such as the discount rate and return on pension assets, are reflective of economic conditions and largely out of our control. Changes in the pension assumptions could adversely affect our earnings, equity and funding requirements.

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A write-off of all or part of our goodwill or other intangible assets could adversely affect our operating results and net worth. Goodwill and other intangible assets are a substantial portion of our assets. At October 1, 2016, goodwill was $740 million and other intangible assets were $114 million of our total assets of $3.0 billion. Our goodwill and other intangible assets may increase in the future since our growth strategy includes acquisitions. However, we may have to write off all or part of our goodwill or other intangible assets if their value becomes impaired. Although this write-off would be a non-cash charge, it could reduce our earnings and net worth significantly. Among other adverse impacts, this could result in our inability to refinance or renegotiate the terms of our bank indebtedness. In 2016, we took a $5 million goodwill impairment charge for a reporting unit within our Space and Defense Controls Segment.

Our sales and earnings may be affected if we cannot identify, acquire or integrate strategic acquisitions, or if we engage in divesting activities. Acquisitions are a key part of our growth strategy. Our historical growth has depended, and our future growth is likely to depend, in part, on our ability to successfully identify, acquire and integrate acquired businesses. We intend to continue to seek additional acquisition opportunities, both to expand into new markets and to enhance our position in existing markets throughout the world. Growth by acquisition involves risk that could adversely affect our financial condition and operating results. We may not know the potential exposure to unanticipated liabilities. Additionally, the expected benefits or synergies might not be fully realized, integrating operations and personnel may be slowed and key employees, suppliers or customers of the acquired business may depart. We may also continue to engage in divesting activities if we deem the operations as non-strategic or underperforming. Divestitures could adversely affect our profitability and, under certain circumstances, require us to record impairment charges or a loss as a result of a transaction. In pursuing acquisition opportunities, integrating acquired businesses, or divesting business operations, management's time and attention may be diverted from our core business, while consuming resources and incurring expenses for these activities.

Our operations in foreign countries expose us to political and currency risks and adverse changes in local legal and regulatory environments. We have significant manufacturing and sales operations in foreign countries. In addition, our domestic operations sell to foreign customers. In 2016, 44% of our net sales were to customers outside of the United States. Our financial results may be adversely affected by fluctuations in foreign currencies and by the translation of the financial statements of our foreign subsidiaries from local currencies into U.S. dollars. We expect international operations and export sales to contribute to our earnings for the foreseeable future. Both the sales from international operations and export sales are subject in varying degrees to risks inherent in doing business outside of the United States. Such risks include the possibility of unfavorable circumstances arising from host country laws or regulations, changes in tariff and trade barriers and import or export licensing requirements. In addition, any local or global health issue or uncertain political climates, international hostilities, natural disasters, or any other terrorist activities could adversely affect customer demand, our operations and our ability to source and deliver products and services to our customers.

Unforeseen exposure to additional income tax liabilities may affect our operating results. Our distribution of taxable income is subject to domestic and, as a result of our significant manufacturing and sales presence in foreign countries, foreign tax jurisdictions. Our effective tax rate and earnings may be affected by shifts in our mix of earnings in countries with varying statutory tax rates, changes in reinvested foreign earnings, changes in the valuation of deferred tax assets, alterations to tax regulations or interpretations and outcomes of any audits performed on previous tax returns.

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Government regulations could limit our ability to sell our products outside the United States and otherwise adversely affect our business. In 2016, approximately 19% of our sales were subject to compliance with the United States export regulations. Our failure to obtain, or fully adhere to the limitations contained in the requisite licenses, meet registration standards or comply with other government export regulations would hinder our ability to generate revenues from the sale of our products outside the United States. The absence of comparable restrictions on competitors in other countries may adversely affect our competitive position. In order to sell our products in European Union countries, we must satisfy certain technical requirements. If we are unable to comply with those requirements with respect to a significant quantity of our products, our sales in Europe would be restricted. Doing business internationally also subjects us to numerous U.S. and foreign laws and regulations, including regulations relating to import-export control, technology transfer restrictions, foreign corrupt practices and anti-boycott provisions. From time to time, we may file voluntary disclosure reports with the U.S. Department of State and the Department of Commerce regarding certain violations of U.S. export laws and regulations discovered by us in the course of our business activities, employee training or internal reviews and audits. To date, our voluntary disclosures have not resulted in a fine, penalty, or export privilege denial or restriction that has had a material adverse impact on our financial condition or ability to export. Our failure, or failure by an authorized agent or representative that is attributable to us, to comply with these laws and regulations could result in administrative, civil or criminal liabilities. In the extreme case, these failures could result in financial penalties, suspension or debarment from government contracts or suspension of our export privileges, which could have a material adverse effect on us.

Governmental regulations and customer demands related to conflict minerals may adversely impact our operating results. Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act, required the Securities and Exchange Commission to establish disclosure requirements for publicly-traded companies whose products contain metals derived from conflict minerals originating from the Democratic Republic of Congo (DRC) and its neighboring countries. The implementation of these requirements could result in additional costs associated with complying with the disclosure requirements. As this regulation will likely impact our suppliers, the availability of raw materials used in our operations could be negatively impacted, including an increase in the price of raw materials. In addition, because our global supply chain is complex, we may face commercial challenges if we are unable to sufficiently verify the origins for all metals used in our products through the due diligence procedures that we have implemented. We have, and will continue to, work with our suppliers and customers to exclude, to the extent feasible, from our product supply chain the use of conflict minerals originating from the DRC or adjoining countries.

The failure or misuse of our products may damage our reputation, necessitate a product recall or result in claims against us that exceed our insurance coverage, thereby requiring us to pay significant damages. Defects in the design and manufacture of our products may necessitate a product recall. We include complex system designs and components in our products that could contain errors or defects, particularly when we incorporate new technologies into our products. If any of our products are defective, we could be required to redesign or recall those products, pay substantial damages or warranty claims and face actions by regulatory bodies and government authorities. Such an event could result in significant expenses, disrupt sales, affect our reputation and that of our products and cause us to withdraw from certain markets. We are also exposed to product liability claims. Many of our products are used in applications where their failure or misuse could result in significant property loss and serious personal injury or death. We carry product liability insurance consistent with industry norms. However, these insurance coverages may not be sufficient to fully cover the payment of any potential claim. A product recall or a product liability claim not covered by insurance could have a material adverse effect on our business, financial condition and results of operations.

We are involved in various legal proceedings, the outcome of which may be unfavorable to us. Our business may be adversely impacted by the outcome of legal proceedings and other contingencies that cannot be predicted with certainty. We estimate loss contingencies and establish reserves based on our assessment where liability is deemed probable and reasonably estimable given the facts and circumstances known to us at a particular point in time. Subsequent developments may affect our assessment and estimates of the loss contingencies recorded as liabilities.

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Future terror attacks, war, natural disasters or other catastrophic events beyond our control could negatively impact our business. Terror attacks, war or other civil disturbances, natural disasters and other catastrophic events could lead to economic instability and decreased demand for commercial products, which could negatively impact our business, financial condition, results of operations and cash flows. From time to time, terrorist attacks worldwide have caused instability in global financial markets and the aviation industry. In 2016, 24% of our net sales were in the commercial aircraft market. Also, our facilities and suppliers are located throughout the world and could be subject to damage from fires, floods, earthquakes or other natural or man-made disasters. Although we carry third party property insurance covering these and other risks, our inability to meet customers' schedules as a result of a catastrophe may result in the loss of customers or significantly increase costs, including penalty claims under customer contracts.
Our operations are subject to environmental laws, and complying with those laws may cause us to incur significant costs. Our operations and facilities are subject to numerous stringent environmental laws and regulations. Although we believe that we are in material compliance with these laws and regulations, future changes in these laws, regulations or interpretations of them, or changes in the nature of our operations may require us to make significant capital expenditures to ensure compliance. We have been and are currently involved in environmental remediation activities. The cost of these activities may become significant depending on the discovery of additional environmental exposures at sites that we currently own or operate, at sites that we formerly owned or operated, or at sites to which we have sent hazardous substances or wastes for treatment, recycling or disposal.

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Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

On October 1, 2016, we occupied 5,181,000 square feet of space, distributed by segment as follows:

	Square Feet			
		Owned	Leased	Total
Aircraft Controls	1,431,000	422,000		1,853,000
Space and Defense Controls	486,000	446,000		932,000
Industrial Systems	737,000	535,000		1,272,000
Components	835,000	267,000		1,102,000
Corporate Headquarters	20,000	2,000		22,000
Total	3,509,000	1,672,000		5,181,000

We have principal manufacturing facilities in the United States and countries throughout the world in the following locations:

- Aircraft Controls - U.S., Philippines and United Kingdom.
- Space and Defense Controls - U.S., United Kingdom, Netherlands, Ireland and Germany.
- Industrial Systems - Germany, Italy, U.S., China, Netherlands, Luxembourg, Philippines, Japan, India, Ireland, Brazil and United Kingdom.
- Components - U.S., United Kingdom, Costa Rica, Canada and Lithuania.

Our corporate headquarters is located in East Aurora, New York.

We believe that our properties have been adequately maintained and are generally in good condition. Operating leases for our properties expire at various times from 2017 through 2036. Upon the expiration of our current leases, we believe that we will be able to either secure renewal terms or enter into leases for alternative locations at market terms.

Item 3. Legal Proceedings.

From time to time, we are involved in legal proceedings. We are not a party to any pending legal proceedings that management believes will result in a material adverse effect on our financial condition, results of operations or cash flows.

Item 4. Mine Safety Disclosures.

Not applicable.

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PART II

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

Our two classes of common shares, Class A common stock and Class B common stock, are traded on the New York Stock Exchange ("NYSE") under the ticker symbols MOG.A and MOG.B. The following chart sets forth, for the periods indicated, the high and low sales prices of the Class A common stock and Class B common stock on the NYSE.

Quarterly Stock Prices

	Class A		Class B	
Fiscal Year Ended	High	Low	High	Low
October 1, 2016				
1st Quarter	$67.92	$54.93	$67.46	$55.35
2nd Quarter	59.66	38.11	59.17	38.32
3rd Quarter	55.96	42.61	55.50	42.90
4th Quarter	61.64	50.96	61.24	51.11
October 3, 2015				
1st Quarter	$79.24	$65.80	$78.51	$66.60
2nd Quarter	77.28	68.07	76.77	69.23
3rd Quarter	75.69	65.72	75.26	66.11
4th Quarter	71.55	52.33	70.11	52.74

The number of shareholders of record of Class A common stock and Class B common stock was 769 and 331, respectively, as of November 8, 2016.

We did not pay cash dividends on our Class A common stock or Class B common stock in 2015 or 2016 and have no current plans to do so.

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The following table summarizes our purchases of our common stock for the quarter ended October 1, 2016.

Issuer Purchases of Equity Securities

Period	(a) Total Number of Shares Purchased (1)(2)	(b) Average Price Paid Per Share	(c) Total number of Shares Purchased as Part of Publicly Announced Plans or Programs (3)	(d) Maximum Number (or Approx. Dollar Value) of Shares that May Yet Be Purchased Under Plans or Programs (3)
July 3, 2016 - July 31, 2016	8,113	$ 55.47	—	3,352,009
August 1, 2016 - August 31, 2016	30,469	59.12	—	3,352,009
September 1, 2016 - October 1, 2016	42,119	59.22	—	3,352,009
Total	80,701	$ 58.81	—	3,352,009

(1) Reflects purchases by the Moog Inc. Stock Employee Compensation Trust Agreement ("SECT") of shares of Class B common stock from the Moog Inc. Retirement Savings Plan ("RSP") as follows: 8,113 shares at $55.47 per share during July; 16,402 shares at $60.11 per share during August; and 10,467 shares at $55.22 per share during September. Excluded above is the SECT purchase of 425,148 shares of Class A common stock from the RSP in exchange for an equivalent value of Class B common stock.

(2) In connection with the exercise of equity-based compensation awards, we accept delivery of shares to pay for the exercise price and withhold shares for tax withholding obligations. In August, we accepted delivery of 14,067 shares at $57.97 per share and in September, we accepted delivery of 31,652 shares at $60.55 per share, in connection with the exercise of equity-based awards.

(3) The Board of Directors has authorized a share repurchase program. This program has been amended from time to time to authorize additional repurchases up to an aggregate 13 million common shares. The program permits the purchase of shares of Class A or Class B common stock in open market or privately negotiated transactions at the discretion of management.

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Performance Graph

The following graph and tables show the performance of the Company's Class A common stock compared to the NYSE Composite-Total Return Index and the S&P Aerospace & Defense Index for a $100 investment made on September 30, 2011, including reinvestment of any dividends.

	9/11	9/12	9/13	9/14	9/15	9/16
Moog Inc. - Class A Common Stock	$100.00	$116.09	$179.86	$209.69	$165.76	$182.53
NYSE Composite - Total Return Index	100.00	124.79	149.27	170.05	159.55	179.25
S&P Aerospace & Defense Index	100.00	121.88	176.78	208.93	216.77	255.50

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Item 6. Selected Financial Data.

For a more detailed discussion of 2014 through 2016, refer to Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations of this report and Item 8, Financial Statements and Supplementary Data of this report.

(dollars in thousands, except per share data)	2016(1)(2)(3)	2015(1)	2014(1)	2013(2)(3)	2012(3)
RESULTS FROM OPERATIONS					
Net sales	$2,411,937	$2,525,532	$2,648,385	$2,610,311	$2,469,536
Net earnings (4)	126,745	131,883	158,198	120,497	152,462
Net earnings per share (4)					
Basic	$3.49	$3.39	$3.57	$2.66	$3.37
Diluted	$3.47	$3.35	$3.52	$2.63	$3.33
Weighted-average shares outstanding					
Basic	36,277,445	38,945,880	44,362,412	45,335,336	45,246,960
Diluted	36,529,344	39,334,520	44,952,437	45,823,720	45,718,324
FINANCIAL POSITION					
Cash and cash equivalents	$325,128	$309,853	$231,292	$157,090	$148,841
Working capital	1,030,915	1,021,990	941,260	924,145	885,032
Total assets	3,041,859	3,086,471	3,208,452	3,237,095	3,105,907
Indebtedness - total	1,011,850	1,075,184	874,036	709,157	764,622
Shareholders' equity	988,411	994,532	1,347,415	1,535,765	1,304,790
Shareholders' equity per common share outstanding	$27.56	$27.09	$32.51	$33.86	$28.80
SUPPLEMENTAL FINANCIAL DATA					
Capital expenditures	$67,208	$80,693	$78,771	$93,174	$107,030
Depreciation and amortization	98,732	103,609	109,259	108,073	100,816
Research and development	147,336	132,271	139,462	134,652	116,403
Twelve-month backlog (5)	1,224,878	1,273,495	1,339,959	1,296,371	1,279,307
RATIOS					
Net return on sales	5.3%	5.2%	6.0%	4.6%	6.2%
Return on shareholders' equity	12.6%	11.3%	10.4%	8.6%	12.1%
Current ratio	2.7	2.7	2.3	2.3	2.3
Net debt to capitalization (6)	41.0%	43.5%	32.3%	26.4%	32.1%

(1) Includes the effects of our share repurchase program. See the Consolidated Statements of Shareholders' Equity and Consolidated Statements of Cash Flow at Item 8, Financial Statements and Supplementary Data of this report.

(2) Includes goodwill impairment charge. See Note 6 of the Consolidated Financial Statements at Item 8, Financial Statements and Supplementary Data of this report.

(3) Includes the effects of acquisitions. See Note 2 of the Consolidated Financial Statements at Item 8, Financial Statements and Supplementary Data of this report. In 2013, we acquired two businesses, one in our Space and Defense Controls segment and one in our Components segment. In 2012, we acquired four businesses, two each in our Components and Space and Defense Controls segments.

(4) Represents net earnings attributable to common shareholders and net earnings per share attributable to common shareholders.

(5) Twelve-month backlog is defined as confirmed orders we believe will be recognized as revenue within the next twelve months.

(6) Net debt is total debt less cash and cash equivalents. Capitalization is the sum of net debt and shareholders' equity.

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

OVERVIEW

We are a worldwide designer, manufacturer and systems integrator of high performance precision motion and fluid controls and control systems for a broad range of applications in aerospace and defense and industrial markets.

Within the aerospace and defense market, our products and systems include:

- Defense market - primary and secondary flight controls for military aircraft, stabilization and automatic ammunition loading controls for armored combat vehicles, tactical and strategic missile steering controls and gun aiming controls.
- Commercial aircraft market - primary and secondary flight controls for commercial aircraft.
- Commercial space market - satellite positioning controls and thrust vector controls for space launch vehicles.

In the industrial market, our products are used in a wide range of applications including:

- Industrial automation market - injection molding, metal forming, heavy industry, material and automotive testing and pilot training simulators.
- Energy market - wind energy, power generation and oil and gas exploration.
- Medical market - enteral clinical nutrition and infusion therapy pumps, CT scanners and ultrasonic sensors and surgical handpieces.

We operate under four segments, Aircraft Controls, Space and Defense Controls, Industrial Systems and Components. Our principal manufacturing facilities are located in the United States, United Kingdom, Philippines, Germany, Italy, Netherlands, China, Costa Rica, Japan, Luxembourg, India, Canada and Ireland.

We have long-term contracts with some of our customers. These contracts are predominantly within Aircraft Controls and Space and Defense Controls and represent 34%, 33% and 34% of our sales in 2016, 2015 and 2014, respectively. We recognize revenue on these contracts using the percentage of completion, cost-to-cost method of accounting as work progresses toward completion. The remainder of our sales are recognized when the risks and rewards of ownership and title to the product are transferred to the customer, principally as units are delivered or as service obligations are satisfied. This method of revenue recognition is predominantly used within the Industrial Systems and Components segments, as well as with aftermarket activity.

We concentrate on providing our customers with products designed and manufactured to the highest quality standards. Our products are applied in demanding applications, "When Performance Really Matters®." We believe we have achieved a leadership position in the high performance, precision controls market, by capitalizing on our strengths, which include:

- superior technical competence in delivering mission-critical solutions,
- an innovative customer-intimacy approach,
- a diverse base of customers and end markets served by a broad product portfolio, and
- a well-established international presence serving customers worldwide.

These strengths afford us the ability to innovate our current solutions into new, complimentary technologies. They also provide us the opportunity to expand our control product franchise from one market to another, organically growing us from a high-performance components supplier to a high-performance systems supplier. In addition, we will continue to strive to achieve substantial content positions on the platforms on which we currently participate, seeking to be the dominant supplier in the current niche markets we serve. We also look for innovation in all aspects of our business, employing new technologies to improve productivity and to develop innovative business models.

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These activities will help us achieve our financial objectives of increasing our revenue base and improving our long term profitability and cash flow from operations. In doing so, we expect to maintain a balanced, diversified portfolio in terms of markets served, product applications, customer base and geographic presence. Our fundamental strategies to achieve our goals center around talent, lean and innovation and include:

- maintaining our technological excellence by building upon our systems integration capabilities while solving our customers' most demanding technical problems in applications "When Performance Really Matters®,"
- utilizing our global capabilities and strong engineering heritage to innovate,
- maximizing customer value by implementing lean enterprise principles, and
- investing in talent development to strengthen our leadership capability and employee performance.

We focus on improving shareholder value through strategic revenue growth, both acquired and organic, through improving operating efficiencies and manufacturing initiatives and through utilizing low cost manufacturing facilities without compromising quality. Additionally, we take a balanced approach to capital deployment, which may include strategic acquisitions or further share buyback activity in order to maximize shareholder returns over the long-term.

We face numerous challenges to improving shareholder value. These include, but are not limited to, adjusting to dynamic global economic conditions that are influenced by governmental, industrial and commercial factors, pricing pressures from customers, strong competition, foreign currency fluctuations and increases in employee benefit costs. We may also engage in restructuring and divesting activities, including reducing overhead, consolidating facilities and exiting some product lines if we deem the operations as non-strategic or underperforming.

Financial Highlights

- Net sales for fiscal 2016 decreased 4% to $2.4 billion, as sales were lower across all of our segments.
- Total operating profit decreased 3% to $238 million.
- Net earnings attributable to common shareholders decreased 4% to $127 million.
- We repurchased 1 million shares of common stock in 2016, lowering our average outstanding shares 7%.
- Diluted earnings per share increased 4% to $3.47.
- Strong cash from operating activities at $216 million, continuing the strong pattern of recent years.

Acquisitions and Divestitures

All of our acquisitions are accounted for under the purchase method and, accordingly, the operating results for the acquired companies are included in the consolidated statements of earnings from the respective dates of acquisition. Under purchase accounting, we record assets and liabilities at fair value and such amounts are reflected in the respective captions on the consolidated balance sheets. The purchase price described for each acquisition below is net of any cash acquired, includes debt issued or assumed and the fair value of contingent consideration.

In 2016, we acquired a 70% ownership in Linear Mold and Engineering ("Linear"), a Livonia, Michigan-based company specializing in metal additive manufacturing that provides engineering, manufacturing and production consulting services to customers across a wide range of industries, including aerospace, defense, energy and industrial. We acquired our share in Linear Mold and Engineering for $23 million. The acquisition also includes a redeemable noncontrolling interest in the remaining 30%, which is exercisable beginning three years from the date of acquisition. This acquisition is included in our Space and Defense Controls segment.

We did not complete any acquisitions in 2014 or in 2015.

In 2015, we completed one divestiture in our Components segment. We sold our Rochester, New York and Erie, Pennsylvania life sciences operations for $3 million.

On November 3, 2016, we sold our Bradford Engineering B.V. operation located in the Netherlands for approximately $1 million in cash. This operation was included in our Space and Defense Controls segment. This transaction will be recorded in our financial statements in the first quarter of 2017. We are currently evaluating the financial statement impact, which potentially includes an income tax benefit associated with this transaction.

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CRITICAL ACCOUNTING POLICIES

Our financial statements and accompanying notes are prepared in accordance with U.S. generally accepted accounting principles. The preparation of these consolidated financial statements requires us to make estimates, assumptions and judgments that affect the amounts reported. These estimates, assumptions and judgments are affected by our application of accounting policies, which are discussed in Note 1 of Item 8, Financial Statements and Supplementary Data of this report. We believe the accounting policies discussed below are the most critical in understanding and evaluating our financial results. These critical accounting policies have been reviewed with the Audit Committee of our Board of Directors.

