

CHART INDUSTRIES INC
Form 10-K
February 23, 2017

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

Form 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 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 No. 1-11442

CHART INDUSTRIES, INC.
(Exact Name of Registrant as Specified in its Charter)
Delaware 34-1712937
(State or Other Jurisdiction of (IRS Employer
Incorporation or Organization) Identification No.)
One Infinity Corporate Centre Drive,
Suite 300, Garfield Heights, Ohio 44125-5370
(Address of Principal Executive Offices) (Zip Code)
Registrant's telephone number, including area code:
(440) 753-1490

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

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, par value \$0.01	The NASDAQ Stock Market LLC

Securities registered pursuant to Section 12(g) of the Act:
None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes No

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§229.405) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.

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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 Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company) 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

The aggregate market value of the voting common equity held by non-affiliates computed by reference to the price of \$24.13 per share at which the common equity was last sold, as of the last business day of the registrant’s most recently completed second fiscal quarter, was \$730,092,603.

As of February 20, 2017, there were 30,687,770 outstanding shares of the Company’s common stock, par value \$0.01 per share.

Documents Incorporated by Reference

Portions of the following document are incorporated by reference into Part III of this Annual Report on Form 10-K: the definitive Proxy Statement to be used in connection with the Registrant’s Annual Meeting of Stockholders to be held on May 25, 2017 (the “2017 Proxy Statement”).

Except as otherwise stated, the information contained in this Annual Report on Form 10-K is as of December 31, 2016.

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PART I

Item 1. Business

THE COMPANY

Overview

Chart Industries, Inc., a Delaware corporation incorporated in 1992 (the “Company,” “Chart,” or “we” as used herein refers to Chart Industries, Inc. and our consolidated subsidiaries, unless the context indicates otherwise), is a leading diversified global manufacturer of highly engineered equipment, packaged solutions, and value-add services used throughout the gas to liquid cycle in all industries that require liquid gases or alternative equipment for gas generation, generally for the industrial gas, energy, and biomedical industries. Our equipment and engineered systems are primarily used for low-temperature and cryogenic applications utilizing our expertise in cryogenic systems and equipment which operate at low temperatures sometimes approaching absolute zero (0 Kelvin; -273° Centigrade; -459° Fahrenheit). Our products include vacuum insulated containment vessels, heat exchangers, cold boxes, liquefaction process units, other cryogenic components, gas processing equipment, and equipment for respiratory therapy.

Our primary customers are large, multinational producers and distributors of hydrocarbon and industrial gases and their end-users. We sell our products and services to more than 2,000 customers worldwide. We have developed long-standing relationships with leading companies in the gas production, gas distribution, gas processing, liquefied natural gas or LNG, chemical and industrial gas industries, including Air Products, Praxair, Airgas “an Air Liquide company,” Air Liquide, The Linde Group or Linde, Bechtel Corporation, ExxonMobil, British Petroleum or BP, ConocoPhillips, PetroChina, CB&I, Toyo, JGC, Samsung, UOP, and Shell, some of whom have been purchasing our products for over 20 years.

We have attained this position by capitalizing on our technical expertise and know-how, broad product offering, reputation for quality, low-cost global manufacturing footprint, and by focusing on attractive, growing markets. We have an established sales and customer support presence across the globe and low cost manufacturing operations in the United States, Central Europe, and China. For the years ended December 31, 2016, 2015, and 2014, we generated sales of \$859.2 million, \$1,040.2 million, and \$1,193.0 million, respectively.

Segments, Applications and Products

We operate in four major end-market applications: Energy, Industrial, Life Sciences, and Respiratory Healthcare, through our three business segments: (i) Energy & Chemicals or E&C, (ii) Distribution & Storage or D&S, and (iii) BioMedical. While each segment manufactures and markets different cryogenic and gas processing equipment and systems to distinct end-users, they all share a reliance on our heat transfer, vacuum insulation, low temperature storage, and gas processing know-how and expertise. The E&C and D&S segments manufacture products used primarily in energy-related and industrial applications, such as the separation, liquefaction, distribution, and storage of hydrocarbon and industrial gases. Through our BioMedical segment, we manufacture and supply medical devices, including cryogenic and non-cryogenic equipment, used in respiratory healthcare. We also manufacture and supply products for life sciences including biological research and animal breeding. Further information about these segments is located in Note 20 of the notes to the Company’s consolidated financial statements included in Item 8 of this Annual Report on Form 10-K.