Revenue Recognition on Long-Term Contracts

Revenue representing 34% of 2016 sales was accounted for using the percentage of completion, cost-to-cost method of accounting. This method of revenue recognition is predominantly used within the Aircraft Controls and Space and Defense Controls segments due to the contractual nature of the business activities, with the exception of their respective aftermarket activities. The contractual arrangements are either firm fixed-price or cost-plus contracts and are with the U.S. Government or its prime subcontractors, foreign governments or commercial aircraft manufacturers, including Boeing and Airbus. The nature of the contractual arrangements includes customers' requirements for delivery of hardware as well as funded nonrecurring development work in anticipation of follow-on production orders. We recognize revenue on contracts in the current period using the percentage of completion, cost-to-cost method of accounting as work progresses toward completion as determined by the ratio of cumulative costs incurred to date to estimated total contract costs at completion, multiplied by the total estimated contract revenue, less cumulative revenue recognized in prior periods. Changes in estimates affecting sales, costs and profits are recognized in the period in which the change becomes known using the cumulative catch-up method of accounting, resulting in the cumulative effect of changes reflected in the period. Estimates are reviewed and updated quarterly for substantially all contracts. A significant change in an estimate on one or more contracts could have a material effect on our results of operations.

Occasionally, it is appropriate to combine or segment contracts. Contracts are combined in those limited circumstances when they are negotiated as a package in the same economic environment with an overall profit margin objective and constitute, in essence, an agreement to do a single project. In such cases, we recognize revenue and costs over the performance period of the combined contracts as if they were one. Contracts are segmented in limited circumstances if the customer had the right to accept separate elements of the contract and the total amount of the proposals on the separate components approximated the amount of the proposal on the entire project. For segmented contracts, we recognize revenue and costs as if they were separate contracts over the performance periods of the individual elements or phases.

Contract costs include only allocable, allowable and reasonable costs which are included in cost of sales when incurred. For applicable U.S. Government contracts, contract costs are determined in accordance with the Federal Acquisition Regulations and the related Cost Accounting Standards. The nature of these costs includes development engineering costs and product manufacturing costs such as direct material, direct labor, other direct costs and indirect overhead costs. Contract profit is recorded as a result of the revenue recognized less costs incurred in any reporting period. Amounts representing performance incentives, penalties, contract claims or change orders are considered in estimating revenues, costs and profits when they can be reliably estimated and realization is considered probable. Revenue recognized on contracts for unresolved claims or unapproved contract change orders was not material in 2016, 2015 or 2014.

Contract Loss Reserves

At October 1, 2016, we had contract loss reserves of $33 million. For contracts with anticipated losses at completion, a provision for the entire amount of the estimated remaining loss is charged against income in the period in which the loss becomes known. Contract losses are determined considering all direct and indirect contract costs, exclusive of any selling, general or administrative cost allocations that are treated as period expenses. Loss reserves are more common on firm fixed-price contracts that involve, to varying degrees, the design and development of new and unique controls or control systems to meet the customers' specifications. Reserves are also recorded for the additional work on completed products in order for them to meet contract specifications.

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Reserves for Inventory Valuation

At October 1, 2016, we had net inventories of $479 million, or 30% of current assets. Reserves for inventory were $109 million, or 17% of gross inventories. Inventories are stated at the lower-of-cost-or-market with cost determined primarily on the first-in, first-out method of valuation.

We record valuation reserves to provide for slow-moving or obsolete inventory by principally using a formula-based method that increases the valuation reserve as the inventory ages. We also take specific circumstances into consideration. We consider overall inventory levels in relation to firm customer backlog in addition to forecasted demand including aftermarket sales. Changes in these and other factors such as low demand and technological obsolescence could cause us to increase our reserves for inventory valuation, which would negatively impact our gross margin. As we record provisions within cost of sales to increase inventory valuation reserves, we establish a new, lower cost basis for the inventory.

Reviews for Impairment of Goodwill

At October 1, 2016, we had $740 million of goodwill, or 24% of total assets. We test goodwill for impairment for each of our reporting units at least annually, during our fourth quarter, and whenever events occur or circumstances change, such as changes in the business climate, poor indicators of operating performance or the sale or disposition of a significant portion of a reporting unit. We also test goodwill for impairment when there is a change in reporting units.

We identify our reporting units by assessing whether the components of our operating segments constitute businesses for which discrete financial information is available and segment management regularly reviews the operating results of those components. As of the date of our impairment test, our reporting units are the same as our operating segments.

Companies may perform a qualitative assessment as the initial step in the annual goodwill impairment testing process for all or selected reporting units. Companies are also allowed to bypass the qualitative analysis and perform a quantitative analysis if desired. Economic uncertainties and the length of time from the calculation of a baseline fair value are factors that we consider in determining whether to perform a quantitative test.

When we evaluate the potential for goodwill impairment using a qualitative assessment, we consider factors including, but not limited to, macroeconomic conditions, industry conditions, the competitive environment, changes in the market for our products and services, regulatory and political developments, entity specific factors such as strategy and changes in key personnel and overall financial performance. If, after completing this assessment, it is determined that it is more likely than not that the fair value of a reporting unit is less than its carrying value, we proceed to a quantitative two-step impairment test.

Quantitative testing first requires a comparison of the fair value of each reporting unit to its carrying value. We principally use the discounted cash flow method to estimate the fair value of our reporting units. The discounted cash flow method incorporates various assumptions, the most significant being projected revenue growth rates, operating margins and cash flows, the terminal growth rate and the discount rate. Management projects revenue growth rates, operating margins and cash flows based on each reporting unit's current business, expected developments and operational strategies typically over a five-year period. If the carrying value of the reporting unit exceeds its fair value, goodwill is considered impaired and any loss must be measured.

In measuring the impairment loss, the implied fair value of goodwill is determined by assigning a fair value to all of the reporting unit's assets and liabilities, including any unrecognized intangible assets, as if the reporting unit had been acquired in a business combination at fair value. If the carrying amount of the reporting unit goodwill exceeds the implied fair value of that goodwill, an impairment loss would be recognized in an amount equal to that excess.

The determination of our assumptions is subjective and requires significant estimates. Changes in these estimates and assumptions could materially affect the results of our reviews for impairment of goodwill.

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For our annual test of goodwill for impairment in 2016, we performed a quantitative assessment for each of our six reporting units.

Reporting Units other than Linear

We determined the fair value of our reporting units other than Linear using discounted cash flows. We projected sales, operating margins and working capital requirements. We applied a 3% terminal value growth rate, which is supported by our historical growth rate, near-term projections and long-term expected market growth. We then discounted our projected cash flows using weighted-average costs of capital that ranged from 9.5% to 11.0% for our various reporting units. These discount rates reflect management's assumptions of marketplace participants' cost of capital. Based on our tests, the fair value of each reporting unit exceeded its carrying amount. Therefore, we concluded that goodwill was not impaired.

The fair value of each reporting unit exceeded its carrying amount by at least 30%. While any individual assumption could differ from those that we used, we believe the overall fair values of our reporting units are reasonable as the values are derived from a mix of reasonable assumptions. Had we used discount rates that were 100 basis points higher or a terminal growth rate that was 100 basis points lower than those we assumed, the fair values of each of our reporting units would have continued to exceed their carrying amounts by at least 15%.

We evaluate the reasonableness of the resulting fair values of our reporting units by comparing the aggregate fair value to our market capitalization and assessing the reasonableness of any resulting premium.

Linear Reporting Unit

We tested goodwill of our Linear reporting unit for impairment in our fourth quarter as part of our annual test. In performing this assessment, we estimated fair value using both a discounted cash flow analysis, which we weighted more heavily, and a market-multiple approach. In our discounted cash flow analysis, we projected sales and operating margins based on our current outlook for this business. We assumed a 5% terminal growth rate, which is supported by our near-term projections and long-term market growth potential in additive manufacturing. We then discounted our projected cash flows using a 15.5% weighted-average cost of capital that reflects management's assumptions of marketplace participants' costs of capital and business risk. Our test resulted in a fair value of Linear that was less than its carrying amount, requiring us to measure goodwill for impairment.

We determined the implied fair value of goodwill and recorded a $5 million impairment charge in our fourth quarter of 2016 for the excess of the carrying amount of goodwill over its implied fair value. We determined the implied fair value of goodwill by taking the difference between the fair value of the reporting unit that we determined using the weighted-average discounted cash flow and market multiple approach and the fair value of the net assets of the reporting unit.

During the fourth quarter, we transferred the management of Linear to Space and Defense Controls. Until that time, Linear was its own operating segment. Effective with this transfer, Linear is now part of the Space and Defense Controls operating segment and no longer qualifies as a separate reporting unit. Since we had a change in reporting units, we considered if an interim goodwill impairment test was necessary. However, in this case, two reporting units are simply being combined into a new reporting unit. We had a considerable excess of fair value over carrying value in our Space and Defense Controls reporting unit as of the beginning of the fourth quarter of 2016 and no adverse changes have occurred in that business since the 2016 annual impairment test date. As we had also just written down Linear's goodwill as a result of the 2016 annual impairment test, we determined that it is not more likely than not that the new Space and Defense Controls reporting unit would yield a fair value less than the carrying value.

Pension Assumptions

We maintain various defined benefit pension plans covering employees at certain locations. Pension expense for all defined benefit plans for 2016 was $45 million. Pension obligations and the related costs are determined using actuarial valuations that involve several assumptions. The most critical assumptions are the discount rate, mortality rates and the long-term expected return on assets. Other assumptions include salary increases and retirement age.

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The discount rate is used to state expected future cash flows at present value. Using a higher discount rate decreases the present value of pension obligations and decreases pension expense. We use the Mercer Pension Above Mean Discount Yield Curve to determine the discount rate for our U.S. defined benefit plans at year end. The discount rate is constructed from bonds included in the Mercer Yield Curve that have a yield higher than the mean yield curve. We believe that the Mercer Pension Above Mean Discount Yield Curve best mirrors the yields of bonds that would be selected by management if actions were taken to settle our obligation. The discount rate used in determining expense for the U.S. Employees' Retirement Plan, our largest plan, in 2016 was 4.5% compared to 4.4% in 2015, and this increase caused expense to decrease by $1 million this year. We changed the method used to estimate the service and interest cost components of net periodic pension costs as of October 1, 2016, which is expected to lower our 2017 expense by approximately $7 million solely due to the change in method. Previously, these costs were determined using a single-weighted average discount rate. The change does not affect the measurement of our benefit obligations. The new method will provide a more precise measure of service and interest costs by improving the correlation between projected benefit cash flows and the discrete spot yield curve rates and will be accounted for as a change in estimate prospectively beginning in the first quarter of 2017. We will use a 3.96% service cost discount rate and a 3.21% interest cost discount rate to determine our expense in 2017 for this plan. The change in discount rates, after considering a $7 million favorable effect of the refined approach to determine service and interest cost, will cause 2017 expense to increase by $2 million.

Mortality rates are used to estimate the life expectancy of plan participants during which they are expected to receive benefit payments. We use a modified version of the mortality table and projection scale published by the Society of Actuaries (SOA), which reflects improvements consistent with the Social Security Administration, as a basis for our mortality assumptions for our U.S. plans. We believe the use of this modified table and projection scale best reflects our demographics and anticipated plan outcomes. We began using this table in October of 2015 which increased expense by $6 million in 2016.

The long-term expected return on assets assumption reflects the average rate of return expected on funds invested or to be invested to provide for the benefits included in the projected benefit obligation. In determining the long-term expected return on assets assumption, we consider our current and target asset allocations. We consider the relative weighting of plan assets, the historical performance of total plan assets and individual asset classes and economic and other indicators of future performance. Asset management objectives include maintaining an adequate level of diversification to reduce interest rate and market risk and to provide adequate liquidity to meet immediate and future benefit payment requirements. In determining the 2016 expense for our largest plan, we used a 7.75% return on assets assumption, compared to 8.0% for 2015. A 25 basis point decrease in the long-term expected return on assets assumption would increase our annual pension expense by $2 million.

Deferred Tax Asset Valuation Allowances

At October 1, 2016, we had gross deferred tax assets of $317 million and deferred tax asset valuation allowances of $11 million. The deferred tax assets principally relate to benefit accruals, inventory obsolescence, tax benefit carryforwards and contract loss reserves. The deferred tax assets include $17 million related to tax benefit carryforwards associated with net operating losses and tax credits, for which $11 million of deferred tax asset valuation allowances are recorded.

We record a valuation allowance to reduce deferred tax assets to the amount of future tax benefit that we believe is more likely than not to be realized. We consider recent earnings projections, allowable tax carryforward periods, tax planning strategies and historical earnings performance to determine the amount of the valuation allowance. Changes in these factors could cause us to adjust our valuation allowance, which would impact our income tax expense when we determine that these factors have changed.

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CONSOLIDATED RESULTS OF OPERATIONS AND OUTLOOK

(dollars and shares in millions, except per share data)	2016	2015	2014	2016 vs. 2015 $ Variance	2016 vs. 2015 % Variance	2015 vs. 2014 $ Variance	2015 vs. 2014 % Variance
Net sales	$2,412	$2,526	$2,648	$(114)	(4 %)	$(123)	(5 %)
Gross margin	29.5 %	29.2 %	30.1 %				
Research and development expenses	$147	$132	$139	$15	11 %	$(7)	(5 %)
Selling, general and administrative expenses as a percentage of sales	14.1 %	14.7 %	15.2 %				
Interest expense	$35	$29	$13	$6	19 %	$16	131 %
Restructuring expense	$15	$15	$13	$—	— %	$3	20 %
Goodwill impairment	$5	$—	$—	$5	n/a	$—	n/a
Other	$(3)	$5	$10	$(8)	(172 %)	$(6)	(54 %)
Effective tax rate	28.5 %	28.3 %	27.7 %				
Net earnings attributable to common shareholders and noncontrolling interest	$124	$132	$158	$(8)	(6 %)	$(26)	(17 %)
Diluted average common shares outstanding	37	39	45	(3)	(7 %)	(6)	(12 %)
Diluted earnings per share attributable to common shareholders	$3.47	$3.35	$3.52	$0.12	4 %	$(0.17)	(5 %)

Net sales decreased in each of our segments in 2016 and 2015. Weaker foreign currencies, in particular the British Pound and the Euro relative to the U.S. Dollar, contributed almost 25% of the sales decline in 2016. Weaker foreign currencies, in particular the Euro and the British Pound relative to the U.S. Dollar, contributed 80% of the sales decline in 2015.

Gross margin increased in 2016 compared to 2015. The restructuring benefits from actions taken in 2015 contributed $9 million of reduced costs. We also benefited from the absence of last year's $7 million correction of an out-of-period accounting adjustment in our Space and Defense Controls segment. However, the improvements were partly offset by an adverse sales mix in both Components and in Industrial Systems due to lower energy and industrial market sales.

Gross margin declined in 2015 compared to 2014 due to an adverse sales mix. We were negatively impacted by lower amounts of military OEM and aftermarket sales and commercial aftermarket sales in Aircraft Controls, as well as lower amounts of energy sales in Industrial Systems and in Components. The decline was partly offset by $14 million of lower amounts of additions to contract loss reserves in Aircraft Controls and $11 million of benefits realized from the 2014 restructuring activities.

Research and development expenses in 2016 increased compared to 2015. Within Aircraft Controls, research and development expenses increased $16 million as we had higher activity on our major commercial OEM programs.

Research and development expenses decreased in 2015 compared to 2014. Within Aircraft Controls, research and development expenses decreased $7 million as we had lower activity on the Airbus A350 program, but was partly offset by higher amounts of Embraer E-Jets activity.

Selling, general and administrative expenses as a percentage of sales decreased in 2016 and in 2015. Most of the declines are due to an on-going focus on expense reduction.

Interest expense in 2016 increased $3 million due to higher interest rates associated with our revolving credit facility. Additionally, interest expense increased $3 million due to higher levels of debt attributable to the funding of our share repurchase program.

Interest expense increased in 2015 compared to 2014. Higher cost debt following the issuance of our $300 million senior notes in November 2014 increased our interest expense by $8 million. Also, higher levels of debt due to funding our share repurchase program increased our interest expense by $5 million.

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In 2014, 2015 and 2016, we incurred restructuring expenses in response to business conditions. In 2014, we incurred $13 million of restructuring expenses primarily in Aircraft Controls and Space and Defense Controls. Through 2015, the total savings were $14 million, or 91% of our projected benefits, and were primarily in cost of sales. In 2015, we incurred $15 million of restructuring expenses, primarily in Space and Defense Controls, Industrial Systems and Aircraft Controls. Through 2016, the total savings were $20 million, or 95% of our original projected benefits and 100% of our revised annual benefits, which reflected amended workforce planning. More than half of these savings are in selling, general and administrative expenses. In 2016, we incurred $15 million of restructuring expenses, primarily in Aircraft Controls and Industrial Systems. Our total projected annual savings are $17 million. Through the last two quarters of 2016, we achieved $5 million of savings, primarily in cost of sales, which is line with our expectations.

In 2016, we recorded a $5 million goodwill impairment charge in Space and Defense Controls related to our recent additive manufacturing acquisition.

Other expense in 2016 includes $2 million of royalty income. Other expense in 2015 includes a $2 million asset impairment write-down in Industrial Systems, $2 million of foreign exchange currency loss and a $1 million loss on the sales of two small operations in our Components segment. Other expense in 2014 includes payment of a $7 million call premium on the early redemption of our 7.25% senior subordinated notes and a $5 million write-down of a technology investment in Industrial Systems.

In comparison to the U.S, statutory tax rate, our effective tax rates in 2016, 2015 and 2014 differ primarily as a result of earnings being taxed in foreign jurisdictions with lower statutory tax rates.

Average common shares outstanding decreased over the past three years due to our share buyback program. Since the Board of Directors amended the program in January 2014, we have repurchased 10 million shares. There are 3 million additional shares available under this program as of year end.

Other comprehensive loss decreased in 2016 compared to 2015. Foreign currency translation adjustments contributed $44 million of less other comprehensive loss compared to 2015, driven by the positive impacts of the Euro and the Canadian Dollar. These positive impacts were partially offset by a decline in the British Pound against the U.S. Dollar. Other comprehensive loss increased in 2015 compared to 2014. Foreign currency translation adjustments decreased other comprehensive income $51 million compared to 2014. This decline was driven by the negative impacts of the British Pound, the Euro and Canadian Dollar against the U.S. Dollar.

2017 Outlook – We expect sales in 2017 to increase 1% from fiscal 2016 to $2.4 billion, driven primarily by higher OEM sales for the Airbus A350 program in Aircraft Controls. We also expect sales in Components will increase due to higher medical pump sales. Partially offsetting the sales growth is an expected decline in Industrial Systems across our major markets. We expect operating margin will increase to 10.3% in 2017 from 9.9% in 2016. The absence of 2016's restructuring expense and the goodwill impairment charge, as well as the associated restructuring benefits, will help drive margin expansion and offset negative impacts associated with an unfavorable sales mix. We expect net earnings attributable to common shareholders will remain flat with 2016 at $127 million. Average diluted shares outstanding will decrease 1% to 36 million due to shares already repurchased under our current share buyback program. We expect diluted earnings per share will range between $3.30 and $3.70, with a midpoint of $3.50, an increase of 1% compared to 2016.

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SEGMENT RESULTS OF OPERATIONS AND OUTLOOK

During 2016, we made a change to our segment reporting. Components now includes the Medical Devices product lines, which we previously reported as a separate segment. All amounts have been restated to present Medical Devices within Components.

Operating profit, as presented below, is net sales less cost of sales and other operating expenses, excluding interest expense, equity-based compensation expense and other corporate expenses. Cost of sales and other operating expenses are directly identifiable to the respective segment or allocated on the basis of sales, manpower or profit. Operating profit is reconciled to earnings before income taxes in Note 17 of Item 8, Financial Statements and Supplementary Data of this report.

Aircraft Controls

(dollars in millions)	2016	2015	2014	2016 vs. 2015 $ Variance	2016 vs. 2015 % Variance	2015 vs. 2014 $ Variance	2015 vs. 2014 % Variance
Net sales - military aircraft	$512	$546	$572	$(34)	(6 %)	$(26)	(4 %)
Net sales - commercial aircraft	551	540	546	11	2 %	(6)	(1 %)
	$1,064	$1,087	$1,118	$(24)	(2 %)	$(31)	(3 %)
Operating profit	$99	$100	$116	$(1)	(1 %)	$(16)	(14 %)
Operating margin	9.3 %	9.2 %	10.4 %				
Backlog	$632	$678	$715	$(46)	(7 %)	$(36)	(5 %)

Aircraft Controls' commercial sales increased in 2016 from 2015 after declining in 2015 from 2014. However, decreases in military sales across all three years resulted in lower total Aircraft Controls sales. In 2016, almost half of the total sales decline was due to the weaker British Pound relative to the U.S. dollar.

In 2016 compared to 2015, military OEM sales decreased $24 million and military aftermarket sales decreased $10 million. OEM sales on the V-22 program decreased $15 million and sales on the FA-18 program decreased $12 million due to lower sales volumes. These declines were partially offset by $5 million of increased sales for the F-35 program. The decline in military aftermarket sales in 2016 is largely due to work on the C-5 refurbishment program winding down, partially offset by increased activity on the F-35 aftermarket program. In 2016 compared to 2015, commercial OEM sales increased $16 million while commercial aftermarket sales decreased $5 million. Commercial OEM sales to Airbus increased $28 million driven by the A350 program, and sales for the Boeing 787 program increased $9 million. These increases were partially offset by lower sales on various business jet and other commercial programs. The commercial aftermarket sales decline was driven by lower levels of Boeing 787 initial provisioning and business jet aftermarket sales.

Military aftermarket sales declined $13 million in 2015 compared to 2014 due to lower spares sales across multiple programs. Also, military OEM sales declined $12 million, due to lower amounts of development work on the KC-46 Tanker program and lower foreign military sales. Sales in commercial aftermarket decreased $12 million due to declining sales for initial provisioning spares for the Boeing 787 program. Slightly offsetting these declines was an increase of $14 million of sales to Airbus due to the ramp up of the new A350 program.

Operating margins in 2016, 2015 and 2014 were affected by restructuring activities. In 2014, we incurred $5 million of restructuring expenses, and in 2015, realized $6 million in restructuring benefits. Also in 2015, we incurred $3 million of restructuring expenses, of which we realized $5 million of benefits in 2016. Most recently in 2016, we incurred $7 million of restructuring expenses. Our total expected savings are $7 million, of which we have realized $2 million in the last two quarters of 2016.

Operating margin increased marginally in 2016 compared to 2015. In 2016, improvements in the costs on our major commercial OEM programs and operational cost containment activities, contributed to higher margin. However, offsetting the margin expansion was an increase of $16 million in research and development expenses, as we had higher activity across all of our major commercial programs. Additionally, we incurred $4 million of higher restructuring charges.

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Operating margin for 2015 declined as compared to 2014, due to an adverse sales mix due to lower amounts of military and commercial aftermarket sales and to lower amounts of military OEM sales. Partly offsetting the margin decline was $14 million of lower additions to contract loss reserves in 2015 compared to 2014. Also, research and development expenses declined $7 million due, in part, to lower activity on the Airbus A350 program. Slightly offsetting the lower Airbus spend was higher research and development expenses associated with the ramp up of the Embraer E-Jets program. The operating profit in 2015 also benefited from restructuring benefits realized from the 2014 restructuring activities.

The twelve-month backlog for Aircraft Controls at October 1, 2016 declined compared to October 3, 2015. Almost half of the decline is due to the weaker British Pound relative to the U.S. Dollar. In addition, changes in commercial OEM order patterns, as well as work completed on military programs, reduced the level of twelve-month backlog. The decrease of twelve-month backlog for Aircraft Controls at October 3, 2015 compared to September 27, 2014 is in part due to the timing of commercial orders as well as work completed on military programs.

2017 Outlook for Aircraft Controls – We expect sales in Aircraft Controls to increase 4% from 2016 driven primarily by the continued ramp up of the Airbus A350 program. Partially offsetting the growth is expected lower commercial aftermarket sales on lower initial provisioning for the Boeing 787 program. We expect military sales will increase marginally, as higher F-35 sales are mostly offset by lower sales in other military programs. We expect operating margin will increase to 9.5% in 2017 from 9.3% in 2016. We expect that research and development costs will decrease $10 million, our restructuring expenses will not repeat and we will continue to realize the benefits of cost saving activities. However, partially offsetting the margin improvements is an expected negative sales mix. Sales from our newer military cost plus development jobs are replacing sales from higher-margin foreign military programs. We will also have lower legacy commercial OEM and commercial aftermarket sales.

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Space and Defense Controls

(dollars in millions)	2016	2015	2014	2016 vs. 2015 $ Variance	2016 vs. 2015 % Variance	2015 vs. 2014 $ Variance	2015 vs. 2014 % Variance
Net sales	$366	$381	$395	$(15)	(4 %)	$ (13)	(3 %)
Operating profit	$41	$33	$26	$8	25 %	$ 7	27 %
Operating margin	11.3 %	8.7 %	6.6 %				
Backlog	$277	$250	$254	$27	11 %	$ (4)	(2 %)

Space and Defense Controls' net sales decreased in 2016 compared to 2015 as sales declined in both our space and our defense markets. Net sales decreased in 2015 compared to 2014 as sales declines in our space market were partially offset by sales growth in our defense market.

Sales in our space market decreased $10 million in 2016 compared to 2015. Sales declined $19 million due primarily to satellite and launch vehicle contracts continuing to wind down. However, this decline was offset by $9 million of additional sales from our recent additive manufacturing acquisition. Sales in our defense market decreased $5 million. Within defense, sales decreased $11 million due to the unfavorable timing of orders on products for European defense vehicles and due to lower sales volumes on missile systems. Partially offsetting these declines was $6 million of higher sales for products on U.S. defense vehicles.

Sales in our space market decreased $26 million in 2015 compared to 2014 due to satellite and launch vehicle programs winding down. Partly offsetting the sales decline was $13 million of sales growth in our defense market. Within defense, sales increased $29 million as production rates increased on defense controls, missile systems and naval systems programs. However, these increases within our defense market were offset by $15 million of lower security sales due to lower sales volume.

Operating margins in 2015 and 2014 were affected by restructuring activities. In 2014, we incurred $5 million of restructuring expenses, and realized $8 million in cost savings in 2015. In 2015, we incurred $6 million of restructuring expenses, and we realized $6 million of cost savings in 2016. More than half of the total restructuring expense in 2015 relates to the termination of a selling and marketing contractual relationship, and did not carry the same ratio of benefits as our previous restructuring activities.

Operating margin increased in 2016 compared to 2015. The absences of last year's $8 million out-of-period adjustment and last year's $6 million restructuring expense contributed to the increase in operating profit. Additionally, improved sales mix, primarily in our satellite business, and cost containment activities contributed incremental operating profit. Partially offsetting the margin improvement is the $5 million goodwill impairment charge related to our recent additive manufacturing acquisition and $2 million more of additions to contract loss reserves in 2016 compared to 2015.

Operating margin increased in 2015 compared to 2014. Operating profit increased due to the benefits realized from our 2014 and 2015 restructuring activities. We also benefited from an improved sales mix as well as cost containment activities. Partly offsetting these increases is an $8 million accounting correction recorded in the second quarter of 2015.

The higher level of twelve-month backlog for Space and Defense Controls at October 1, 2016 compared to October 3, 2015 is due to higher orders for defense controls and naval programs. The lower level of twelve-month backlog for Space and Defense Controls at October 3, 2015 compared to September 27, 2014 is due to declines in our security and defense controls markets, partly offset by increases in our satellites programs.

2017 Outlook for Space and Defense Controls – We expect sales in Space and Defense Controls to remain flat from fiscal 2016. We expect sales in our space market will remain flat as higher satellite component sales are offset by slightly lower launch vehicle sales. Additionally, we expect sales in our defense market will remain flat as higher sales for products on U.S. defense vehicles are offset by lower missile sales. We expect operating margin will increase to 13.2% in 2017 from 11.3% in 2016, as the goodwill impairment charge does not repeat and we continue to realize savings from cost containment actions.

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Industrial Systems

(dollars in millions)	2016	2015	2014	2016 vs. 2015 $ Variance	2016 vs. 2015 % Variance	2015 vs. 2014 $ Variance	2015 vs. 2014 % Variance
Net sales	$515	$522	$591	$(7)	(1%)	$(69)	(12%)
Operating profit	$49	$45	$58	$4	8%	$(13)	(23%)
Operating margin	9.4%	8.6%	9.8%				
Backlog	$145	$178	$182	$(32)	(18%)	$(5)	(3%)

Industrial Systems' net sales decreased in 2016 and 2015 across all of our major markets. Weaker foreign currencies, in particular the Euro and the Brazilian Real relative to the U.S. Dollar, caused sales to decline $11 million, but were partially offset by real sales growth. Weaker foreign currencies, in particular the Euro relative to the U.S. Dollar, contributed $60 million of the sales decline in 2015 compared to 2014.

Excluding the currency effects on sales in 2016 compared to 2015, sales increased $9 million in our simulation and test market due to higher sales to flight simulation customers. Also in our energy market, sales increased $6 million due to stronger wind product sales in China. Partially offsetting the increases were declines across our industrial automation products due to the continuing economic weakness in our markets resulting in lower demand for our metal forming, steel production and aftermarket products and services.

Sales in our energy market decreased $31 million in 2015 compared to 2014. Unfavorable foreign currency translation contributed approximately half of the decline. Additionally, sales of our non-renewable energy products contributed the other half of the decline due to the unfavorable macro-economic conditions related, in part, to the significant decline in the price of crude oil. Within our industrial automation market, sales decreased $27 million. Unfavorable foreign currency translation contributed $33 million to the decline, but was partly offset by sales increases in our aftermarket services. Sales within our simulation and test market decreased $11 million. Unfavorable foreign currency translation contributed approximately 80% of the decline.

Operating margins in 2016 and 2015 were affected by restructuring activities. In 2015, we incurred $5 million of restructuring expenses, and realized $7 million in cost savings in 2016. In 2016, we incurred $5 million of restructuring expenses. Our total expected savings are $6 million, of which we have realized $1 million in the last two quarters of 2016.

Operating margin increased in 2016 compared to 2015 due to the realized restructuring benefits from the 2015 restructuring actions, additional cost containment activities and $4 million of lower research and development expenses. Partially offsetting the margin improvement was a negative sales mix due in part to lower industrial automation sales.

Operating margin decreased in 2015 compared to 2014. Our operating profit was negatively impacted by the strengthening U.S. Dollar relative to foreign currencies, lower sales volumes and margin pressures in the energy business and additional restructuring expense. Partly offsetting the declines was $6 million of lower write downs in 2015.

The lower level of twelve-month backlog in Industrial Systems at October 1, 2016 compared to October 3, 2015 is due to canceled wind energy orders with a key customer who was recently acquired, as well as the completion of simulation orders. The lower level of twelve-month backlog in Industrial Systems at October 3, 2015 compared to September 27, 2014 is primarily due the impact of foreign currency translation, but was partly offset by higher levels of industrial automation orders.

2017 Outlook for Industrial Systems – We expect sales in Industrial Systems to decline 5% from 2016 across all of our major markets. We expect that wind energy sales will decrease as a result of lost sales to a key customer who was acquired. Also, we expect that simulation and test sales will decrease from the high level of sales in 2016. Additionally, we expect lower industrial automation sales as the global economic conditions continue to negatively impact our sales. We expect operating margin will increase to 10.0% in 2017 from 9.4% in 2016, as we will benefit from both our restructuring actions in 2016 and our continued cost containment actions.

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Components

(dollars in millions)	2016	2015	2014	2016 vs. 2015 $ Variance	2016 vs. 2015 % Variance	2015 vs. 2014 $ Variance	2015 vs. 2014 % Variance
Net sales	$467	$536	$545	$(69)	(13 %)	$(9)	(2 %)
Operating profit	$50	$67	$76	$(17)	(26 %)	$(9)	(11 %)
Operating margin	10.7 %	12.5 %	13.9 %				
Backlog	$170	$168	$188	$2	1 %	$(21)	(11 %)

Components' net sales decreased in 2016 and in 2015, with most of our markets declining across these years. Within our industrial market, sales decreased $41 million. Approximately two-thirds of the decline is in our energy market where the macro-economic conditions centered around the significant decline in the price of crude oil has continued to result in lower demand for our marine products. The remaining decline in our industrial market is due to unfavorable order timing. Within our aerospace and defense market, sales declined $20 million due primarily to lower demand for aftermarket products. Sales also declined $8 million in our medical market, as lower sales for our sleep apnea products were partially offset by higher sales for medical pump sales.

Sales in our industrial market decreased $16 million in 2015 compared to 2014. Our marine energy sales declined $22 million related to the decline in the price of crude oil and the resulting lower demand for our products. Slightly offsetting the decline was a sales increase of $6 million, driven by a strong demand in the U.S. industrial market. Sales in our aerospace and defense market increased $4 million in 2015 compared to 2014 due to higher levels of defense controls and naval product sales. Sales in our medical market increased $2 million, due in part to higher IV pumps and sets sales as we continued to replace competitors' older products in the U.S. home healthcare market.

Operating margin decreased in 2016 compared to 2015. The decreases are due, in part, to lower demand for our marine energy products resulting from the significant decline in the price of crude oil, as well as lower sales in our military markets. We also incurred $2 million of higher research and development expenses in 2016.

Operating margin declined in 2015 compared to 2014. The decrease is primarily due to lower demand for our marine energy products resulting from the significant decline in the price of crude oil. Additionally, cost overruns on some military programs negatively impacted operating margin.

The twelve-month backlog at October 1, 2016 is comparable to the level at October 3, 2015 as higher industrial orders are mostly offset by completed aerospace and defense orders. The twelve-month backlog at October 3, 2015 declined compared to the level at September 27, 2014 due to reduced orders for our marine energy products, as well as timing of defense orders.

2017 Outlook for Components – We expect sales in Components to increase 2% from 2016. We expect that our medical market will contribute all of the growth due to higher sales volumes of enteral pumps and sets. We expect that our aerospace and defense sales and our industrial sales will remain flat. We expect operating margin will decrease to 10.4% in 2017 from 10.7% in 2016, as we continue to be affected by the negative sales mix in our industrial and aerospace and defense markets.

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FINANCIAL CONDITION AND LIQUIDITY

(dollars in millions)	2016	2015	2014	2016 vs. 2015 $ Variance	2016 vs. 2015 % Variance	2015 vs. 2014 $ Variance	2015 vs. 2014 % Variance
Net cash provided (used) by:							
Operating activities	$216	$335	$287	$(119)	(35 %)	$47	17 %
Investing activities	(77)	(68)	(87)	(9)	14 %	19	(22 %)
Financing activities	(120)	(166)	(118)	46	(28 %)	(48)	40 %

Our available borrowing capacity and our cash flow from operations provide us with the financial resources needed to run our operations, reinvest in our business and make strategic acquisitions.

At October 1, 2016, our cash balance was $325 million, which is primarily held outside of the U.S. Cash flow from our U.S. operations, together with borrowings on our credit facility, fund on-going activities, debt service requirements and future growth investments. We reinvest the cash generated from foreign operations locally and such international balances are not available to pay down debt in the U.S. unless we decide to further repatriate such amounts. During 2016, we repatriated $91 million of earnings from various foreign subsidiaries and used the funds to pay down our U.S. revolving credit facility. If we determine further repatriation of foreign funds is necessary, we would then be required to pay U.S. income taxes on those funds.

Operating activities

Net cash provided by operating activities decreased in 2016 compared to 2015. Unfavorable timing of payments and collections across all of our segments used $89 million more of cash compared to a year ago. Additionally, we contributed an additional $19 million in pension contributions in 2016.

Net cash provided by operating activities increased in 2015 compared to 2014. We improved by $37 million due to the favorable timing on collections of receivables, primarily in our Space and Defense Controls, Components and Aircraft Controls segments, and improved by $29 million due to lower pension funding levels. Additionally, we benefited by $24 million due to the favorable timing of customer advances, primarily in Aircraft Controls. The change in the cash provided by operating activities was negatively impacted by $34 million of lower earnings and non-cash charges.

Investing activities

Net cash used by investing activities in 2016 included $67 million for capital expenditures and $11 million for the 70% ownership for the Linear Mold and Engineering acquisition.

Net cash used by investing activities in 2015 included $81 million for capital expenditures. In 2015, investment activities provided $7 million of cash as we liquidated retirement plan investments in order to purchase our stock, and $3 million of proceeds from the sale of two medical operations in our Components segment.

Net cash used by investing activities in 2014 included $79 million for capital expenditures and $9 million used to redeem our 7.25% senior subordinated notes that were invested in our supplemental retirement plan.

We expect our 2017 capital expenditures to be approximately $80 million, as we support the increased production of commercial aircraft.

Financing activities

Net cash used by financing activities in 2016 included $39 million to fund our stock repurchase program. We repurchased approximately 850,000 shares, averaging $46 per share, and used our credit facility for funding.

Net cash used by financing activities in 2015 included $344 million to fund our stock repurchase program. Additionally, net cash used by financing activities in 2015 included the net proceeds of issuing our $300 million aggregate principal 5.25% senior notes, which were used to pay down our U.S. revolving credit facility borrowings.

Net cash used by financing activities in 2014 included $266 million to fund our stock repurchase program and $7 million for the call premium on our 7.25% senior subordinated notes. We also used credit facility borrowings to fund the redemption of our 7.25% senior subordinated notes.

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CAPITAL STRUCTURE AND RESOURCES

We maintain bank credit facilities to fund our short and long-term capital requirements, including for acquisitions. From time to time, we also sell debt and equity securities to fund acquisitions or take advantage of favorable market conditions.

We have $300 million aggregate principal amount of 5.25% senior notes due December 1, 2022 with interest paid semiannually on June 1 and December 1 of each year. The senior notes are unsecured obligations, guaranteed on a senior unsecured basis by certain subsidiaries and contain normal incurrence-based covenants and limitations such as the ability to incur additional indebtedness, pay dividends, make other restricted payments and investments, create liens and certain corporate acts such as mergers and consolidations.

On June 28, 2016, we amended our U.S. revolving credit facility. This amendment extended the maturity to June 28, 2021. The U.S. revolving credit facility has a capacity of $1.1 billion and also provides an expansion option, which permits us to request an increase of up to $200 million to the credit facility upon satisfaction of certain conditions. The U.S. revolving credit facility had an outstanding balance of $590 million at October 1, 2016. Interest on the outstanding credit facility borrowings is principally based on LIBOR plus the applicable margin, which was 1.63% at October 1, 2016. The credit facility is secured by substantially all of our U.S. assets.

The U.S. revolving credit facility contains various covenants. The covenant for minimum interest coverage ratio, defined as the ratio of EBITDA to interest expense for the most recent four quarters, is 3.0. The covenant for the maximum leverage ratio, defined as the ratio of net debt, including letters of credit, to EBITDA for the most recent four quarters, is 3.5. We are in compliance with all covenants. EBITDA is defined in the loan agreement as (i) the sum of net income, interest expense, income taxes, depreciation expense, amortization expense, other non-cash items reducing consolidated net income and non-cash equity-based compensation expenses minus (ii) other non-cash items increasing consolidated net income.

We are generally not required to obtain the consent of lenders of the U.S. revolving credit facility before raising significant additional debt financing; however, certain limitations and conditions may apply that would require consent to be obtained. In recent years, we have demonstrated our ability to secure consents to access debt markets. We have also been successful in accessing equity markets from time to time. We believe that we will be able to obtain additional debt or equity financing as needed.

At October 1, 2016, we had $503 million of unused capacity, including $491 million from the U.S. revolving credit facility after considering standby letters of credit. However, our leverage ratio covenant limits our total borrowing capacity to $418 million as of October 1, 2016.

We have a trade receivables securitization facility (the "Securitization Program"), which terminates on April 13, 2018. Under the Securitization Program, we sell certain trade receivables and related rights to an affiliate, which in turn sells an undivided variable percentage ownership interest in the trade receivables to a financial institution, while maintaining a subordinated interest in a portion of the pool of trade receivables. The Securitization Program effectively increases our borrowing capacity by up to $120 million and lowers our cost to borrow funds as compared to the U.S. revolving credit facility. We had an outstanding balance of $120 million at October 1, 2016. The Securitization Program has a minimum borrowing requirement, which was $96 million at October 1, 2016. Interest on the secured borrowings under the Securitization Program was 1.41% at October 1, 2016 and is based on 30-day LIBOR plus an applicable margin.

Net debt to capitalization was 41% at October 1, 2016 and 44% at October 3, 2015. The decrease in net debt to capitalization is primarily due to our net earnings and positive cash flow.

We believe that our cash on hand, cash flows from operations and available borrowings under short and long-term arrangements will continue to be sufficient to meet our operating needs.

The Board of Directors authorized a share repurchase program beginning in January 2014 that includes both Class A and Class B common shares, and allows us to buy up to an aggregate 13 million common shares. Under this program, we have purchased approximately 9.6 million shares for $650 million as of October 1, 2016.

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Off Balance Sheet Arrangements

We do not have any material off balance sheet arrangements that have or are reasonably likely to have a material future effect on our results of operations or financial condition.

Contractual Obligations and Commercial Commitments

Our significant contractual obligations and commercial commitments at October 1, 2016 are as follows:

(dollars in millions)	Payments due by period				
Contractual Obligations	Total	2017	2018-2019	2020-2021	After 2021
Long-term debt	$1,010	$—	$120	$590	$300
Interest on long-term debt	80	16	32	31	1
Operating leases	130	22	38	26	45
Purchase obligations	656	507	127	8	14
Total contractual obligations	$1,876	$545	$317	$655	$360

In addition to the obligations in the table above, we have $1 million recorded for unrecognized tax benefits in current liabilities, which includes related accrued interest. We are unable to determine if and when any of those amounts will be settled, nor can we estimate any potential changes to the unrecognized tax benefits.

The table above excludes interest on variable-rate debt, primarily our U.S. revolving credit facility, as we are unable to determine the rate and average balance outstanding for the periods presented in the above table. Interest on variable-rate long-term debt, assuming the rate and outstanding balances do not change from those at October 1, 2016, would be approximately $14 million annually.

Total contractual obligations exclude pension obligations. In 2017, we have no minimum funding requirements. However, we anticipate making contributions to defined benefit pension plans of $70 million, of which approximately $63 million is to the U.S. plan. We are unable to determine minimum funding requirements beyond 2017.

We have made discretionary incremental contributions to our defined benefit plans in excess of minimum funding requirements in 2016 and expect to continue to do the same in 2017. These additional contributions are being made in an effort to migrate toward fully funded status and reduce the volatility to our consolidated financial statements.

(dollars in millions)	Commitments expiring by period				
Other Commercial Commitments	Total	2017	2018-2019	2020-2021	After 2021
Standby letters of credit	$19	$ 14	$ 2	$ 3	$ —

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ECONOMIC CONDITIONS AND MARKET TRENDS

We operate within the aerospace and defense and industrial markets. Our aerospace and defense markets are affected by market conditions and program funding levels, while our industrial markets are influenced by general capital investment trends and economic conditions. A common factor throughout our markets is the continuing demand for technologically advanced products.

Aerospace and Defense

Approximately 65% of our 2016 sales were generated in aerospace and defense markets. Within aerospace and defense, we serve three end markets: defense, commercial aircraft and space.

The defense market is dependent on military spending for development and production programs. Aircraft production programs are typically long-term in nature, offering predictability as to capacity needs and future revenues. We maintain positions on numerous high priority programs, including the Lockheed Martin F-35 Joint Strike Fighter, FA-18E/F Super Hornet and V-22 Osprey. The large installed base of our products leads to attractive aftermarket sales and service opportunities. The tactical and strategic missile, missile defense and defense controls markets are dependent on many of the same market conditions as military aircraft, including overall military spending and program funding levels. Our security and surveillance product line is dependent on government funding at federal and local levels, as well as private sector demand.

Reductions in the U.S. Department of Defense's mandatory and discretionary budgeted spending, which became effective on March 1, 2013, resulting from the Budget Control Act of 2011, has had and will continue to have ongoing ramifications for the domestic aerospace and defense market for the near future. As originally passed, the Budget Control Act provided that, in addition to an initial significant reduction in future domestic defense spending, further automatic cuts to defense spending authorization (which is generally referred to as sequestration) of approximately $500 billion through the Federal Government's 2021 fiscal year would be triggered by the failure of Congress to produce a deficit reduction bill. The sequestration spending cuts were intended to be uniform by category for programs, projects and activities within accounts. The Bipartisan Budget Act of 2013 and the Bipartisan Budget Act of 2015 provided stability and modest growth in the Department of Defense spending through 2017. However, future budgets beyond 2017 are uncertain with respect to the overall levels of defense spending. As a result of this uncertainty, we expect we will continue to face significant challenges over the next decade. We believe that our military sales remain likely to be most affected due to lower defense spending. Currently, we expect approximately $670 million of U.S. defense sales in 2017.

The commercial aircraft market is dependent on a number of factors, including global demand for air travel, which generally follows underlying economic growth. As such, the commercial aircraft market has historically exhibited cyclical swings which tend to track the overall economy. In recent years, the development of new, more fuel-efficient commercial air transports has helped drive increased demand in the commercial aircraft market, as airlines replace older, less fuel-efficient aircraft with newer models in an effort to reduce operating costs. The aftermarket is driven by usage of the existing aircraft fleet and the age of the installed fleet, and is impacted by fleet re-sizing programs for passenger and cargo aircraft. Changes in aircraft utilization rates affect the need for maintenance and spare parts and impact aftermarket sales. Boeing and Airbus have historically adjusted production in line with air traffic volume. Demand for our commercial aircraft products is in large part dependent on new aircraft production, which is increasing as Boeing and Airbus work to fulfill large backlogs of unfilled orders.