The following charts show the proportion of our revenues generated by each business segment, as well as our estimate of the proportion of revenue generated by end-user application for the year ended December 31, 2016:

Energy & Chemicals Segment

E&C (18% of sales for the year ended December 31, 2016) facilitates major natural gas, petrochemical processing, and industrial gas companies in the production of their products. E&C supplies mission critical engineered equipment and systems used in the separation, liquefaction, and purification of hydrocarbon and industrial gases that span gas-to-liquid applications including natural gas processing, petrochemical, LNG, and industrial gas applications. Our principal products include brazed aluminum heat exchangers, Core-in-Kettle[®] heat exchangers, air cooled heat exchangers, cold boxes, and process systems. Brazed aluminum heat exchangers accounted for 7.4%, 11.9%, and 14.9% of consolidated sales for the years ended December 31, 2016, 2015, and 2014, respectively. Process systems accounted for 5.8%, 14.0%, and 12.3% of consolidated sales for the years ended December 31, 2016, 2015, and 2014, respectively.

Natural Gas Processing (including Petrochemical) Applications

We provide natural gas processing solutions that facilitate the progressive cooling and liquefaction of hydrocarbon mixtures for the subsequent recovery or purification of component gases, which accounted for 12.3%, 17.4%, and 17.5% of consolidated sales for the years ended December 31, 2016, 2015, and 2014, respectively. Our brazed aluminum heat exchangers allow producers to obtain purified hydrocarbon by-products, such as methane, ethane, propane, and ethylene, which are commercially marketable for various industrial or residential uses. Our cold boxes are highly engineered systems that incorporate brazed aluminum heat exchangers, pressure vessels, and interconnecting piping used to significantly reduce the temperature of gas mixtures to liquefy component gases so that they can be separated and purified for further use in multiple energy, industrial, scientific, and commercial applications. Our air cooled heat exchangers are used to cool or condense fluids to allow for further processing and for cooling gas compression equipment. Customers for our natural gas processing applications include large companies in the hydrocarbon processing industry, as well as engineering, procurement and construction (“EPC”) contractors. Demand for these applications is primarily driven by the growth in the natural gas liquids (or NGLs) separation and other natural gas segments of the hydrocarbon processing industries, including LNG. In the future, management believes that continuing efforts by petroleum producing countries to better utilize stranded natural gas and previously flared gases present a promising source of demand. We have a number of competitors for our heat exchangers and cold boxes, including certain leading companies in the industrial gas and hydrocarbon processing industries and many smaller fabrication-only facilities around the world. Competition with respect to our more specialized brazed aluminum heat exchangers includes a small number of global (European and Asian) manufacturers.

LNG Applications

We provide process technology, liquefaction train, and independent mission critical equipment for the liquefaction of LNG, including small to mid-scale facilities, floating LNG applications, and large base-load export facilities, which accounted for 4.4%, 13.1%, and 12.1% of consolidated sales for the years ended December 31, 2016, 2015, and 2014, respectively. We are a leading supplier to EPC firms where we provide equipment or design the process and provide equipment, providing an integrated and optimized approach to the project. These “Concept-to-Reality” process systems incorporate many of Chart’s core products, including brazed aluminum heat exchangers, Core-in-Kettle® heat exchangers, cold boxes, pressure vessels, pipe work, and air cooled heat exchangers. These systems are used for global LNG projects, including projects in North America and China, for local LNG production and LNG export terminals. Our proprietary IPSMR® (Integrated Pre-cooled Single Mixed Refrigerant) liquefaction process technology offers lower capital expenditure rates than competing processes per ton of LNG produced and very competitive operating costs.

Demand for LNG applications is primarily driven by increased use and global trade in natural gas (transported as LNG) since natural gas offers significant cost and environmental advantages over other fossil fuels. Demand for LNG applications is also driven by diesel displacement and continuing efforts by petroleum producing countries to better utilize stranded natural gas and previously flared gases. We have a number of competitors for these applications, including leading industrial gas companies, other brazed aluminum heat exchanger manufacturers, and other equipment fabricators to whom we also act as a supplier of equipment, including heat exchangers and cold boxes.

Industrial Gas Applications

For industrial gas applications, our brazed aluminum heat exchangers and cold boxes are used to produce high purity atmospheric gases, such as oxygen, nitrogen, and argon, which have diverse industrial applications. Cold boxes are used to separate air into its major atmospheric components, including oxygen, nitrogen, and argon, where the gases are used in a diverse range of applications such as metal production and heat treating, enhanced oil and gas production, coal gasification, chemical and oil refining, electronics, medical, the quick-freezing of food, wastewater treatment, and industrial welding. Our brazed aluminum heat exchangers and cold boxes are also used in the purification of helium and hydrogen.