The commercial space market is comprised of large satellite customers, traditionally communications companies. Trends for this market, as well as for commercial launch vehicles, follow demand for increased capacity. This, in turn tends to track with underlying demand for increased consumption of telecommunication services, satellite replacement and global navigation needs. The space market is also partially dependent on the governmental-authorized levels of funding for satellite communications, as well as investment for commercial and exploration activities.

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Industrial

Approximately 35% of our 2016 sales were generated in industrial markets. Within industrial, we serve three end markets: industrial automation, energy and medical.

The industrial automation market we serve is influenced by several factors including capital investment, product innovation, economic growth, cost-reduction efforts and technology upgrades. We experience challenges from the need to react to the demands of our customers, who are in large part sensitive to international and domestic economic conditions.

The energy market we serve is affected by changing oil and natural gas prices, global urbanization, the resulting change in supply and demand for global energy and the political climate and corresponding public support for investments in renewable energy generation capacity. Historically, drivers for global growth include investments in power generation infrastructure, including renewable energy, and exploration in search of new oil and gas resources. However, the recent significant decline in the price of crude oil has reduced investment in exploration activities. This reduced investment has directly affected our energy business in Components and in Industrial Systems. Currently, we expect approximately $33 million of oil exploration-related sales in 2017, down from approximately $100 million in 2014.

The medical market we serve is influenced by economic conditions, regulatory environments, hospital and outpatient clinic spending on equipment, population demographics, medical advances, patient demands and the need for precision control components and systems. Advances in medical technology and medical treatments have had the effect of extending the average life spans, in turn resulting in greater need for medical services. These same technology and treatment advances also drive increased demand from the general population as a means to improve quality of life. Access to medical insurance, whether through government funded health care plans or private insurance, also affects the demand for medical services.

Foreign Currencies

We are affected by the movement of foreign currencies compared to the U.S. dollar, particularly in Industrial Systems. About one-quarter of our 2016 sales were denominated in foreign currencies. During 2016, average foreign currency rates generally weakened against the U.S. dollar compared to 2015. The translation of the results of our foreign subsidiaries into U.S. dollars decreased sales by $26 million compared to one year ago. During 2015, average foreign currency rates generally weakened against the U.S. dollar compared to 2014. The translation of the results of our foreign subsidiaries into U.S. dollars decreased 2015 sales by $99 million compared to 2014.

RECENT ACCOUNTING PRONOUNCEMENTS

See Note 1 of the Consolidated Financial Statements included in Item 8, Financial Statements and Supplementary Data of this report for further information regarding Financial Accounting Standards Board issued Accounting Standards Updates ("ASU").

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Item 7A. Quantitative and Qualitative Disclosures about Market Risk.

In the normal course of business, we are exposed to interest rate risk from our long-term debt and foreign exchange rate risk related to our foreign operations and foreign currency transactions. To manage these risks, we may enter into derivative instruments such as interest rate swaps and foreign currency forward contracts. We do not hold or issue financial instruments for trading purposes. In 2016, our derivative instruments consisted of interest rate swaps designated as cash flow hedges and foreign currency forwards.

At October 1, 2016, we had $525 million of borrowings subject to variable interest rates. During 2016, our average borrowings subject to variable interest rates were $605 million and, therefore, if interest rates had been one percentage point higher during 2016, our interest expense would have been $6 million higher. At October 1, 2016, we had interest rate swaps with notional amounts totaling $185 million. The interest rate swaps effectively convert this amount of variable-rate debt to fixed-rate debt at 2.5%, including the applicable margin of 1.63% as of October 1, 2016. The interest will revert back to variable rates based on LIBOR plus the applicable margin upon the maturity of the interest rate swaps. These interest rate swaps will mature at various times between December 5, 2016 and July 8, 2019.

We also enter into forward contracts to reduce fluctuations in foreign currency cash flows related to third party purchases, intercompany product shipments and to reduce exposure on intercompany balances that are denominated in foreign currencies. We have foreign currency forwards with notional amounts of $201 million outstanding at October 1, 2016 that mature at various times through September 28, 2018. These include notional amounts of $131 million outstanding where the U.S. dollar is one side of the trade. The net fair value of all of our foreign currency contracts was a $4 million net liability at October 1, 2016. A hypothetical 10 percent increase in the value of the U.S. dollar against all currencies would decrease the fair value of our foreign currency contracts at October 1, 2016 by approximately $1 million, while a hypothetical 10 percent decrease in the value of the U.S. dollar against all currencies would increase the fair value of our foreign currency contracts at October 1, 2016 by less than $1 million. It is important to note that gains and losses indicated in the sensitivity analysis would often be offset by gains and losses on the underlying receivables and payables.

Although the majority of our sales, expenses and cash flows are transacted in U.S. dollars, we have exposure to changes in foreign currency exchange rates such as the Euro, British pound and Japanese yen. If average annual foreign exchange rates collectively weakened or strengthened against the U.S. dollar by 10%, our net earnings in 2016 would have decreased or increased by $8 million from foreign currency translation. This sensitivity analysis assumed that each exchange rate would change in the same direction relative to the U.S. dollar and excludes the potential effects that changes in foreign currency exchange rates may have on actual transactions.

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Item 8. Financial Statements and Supplementary Data.

Inc.

Consolidated Statements of Earnings

(dollars in thousands, except per share data)	Fiscal Years Ended		
	October 1, 2016	October 3, 2015	September 27, 2014
Net sales	$2,411,937	$2,525,532	$ 2,648,385
Cost of sales	1,700,354	1,788,828	1,850,809
Gross profit	711,583	736,704	797,576
Research and development	147,336	132,271	139,462
Selling, general and administrative	339,961	371,498	403,487
Interest	34,605	28,967	12,513
Restructuring	15,393	15,449	12,913
Goodwill impairment	4,800	—	—
Other	(3,372)	4,685	10,278
Earnings before income taxes	172,860	183,834	218,923
Income taxes	49,227	51,951	60,725
Net earnings attributable to common shareholders and noncontrolling interest	$123,633	$131,883	$ 158,198
Net earnings (loss) attributable to noncontrolling interest	(3,112)	—	—
Net earnings attributable to common shareholders	$126,745	$131,883	$ 158,198
Net earnings per share attributable to common shareholders			
Basic	$3.49	$3.39	$ 3.57
Diluted	$3.47	$3.35	$ 3.52
Average common shares outstanding			
Basic	36,277,445	38,945,880	44,362,412
Diluted	36,529,344	39,334,520	44,952,437

See accompanying Notes to Consolidated Financial Statements.

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Inc.
Consolidated Statements of Comprehensive Income (Loss)

(dollars in thousands)	Fiscal Years Ended October 1, 2016	October 3, 2015	September 27, 2014
Net earnings attributable to common shareholders and noncontrolling interest	$123,633	$131,883	$ 158,198
Other comprehensive income (loss), net of tax:			
Foreign currency translation adjustment	(37,838)	(82,042)	(31,318)
Retirement liability adjustment	(54,184)	(51,926)	(41,289)
Change in accumulated income (loss) on derivatives	(1,304)	(929)	(73)
Other comprehensive income (loss), net of tax	(93,326)	(134,897)	(72,680)
Comprehensive income (loss)	$30,307	$(3,014)	$ 85,518
Comprehensive income (loss) attributable to noncontrolling interest	(3,112)	—	—
Comprehensive income (loss) attributable to common shareholders	$33,419	$(3,014)	$ 85,518

See accompanying Notes to Consolidated Financial Statements.

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Inc.
Consolidated Balance Sheets

(dollars in thousands, except per share data)	October 1, 2016	October 3, 2015
ASSETS		
Current assets		
Cash and cash equivalents	$325,128	$309,853
Receivables	688,388	698,419
Inventories	479,040	493,360
Deferred income taxes	92,903	91,210
Prepaid expenses and other current assets	34,688	34,653
Total current assets	1,620,147	1,627,495
Property, plant and equipment, net	522,369	536,756
Goodwill	740,162	737,212
Intangible assets, net	113,560	143,723
Other assets	45,621	41,285
Total assets	$3,041,859	$3,086,471
LIABILITIES AND SHAREHOLDERS' EQUITY		
Current liabilities		
Short-term borrowings	$1,379	$83
Current installments of long-term debt	167	34
Accounts payable	144,450	165,973
Accrued salaries, wages and commissions	126,319	125,270
Customer advances	167,514	167,423
Contract loss reserves	32,543	30,422
Other accrued liabilities	116,860	116,300
Total current liabilities	589,232	605,505
Long-term debt, excluding current installments	1,010,304	1,075,067
Long-term pension and retirement obligations	401,747	348,239
Deferred income taxes	42,171	60,209
Other long-term liabilities	4,343	2,919
Total liabilities	2,047,797	2,091,939
Commitments and contingencies (Note 18)	—	—
Redeemable noncontrolling interest	5,651	—
Shareholders' equity		
Common stock - par value $1.00		
Class A - Authorized 100,000,000 shares	43,667	43,639
Issued 43,666,801 and outstanding 32,131,566 shares at October 1, 2016		
Issued 43,638,618 and outstanding 33,320,187 shares at October 3, 2015		
Class B - Authorized 20,000,000 shares. Convertible to Class A on a one-for-one basis	7,613	7,641
Issued 7,612,912 and outstanding 3,734,067 shares at October 1, 2016		
Issued 7,641,095 and outstanding 3,388,788 shares at October 3, 2015		
Additional paid-in capital	465,762	456,512
Retained earnings	1,706,539	1,579,794
Treasury shares	(741,700)	(701,771)
Stock Employee Compensation Trust	(49,463)	(44,211)
Supplemental Retirement Plan Trust	(8,946)	(5,337)
Accumulated other comprehensive loss	(435,061)	(341,735)
Total shareholders' equity	988,411	994,532

Total liabilities and shareholders' equity	$3,041,859	$3,086,471

See accompanying Notes to Consolidated Financial Statements.

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Inc.
Consolidated Statements of Shareholders' Equity

(dollars in thousands)	Fiscal Years Ended October 1, 2016	October 3, 2015	September 27, 2014
COMMON STOCK			
Beginning and end of year	$51,280	$51,280	$51,280
ADDITIONAL PAID-IN CAPITAL			
Beginning of year	456,512	463,965	447,478
Issuance of treasury shares	(429)	(4,529)	256
Equity-based compensation expense	3,271	5,074	7,189
Adjustment to market - SECT, SERP and other	6,408	(7,998)	9,042
End of year	465,762	456,512	463,965
RETAINED EARNINGS			
Beginning of year	1,579,794	1,447,911	1,289,713
Net earnings attributable to common shareholders	126,745	131,883	158,198
End of year	1,706,539	1,579,794	1,447,911
TREASURY SHARES AT COST			
Beginning of year	(701,771)	(360,445)	(83,003)
Class A shares issued related to equity awards	5,003	15,965	1,991
Class A and B shares purchased	(44,932)	(357,291)	(279,433)
End of year	(741,700)	(701,771)	(360,445)
STOCK EMPLOYEE COMPENSATION TRUST (SECT)			
Beginning of year	(44,211)	(48,458)	(35,545)
Issuance of shares	28,048	7,395	1,144
Purchase of shares	(28,799)	(15,151)	(7,924)
Adjustment to market	(4,501)	12,003	(6,133)
End of year	(49,463)	(44,211)	(48,458)
SUPPLEMENTAL RETIREMENT PLAN (SERP) TRUST			
Beginning of year	(5,337)	—	—
Purchase of shares	(2,300)	(7,328)	—
Adjustment to market	(1,309)	1,991	—
End of year	(8,946)	(5,337)	—
ACCUMULATED OTHER COMPREHENSIVE LOSS			
Beginning of year	(341,735)	(206,838)	(134,158)
Other comprehensive income (loss)	(93,326)	(134,897)	(72,680)
End of year	(435,061)	(341,735)	(206,838)
TOTAL SHAREHOLDERS' EQUITY	$988,411	$994,532	$1,347,415
REDEEMABLE NONCONTROLLING INTEREST			
Beginning of year	$—	$—	$—
Redeemable noncontrolling interest of acquired entity	8,763	—	—
Net loss attributable to redeemable noncontrolling interest	(3,112)	—	—
End of year	$5,651	$—	$—

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Inc.

Consolidated Statements of Shareholders' Equity, Continued

(share data)	Fiscal Years Ended October 1, 2016	October 3, 2015	September 27, 2014
TREASURY SHARES - CLASS A COMMON STOCK			
Beginning of year	(10,318,431)	(5,806,702)	(2,004,262)
Class A shares issued related to equity awards	152,099	543,923	283,921
Class A shares purchased	(943,755)	(5,055,652)	(4,086,361)
End of year	(11,110,087)	(10,318,431)	(5,806,702)
TREASURY SHARES - CLASS B COMMON STOCK			
Beginning of year	(3,323,926)	(3,319,038)	(3,305,971)
Class B shares purchased	—	(4,888)	(13,067)
End of year	(3,323,926)	(3,323,926)	(3,319,038)
SECT SHARES - CLASS A COMMON STOCK			
Beginning of year	—	—	—
Purchase of shares	(425,148)	—	—
End of year	(425,148)	—	—
SECT SHARES - CLASS B COMMON STOCK			
Beginning of year	(828,381)	(710,841)	(610,223)
Issuance of shares	487,678	101,000	18,444
Purchase of shares	(64,216)	(218,540)	(119,062)
End of year	(404,919)	(828,381)	(710,841)
SERP TRUST SHARES - CLASS B COMMON STOCK			
Beginning of year	(100,000)	—	—
Purchase of shares	(50,000)	(100,000)	—
End of year	(150,000)	(100,000)	—

See accompanying Notes to Consolidated Financial Statements.

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Inc.
Consolidated Statements of Cash Flows

(dollars in thousands)	Fiscal Years Ended October 1, 2016	October 3, 2015	September 27, 2014
CASH FLOWS FROM OPERATING ACTIVITIES			
Net earnings attributable to common shareholders and noncontrolling interest	$123,633	$131,883	$ 158,198
Adjustments to reconcile net earnings to net cash provided (used) by operating activities:			
Depreciation	77,407	78,610	78,078
Amortization	21,325	24,999	31,181
Deferred income taxes	4,248	12,991	5,021
Equity-based compensation expense	3,271	5,074	7,189
Redemption of senior subordinated notes	—	—	8,002
Other	13,440	7,826	7,260
Changes in assets and liabilities providing (using) cash:			
Receivables	1,672	60,616	23,707
Inventories	12,644	3,821	23,666
Accounts payable	(21,821)	8,107	(17,783)
Customer advances	2,903	24,112	(304)
Accrued expenses	(727)	(6,525)	7,685
Accrued income taxes	4,481	(9,986)	6,273
Net pension and post retirement liabilities	(29,708)	(15,048)	(43,612)
Other assets and liabilities	3,086	8,066	(7,459)
Net cash provided by operating activities	215,854	334,546	287,102
CASH FLOWS FROM INVESTING ACTIVITIES			
Acquisitions of businesses, net of cash acquired	(11,016)	—	—
Purchase of property, plant and equipment	(67,208)	(80,693)	(78,771)
Other investing transactions	1,256	13,095	(8,124)
Net cash used by investing activities	(76,968)	(67,598)	(86,895)
CASH FLOWS FROM FINANCING ACTIVITIES			
Net short-term repayments	—	(3,570)	(977)
Proceeds from revolving lines of credit	324,670	428,130	680,875
Payments on revolving lines of credit	(409,670)	(518,130)	(319,740)
Proceeds from long-term debt	20,000	—	—
Payments on long-term debt	(10,098)	(5,259)	(3,256)
Proceeds from senior notes, net of issuance costs	—	294,430	—
Payments on senior subordinated notes	—	—	(191,575)
Payment of premium on redemption of senior subordinated notes	—	—	(6,945)
Proceeds from sale of treasury stock	4,574	11,436	2,247
Purchase of outstanding shares for treasury	(44,933)	(363,848)	(272,876)
Proceeds from sale of stock held by SECT	28,048	7,395	1,144
Purchase of stock held by SECT	(28,799)	(15,151)	(7,924)
Purchase of stock held by SERP Trust	(2,300)	(7,328)	—
Excess tax benefits from equity-based payment arrangements	598	5,996	2,910
Other financing transactions	(1,950)	(100)	(2,288)
Net cash used by financing activities	(119,860)	(165,999)	(118,405)
Effect of exchange rate changes on cash	(3,751)	(22,388)	(7,600)
Increase in cash and cash equivalents	15,275	78,561	74,202

Cash and cash equivalents at beginning of period	309,853	231,292	157,090
Cash and cash equivalents at end of year	$325,128	$309,853	$ 231,292
SUPPLEMENTAL CASH FLOW INFORMATION			
Interest paid	$34,150	$23,718	$ 17,300
Income taxes paid, net of refunds	41,517	39,890	41,999
Unsecured notes issued for acquisitions	1,280	—	—

See accompanying Notes to Consolidated Financial Statements.

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Notes to Consolidated Financial Statements
(dollars in thousands, except per share data)

Note 1 - Summary of Significant Accounting Policies

Consolidation: The consolidated financial statements include the accounts of Moog Inc. and all of our U.S. and foreign subsidiaries. All intercompany balances and transactions have been eliminated in consolidation.

Fiscal Year: Our fiscal year ends on the Saturday that is closest to September 30. The consolidated financial statements include 52 weeks for the year ended October 1, 2016, 53 weeks for the year ended October 3, 2015 and 52 weeks for the year ended September 27, 2014.

Operating Cycle: Consistent with industry practice, aerospace and defense related inventories, unbilled recoverable costs and profits on long-term contract receivables, customer advances and contract loss reserves include amounts relating to contracts having long production and procurement cycles, portions of which are not expected to be realized or settled within one year.

Foreign Currency Translation: Assets and liabilities of subsidiaries that prepare financial statements in currencies other than the U.S. dollar are translated using rates of exchange as of the balance sheet date and the statements of earnings are translated at the average rates of exchange for each reporting period.

Use of Estimates: The preparation of financial statements in conformity with U.S. generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting periods. Actual results could differ from those estimates and assumptions.

Revenue Recognition: We recognize revenue using either the percentage of completion method for contracts or as units are delivered or services are performed.

Percentage of completion method for contracts: Revenue representing 34%, 33% and 34% of 2016, 2015 and 2014 sales, respectively, was accounted for using the percentage of completion, cost-to-cost method of accounting. This method of revenue recognition is predominantly used within the Aircraft Controls and Space and Defense Controls segments due to the contractual nature of the business activities, with the exception of their respective aftermarket activities. The contractual arrangements are either firm fixed-price or cost-plus contracts and are primarily with the U.S. Government or its prime subcontractors, foreign governments or commercial aircraft manufacturers, including Boeing and Airbus. The nature of the contractual arrangements includes customers' requirements for delivery of hardware as well as funded nonrecurring development work in anticipation of follow-on production orders.

Revenue on contracts using the percentage of completion, cost-to-cost method of accounting is recognized as work progresses toward completion as determined by the ratio of cumulative costs incurred to date to estimated total contract costs at completion, multiplied by the total estimated contract revenue, less cumulative revenue recognized in prior periods. Changes in estimates affecting sales, costs and profits are recognized in the period in which the change becomes known using the cumulative catch-up method of accounting, resulting in the cumulative effect of changes reflected in the period. Estimates are reviewed and updated quarterly for substantially all contracts. A significant change in an estimate on one or more contracts could have a material effect on our results of operations.

Occasionally, it is appropriate to combine or segment contracts. Contracts are combined in those limited circumstances when they are negotiated as a package in the same economic environment with an overall profit margin objective and constitute, in essence, an agreement to do a single project. In such cases, revenue and costs are recognized over the performance period of the combined contracts as if they were one. Contracts are segmented in limited circumstances if the customer had the right to accept separate elements of the contract and the total amount of the proposals on the separate components approximated the amount of the proposal on the entire project. For segmented contracts, revenue and costs are recognized as if they were separate contracts over the performance periods of the individual elements or phases.

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Contract costs include only allocable, allowable and reasonable costs, as determined in accordance with the Federal Acquisition Regulations and the related Cost Accounting Standards for applicable U.S. Government contracts, and are included in cost of sales when incurred. The nature of these costs includes development engineering costs and product manufacturing costs including direct material, direct labor, other direct costs and indirect overhead costs. Contract profit is recorded as a result of the revenue recognized less costs incurred in any reporting period. Amounts representing performance incentives, penalties, contract claims or change orders are considered in estimating revenues, costs and profits when they can be reliably estimated and realization is considered probable. Revenue recognized on contracts for unresolved claims or unapproved contract change orders was not material for 2016, 2015 or 2014.

For contracts with anticipated losses at completion, a provision for the entire amount of the estimated remaining loss is charged against income in the period in which the loss becomes known. Contract losses are determined considering all direct and indirect contract costs, exclusive of any selling, general or administrative cost allocations that are treated as period expenses. Loss reserves are more common on firm fixed-price contracts that involve, to varying degrees, the design and development of new and unique controls or control systems to meet the customers' specifications.

As units are delivered or services are performed: In 2016, 66% of our sales were recognized as units were delivered or as service obligations were satisfied. Revenue is recognized when the risks and rewards of ownership and title to the product are transferred to the customer. When engineering or similar services are performed, revenue is recognized upon completion of the obligation including any delivery of engineering drawings or technical data. This method of revenue recognition is predominantly used within the Industrial Systems and Components segments, as well as with aftermarket activity. Profits are recorded as costs are relieved from inventory and charged to cost of sales and as revenue is recognized. Inventory costs include all product manufacturing costs such as direct material, direct labor, other direct costs and indirect overhead cost allocations.

Shipping and Handling Costs: Shipping and handling costs are included in cost of sales.

Research and Development: Research and development costs are expensed as incurred and include salaries, benefits, consulting, material costs and depreciation.

Bid and Proposal Costs: Bid and proposal costs are expensed as incurred and classified as selling, general and administrative expenses.

Equity-Based Compensation: Our stock-based compensation plans allow for various types of stock-based incentive awards. The types and mix of stock-based incentive awards are evaluated on an on-going basis and may vary based on our overall strategy regarding compensation. Equity-based compensation expense is based on share-based payment awards that are ultimately expected to vest over the requisite services periods and are based on the fair value of the award measured on the grant date. Vesting requirements vary for directors, officers and key employees. In general, awards granted to officers and key employees principally vest over three years, in equal annual installments for time-based awards and in three years cliff vest for performance-based awards. Equity-based compensation expense is included in selling, general and administrative expenses.

Earnings Per Share: Basic and diluted weighted-average shares outstanding are as follows:

	2016	2015	2014
Basic weighted-average shares outstanding	36,277,445	38,945,880	44,362,412
Dilutive effect of equity-based awards	251,899	388,640	590,025
Diluted weighted-average shares outstanding	36,529,344	39,334,520	44,952,437

Cash and Cash Equivalents: All highly liquid investments with an original maturity of three months or less are considered cash equivalents.

Allowance for Doubtful Accounts: The allowance for doubtful accounts is based on our assessment of the collectibility of customer accounts. The allowance is determined by considering factors such as historical experience, credit quality, age of the accounts receivable balances and current economic conditions that may affect a customer's ability to pay.

Inventories: Inventories are stated at the lower-of-cost-or-market with cost determined on the first-in, first-out (FIFO) method of valuation.

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Property, Plant and Equipment: Property, plant and equipment are stated at cost. Plant and equipment are depreciated principally using the straight-line method over the estimated useful lives of the assets, generally ranging from 15 to 40 years for buildings and improvements, 5 to 15 years for machinery and equipment and 3 to 7 years for computer equipment and software. Leasehold improvements are amortized on a straight-line basis over the term of the lease or the estimated useful life of the asset, whichever is shorter.

Goodwill: We test goodwill for impairment at the reporting unit level on an annual basis or more frequently if an event occurs or circumstances change that indicate that the fair value of a reporting unit is likely to be below its carrying amount. We also test goodwill for impairment when there is a change in reporting units.

We may elect to perform a qualitative assessment that considers economic, industry and company-specific factors for all or selected reporting units. If, after completing this assessment, it is determined that it is more likely than not that the fair value of a reporting unit is less than its carrying value, we proceed to a quantitative test. We may also elect to perform a quantitative test instead of a qualitative test for any or all of our reporting units.

Quantitative testing requires a comparison of the fair value of each reporting unit to its carrying value. We typically use the discounted cash flow method to estimate the fair value of our reporting units. The discounted cash flow method incorporates various assumptions, the most significant being projected revenue growth rates, operating margins and cash flows, the terminal growth rate and the weighted-average cost of capital. If the carrying value of the reporting unit exceeds its fair value, goodwill is considered impaired and any loss must be measured. To determine the amount of the impairment loss, the implied fair value of goodwill is determined by assigning a fair value to all of the reporting unit's assets and liabilities, including any unrecognized intangible assets, as if the reporting unit had been acquired in a business combination at fair value. If the carrying amount of the reporting unit goodwill exceeds the implied fair value of that goodwill, an impairment loss would be recognized in an amount equal to that excess.

We recorded a $4,800 goodwill impairment charge in 2016 in the additive manufacturing reporting unit within our Space and Defense Controls segment.

There were no impairment charges recorded in 2015 or 2014.

Acquired Intangible Assets: Acquired identifiable intangible assets are recorded at cost and are amortized over their estimated useful lives.

Impairment of Long-Lived Assets: Long-lived assets, including acquired identifiable intangible assets, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of those assets may not be recoverable. We use undiscounted cash flows to determine whether impairment exists and measure any impairment loss using discounted cash flows

In 2016, we recorded $4,913 of impairment charges in our Aircraft Controls segment. These charges primarily related to intangible assets as a result of restructuring actions taken for a product line we are no longer pursuing. These charges are included in restructuring in the consolidated statements of earnings

In 2015, we recorded $2,432 of impairment charges in our Industrial Systems segment. These charges primarily related to intangible assets from a wind energy product line and are included as other expense. We also recorded an additional $472 impairment charge related to intangible assets on the product line we decided to exit in 2014, included as restructuring in the consolidated statements of earnings.

In 2014, as a result of restructuring plans we recorded a $739 impairment charge in our Industrial Systems segment related to intangible assets from a product line we decided to exit. We also recorded a $1,296 impairment charge in our Components segment related to equipment from a product line we are no longer pursuing. Both of these charges are included as restructuring in the consolidated statements of earnings.

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Product Warranties: In the ordinary course of business, we warrant our products against defect in design, materials and workmanship typically over periods ranging from twelve to sixty months. We determine warranty reserves needed by product line based on historical experience and current facts and circumstances. Activity in the warranty accrual is summarized as follows:

	2016	2015	2014
Warranty accrual at beginning of period	$18,660	$19,953	$17,429
Warranties issued during current year	13,272	9,666	12,611
Adjustments to pre-existing warranties	(1,463)	(2,416)	(2,037)
Reductions for settling warranties	(8,486)	(7,448)	(7,759)
Foreign currency translation	(620)	(1,095)	(291)
Warranty accrual at end of period	$21,363	$18,660	$19,953

Financial Instruments: Our financial instruments consist primarily of cash and cash equivalents, receivables, notes payable, accounts payable, long-term debt, interest rate swaps and foreign currency contracts. The carrying values for our financial instruments approximate fair value with the exception at times of long-term debt. We do not hold or issue financial instruments for trading purposes.

We carry derivative instruments on the consolidated balance sheets at fair value, determined by reference to quoted market prices. The accounting for changes in the fair value of a derivative instrument depends on whether it has been designated and qualifies as part of a hedging relationship and, if so, the reason for holding it. Our use of derivative instruments is generally limited to cash flow hedges of certain interest rate risks and minimizing foreign currency exposure on foreign currency transactions, which are typically designated in hedging relationships, and intercompany balances, which are not designated as hedging instruments. Cash flows resulting from forward contracts are accounted for as hedges of identifiable transactions or events and classified in the same category as the cash flows from the items being hedged.

Reclassifications: Certain prior year amounts have been reclassified to conform to current year's presentation. During 2016, we made a change to our segment reporting to include Medical Devices within our Components segment. The Goodwill, Restructuring and Segment footnotes have been restated to reflect this change.

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Recent Accounting Pronouncements:

Standard	Description	Financial Statement Effect or Other Significant Matters
ASU no. 2014-09 Revenue from Contracts with Customers (And All Related ASUs)	The standard requires revenue recognition to depict the transfer of 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 standard also requires additional disclosures about the nature, amount, timing and uncertainty of revenue and cash flows arising from customer contracts, including significant judgments and assets recognized from costs incurred to obtain or fulfill a contract. The provisions of the standard, as well as all subsequently issued clarifications to the standard, are effective for fiscal years beginning after December 15, 2017 and interim periods within those fiscal years. The standard can be adopted using either a full retrospective or modified retrospective approach.	We are currently evaluating the alternative methods of adoption and the effect on our financial statements and related disclosures. Date of adoption: Q1 2019
ASU no. 2015-17 Balance Sheet Classification of Deferred Taxes	The standard amends existing guidance to require presentation of deferred tax assets and liabilities as noncurrent within the balance sheet. The provisions of the standard are effective for fiscal years beginning after December 15, 2016 and interim periods within those fiscal years. Early adoption is permitted, and may be applied either prospectively or retrospectively.	Deferred income tax balances currently included in total current assets and total current liabilities in our balance sheet will be included in other assets and long term deferred income taxes. Date of early adoption: anticipated Q1 2017
ASU no. 2016-01 Recognition and Measurement of Financial Assets and Financial Liabilities	The standard requires most equity investments be measured at fair value, with subsequent changes in fair value recognized in net income. The amendment also impacts the measurement of financial liabilities under the fair value option as well as certain presentation and disclosure requirements for financial instruments. The provisions of the standard are effective for fiscal years beginning after December 15, 2017 and interim periods within those fiscal years. Early adoption is permitted for some, but not all, provisions. The amendment requires certain provisions to be applied prospectively and others to be applied by means of a cumulative-effect adjustment.	We are currently evaluating the effect on our financial statements and related disclosures. Date of adoption: Q1 2019
ASU no. 2016-02 Leases	The standard requires most lease arrangements to be recognized in the balance sheet as lease assets and lease liabilities. The standard also requires additional disclosures about the leasing arrangements. The provisions of the standard are effective for fiscal years beginning after December 15, 2018 and interim periods within those years. Early adoption is permitted.	We are currently evaluating the effect on our financial statements and related disclosures. Date of adoption: Q1 2020

We consider the applicability and impact of all ASUs. ASUs not listed above were assessed and determined to be either not applicable, or had or are expected to have minimal impact on our financial statements and related disclosures.

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Note 2 - Acquisitions and Divestitures

In 2016, we acquired a 70% ownership in Linear Mold and Engineering, a Livonia, Michigan-based company specializing in metal additive manufacturing that provides engineering, manufacturing and production consulting services to customers across a wide range of industries, including aerospace, defense, energy and industrial. The purchase price, net of acquired cash, was $22,765 consisting of $11,016 in cash, issuance of a $1,280 unsecured note and assumption of $10,469 of debt. The acquisition also includes a redeemable noncontrolling interest in the remaining 30%, which is exercisable beginning three years from the date of acquisition. This acquisition is included in our Space and Defense Controls segment. Purchase price allocations for the acquisition are complete.

In 2015, we sold the Rochester, New York and Erie, Pennsylvania life sciences operations of our Components segment for $2,988 in cash.

On November 3, 2016, we sold our Bradford Engineering B.V. operation located in the Netherlands for approximately $1,300 in cash. This operation was included in our Space and Defense Controls segment. This transaction will be recorded in our financial statements in the first quarter of 2017. We are currently evaluating the financial statement impact, which potentially includes an income tax benefit associated with this transaction.

Note 3 - Receivables

Receivables consist of:

	October 1, 2016	October 3, 2015
Accounts receivable	$306,469	$291,188
Long-term contract receivables:		
Amounts billed	130,429	113,565
Unbilled recoverable costs and accrued profits	245,376	286,395
Total long-term contract receivables	375,805	399,960
Other	10,652	12,557
Total receivables	692,926	703,705
Less allowance for doubtful accounts	(4,538)	(5,286)
Receivables	$688,388	$698,419

Under our trade receivables securitization facility (the "Securitization Program"), we securitize certain trade receivables in transactions that are accounted for as secured borrowings. We maintain a subordinated interest in a portion of the pool of trade receivables that are securitized. The retained interest, which is included in receivables in the consolidated balance sheets, is recorded at fair value, which approximates the total amount of the designated pool of accounts receivable. See Note 7, Indebtedness, for additional disclosures related to the Securitization Program.

Long-term contract receivables are primarily associated with prime contractors and subcontractors in connection with U.S. Government contracts, commercial aircraft and satellite manufacturers. Amounts billed under long-term contracts to the U.S. Government were $2,535 at October 1, 2016 and $8,284 at October 3, 2015. Unbilled recoverable costs and accrued profits under long-term contracts to be billed to the U.S. Government were $12,195 at October 1, 2016 and $13,733 at October 3, 2015. Unbilled recoverable costs and accrued profits principally represent revenues recognized on contracts that were not billable on the balance sheet date. These amounts will be billed in accordance with contract terms, generally as certain milestones are reached or upon shipment. Approximately 80% of unbilled amounts are expected to be collected within one year. In situations where billings exceed revenues recognized, the excess is included in customer advances.

There are no material amounts of claims or unapproved change orders included in the consolidated balance sheets. There are no material balances billed but not paid by customers under retainage provisions.

Concentrations of credit risk on receivables are limited to those from significant customers who are believed to be financially sound. Receivables from Boeing were $169,199 at October 1, 2016 and $161,820 at October 3, 2015. We perform periodic credit evaluations of our customers' financial condition and generally do not require collateral.

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Note 4 - Inventories

Inventories, net of reserves, consist of:

	October 1, 2016	October 3, 2015
Raw materials and purchased parts	$174,331	$188,843
Work in progress	235,258	243,373
Finished goods	69,451	61,144
Inventories	$479,040	$493,360

There are no material inventoried costs relating to long-term contracts where revenue is accounted for using the percentage of completion, cost-to-cost method of accounting as of October 1, 2016 and October 3, 2015.

Note 5 - Property, Plant and Equipment

Property, plant and equipment consists of:

	October 1, 2016	October 3, 2015
Land	$28,932	$27,132
Buildings and improvements	408,107	397,340
Machinery and equipment	684,995	669,578
Computer equipment and software	126,144	119,874
Property, plant and equipment, at cost	1,248,178	1,213,924
Less accumulated depreciation and amortization	(725,809)	(677,168)
Property, plant and equipment, net	$522,369	$536,756

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Note 6 - Goodwill and Intangible Assets

The changes in the carrying amount of goodwill are as follows:

	Aircraft Controls	Space and Defense Controls	Industrial Systems	Components	Total
Balance at September 28, 2013	$192,413	$163,136	$121,320	$290,055	$766,924
Adjustments to prior year acquisitions	—	(2,734)	—	—	(2,734)
Foreign currency translation	439	(795)	(3,311)	(2,671)	(6,338)
Balance at September 27, 2014	192,852	159,607	118,009	287,384	757,852
Divestiture	—	—	—	(1,715)	(1,715)
Foreign currency translation	(4,327)	(1,394)	(7,166)	(6,038)	(18,925)
Balance at October 3, 2015	188,525	158,213	110,843	279,631	737,212
Acquisitions	—	21,076	—	—	21,076
Impairment	—	(4,800)	—	—	(4,800)
Foreign currency translation	(8,831)	25	(4,525)	5	(13,326)
Balance at October 1, 2016	$179,694	$174,514	$106,318	$279,636	$740,162

We test goodwill for impairment at least annually, during our fourth quarter. We recorded a $4,800 goodwill impairment charge in 2016 in a reporting unit within our Space and Defense Controls segment, given the business outlook for this reporting unit. We estimated the fair value of this reporting unit principally using a discounted cash flow analysis.

Goodwill in our Medical Devices reporting unit, included in our Components segment, is net of a $38,200 accumulated impairment loss at October 1, 2016.

The components of intangible assets are as follows:

	October 1, 2016			October 3, 2015	
	Weighted-Average Life (years)	Gross Carrying Amount	Accumulated Amortization	Gross Carrying Amount	Accumulated Amortization
Customer-related	11	$165,445	$(117,434)	$171,779	$(110,697)
Technology-related	9	70,277	(52,060)	73,299	(49,723)
Program-related	19	64,774	(26,018)	75,720	(27,463)
Marketing-related	9	25,031	(17,649)	25,997	(16,648)
Other	10	4,269	(3,075)	4,771	(3,312)
Intangible assets	12	$329,796	$(216,236)	$351,566	$(207,843)

Substantially all acquired intangible assets other than goodwill are being amortized. Customer-related intangible assets primarily consist of customer relationships. Technology-related intangible assets primarily consist of technology, patents, intellectual property and software. Program-related intangible assets consist of long-term programs represented by current contracts and probable follow on work. Marketing-related intangible assets primarily consist of trademarks, trade names and non-compete agreements.

Amortization of acquired intangible assets was $21,058 in 2016, $24,708 in 2015 and $29,907 in 2014. Based on acquired intangible assets recorded at October 1, 2016, amortization is estimated to be approximately $18,000 in 2017, $17,000 in 2018, $15,400 in 2019, $13,400 in 2020 and $8,000 in 2021.

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Note 7 - Indebtedness

Short-term borrowings consist of:

	October 1, 2016	October 3, 2015
Lines of credit	$ 99	$ 83
Other short-term debt	1,280	—
Short-term borrowings	$ 1,379	$ 83

We maintain short-term credit facilities with banks throughout the world that are principally demand lines subject to revision by the banks. Interest on outstanding lines of credit is 0.9% at October 1, 2016.

Long-term debt consists of:

	October 1, 2016	October 3, 2015
U.S. revolving credit facility	$590,000	$675,000
Senior notes	300,000	300,000
Securitization program	120,000	100,000
Obligations under capital leases	471	101
Senior debt	1,010,471	1,075,101
Less current installments	(167)	(34)
Long-term debt	$1,010,304	$1,075,067

On June 28, 2016, we amended our U.S. revolving credit facility. The amendment extended the maturity of the credit facility to June 28, 2021. Our U.S. revolving credit facility has a capacity of $1,100,000 and provides an expansion option, which permits us to request an increase of up to $200,000 to the credit facility upon satisfaction of certain conditions. The credit facility is secured by substantially all of our U.S. assets. The loan agreement contains various covenants which, among others, specify interest coverage and maximum leverage and capital expenditures. We are in compliance with all covenants. Interest on all of the outstanding credit facility borrowings is 2.2% and is based on LIBOR plus the applicable margin, which was 1.63% at October 1, 2016.

At October 1, 2016, we had $300,000 aggregate principal amount of 5.25% senior notes due December 1, 2022 with interest paid semiannually on June 1 and December 1 of each year. The senior notes are unsecured obligations, guaranteed on a senior unsecured basis by certain subsidiaries and contain normal incurrence-based covenants and limitations such as the ability to incur additional indebtedness, pay dividends, make other restricted payments and investments, create liens and certain corporate acts such as mergers and consolidations.

On April 15, 2016, we amended the Securitization Program. The amendment increased our borrowing capacity to $120,000 and extended the maturity to April 13, 2018. Under the Securitization Program, we sell certain trade receivables and related rights to an affiliate, which in turn sells an undivided variable percentage ownership interest in the trade receivables to a financial institution, while maintaining a subordinated interest in a portion of the pool of trade receivables. Interest for the Securitization Program is 1.4% at October 1, 2016 and is based on 30-day LIBOR plus an applicable margin. A commitment fee is also charged based on a percentage of the unused amounts available and is not material. The agreement governing the Securitization Program contains restrictions and covenants which include limitations on the making of certain restricted payments, creation of certain liens, and certain corporate acts such as mergers, consolidations and sale of substantially all assets. The Securitization Program has a minimum borrowing requirement equal to the lesser of either 80% of our borrowing capacity or 100% of our borrowing base, which is a subset of the trade receivables sold under this agreement. As of October 1, 2016, our minimum borrowing requirement was $96,000.

Maturities of long-term debt are $167 in 2017, $120,139 in 2018, $133 in 2019, $32 in 2020, $590,000 in 2021 and $300,000 thereafter.

At October 1, 2016, we had pledged assets with a net book value of $1,447,486 as security for long-term debt.

At October 1, 2016, we had $503,164 of unused short and long-term borrowing capacity, including $491,034 from the U.S. revolving credit facility. However, our leverage ratio covenant limits our total borrowing capacity to $417,742 as of October 1, 2016.

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Commitment fees are charged on some of these arrangements and on the U.S. revolving credit facility based on a percentage of the unused amounts available and are not material.

Note 8 - Derivative Financial Instruments

We principally use derivative financial instruments to manage interest rate risk associated with long-term debt and foreign exchange risk related to foreign operations and foreign currency transactions. We enter into derivative financial instruments with a number of major financial institutions to minimize counterparty credit risk.

Derivatives designated as hedging instruments

Interest rate swaps are used to adjust the proportion of total debt that is subject to variable and fixed interest rates. The interest rate swaps are designated as hedges of the amount of future cash flows related to interest payments on variable-rate debt that, in combination with the interest payments on the debt, convert a portion of the variable-rate debt to fixed-rate debt. At October 1, 2016, we had interest rate swaps with notional amounts totaling $185,000. The interest rate swaps effectively convert this amount of variable-rate debt to fixed-rate debt at 2.5%, including the applicable margin of 1.63% as of October 1, 2016. The interest will revert back to variable rates based on LIBOR plus the applicable margin upon the maturity of the interest rate swaps. These interest rate swaps mature at various times between December 5, 2016 and July 8, 2019.

We use foreign currency forward contracts as cash flow hedges to effectively fix the exchange rates on future payments and revenue. To mitigate exposure in movements between various currencies, including the Philippine peso and the British pound, we had outstanding foreign currency forwards with notional amounts of $66,809 at October 1, 2016. These contracts mature at various times through September 28, 2018.

These interest rate swaps and foreign currency forwards are recorded on the consolidated balance sheet at fair value and the related gains or losses are deferred in shareholders' equity as a component of Accumulated Other Comprehensive Income (Loss) (AOCIL). These deferred gains and losses are reclassified into the consolidated statements of earnings during the periods in which the related payments or receipts affect earnings. However, to the extent the interest rate swaps and foreign currency forwards are not perfectly effective in offsetting the change in the value of the payments being hedged, the ineffective portion of these contracts is recognized in earnings immediately. Ineffectiveness was not material in 2016, 2015 or 2014.

Derivatives not designated as hedging instruments

We also have foreign currency exposure on balances, primarily intercompany, that are denominated in a foreign currency and are adjusted to current values using period-end exchange rates. The resulting gains or losses are recorded in the consolidated statements of earnings. To minimize foreign currency exposure, we have foreign currency forwards with notional amounts of $134,350 at October 1, 2016. The foreign currency forwards are recorded in the consolidated balance sheets at fair value and resulting gains or losses are recorded in the consolidated statements of earnings. We recorded a net gain of $6,089 in 2016 and a net loss of $1,344 in 2015 on the foreign currency forwards. These gains and losses are included in other expense and generally offset the gains and losses from the foreign currency adjustments on the intercompany balances that are also included in other income or expense.

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Summary of derivatives

The fair value and classification of derivatives is summarized as follows:

		October 1, 2016	October 3, 2015
Derivatives designated as hedging instruments:			
Foreign currency contracts	Other current assets	$379	$12
Foreign currency contracts	Other assets	56	39
Interest rate swaps	Other current assets	52	—
Interest rate swaps	Other assets	69	—
	Total asset derivatives	$556	$51
Foreign currency contracts	Other accrued liabilities	$4,080	$1,755
Foreign currency contracts	Other long-term liabilities	448	572
Interest rate swaps	Other accrued liabilities	201	756
Interest rate swaps	Other long-term liabilities	—	268
	Total liability derivatives	$4,729	$3,351
Derivatives not designated as hedging instruments:			
Foreign currency contracts	Other current assets	$422	$115
Foreign currency contracts	Other accrued liabilities	$76	$429

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Note 9 - Fair Value

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Depending on the nature of the asset or liability, various techniques and assumptions can be used to estimate fair value. The definition of the fair value hierarchy is as follows:

Level 1 – Quoted prices in active markets for identical assets and liabilities.

Level 2 – Observable inputs other than quoted prices in active markets for similar assets and liabilities.

Level 3 – Inputs for which significant valuation assumptions are unobservable in a market and therefore value is based on the best available data, some of which is internally developed and considers risk premiums that a market participant would require.

Our derivatives are valued using various pricing models or discounted cash flow analyses that incorporate observable market data, such as interest rate yield curves and currency rates, and are classified as Level 2 within the valuation hierarchy.

The following table presents the fair values and classification of our financial assets and liabilities measured on a recurring basis, all of which are classified as Level 2:

	Classification	October 1, 2016	October 3, 2015
Foreign currency contracts	Other current assets	$ 801	$ 127
Foreign currency contracts	Other assets	56	39
Interest rate swaps	Other current assets	52	—
Interest rate swaps	Other assets	69	—
	Total assets	$ 978	$ 166
Foreign currency contracts	Other accrued liabilities	$ 4,156	$ 2,184
Foreign currency contracts	Other long-term liabilities	448	572
Interest rate swaps	Other accrued liabilities	201	756
Interest rate swaps	Other long-term liabilities	—	268
	Total liabilities	$ 4,805	$ 3,780

Our only financial instrument for which the carrying value differs from its fair value is long-term debt. At October 1, 2016, the fair value of long-term debt was $1,015,361 compared to its carrying value of $1,010,471. The fair value of long-term debt is classified as Level 2 within the fair value hierarchy and was estimated based on quoted market prices.