Demand for industrial gas applications is driven by growth in manufacturing and industrial gas use. Other key global drivers involve developing Gas to Liquids, or GTL, clean coal processes including Coal to Liquids, or CTL, and Integrated Gasification Combined Cycle, or IGCC, power projects. In addition, demand for our products in developed countries is expected to continue as customers upgrade their facilities for greater efficiency and regulatory compliance. We have a number of competitors for these applications, including leading industrial gas companies and EPC firms, to whom we also act as a supplier of equipment, including heat exchangers and cold boxes.

After Market Services

To support the products and solutions we sell, our Lifecycle group offers services through the entire lifecycle of our products, which is unique and unparalleled in the markets we serve. Our focus is to build relationships with plant stakeholders, from process and mechanical engineers to operations and maintenance personnel, focusing on the optimized performance and lifespan of Chart proprietary equipment. Lifecycle services include extended warranties, plant start-up, parts, 24/7 support, monitoring and process optimization, as well as repair, maintenance, and upgrades. We perform plant services on equipment, including brazed aluminum heat exchangers, air cooled heat exchangers, cold boxes, etc.

Distribution & Storage Segment

D&S (58% of sales for the year ended December 31, 2016) designs, manufactures, and services cryogenic solutions for the storage and delivery of cryogenic liquids used in industrial gas and LNG applications. Using sophisticated vacuum insulation technology, our cryogenic storage systems are able to store and transport liquefied industrial gases and hydrocarbon gases at temperatures from 0° Fahrenheit to temperatures nearing absolute zero. End-use customers for our cryogenic storage equipment include industrial gas producers and distributors, chemical producers, manufacturers of electrical components, health care organizations, food processors, and businesses in the oil and natural gas industries. Cryogenic bulk storage systems accounted for 17.3%, 15.0%, and 12.7% of consolidated sales for the years ended December 31, 2016, 2015, and 2014, respectively. Cryogenic packaged gas systems accounted for

17.7%, 15.3%, and 13.4% of consolidated sales for the years ended December 31, 2016, 2015, and 2014, respectively.

We service industrial gas and LNG applications as follows:

Industrial Gas Applications

We design, manufacture, install, service, and maintain bulk and packaged gas cryogenic solutions for the storage, distribution, vaporization, and application of industrial gases, which accounted for 45.1%, 35.7%, and 30.9% of consolidated sales for the years ended December 31, 2016, 2015, and 2014, respectively. Industrial gas applications include any end-use of the major elements

of air (nitrogen, oxygen, and argon), including manufacturing, welding, electronics, medical, nitrogen dosing, food processing, and beverage carbonation. Carbon dioxide, nitrous oxide, hydrogen, and helium applications also utilize our equipment. Our products span the entire spectrum of industrial gas demand from small customers requiring cryogenic packaged gases to large users requiring custom engineered cryogenic storage systems in both mobile and stationary applications. We also offer cryogenic components, including vacuum insulated pipe (“VIP”), engineered bulk gas installations, specialty liquid nitrogen, or LN2, end-use equipment, and cryogenic flow meters. Principal customers for industrial applications are global industrial gas producers and distributors.

Demand for industrial gas applications is driven primarily by the significant installed base of users of cryogenic liquids, as well as new applications and distribution technologies for cryogenic liquids. Our competitors tend to be regionally focused while we are able to supply a broad range of systems on a worldwide basis. We also compete with several suppliers owned by the global industrial gas producers. From a technology perspective, we tend to compete with compressed gas alternatives or on-site generated gas supply.

LNG Applications

We supply cryogenic solutions for the storage, distribution, regasification, and use of LNG, which accounted for 12.8%, 11.1%, and 17.6% of consolidated sales for the years ended December 31, 2016, 2015, and 2014, respectively. LNG may be utilized as an alternative to other fossil fuels such as diesel, propane, or fuel oil in transportation or off pipeline applications. Examples include heavy duty truck and transit bus transportation, locomotive propulsion, marine, and power generation in remote areas that often occurs in oil and gas drilling. We refer to our LNG distribution products as a “Virtual Pipeline,” as the traditional natural gas pipeline is replaced with cryogenic distribution to deliver the gas to the end-user. We supply cryogenic trailers, ISO containers, railcars, bulk storage tanks, fuel stations, loading facilities, and regasification equipment specially configured for delivering LNG into Virtual Pipeline applications. LNG may also be used as a fuel for a variety of on and off-road vehicles and applications. Our LNG vehicle fueling applications primarily consist of LNG and liquefied/compressed natural gas refueling systems for heavy-duty truck and bus fleets. We sell LNG applications around the world from various D&S facilities to numerous end-users, energy companies, and gas distributors. Additionally, we supply large vacuum insulated storage tanks as equipment for purchasers of standard liquefaction plants sold by our E&C business. Demand for LNG applications is driven by the spread in price between oil and gas, diesel displacement initiatives, environmental and energy security initiatives, and the associated cost of equipment. Our competitors tend to be regionally focused or product-specific, while we are able to supply a broad range of solutions required by LNG applications. We compete with compressed natural gas (or CNG) or field gas in several of these applications and LNG is most highly valued where its energy density and purity are beneficial to the end-user.

After Market Services

D&S operates multiple service locations in the United States, China, and Europe. These service locations provide installation, service, repair, maintenance, and refurbishment of cryogenic products. We service Chart products, as well as our competitors throughout the world. We provide services for storage vessels, VIP, reconfigurations, relocation, trailers, ISO containers, vaporizers, and other gas to liquid equipment.

BioMedical Segment

BioMedical (24% of sales for the year ended December 31, 2016) consists of various product lines built around our core competencies in cryogenics, vacuum insulation, low temperature storage, and pressure swing adsorption gas generation, with a focus on the respiratory and biological users of the liquids and gases instead of the large producers and distributors of cryogenic liquids. Applications in the BioMedical segment include the following:

Respiratory Therapy

Respiratory therapy products accounted for 13.8%, 12.7%, and 11.8% of consolidated sales for the years ended December 31, 2016, 2015, and 2014, respectively. Our respiratory oxygen product line is comprised of a range of medical respiratory products, including liquid oxygen systems and stationary, transportable, and portable oxygen concentrators, all of which are used primarily for in-home supplemental oxygen treatment of patients with chronic obstructive pulmonary diseases, such as bronchitis, emphysema, and asthma.

We believe that competition for our respiratory products is based primarily upon product quality, performance, reliability, ease-of-use and price, which we focus our marketing strategies on these considerations. Furthermore,

competition also includes the impact of other modalities in the broader respiratory industry.

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Life Sciences

Our life science products include vacuum insulated containment vessels for the storage of biological materials. The primary applications for this product line include medical laboratories, biotech/pharmaceutical research facilities, blood and tissue banks, veterinary laboratories, large-scale repositories, and artificial insemination, particularly in the beef and dairy industry.

The significant competitors for life science products include a number of companies worldwide. These products are sold through multiple channels of distribution specifically applicable to each industry sector. The distribution channels range from highly specialized cryogenic storage systems providers to general supply and catalogue distribution operations and breeding service providers. Competition in this field is focused on design, reliability, and price. Alternatives to vacuum insulated containment vessels include electrically powered mechanical refrigeration.

Commercial Oxygen and Nitrogen Generation

Our commercial oxygen and nitrogen generation products include self-contained generators, standard generators, and packaged systems for industrial and medical oxygen and nitrogen generating systems. These generators produce oxygen or nitrogen from compressed air and provide an efficient and cost-effective alternative to the procurement of oxygen or nitrogen from third party cylinder or liquid suppliers. Applications include mining operations, industrial plants, ozone generation, hospital medical oxygen, and wastewater treatment, among other commercial or military applications. Management expects demand for this product line to increase over the long-term with competition focused on design, reliability, and price.

Domestic and Foreign Operations

Financial and other information regarding domestic and foreign operations is located in Note 20 of the notes to the Company's consolidated financial statements included in Item 8 of this Annual Report on Form 10-K. Additional information regarding risks attendant to foreign operations is set forth in Item 7A of this Annual Report on Form 10-K under the caption "Quantitative and Qualitative Disclosures About Market Risk" and Item 7 under the caption "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Engineering and Product Development

Our engineering and product development activities are focused primarily on developing new and improved solutions and equipment for the users of cryogenic liquids and hydrocarbon and industrial gases across all industries served. Our engineering, technical and marketing employees actively assist customers in specifying their needs and in determining appropriate products to meet those needs. Portions of our engineering expenditures typically are charged to customers, either as separate items or as components of product cost.