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Note 10 - Restructuring

In 2016, we initiated further restructuring actions in conjunction with exiting a product line within Aircraft Controls in the U.S. and a facility in the U.K. We have also taken actions as a result of the business outlook in specific markets and locations in Components and Industrial Systems. Those actions have resulted in workforce reductions in Canada, Europe and the U.S. for Components and will result in workforce reductions primarily in Europe for Industrial Systems.

In 2015, we initiated additional restructuring plans as a result of ongoing reviews of our lines of business and operations. The restructuring actions taken resulted in workforce reductions, primarily in the U.S., Europe and Asia.

In 2014, we initiated restructuring plans in response to the business outlook. The restructuring actions taken resulted in workforce reductions, primarily in the U.S. and Europe.

The restructuring charge in 2016 consists of $9,117 for severance, $4,913 of non-cash charges for the impairment of long-lived assets in our Aircraft Controls segment and $1,363 for facility closure. The restructuring charge in 2015 principally relates to severance, but also includes $3,773 related to the termination of a sales and marketing contract and $472 for the impairment of long-lived assets in our Industrial Systems segment. Restructuring expense in 2014 principally relates to severance, but also includes $1,296 for the impairment of long-lived assets in our Components segment and $739 for the impairment of long-lived assets in our Industrial Systems segment.

Restructuring activity for severance and other costs by segment and reconciliation to consolidated amounts is as follows:

	Aircraft Controls	Space and Defense Controls	Industrial Systems	Components	Corporate	Total
Balance at September 28, 2013	$ 36	$ 4,376	$ 2,717	$ —	$ —	$ 7,129
Charged to expense - 2014 plan	5,440	5,438	739	1,296	—	12,913
Cash payments - 2013 plan	(35)	(4,014)	(2,452)	—	—	(6,501)
Non-cash charges - 2014 plan	—	—	(739)	(1,296)	—	(2,035)
Foreign currency translation	(2)	(36)	(79)	—	—	(117)
Balance at September 27, 2014	5,439	5,764	186	—	—	11,389
Charged to expense - 2015 plan	2,955	6,324	5,150	1,020	—	15,449
Adjustments to provision	(407)	(309)	—	—	—	(716)
Cash payments - 2013 plan	—	(490)	—	—	—	(490)
Cash payments - 2014 plan	(4,833)	(3,822)	(178)	—	—	(8,833)
Cash payments - 2015 plan	(80)	(167)	(679)	(761)	—	(1,687)
Non-cash charges - 2015 plan	—	—	(472)	—	—	(472)
Foreign currency translation	(27)	(63)	(4)	—	—	(94)
Balance at October 3, 2015	3,047	7,237	4,003	259	—	14,546
Charged to expense - 2016 plan	7,317	—	4,824	1,525	1,727	15,393
Adjustments to provision	(275)	(328)	(243)	(5)	—	(851)
Cash payments - 2014 plan	(72)	(776)	—	—	—	(848)
Cash payments - 2015 plan	(2,342)	(5,455)	(3,088)	(234)	—	(11,119)
Cash payments - 2016 plan	(1,244)	—	(2,015)	(1,176)	—	(4,435)
Non-cash charges - 2016 plan	(4,913)	—	—	—	—	(4,913)
Foreign currency translation	(44)	(13)	130	—	—	73
Balance at October 1, 2016	$ 1,474	$ 665	$ 3,611	$ 369	$ 1,727	$ 7,846

As of October 1, 2016, the restructuring accrual consists of $605 for the 2014 plan, $457 for the 2015 plan and $6,784 for the 2016 plan. Restructuring for all plans is expected to be paid by September 30, 2017, except portions classified as long-term liabilities based on payment arrangements.

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Note 11 - Employee Benefit Plans

We maintain multiple employee benefit plans, covering employees at certain locations.

Our qualified U.S. defined benefit pension plan is not open to new entrants. New employees are not eligible to participate in the pension plan. Instead, we make contributions for those employees to an employee-directed investment fund in the Moog Inc. Retirement Savings Plan ("RSP"). The Company's contributions are based on a percentage of the employee's eligible compensation and age. These contributions are in addition to the employer match on voluntary employee contributions.

The RSP includes an Employee Stock Ownership Plan. As one of the investment alternatives, participants in the RSP can acquire our stock at market value. We match 25% of the first 2% of eligible compensation contributed to any investment selection. Shares are allocated and compensation expense is recognized as the employer share match is earned. At October 1, 2016, the participants in the RSP owned 1,839,185 Class B shares.

The changes in projected benefit obligations and plan assets and the funded status of the U.S. and non-U.S. defined benefit plans are as follows:

	U.S. Plans		Non-U.S. Plans	
	2016	2015	2016	2015
Change in projected benefit obligation:				
Projected benefit obligation at prior year measurement date	$850,991	$784,203	$180,111	$188,942
Service cost	23,637	23,635	5,204	6,087
Interest cost	37,659	34,031	4,928	4,814
Contributions by plan participants	—	—	863	774
Actuarial losses	96,107	35,064	38,265	4,639
Foreign currency exchange impact	—	—	(4,063)	(19,149)
Benefits paid from plan assets	(24,710)	(22,612)	(1,632)	(2,186)
Benefits paid by Moog	(2,754)	(2,508)	(2,429)	(2,312)
Other	(1,875)	(822)	(1,939)	(1,498)
Projected benefit obligation at measurement date	$979,055	$850,991	$219,308	$180,111
Change in plan assets:				
Fair value of assets at prior year measurement date	$578,783	$585,677	$117,693	$120,754
Actual return on plan assets	57,646	(28,435)	19,926	4,437
Employer contributions	67,928	47,666	6,155	8,208
Contributions by plan participants	—	—	863	774
Benefits paid	(27,464)	(25,120)	(4,061)	(4,498)
Foreign currency exchange impact	—	—	(3,801)	(10,983)
Other	(1,875)	(1,005)	(1,336)	(999)
Fair value of assets at measurement date	$675,018	$578,783	$135,439	$117,693
Funded status and amount recognized in assets and liabilities	$(304,037)	$(272,208)	$(83,869)	$(62,418)
Amount recognized in assets and liabilities:				
Other assets - non-current	$—	$—	$108	$220
Accrued and long-term pension liabilities	(304,037)	(272,208)	(83,977)	(62,638)
Amount recognized in assets and liabilities	$(304,037)	$(272,208)	$(83,869)	$(62,418)
Amount recognized in AOCIL, before taxes:				
Prior service cost (credit)	$694	$881	$(1,269)	$(737)
Actuarial losses	449,377	386,759	57,926	38,869
Amount recognized in AOCIL, before taxes	$450,071	$387,640	$56,657	$38,132

U.S. plan assets included 149,022 shares of Class A common stock and 1,001,034 shares of Class B common stock.

Our funding policy is to contribute at least the amount required by law in the respective countries.

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The total accumulated benefit obligation as of the measurement date for all defined benefit pension plans was $1,105,973 in 2016 and $941,266 in 2015. At the measurement date in 2016, our plans had fair values of plan assets totaling $810,457. At the measurement date in 2016, three of our plans had fair values of plan assets totaling $65,706, which exceeded their accumulated benefit obligations of $60,939. At the measurement date in 2015, three of our plans had fair values of plan assets totaling $62,070, which exceeded their accumulated benefit obligations of $54,603. The following table provides aggregate information for the other pension plans, which have projected benefit obligations or accumulated benefit obligations in excess of plan assets:

	October 1, 2016	October 3, 2015
Projected benefit obligation	$1,128,524	$968,848
Accumulated benefit obligation	1,045,034	886,663
Fair value of plan assets	744,751	634,406

Weighted-average assumptions used to determine benefit obligations as of the measurement dates and weighted-average assumptions used to determine net periodic benefit cost are as follows:

	U.S. Plans			Non-U.S. Plans		
	2016	2015	2014	2016	2015	2014
Assumptions for net periodic benefit cost:						
Discount rate	4.5%	4.4%	5.0%	3.0%	3.1%	3.7%
Return on assets	7.7%	8.0%	8.4%	4.1%	4.5%	4.1%
Rate of compensation increase	4.1%	4.1%	4.1%	2.6%	3.0%	2.8%
Assumptions for benefit obligations:						
Discount rate	3.8%	4.5%	4.4%	1.9%	3.0%	3.1%
Rate of compensation increase	3.5%	4.1%	4.1%	2.3%	3.0%	2.7%

Beginning in 2017, we will change the method used to estimate the service and interest cost components of net periodic pension cost. The new method uses the spot yield curve approach to estimate the service and interest costs by applying the specific spot rates along the yield curve used to determine the benefit obligation to the relevant projected cash outflows. Previously, these cost components were determined using a single-weighted average discount rate. This change does not affect the measurement of the projected benefit obligation.

We have made this change to provide a more precise measurement of service and interest costs by improving the correlation between projected benefit cash flows to the corresponding spot yield curve rates. We have accounted for this change as a change in accounting estimate and accordingly have accounted for it prospectively. The more granular application of the spot rates will reduce the service and interest cost for the annual net periodic pension expense in 2017 by approximately $7,000. The spot rates used to determine service and interest costs for our plans ranged from 1.26% to 4.30%, which results in a 3.96% service cost discount rate and a 3.21% interest cost discount rate to determine 2017 expense. Had this approach been applied to 2016 expense, these rates would have resulted in weighted-average rates for service and interest costs of 3.88% and 4.72%, respectively.

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Pension plan investment policies and strategies are developed on a plan specific basis, which varies by country. The overall objective for the long-term expected return on both domestic and international plan assets is to earn a rate of return over time to meet anticipated benefit payments in accordance with plan provisions. The long-term investment objective of both the domestic and international retirement plans is to maintain the economic value of plan assets and future contributions by producing positive rates of investment return after subtracting inflation, benefit payments and expenses. Each of the plan's strategic asset allocations is based on this long-term perspective and short-term fluctuations are viewed with appropriate perspective.

The U.S. qualified defined benefit plan's assets are invested for long-term investment results. To accommodate the long-term investment horizon while providing appropriate liquidity, the plan maintains a liquid cash reserve of one-month to three-months of benefit distributions. Its assets are broadly diversified to help alleviate the risk of adverse returns in any one security or investment class. The international plans' assets are invested in both low-risk and high-risk investments in order to achieve the long-term investment strategy objective. Investment risks for both domestic and international plans are considered within the context of the entire plan, rather than on a security-by-security basis.

The U.S. qualified defined benefit plan and certain international plans have investment committees that are responsible for formulating investment policies, developing manager guidelines and objectives and approving and managing qualified advisors and investment managers. The guidelines established for each of the plans define permitted investments within each asset class and apply certain restrictions such as limits on concentrated holdings in order to meet overall investment objectives.

Pension obligations and the related costs are determined using actuarial valuations that involve several assumptions. The return on assets assumption reflects the average rate of return expected on funds invested or to be invested to provide for the benefits included in the projected benefit obligation. In determining the return on assets assumption, we consider the relative weighting of plan assets, the historical performance of total plan assets and individual asset classes and economic and other indicators of future performance. Asset management objectives include maintaining an adequate level of diversification to reduce interest rate and market risk and to provide adequate liquidity to meet immediate and future benefit payment requirements.

In determining our U.S. pension expense for 2016, we assumed an average rate of return on U.S. pension assets of approximately 7.7% measured over a planning horizon with reasonable and acceptable levels of risk. The rate of return assumed an average of 50% in equity securities, 40% in fixed income securities and 10% in other securities. In determining our non-U.S. pension expense for 2016, we assumed an average rate of return on non-U.S. pension assets of approximately 4.1% measured over a planning horizon with reasonable and acceptable levels of risk. The rate of return assumed an average asset allocation of 30% in equity securities and 70% in fixed income securities.

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The weighted average asset allocations by asset category for the pension plans as of October 1, 2016 and October 3, 2015 are as follows:

	U.S. Plans			Non-U.S. Plans		
	Target	2016 Actual	2015 Actual	Target	2016 Actual	2015 Actual
Asset category:						
Equity	20%-50%	55%	59%	30%-50%	32%	30%
Debt	35%-60%	36%	31%	40%-60%	36%	42%
Real estate and other	10%-20%	9%	10%	10%-30%	32%	28%

The following tables present the consolidated plan assets using the fair value hierarchy, which is described in Note 9 - Fair Value, as of October 1, 2016 and October 3, 2015.

U.S. Plans, October 1, 2016	Level 1	Level 2	Level 3	Total
Shares of registered investment companies:				
Non-investment grade	$—	$45,709	$—	$45,709
Real assets	—	37,337	—	37,337
Other	—	177,037	—	177,037
Fixed income funds:				
U.S. Government obligations	—	23,867	—	23,867
Corporate and other	—	230	—	230
Employer securities	68,574	—	—	68,574
Interest in common collective trusts	—	237,032	—	237,032
Money market funds	—	18,962	—	18,962
Limited partnerships	—	—	44,003	44,003
Insurance contracts and other	—	—	22,267	22,267
Fair value	$68,574	$540,174	$66,270	$675,018

Non-U.S. Plans, October 1, 2016	Level 1	Level 2	Level 3	Total
Shares of registered investment companies	$—	$6,523	$—	$6,523
Domestic equity	7,616	—	—	7,616
International equity	10,562	—	—	10,562
Fixed income funds	6,246	23,574	—	29,820
Unit linked life insurance funds	—	36,889	—	36,889
Cash and cash equivalents	73	553	—	626
Insurance contracts and other	—	789	42,614	43,403
Fair value	$24,497	$68,328	$42,614	$135,439

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U.S. Plans, October 3, 2015	Level 1	Level 2	Level 3	Total
Shares of registered investment companies:				
Non-investment grade	$—	$38,517	$—	$38,517
Real assets	—	35,647	—	35,647
Other	—	78,102	—	78,102
Fixed income funds:				
U.S. Government obligations	—	64,441	—	64,441
Corporate and other	—	106,120	—	106,120
Employer securities	62,214	—	—	62,214
Interest in common collective trusts	—	88,870	—	88,870
Money market funds	—	16,887	—	16,887
Limited partnerships	—	—	64,760	64,760
Insurance contracts and other	—	—	23,225	23,225
Fair value	$62,214	$428,584	$87,985	$578,783

Non-U.S. Plans, October 3, 2015	Level 1	Level 2	Level 3	Total
Shares of registered investment companies	$—	$3,683	$—	$3,683
Domestic equity	6,142	209	—	6,351
International equity	8,806	—	—	8,806
Fixed income funds	5,615	24,131	—	29,746
Unit linked life insurance funds	—	38,260	—	38,260
Cash and cash equivalents	252	880	—	1,132
Insurance contracts and other	—	779	28,936	29,715
Fair value	$20,815	$67,942	$28,936	$117,693

The following is a roll forward of the consolidated plan assets classified as Level 3 within the fair value hierarchy:

	U.S. Plans	Non-U.S. Plans	Total
Balance at September 27, 2014	$103,717	$ 30,183	$133,900
Return on assets	849	1,083	1,932
Purchases from contributions to Plans	39,188	3,118	42,306
Proceeds from sales of investments	(54,479)	—	(54,479)
Settlements paid in cash	(1,290)	(1,985)	(3,275)
Foreign currency translation	—	(3,463)	(3,463)
Balance at October 3, 2015	87,985	28,936	116,921
Return on assets	(704)	11,723	11,019
Purchases from contributions to Plans	12,366	3,472	15,838
Proceeds from sales of investments	(30,695)	—	(30,695)
Settlements paid in cash	(2,682)	(2,231)	(4,913)
Foreign currency translation	—	714	714
Balance at October 1, 2016	$66,270	$ 42,614	$108,884

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The valuation methodologies used for pension plan assets measured at fair value have been applied consistently. Cash and cash equivalents consist of direct cash holdings and institutional short-term investment vehicles. Direct cash holdings are valued at cost, which approximates fair value. Institutional short-term investment vehicles are valued daily. Investments in U.S. Government obligations are valued by a pricing service based upon closing market prices at year end. Shares of registered investment companies are valued at net asset value of shares held by the plan at year end. Common stocks traded on national exchanges are valued at the last reported sales price. Investments denominated in foreign currencies are translated into U.S. dollars using the last reported exchange rate. Fixed income funds are valued using methods, such as dealer quotes, available trade information, spreads, bids and offers provided by a pricing vendor. Investments in insurance contracts are valued at contract value, which is the fair value of the underlying investment of the insurance company. Securities or other assets for which market quotations are not readily available or for which market quotations do not represent the value at the time of pricing (including certain illiquid securities) are fair valued in accordance with procedures established under the supervision and responsibility of the Custodian of that investment. Such procedures may include the use of independent pricing services or affiliated advisor pricing, which use prices based upon yields or prices of securities of comparable quality, coupon, maturity and type, indications as to values from dealers, operating data and general market conditions.

The following table summarizes investments measured at fair value based on net asset value (NAV) per share as of October 1, 2016:

	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
Interest in common collective trusts (1)	$ —	Daily, Weekly	0-5 days
Insurance contracts and other (2)	—	Quarterly	60-90 days
Limited partnerships (3)	7,052	Varies	10-45 days
Total	$ 7,052		

(1) Interest in common collective trusts consist of pools of investments used by institutional investors to obtain exposure to equity and fixed income markets. Common collective trusts held by us invest primarily in investment grade fixed income securities, common stock and real property assets.

(2) Insurance contracts and other includes hedge funds held by us, which invest primarily in global equity long and short positions. The primary strategy for the hedge funds is to seek risk-adjusted returns with volatility lower than the broad equity markets primarily through long and short investment opportunities in the global markets.

(3) Investments in limited partnerships held by us invest primarily in emerging markets, equity and equity related securities. The strategy for the partnerships is to have exposure to certain markets or to securities that are judged to achieve superior earnings growth and/or judged undervalued relative to intrinsic value.

The preceding methods may produce a fair value calculation that may not be indicative of net realizable value or reflective of future fair values. Furthermore, although we believe the valuation methods are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different fair value measurement at the reporting date.

Pension expense for all defined benefit plans is as follows:

	U.S. Plans			Non-U.S. Plans		
	2016	2015	2014	2016	2015	2014
Service cost	$23,637	$23,635	$21,571	$5,204	$6,087	$5,533
Interest cost	37,659	34,031	33,354	4,928	4,814	5,984
Expected return on plan assets	(50,383)	(47,136)	(43,374)	(4,862)	(5,166)	(4,487)
Amortization of prior service cost (credit)	187	149	149	(103)	(70)	(57)
Amortization of actuarial loss	26,168	22,355	16,346	2,600	2,289	1,398
Settlement loss	59	54	37	131	77	—
Pension expense for defined benefit plans	$37,327	$33,088	$28,083	$7,898	$8,031	$8,371

The estimated net prior service cost and net actuarial loss that will be amortized from accumulated other comprehensive loss into net periodic benefit cost for pension plans in 2017 are $71 and $38,264, respectively.

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Benefits expected to be paid to the participants of the plans are:

	U.S. Plans	Non-U.S. Plans
2017	$ 31,020	$ 5,305
2018	34,368	5,814
2019	37,030	6,229
2020	40,106	5,692
2021	43,557	6,476
Five years thereafter	266,881	42,631

We presently anticipate contributing approximately $63,200 to the U.S. plans and $7,000 to the non-U.S. plans in 2017.

Pension expense for the defined contribution plans consists of:

	2016	2015	2014
U.S. defined contribution plans	$14,128	$13,621	$13,196
Non-U.S. defined contribution plans	6,029	6,570	6,458
Total pension expense for defined contribution plans	$20,157	$20,191	$19,654

We provide postretirement health care benefits to certain domestic retirees, who were hired prior to October 1, 1989. There are no plan assets. The changes in the accumulated benefit obligation of this unfunded plan for 2016 and 2015 are shown in the following table:

	October 1, 2016	October 3, 2015
Change in Accumulated Postretirement Benefit Obligation (APBO):		
APBO at prior year measurement date	$12,532	$15,331
Service cost	161	226
Interest cost	468	576
Contributions by plan participants	1,944	2,228
Benefits paid	(3,043)	(2,795)
Actuarial losses (gains)	763	(3,034)
APBO at measurement date	$12,825	$12,532
Funded status	$(12,825)	$(12,532)
Accrued postretirement benefit liability	$12,825	$12,532
Amount recognized in AOCIL, before taxes:		
Actuarial gains	3,896	5,232
Amount recognized in AOCIL, before taxes	$3,896	$5,232

The cost of the postretirement benefit plan is as follows:

	2016	2015	2014
Service cost	$161	$226	$225
Interest cost	468	576	624
Amortization of actuarial gain	(572)	(106)	(261)
Net periodic postretirement benefit cost	$57	$696	$588

As of the measurement date, the assumed discount rate used in the accounting for the postretirement benefit obligation was 3.2% in 2016, 3.9% in 2015 and 3.9% in 2014. As of the measurement date, the assumed discount rate used in the accounting for the net periodic postretirement benefit cost was 3.9% in 2016, 4.5% in 2015 and 4.5% in 2014.

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For measurement purposes, a 6.8%, 6.6% and 6.9% annual per capita rate of increase of medical and drug costs before age 65, medical costs after age 65 and drug costs after age 65, respectively, were assumed for 2017, all gradually decreasing to 4.5% for 2028 and years thereafter. A one percentage point increase in this rate would increase our accumulated postretirement benefit obligation as of the measurement date in 2016 by $358, while a one percentage point decrease in this rate would decrease our accumulated postretirement benefit obligation by $311. There would be no material effect on the total service cost and interest cost components of the net periodic postretirement benefit cost given a one percentage point increase or decrease in this rate.

Employee and management profit sharing reflects a discretionary payment based on our financial performance. Profit share expense was $16,656, $13,188 and $22,030 in 2016, 2015 and 2014, respectively.

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Note 12 - Income Taxes

The reconciliation of the provision for income taxes to the amount computed by applying the U.S. federal statutory tax rate to earnings before income taxes is as follows:

	2016	2015	2014
Earnings before income taxes:			
Domestic	$82,848	$78,074	$106,671
Foreign	90,012	105,760	112,252
Total	$172,860	$183,834	$218,923
Federal statutory income tax rate	35.0 %	35.0 %	35.0 %
Increase (decrease) in income taxes resulting from:			
Repatriated earnings	26.8 %	—	—
R&D and foreign tax credits	(30.6)%	(2.7)%	(1.2)%
Foreign tax rates	(2.7)%	(4.8)%	(5.2)%
Export and manufacturing incentives	(1.0)%	(0.7)%	(0.8)%
Change in enacted tax rates	(0.9)%	(0.3)%	(0.5)%
State taxes, net of federal benefit	0.5 %	0.8 %	1.0 %
Change in valuation allowance for deferred taxes	0.9 %	1.1 %	0.6 %
Other	0.5 %	(0.1)%	(1.2)%
Effective income tax rate	28.5 %	28.3 %	27.7 %

At October 1, 2016, foreign tax benefit carryforwards total $38,132. Domestic benefit carryforwards total $27,404, including $20,956 of state tax losses. We also have $3,779 of state tax credit carryforwards. Some of these tax benefit carryforwards do not expire and can be used to reduce current taxes otherwise due on future earnings of those subsidiaries. The change in the valuation allowance relates to tax benefit carryforwards reflecting recent and projected financial performance, tax planning strategies and statutory tax carryforward periods.

During 2016, we repatriated $90,937 of earnings from various foreign subsidiaries and the tax expense was completely offset by foreign tax credits.

No provision has been made for U.S. federal or foreign taxes on that portion of certain foreign subsidiaries' undistributed earnings ($857,447 at October 1, 2016) considered to be permanently reinvested. It is not practicable to determine the amount of tax that would be payable if these amounts were repatriated to the U.S.

The components of income taxes are as follows:

	2016	2015	2014
Current:			
Federal	$12,812	$12,065	$25,325
Foreign	29,794	25,844	28,074
State	2,373	1,051	2,305
Total current	44,979	38,960	55,704
Deferred:			
Federal	10,078	10,800	5,034
Foreign	(4,734)	882	(1,148)
State	(1,096)	1,309	1,135
Total deferred	4,248	12,991	5,021
Income taxes	$49,227	$51,951	$60,725

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Realization of deferred tax assets is dependent, in part, upon the generation of future taxable income during the periods in which those temporary differences become deductible. Management considers projected future taxable income and tax planning strategies in making its assessment of the recoverability of deferred tax assets.
The tax effects of temporary differences that generated deferred tax assets and liabilities are as follows:

	October 1, 2016	October 3, 2015
Deferred tax assets:		
Benefit accruals	$237,261	$210,241
Inventory reserves	33,950	32,948
Tax benefit carryforwards	17,349	14,245
Contract loss reserves not currently deductible	10,931	9,049
Other accrued expenses	17,669	17,676
Total gross deferred tax assets	317,160	284,159
Less valuation allowance	(10,938)	(9,583)
Total net deferred tax assets	306,222	274,576
Deferred tax liabilities:		
Differences in bases and depreciation of property, plant and equipment	163,977	162,661
Pension	77,471	70,273
Total gross deferred tax liabilities	241,448	232,934
Net deferred tax assets	$64,774	$41,642

Net deferred tax assets and liabilities are included in the balance sheet as follows:

	October 1, 2016	October 3, 2015
Current assets	$92,903	$91,210
Other assets	14,325	11,158
Other accrued liabilities	(283)	(517)
Long-term liabilities	(42,171)	(60,209)
Net deferred tax assets	$64,774	$41,642

We have unrecognized tax benefits which, if ultimately recognized, will reduce our annual effective tax rate. A reconciliation of the total amounts of unrecognized tax benefits, excluding interest and penalties, is as follows:

	October 1, 2016	October 3, 2015
Balance at beginning of year	$ 1,184	$ 1,793
Reductions as a result of lapse of statute of limitations	(686)	(609)
Balance at end of year	$ 498	$ 1,184

We are subject to income taxes in the U.S. and in various states and foreign jurisdictions. Tax regulations within each jurisdiction are subject to the interpretation of the related tax laws and regulations and require the application of significant judgment. With few exceptions, we are no longer subject to U.S. federal, state and local, or non-U.S. income tax examinations by tax authorities in significant jurisdictions for years before 2014. The statute of limitations in several jurisdictions will expire in the next twelve months and we will have $498 of unrecognized tax benefits recognized if the statute of limitations expires without the relevant taxing authority examining the applicable returns.
We record interest and penalties related to unrecognized tax benefits in income tax expense. We had accrued interest and penalties of $469 and $1,019 at October 1, 2016 and October 3, 2015, respectively. We expensed interest of $276 and $208 for 2016 and 2015, respectively.

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Note 13 - Shareholders' Equity

Class A and Class B common stock share equally in our earnings and are identical with certain exceptions. Other than on matters relating to the election of directors or as required by law where the holders of Class A and Class B shares vote as separate classes, Class A shares have limited voting rights, with each share of Class A being entitled to one-tenth of a vote on most matters, and each share of Class B being entitled to one vote. Class A shareholders are entitled, subject to certain limitations, to elect at least 25% of the Board of Directors (rounded up to the nearest whole number) with Class B shareholders entitled to elect the balance of the directors. No cash dividend may be paid on Class B shares unless at least an equal cash dividend is paid on Class A shares. Class B shares are convertible at any time into Class A shares on a one-for-one basis at the option of the shareholder. The number of common shares issued reflects conversion of Class B to Class A of 28,183 in 2016, 11,087 in 2015 and 14,471 in 2014.

Class A shares and Class B shares reserved for issuance at October 1, 2016 are as follows:

	Shares
Conversion of Class B to Class A shares	7,612,912
2014 Long Term Incentive Plan	2,000,000
2008 Stock Appreciation Rights Plan	1,566,801
2003 Stock Option Plan	118,098
Class A and B shares reserved for issuance	11,297,811

We are authorized to issue up to 10,000,000 shares of preferred stock. The Board of Directors may authorize, without further shareholder action, the issuance of additional preferred stock which ranks senior to both classes of our common stock with respect to the payment of dividends and the distribution of assets on liquidation. The preferred stock, when issued, would have such designations relative to voting and conversion rights, preferences, privileges and limitations as determined by the Board of Directors.

We issue common stock under our equity compensation plans from treasury stock. As of October 1, 2016, in addition to the shares reserved for issuance upon the exercise of outstanding equity awards, there were 1,780,950 shares authorized for awards that may be granted in the future under the 2014 Long Term Incentive Plan.

Our board of directors has authorized a share repurchase program that has been amended from time to time to authorize additional repurchases. During 2016, we repurchased 850,546 shares of our Class A common stock for $39,103. During 2015 and 2014, we repurchased 4,795,568 and 4,001,877 of our Class A and Class B common stock for $337,739 and $273,008, respectively.

As of October 1, 2016, the total remaining authorization for future common share repurchases under our program is 3,352,009 shares.

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Note 14 - Equity-Based Compensation

We have equity-based compensation plans that authorize the issuance of equity-based awards for shares of Class A and Class B common stock to directors, officers and key employees. Equity-based compensation grants are designed to reward long-term contributions to Moog and provide incentives for recipients to remain with Moog.

On January 7, 2015, shareholders approved the 2014 Long Term Incentive Plan ("2014 Plan"). The 2014 Plan authorizes the issuance of a total of 2,000,000 shares of either Class A or Class B common stock. The 2014 Plan is intended to provide a flexible framework that permits the development and implementation of a variety of stock-based programs that base awards on key performance metrics as well as align our long term incentive compensation with our peers and shareholder interests.

During 2016, we granted awards in the form of stock appreciations rights (SARs) and performance-based restricted stock units (PSUs). The compensation cost for employee and non-employee director share-based compensation programs for all current and prior year awards granted are as follows:

	2016	2015	2014
Stock appreciation rights	$2,482	$4,955	$6,751
Performance-based restricted stock units	755	—	—
Stock options	34	119	438
Total compensation cost	$3,271	$5,074	$7,189

Stock Appreciation Rights and Stock Options

The fair value of SARs granted was estimated on the date of grant using the Black-Scholes option-pricing model. The following table provides the range of assumptions used to value awards and the weighted-average fair value of the awards granted.

	2016	2015	2014
Expected volatility	24% - 29%	24% - 38%	29% - 39%
Risk-free rate	1.4% - 1.8%	.9% - 1.9%	.7% - 2.0%
Expected dividends	— %	— %	— %
Expected term	4-6 years	3-7 years	3-7 years
Weighted-average fair value of awards granted	$18.24	$28.71	$23.74

To determine expected volatility, we generally use historical volatility based on weekly closing prices of our Class A and Class B common stock over periods that correlate with the expected terms of the awards granted. The risk-free rate is based on the United States Treasury yield curve at the time of grant for the appropriate expected term of the awards granted. Expected dividends are based on our history and expectation of dividend payouts. The expected term of equity-based awards is based on vesting schedules, expected exercise patterns and contractual terms.

The number of shares received upon the exercise of a SAR is equal in value to the difference between the fair market value of the common stock on the exercise date and the exercise price of the SAR. The term of a SAR may not exceed ten years from the grant date. Options outstanding as of October 1, 2016 consisted of both incentive options and non-qualified options. Options become exercisable over periods not exceeding ten years. The exercise price of SARs and options, determined by a committee of the Board of Directors, may not be less than the fair value of the common stock on the grant date.

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SARs and options are as follows:

Stock Appreciation Rights	Number of Awards	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Life	Aggregate Intrinsic Value
Outstanding at October 3, 2015	1,373,544	$ 45.90		
Granted in 2016	194,000	65.02		
Exercised in 2016	(37,996)	37.13		
Expired in 2016	(32,337)	56.56		
Forfeited in 2016	(29,992)	67.89		
Outstanding at October 1, 2016	1,467,219	$ 47.97	5.2 years	$ 20,923
Exercisable at October 1, 2016	1,157,117	$ 42.81	4.3 years	$ 20,923
Stock Options				
Outstanding at October 3, 2015	255,883	$36.81		
Exercised in 2016	(137,785)	33.20		
Outstanding at October 1, 2016	118,098	$41.02	0.9 years	$2,187
Exercisable at October 1, 2016	111,216	$41.02	0.9 years	$2,060

The aggregate intrinsic value in the preceding tables represents the total pre-tax intrinsic value, based on our closing price of Class A common stock of $59.54 and Class B common stock of $59.64 as of October 1, 2016. That value would have been effectively received by the option and SAR holders had all option and SAR holders exercised their options and SARs as of that date.

The intrinsic value of awards exercised and fair value of awards vested are as follows:

	2016	2015	2014
Stock Appreciation Rights			
Intrinsic value of SARs exercised	$865	$14,566	$9,534
Total fair value of SARs vested	$5,876	$5,424	$7,633
Stock Options			
Intrinsic value of options exercised	$4,100	$14,205	$6,977
Total fair value of options vested	$947	$981	$1,009

As of October 1, 2016, total unvested compensation expense associated with SARs amounted to $2,376 and will be recognized over a weighted-average period of two years.

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Performance-Based Restricted Stock Units

PSU awards consist of shares of our stock which are payable upon the determination that we achieve certain established performance targets and can range from 0% to 200% of the targeted payout based on the actual results. PSU's granted in 2016 have a performance period of three years. The fair value of each PSU granted is equal to the fair market value of our common stock on the date of grant. PSUs granted generally have a three year period cliff vesting schedule; however, according to the grant agreements, if certain conditions are met, the employee (or beneficiary) will receive a prorated amount of the award based on active employment during the service period.

PSUs are as follows:

Performance-Based Restricted Stock Units	Number of Awards	Weighted-Average Grant Date Fair Value
Nonvested at October 3, 2015	—	$ —
Granted in 2016	41,550	64.95
Forfeited in 2016	(3,500)	64.95
Nonvested at October 1, 2016	38,050	$ 64.95

As of October 1, 2016, total unvested compensation expense associated with nonvested PSUs amounted to $1,717 and will be recognized over a weighted-average period of two years.

Note 15 - Stock Employee Compensation Trust and Supplemental Retirement Plan Trust

The Stock Employee Compensation Trust (SECT) assists in administering and provides funding for equity-based compensation plans and benefit programs, including the Moog Inc. Retirement Savings Plan (RSP). The Supplemental Retirement Plan (SERP) Trust provides funding for benefits under the Moog Inc. SERP. Both the SECT and the SERP Trusts hold shares as investments. The shares in the SECT and SERP Trusts are not considered outstanding for purposes of calculating earnings per share. However, in accordance with the trust agreements governing the SECT and SERP Trusts, the trustees vote all shares held by the SECT and SERP Trusts on all matters submitted to shareholders.

Note 16 - Accumulated Other Comprehensive Income (Loss)

The changes in AOCIL, net of tax, by component are as follows:

	Accumulated foreign currency translation	Accumulated retirement liability	Accumulated gain (loss) on derivatives	Total
AOCIL at September 27, 2014	$ 9,254	$ (214,984)	$ (1,108)	$ (206,838)
Other comprehensive income (loss) before reclassifications	(82,042)	(67,432)	(2,848)	(152,322)
Amounts reclassified from AOCIL	—	15,506	1,919	17,425
Other comprehensive income (loss)	(82,042)	(51,926)	(929)	(134,897)
AOCIL at October 3, 2015	(72,788)	(266,910)	(2,037)	(341,735)
Other comprehensive income (loss) before reclassifications	(37,838)	(72,094)	(4,227)	(114,159)
Amounts reclassified from AOCIL	—	17,910	2,923	20,833
Other comprehensive income (loss)	(37,838)	(54,184)	(1,304)	(93,326)
AOCIL at October 1, 2016	$ (110,626)	$ (321,094)	$ (3,341)	$ (435,061)

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The amounts reclassified from AOCIL into earnings are as follows:

	Statement of earnings classification	2016	2015
Retirement liability:			
Prior service cost		$108	$98
Actuarial losses		28,196	24,457
Reclassification from AOCIL into earnings		28,304	24,555
Tax effect		(10,394)	(9,049)
Net reclassification from AOCIL into earnings		$17,910	$15,506
Derivatives:			
Foreign currency contracts	Sales	$1,287	$233
Foreign currency contracts	Cost of sales	1,598	1,333
Interest rate swaps	Interest	771	1,378
Reclassification from AOCIL into earnings		3,656	2,944
Tax effect		(733)	(1,025)
Net reclassification from AOCIL into earnings		$2,923	$1,919

The amounts deferred in AOCIL are as follows:

	Statement of earnings classification	Net deferral in AOCIL - effective portion	
		2016	2015
Retirement liability:			
Net actuarial loss during period		$(110,856)	$(109,148)
Tax effect		38,762	41,716
Net deferral in AOCIL of retirement liability		$(72,094)	$(67,432)
Derivatives:			
Foreign currency contracts	Sales	$(3,829)	$(386)
Foreign currency contracts	Cost of sales	(1,370)	(1,527)
Interest rate swaps	Interest	125	(2,431)
Net loss		(5,074)	(4,344)
Tax effect		847	1,496
Net deferral in AOCIL of derivatives		$(4,227)	$(2,848)

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Note 17 - Segments

During 2016, we made a change to our segment reporting. Components now includes the Medical Devices product lines, which were previously reported as a separate segment. All amounts have been restated to present Medical Devices within Components.

Aircraft Controls. We design, manufacture and integrate primary and secondary flight controls for military and commercial aircraft and provide aftermarket support. Our systems are used on both development and production programs in large commercial transports, supersonic fighters, multi-role military aircraft, business jets and rotorcraft. We also supply ground-based navigation aids.

We are currently working on the KC-46 military air refueling tanker on the military side, and the Airbus A350XWB, COMAC C919 and the Embraer E-Jet E2 family on the commercial side. Typically development programs require concentrated periods of research and development by our engineering teams, while production programs are generally long-term manufacturing efforts that extend for as long as the aircraft builder receives new orders.

In the past few years, a number of significant programs have begun to transition from the development phase to initial low-rate production, including the Lockheed Martin F-35 Joint Strike Fighter on the military side and the Boeing 787 on the commercial side. In terms of mature production programs, our large military programs include the F/A-18E/F Super Hornet, the V-22 Osprey tiltrotor and the Black Hawk UH-60/Seahawk SH-60 helicopter, while our large commercial production programs include the full line of Boeing 7-series aircraft, Airbus A330 and A380 and a variety of business jets.

Aftermarket sales, which represented 29%, 30% and 32% of 2016, 2015 and 2014 sales, respectively, for this segment consist of the maintenance, repair, overhaul and parts supply for both military and commercial aircraft. Further, we sell spare parts and line replaceable units to both military and commercial customers that they store throughout the world in order to minimize down time.

Space and Defense Controls. We provide controls for satellites, space vehicles, launch vehicles, armored combat vehicles, tactical and strategic missiles, security and surveillance and other defense applications.

Within our space market, we design, manufacture and integrate commercial and military satellite positioning controls. These propulsion and actuation systems and the components control attitude, orbit insertion, solar panels and antennas. We also design, manufacture and integrate steering and propulsion controls for space launch vehicles, such as the Atlas, Delta and Ariane platforms. Additionally, we design and manufacture spaceflight electronics and software. We are also developing new control products and systems for a variety of programs related to manned spaceflight including: NASA's new Space Launch System, Multi-Purpose Crew Vehicle and Soft Capture System.

Within our defense market, we design controls for gun aiming, stabilization and automatic ammunition loading for armored combat vehicles for a variety of domestic and international customers. We also design controls for steering tactical and strategic missiles including: Lockheed Martin's Hellfire®, the U.S. National Missile Defense Agency's Ballistic Missile Defense initiatives and Raytheon's TOW and Trident missiles. We also design, build and integrate weapons stores management systems for light attack aerial reconnaissance, ground and sea platforms, as well as build high power, quiet controls for naval surface ships and submarines such as the US Virginia Class. Our sensor and surveillance products are used in both military and commercial applications such as electrical grid and other critical infrastructure protection applications.

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Industrial Systems. Our Industrial Systems segment serves a global customer base across a variety of markets.

In the industrial automation market, we design, manufacture and integrate systems for industrial automation customers for applications in injection and blow molding machinery, metal forming presses and heavy industry in steel and aluminum production. Our systems allow for precise controls of critical parameters in the industrial manufacturing processes, using both hydraulic and electric technology. Other industrial automation markets we serve include material handling and paper mills.

In the energy market, we supply solutions for power generation applications which allow for precise control and greater safety of fuel metering and guide vane positioning on steam and gas turbines. We also design and manufacture high reliability systems and components for applications in oil and gas exploration and production, including downhole drilling, topside and subsea environments, as well as electric pitch controls and blade monitoring systems for wind turbines.

In the simulation and test market, we supply electromechanical motion simulation bases for the flight simulation and training markets, as well as medical training simulators. For the test markets, we supply custom test systems and controls for automotive, structural and fatigue testing.

Components. Our Components segment serves many of the same markets as our other segments. Our Components segment’s largest product categories include slip rings and fiber optic rotary joints, motors, and infusion and enteral pumps and associated sets.

Slip rings and fiber optic rotary joints use sliding contacts and optical technology to allow unimpeded rotation while delivering power and data through a rotating interface. They come in a range of sizes that allow them to be used in many applications, including diagnostic imaging CT scan medical equipment, blade de-icing and data transfer for rotorcraft, remotely operated vehicles and floating platforms for offshore oil exploration, surveillance cameras, forward-looking infrared camera installations and radar pedestals, satellites, missiles and wind turbines.

Our motors are used in an equally broad range of markets, many of which are the same as for slip rings. We design and manufacture a series of fractional horsepower brushless motors that provide extremely low acoustic noise and reliable long life operation, with the largest market being sleep apnea equipment. Industrial customers use our motors for material handling and electric pumps. Military programs use our motors for gimbals, missiles and radar pedestals.

Infusion therapy products include infusion pumps and associated administration sets. They offer IV, intra-arterial, subcutaneous or epidural flow of fluids and precise medicine delivery and can be applied to many applications, including hydration, nutrition, patient-controlled analgesia, local anesthesia, chemotherapy and antibiotics.

Enteral clinical nutrition products include a complete line of portable and stationary pumps along with disposable sets. They are designed for ease of use and mobility. Medical customers use our enteral feeding products in the delivery of enteral nutrition for patients in their own homes, hospitals and long-term care facilities.

Our Components’ segment's other product lines include ultrasonic and optical sensors and surgical hand pieces used in medical applications, electromechanical actuators for military, aerospace and commercial applications, fiber optic modems that provide electrical-to-optical conversion of communication and data signals, avionic instrumentation, subsea navigation and control systems, acoustic sensors and sonars for energy and marine applications including remotely-operated underwater vehicles and optical switches and resolvers.

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Segment information and reconciliations to consolidated amounts are as follows:

	2016	2015	2014
Net sales:			
Aircraft Controls	$1,063,718	$1,086,547	$1,117,656
Space and Defense Controls	366,091	381,444	394,505
Industrial Systems	514,984	521,505	590,971
Components	467,144	536,036	545,253
Net sales	$2,411,937	$2,525,532	$2,648,385
Operating profit:			
Aircraft Controls	$98,509	$100,006	$115,726
Space and Defense Controls	41,419	33,236	26,119
Industrial Systems	48,542	45,021	58,108
Components	49,772	67,250	75,764
Total operating profit	238,242	245,513	275,717
Deductions from operating profit:			
Interest expense	34,605	28,967	12,513
Equity-based compensation expense	3,271	5,074	7,189
Corporate and other expenses, net	27,506	27,638	37,092
Earnings before income taxes	$172,860	$183,834	$218,923
Depreciation and amortization:			
Aircraft Controls	$46,541	$51,385	$49,021
Space and Defense Controls	16,033	14,054	15,735
Industrial Systems	20,487	20,731	23,170
Components	14,422	16,576	19,467
Corporate	1,249	863	1,866
Total depreciation and amortization	$98,732	$103,609	$109,259
Identifiable assets:			
Aircraft Controls	$1,150,138	$1,220,814	$1,257,099
Space and Defense Controls	450,606	440,439	480,806
Industrial Systems	574,053	591,367	648,580
Components	667,387	607,436	657,327
Corporate	199,675	226,415	164,640
Total assets	$3,041,859	$3,086,471	$3,208,452

Operating profit is net sales less cost of sales and other operating expenses, excluding interest expense, equity-based compensation expense and other corporate expenses. Cost of sales and other operating expenses are directly identifiable to the respective segment or allocated on the basis of sales, manpower or profit.

	2016	2015	2014
Capital expenditures:			
Aircraft Controls	$28,437	$47,389	$45,243
Space and Defense Controls	7,498	9,022	8,992
Industrial Systems	15,276	15,371	12,459
Components	15,576	8,371	11,816
Corporate	421	540	261
Total capital expenditures	$67,208	$80,693	$78,771

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Sales, based on the customer's location, and property, plant and equipment by geographic area are as follows:

	2016	2015	2014
Net sales:			
United States	$1,353,398	$1,413,877	$1,485,556
Germany	173,182	199,351	205,005
Japan	164,702	156,999	180,026
France	120,907	84,733	75,963
United Kingdom	74,378	97,359	133,777
Other	525,370	573,213	568,058
Net sales	$2,411,937	$2,525,532	$2,648,385
Property, plant and equipment, net:			
United States	$302,446	$307,874	$312,790
Philippines	65,000	68,101	72,602
United Kingdom	64,280	77,949	74,111
Other	90,643	82,832	95,845
Property, plant and equipment, net	$522,369	$536,756	$555,348

Sales to Boeing were $346,596, $399,082 and $431,148, or 14%, 16% and 16% of sales, in 2016, 2015 and 2014, respectively, including sales to Boeing Commercial Airplanes of $251,288, $240,984 and $243,114 in 2016, 2015 and 2014, respectively. Sales arising from U.S. Government prime or sub-contracts, including military sales to Boeing, were $726,562, $780,259 and $763,004 in 2016, 2015 and 2014, respectively. Sales to Boeing and the U.S. Government and its prime- or sub-contractors are made primarily from our Aircraft Controls and Space and Defense Controls segments.

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Note 18 - Commitments and Contingencies

From time to time, we are involved in legal proceedings. We are not a party to any pending legal proceedings which management believes will result in a material adverse effect on our financial condition, results of operations or cash flows.

We are engaged in administrative proceedings with governmental agencies and legal proceedings with governmental agencies and other third parties in the normal course of our business, including litigation under Superfund laws, regarding environmental matters. We believe that adequate reserves have been established for our share of the estimated cost for all currently pending environmental administrative or legal proceedings and do not expect that these environmental matters will have a material adverse effect on our financial condition, results of operations or cash flows.

In the ordinary course of business we could be subject to ongoing claims or disputes from our customers, the ultimate settlement of which could have a material adverse impact on our consolidated results of operations. While the receivables and any loss provisions recorded to date reflect management's best estimate of the projected costs to complete a given project, there is still significant effort required to complete the ultimate deliverable. Future variability in internal cost and as well as future profitability is dependent upon a number of factors including deliveries, performance and government budgetary pressures. The inability to achieve a satisfactory contractual solution, further unplanned delays, additional developmental cost growth or variations in any of the estimates used in the existing contract analysis could lead to further loss provisions. Additional losses could have a material adverse impact on our financial condition, results of operations or cash flows in the period in which the loss may be recognized.

We lease certain facilities and equipment under operating lease arrangements. These arrangements may include fair market renewal or purchase options. Rent expense under operating leases amounted to $28,279 in 2016, $27,764 in 2015 and $26,238 in 2014. Future minimum rental payments required under non-cancellable operating leases are $22,023 in 2017, $20,088 in 2018, $17,662 in 2019, $13,840 in 2020, $11,847 in 2021 and $44,910 thereafter.

We are contingently liable for $18,966 of standby letters of credit issued by a bank to third parties on our behalf at October 1, 2016. Purchase commitments outstanding at October 1, 2016 are $655,572, including $19,627 for property, plant and equipment.

Note 19 - Quarterly Data - Unaudited

2016	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Total
Net sales	$568,457	$611,142	$613,260	$619,078	$2,411,937
Gross profit	161,460	179,187	183,662	187,274	711,583
Net earnings attributable to common shareholders	26,241	31,050	36,311	33,143	126,745
Net earnings per share attributable to common shareholders:					
Basic	$0.71	$0.85	$1.01	$0.92	$3.49
Diluted	$0.71	$0.85	$1.00	$0.92	$3.47

2015	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	Total
Net sales	$630,523	$637,246	$634,539	$623,224	$2,525,532
Gross profit	183,918	173,550	190,576	188,660	736,704
Net earnings attributable to common shareholders	35,265	32,093	36,331	28,194	131,883
Net earnings per share attributable to common shareholders:					
Basic	$0.87	$0.81	$0.95	$0.76	$3.39
Diluted	$0.86	$0.80	$0.94	$0.75	$3.35

Note: Quarterly amounts may not add to the total due to rounding.

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Report of Independent Registered Public Accounting Firm

The Board of Directors and Shareholders of Moog Inc.

We have audited the accompanying consolidated balance sheets of Moog Inc. as of October 1, 2016 and October 3, 2015, and the related consolidated statements of earnings, comprehensive income (loss), shareholders' equity and cash flows for each of the three years in the period ended October 1, 2016. Our audits also included the financial statement schedule listed in the Index at Item 15(a). These financial statements and schedule are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements and schedule based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Moog Inc. at October 1, 2016 and October 3, 2015, and the consolidated results of its operations and its cash flows for each of the three years in the period ended October 1, 2016, in conformity with U.S. generally accepted accounting principles. Also, in our opinion, the related financial statement schedule, when considered in relation to the basic financial statements taken as a whole, presents fairly in all material respects the information set forth therein.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), Moog Inc.’s internal control over financial reporting as of October 1, 2016, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated November 14, 2016 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Buffalo, New York
November 14, 2016

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MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rule 13a-15(f) and 15d-15(f) of the Exchange Act. Under the supervision and with the participation of our management, including the Chief Executive Officer and Chief Financial Officer, we conducted an evaluation of the effectiveness of our internal control over financial reporting as of October 1, 2016 based upon the framework in Internal Control - Integrated Framework (2013) by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on that evaluation, our management concluded that our internal control over financial reporting is effective as of October 1, 2016.

We completed one acquisition in 2016, which was excluded from our management's report on internal control over financial reporting as of October 1, 2016. On December 3, 2015, we acquired a 70% ownership in Linear Mold and Engineering. This acquisition is included in our 2016 consolidated financial statements and constituted $31 million and $29 million of total and net assets, respectively, as of October 1, 2016 and $8.8 million and $(7.0) million of net sales and net loss attributable to common shareholders, respectively, for the year then ended.

Ernst & Young LLP, independent registered public accounting firm, has audited our consolidated financial statements included in this Annual Report on Form 10-K and, as part of their audit, has issued their report, included herein, on the effectiveness of our internal control over financial reporting.

/s/ JOHN R. SCANNELL
John R. Scannell
Chief Executive Officer
(Principal Executive Officer)

/s/ DONALD R. FISHBACK
Donald R. Fishback
Vice President,
Chief Financial Officer
(Principal Financial Officer)

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Report of Independent Registered Public Accounting Firm

The Board of Directors and Shareholders of Moog Inc.

We have audited Moog Inc.'s internal control over financial reporting as of October 1, 2016, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). Moog Inc.'s management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the company's internal control over financial reporting based on our audit.

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

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

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

As indicated in the accompanying Management's Report on Internal Control over Financial Reporting, management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of Linear Mold & Engineering Inc., which are included in the 2016 consolidated financial statements of Moog Inc. and constituted $31 million and $29 million of total and net assets, respectively, as of October 1, 2016 and $8.8 million and $(7.0) million of net sales and net loss attributable to common shareholders respectively, for the year then ended. Our audit of internal control over financial reporting of Moog Inc. also did not include an evaluation of the internal control over financial reporting of Linear Mold & Engineering Inc. acquired in 2016.

In our opinion, Moog Inc. maintained, in all material respects, effective internal control over financial reporting as of October 1, 2016 based on the COSO criteria.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of Moog Inc. as of October 1, 2016 and October 3, 2015, and the related

consolidated statements of earnings, comprehensive income (loss), shareholders' equity and cash flows for each of the three years in the period ended October 1, 2016 of Moog Inc. and our report dated November 14, 2016 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Buffalo, New York
November 14, 2016

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

Not applicable.

Item 9A. Controls and Procedures.

Disclosure Controls and Procedures.

We carried out an evaluation, under the supervision and with the participation of our management, including the Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures as defined in Exchange Act Rules 13a-15(e) and 15d-15(e). Based on that evaluation, the Chief Executive Officer and Chief Financial Officer concluded that these disclosure controls and procedures are effective as of the end of the period covered by this report, to ensure that information required to be disclosed in reports filed or submitted under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms, and that such information is accumulated and communicated to management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosures.

Management's Report on Internal Control over Financial Reporting.

See the report appearing under Item 8, Financial Statements and Supplemental Data of this report.

Changes in Internal Control over Financial Reporting.

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

Item 9B. Other Information.

Not applicable.

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PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information required herein with respect to our directors and certain information required herein with respect to our executive officers is incorporated by reference to the 2016 Proxy. Other information required herein is included in Item 1, Business, under “Executive Officers of the Registrant” of this report.

We have adopted a code of ethics that applies to our Chief Executive Officer, Chief Financial Officer and Controller. The code of ethics is available upon request without charge by contacting our Chief Financial Officer at 716-652-2000.

Item 11. Executive Compensation.

The information required herein is incorporated by reference to the 2016 Proxy.

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

The information required herein is incorporated by reference to the 2016 Proxy.

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

The information required herein is incorporated by reference to the 2016 Proxy.

Item 14. Principal Accountant Fees and Services.

The information required herein is incorporated by reference to the 2016 Proxy.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

Documents filed as part of this report:

1 Financial Statements

- Consolidated Statements of Earnings
- Consolidated Statements of Comprehensive Income (Loss)
- Consolidated Balance Sheets
- Consolidated Statements of Shareholders’ Equity
- Consolidated Statements of Cash Flows
- Notes to Consolidated Financial Statements
- Reports of Independent Registered Public Accounting Firm

2 Financial Statement Schedules

II. Valuation and Qualifying Accounts.

Schedules other than that listed above are omitted because the conditions requiring their filing do not exist or because the required information is included in the Consolidated Financial Statements, including the Notes thereto.

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3 Exhibits

(3) Articles of Incorporation and By-Laws.

(i) Restated Certificate of Incorporation of Moog Inc., incorporated by reference to exhibit 3(i) of our report on Form 10-K for the year ended September 28, 2013.

(ii) Restated By-laws of Moog Inc., dated November 30, 2011, as amended, incorporated by reference to exhibit 3.2 of our report on Form 10-K for the year ended October 1, 2011.

(4) Instruments defining the rights of security holders, including indentures.

(a) Form of Indenture between Moog Inc. and MUFG Union Bank, N.A. as Trustee, dated November 21, 2014, relating to the 5.25% Senior Notes due 2022, incorporated by reference to exhibit 4.1 of our report on Form 8-K dated November 21, 2014.

(9) Voting trust agreement.

(a) Agreement as to Voting, effective November 30, 1983, incorporated by reference to exhibit 9A of our report on Form 10-K for the year ended September 27, 2014.

(10) Material contracts.

Credit and Securitization agreements.

(a) Form of Receivables Purchase Agreement, by and among Moog Receivables LLC, as Seller, Moog Inc., as Servicer, Market Street Funding LLC, as Issuer, and PNC Bank, National Association, as Administrator, dated as of March 5, 2012, incorporated by reference to exhibit 10.1 on Form 8-K dated March 9, 2012.

(b) Second Amendment to the Receivables Purchase Agreement, dated March 4, 2013, by and among Moog Receivables LLC, as Seller, Moog Inc., as Servicer, Market Street Funding LLC, as Issuer and PNC Bank, National Association, as Administrator, incorporated by reference to exhibit 10.1 on Form 8-K dated March 6, 2013.

(c) Fifth Amendment to the Receivables Purchase Agreement, dated February 14, 2014, by and among Moog Receivables LLC, as Seller, Moog Inc., as Servicer, Market Street Funding LLC, as Issuer and PNC Bank, National Association, as Administrator, incorporated by reference to exhibit 10.1 on Form 8-K dated February 14, 2014.

(d) Seventh Amendment to the Receivables Purchase Agreement, dated February 10, 2015, by and among Moog Receivables LLC, as Seller, Moog Inc. as Servicer, Market Street Funding LLC, as Issuer and PNC Bank, National Association, as Administrator, incorporated by reference to exhibit 10.1 on Form 8-K dated February 10, 2015.

(e) Eighth Amendment to the Receivables Purchase Agreement, dated April 15, 2016, by and among Moog Receivables LLC, as Seller, Moog Inc. as Servicer, Market Street Funding LLC, as Issuer and PNC Bank, National Association, as Administrator, incorporated by reference to exhibit 10.1 on Form 8-K dated April 15, 2016.

(f) Fourth Amended and Restated Loan Agreement between Moog Inc., HSBC Bank USA, National Association, Manufacturers and Traders Trust Company, Bank of America, N.A. and JPMorgan Chase Bank, N.A. dated as of March 28, 2013, incorporated by reference to exhibit 10.1 of our report on Form 8-K dated April 1, 2013.

(g) Amendment No. 1 dated as of May 22, 2014, to the Fourth Amended and Restated Loan Agreement, incorporated by reference to exhibit 10.1 of our report on Form 8-K dated May 22, 2014.

(h) Amendment No. 3 dated as of June 28, 2016, to the Fourth Amended and Restated Loan Agreement, incorporated by reference to exhibit 10.1 of our report on Form 8-K dated June 28, 2016.

Management contracts or compensatory plan or arrangement.

(i) 2003 Stock Option Plan, incorporated by reference to exhibit A of definitive proxy statement filed under Schedule 14A on January 9, 2003.

(j) Forms of Stock Option Agreements under the 1998 Stock Option Plan and 2003 Stock Option Plan, incorporated by reference to exhibit 10.12 of our report on Form 10-K for the year ended September 25, 2004.

(k) 2008 Stock Appreciation Rights Plan, incorporated by reference to exhibit A of definitive proxy statement filed under Schedule 14A on December 10, 2007.

(l) Form of Stock Appreciation Rights Award Agreement under 2008 Stock Appreciation Rights Plan, incorporated by reference to exhibit 10.14 of our report on Form 10-K for the year ended September 27, 2008.

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(m) First Amendment to the Moog Inc. 2008 Stock Appreciation Rights Plan, incorporated by reference to Appendix A of definitive proxy statement filed under Schedule 14A on December 13, 2012.

(n) Second Amendment to the Moog Inc. 2008 Stock Appreciation Rights Plan, incorporated by reference to Item 8.01 on Form 8-K dated December 26, 2012.

(o) 2014 Long Term Incentive Plan, incorporated by reference to exhibit A of definitive proxy statement filed under Schedule 14A on December 12, 2014.

(p) Form of Stock Appreciation Rights Award Agreement under the 2014 Long Term Incentive Plan, incorporated by reference to exhibit 10.2 (Class A common stock) and exhibit 10.3 (Class B common stock) of our report on Form 8-K dated November 20, 2015.

(q) Form of Restricted Stock Unit Award Agreement under the 2014 Long Term Incentive Plan, incorporated by reference to exhibit 10.4 (Class A common stock) and exhibit 10.5 (Class B common stock) of our report on Form 8-K dated November 20, 2015.

(r) Form of Employment Termination Benefits Agreement between Moog Inc. and Employee-Officers, incorporated by reference to exhibit 10(vii) of our report on Form 10-K for the year ended September 25, 1999.

(s) Deferred Compensation Plan for Directors and Officers, amended and restated May 16, 2002, incorporated by reference to exhibit 10(ii) of our report on Form 10-K for the year ended September 28, 2002.

(t) Form of Indemnification Agreement for officers, directors and key employees, incorporated by reference to exhibit 10.1 of our report on Form 8-K dated November 30, 2004.

(u) Description of Management Short Term Incentive Plan, incorporated by reference to exhibit 10.1 of our report on Form 8-K/A dated November 24, 2015.

(v) Supplemental Retirement Plan, as amended and restated, effective January 1, 2013, as amended May 8, 2013, incorporated by reference to exhibit 10.1 of our report on Form 10-Q for the quarter ended January 3, 2015.

(w) Amendment No. 1 to the Supplemental Retirement Plan, dated July 28, 2015, effective July 31, 2015, incorporated by reference to exhibit 10.1 of our report on Form 8-K dated July 31, 2015.

(x) Amendment No. 2 to the Supplemental Retirement Plan, as amended and restated, effective January 1, 2013, as amended effective November 30, 2015, incorporated by reference to exhibit 10.6 of our report on Form 8-K dated November 20, 2015.

(y) Defined Contribution Supplemental Executive Retirement Plan, dated March 4, 2016, incorporated by reference to exhibit 10.1 of our report on Form 10-Q for the quarter ended April 2, 2016.

Other material contracts.

(z) Moog Inc. Stock Employee Compensation Trust Agreement amended and restated as of August 13, 2014, incorporated by reference to exhibit 10.2 of our report on Form 10-Q for the quarter ended January 3, 2015.

(aa) Moog Inc. Supplemental Retirement Plan Trust, as amended and restated, effective January 1, 2015, incorporated by reference to exhibit 10.1 of our Form 10-Q for the quarter ended April 4, 2015.

All of the exhibits listed above have been filed under Moog Inc., Securities and Exchange Commission file number 1-05129.

(21) Our subsidiaries. (All of which are wholly owned by the Corporation, directly or indirectly, unless otherwise noted). The names of indirectly owned subsidiaries are indented under the names of their respective parent corporations.

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Name	State/Country of Incorporation
Bradford Engineering B.V.	Netherlands
Broad Reach Engineering Company	Delaware
Octant Technologies Inc.	California
Curlin Medical Inc.	Delaware
Moog MDG SRL	Costa Rica
Viltechmeda UAB	Lithuania
ZEVEX, Inc.	Delaware
Harmonic Linear Drives Ltd.	England and Wales
Ingenieurburo Pieper GmbH	Germany
Linear AMS, Inc. (70% owned by Moog Inc.)	Michigan
Moog Asset Management LLC	Delaware
Moog Australia Pty., Ltd.	Australia
Moog do Brasil Controles Ltda.	Brazil
Moog Components Group GmbH	Germany
Moog Controls Corp.	Ohio
Moog Controls Hong Kong Ltd.	Hong Kong
Moog Control Systems (Shanghai) Co., Ltd.	People's Republic of China
Moog Industrial Controls (Shanghai) Co., Ltd.	People's Republic of China
Moog Controls (India) Pvt. Ltd.	India
Moog Controls Ltd.	United Kingdom
Moog Fernau Ltd.	United Kingdom
Moog Components Group Limited	United Kingdom
Tritech Holdings Limited	United Kingdom
Tritech International Limited	United Kingdom
Tritech do Brasil Servicos E Equipamentos Submarinos Ltda.	Brazil
Moog Norden AB	Sweden
Moog OY	Finland
Moog Wolverhampton Limited	United Kingdom
Moog Europe Holdings Luxembourg SCS	Luxembourg
Focal Technologies Corporation	Nova Scotia
Moog Holding GmbH & Co. KG	Germany
Insensys Holdings Ltd.	United Kingdom
Moog Insensys Limited	United Kingdom
Moog B.V.	Netherlands
Moog GmbH	Germany
Moog Italiana S.r.l.	Italy
Moog Luxembourg S.A.R.L.	Luxembourg
Moog Unna GmbH	Germany
Moog Control Equipment (Shanghai) Co. Ltd.	People's Republic of China
Obshestwo s Ogranizennoi Otwetstwennostju MOOG	Russia
Moog Luxembourg Finance S.A.R.L.	Luxembourg
Moog International Financial Services Center S.a.r.l.	Luxembourg
Moog Verwaltungs GmbH	Germany
Moog Holdings Ltd.	Ireland
Moog Dublin Ltd.	Ireland
Moog UK Cheltenham Ltd.	United Kingdom
Moog Ireland Limited	Ireland
Moog Japan Ltd.	Japan

Moog Korea Ltd.	South Korea
Moog Receivables LLC	Delaware
Moog S.A.R.L. (95% owned by Moog Inc.; 5% owned by Moog GmbH)	France
Moog Singapore Pte. Ltd.	Singapore
Moog India Technology Center Pvt. Ltd.	India
Moog Motion Controls Private Limited	India
Moog UK Westcott Ltd.	United Kingdom

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(23) Consent of Ernst & Young LLP. (Filed herewith)

(31.1) Certification of Chief Executive Officer pursuant to Exchange Act Rule 13a-14(a) as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002. (Filed herewith)

(31.2) Certification of Chief Financial Officer pursuant to Exchange Act Rule 13a-14(a) as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002. (Filed herewith)

(32.1) Certification pursuant to 18 U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002. (Furnished herewith)

(101) Interactive Data Files (submitted electronically herewith)
(101.INS) XBRL Instance Document

(101.SCH) XBRL Taxonomy Extension Schema Document

(101.CAL) XBRL Taxonomy Extension Calculation Linkbase Document

(101.DEF) XBRL Taxonomy Extension Definition Linkbase Document

(101.LAB) XBRL Taxonomy Extension Label Linkbase Document

(101.PRE) XBRL Taxonomy Extension Presentation Linkbase Document
In accordance with Rule 406T of Regulation S-T, the XBRL related information in Exhibit 101 to this Annual Report on Form 10-K shall not be deemed to be “filed” for purposes of Section 18 of the Exchange Act, or otherwise subject to the liability of that section and shall not be part of any registration or other document filed under the Securities Act or the Exchange Act, except as shall be expressly set forth by specific reference in such filing.

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Inc.

Valuation and Qualifying Accounts - Fiscal Years 2014, 2015 and 2016

(dollars in thousands) Schedule II

Description	Balance at beginning of year	Additions charged to costs and expenses	Deductions	Foreign exchange impact and other	Balance at end of year
Fiscal year ended September 27, 2014					
Contract loss reserves	$ 44,228	$ 35,692	$ 43,909	$ (27)	$ 35,984
Allowance for doubtful accounts	4,499	3,192	3,248	(102)	4,341
Reserve for inventory valuation	98,113	17,791	11,783	(1,549)	102,572
Deferred tax valuation allowance	7,906	1,585	108	(167)	9,216
Fiscal year ended October 3, 2015					
Contract loss reserves	$ 35,984	$ 24,073	$ 29,120	$ (515)	$ 30,422
Allowance for doubtful accounts	4,341	2,889	1,624	(320)	5,286
Reserve for inventory valuation	102,572	21,166	17,911	(2,477)	103,350
Deferred tax valuation allowance	9,216	1,313	281	(665)	9,583
Fiscal year ended October 1, 2016					
Contract loss reserves	$ 30,422	$ 29,469	$ 27,152	$ (196)	$ 32,543
Allowance for doubtful accounts	5,286	1,594	2,095	(247)	4,538
Reserve for inventory valuation	103,350	24,183	17,622	(719)	109,192
Deferred tax valuation allowance	9,583	2,981	1,521	(105)	10,938

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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.

Moog Inc.
(Registrant)
By /s/ JOHN R. SCANNELL
John R. Scannell
Chief Executive Officer
Date: November 14, 2016

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 indicated on November 14, 2016.

/s/ JOHN R. SCANNELL
John R. Scannell
Chairman of the Board and Director
Chief Executive Officer
(Principal Executive Officer)

/s/ PETER J. GUNDERMANN
Peter J. Gundermann
Director

/s/ DONALD R. FISHBACK
Donald R. Fishback
Director
Vice President and Chief Financial Officer
(Principal Financial Officer)

/s/ KRAIG H. KAYSER
Kraig H. Kayser
Director

/s/ JENNIFER WALTER
Jennifer Walter
Controller
(Principal Accounting Officer)

/s/ R. BRADLEY LAWRENCE
R. Bradley Lawrence
Director

/s/ RICHARD A. AUBRECHT
Richard A. Aubrecht
Director

/s/ BRIAN J. LIPKE
Brian J. Lipke
Director

/s/ WILLIAM G. GISEL, JR.
William G. Gisel, Jr.
Director

/s/ BRENDA L. REICHELDERFER
Brenda L. Reichelderfer
Director