Competition

We believe we can compete effectively around the world and that we are a leading competitor in the industries we serve. Competition is based primarily on performance and the ability to provide the design, engineering, and manufacturing capabilities required in a timely and cost-efficient manner. Contracts are usually awarded on a competitive bid basis. Quality, technical expertise, and timeliness of delivery are the principal competitive factors within the industries we serve. Price and terms of sale are also important competitive factors. Because our equipment is specialized and independent third-party prepared market share data is not available, it is difficult to know for certain our exact position in our markets, although we believe we rank among the leaders in each of the markets we serve. We base our statements about industry and market positions on our reviews of annual reports and published investor presentations of our competitors and augment this data with information received by marketing consultants conducting competition interviews and our sales force and field contacts. For information concerning competition within a specific segment of the Company's business, see the descriptions provided under segment captions in this Annual Report on Form 10-K.

Marketing

We market our products and services in each of our segments throughout the world primarily through direct sales personnel and independent sales representatives and distributors. The technical and custom design nature of our products requires a professional, highly trained sales force. We use independent sales representatives and distributors to market our products and services in certain foreign countries and in certain North American regions. These independent sales representatives supplement our direct sales force in dealing with language and cultural matters. Our

domestic and foreign independent sales representatives earn commissions on sales, which vary by product type.

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Backlog

The dollar amount of our backlog as of December 31, 2016, 2015, and 2014 was \$342.6 million, \$374.6 million, and \$640.1 million, respectively. Approximately 16.8% of the December 31, 2016 backlog is expected to be filled beyond 2017. Backlog is comprised of the portion of firm signed purchase orders or other written contractual commitments received from customers that we have not recognized as revenue under the percentage of completion method or based upon shipment. Backlog can be significantly affected by the timing of orders for large products, particularly in the E&C segment, and the amount of backlog at December 31, 2016 described above is not necessarily indicative of future backlog levels or the rate at which backlog will be recognized as sales. Orders included in our backlog may include customary cancellation provisions under which the customer could cancel all or part of the order, potentially subject to the payment of certain costs and/or penalties. For further information about our backlog, including backlog by business segment, see Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Customers

We sell our products primarily to gas producers, distributors, and end-users across energy, industry, life sciences, and respiratory healthcare applications in countries throughout the world. Sales to our top ten customers accounted for 38%, 36%, and 34% of consolidated sales in 2016, 2015, and 2014, respectively. One customer, Airgas "an Air Liquide company" and Air Liquide, exceeded 10% of consolidated sales in 2016. Sales revenue from this customer represented approximately \$98.9 million or 11.5% of total consolidated sales revenue and is primarily attributable to the D&S segment, along with the BioMedical and E&C segments. No customer exceeded 10% of consolidated sales in 2015 or 2014.

Our sales to particular customers fluctuate from period to period, but the global producers and distributors of hydrocarbon and industrial gases and their suppliers tend to be a consistently large source of revenue for us. Our supply contracts are generally contracts for "requirements" only. While our customers may be obligated to purchase a certain percentage of their supplies from us, there are generally no minimum requirements. Also, many of our contracts may be canceled at any time, subject to possible cancellation charges. To minimize credit risk from trade receivables, we review the financial condition of potential customers in relation to established credit requirements before sales credit is extended and we monitor the financial condition of customers to help ensure timely collections and to minimize losses. In addition, for certain domestic and foreign customers, particularly in the D&S and E&C segments, we require advance payments, letters of credit, bankers' acceptances, and other such guarantees of payment. Certain customers also require us to issue letters of credit or performance bonds, particularly in instances where advance payments are involved, as a condition to placing the order. We believe our relationships with our customers are generally good.

Intellectual Property

Although we have a number of patents, trademarks, and licenses related to our business, no one of them or related group of them is considered by us to be of such importance that its expiration or termination would have a material adverse effect on our business. In general, we depend upon technological capabilities, manufacturing quality control, and application of know-how, rather than patents or other proprietary rights, in the conduct of our business.

Raw Materials and Suppliers

We manufacture most of the products we sell. The raw materials used in manufacturing include aluminum products (including sheets, bars, plate, and piping), stainless steel products (including sheets, plates, heads, and piping), palladium oxide, carbon steel products (including sheets, plates, and heads), valves and gauges, and fabricated metal components. Most raw materials are available from multiple sources of supply. We believe our relationships with our raw material suppliers and other vendors are generally good. Commodity components of our raw material (stainless steel and carbon steel) could experience some level of volatility during 2017 and may have a relational impact on raw material pricing. Subject to certain risks related to our suppliers as discussed under Item 1A. "Risk Factors," we foresee no acute shortages of any raw materials that would have a material adverse effect on our operations.

Employees

As of January 31, 2017, we had 4,050 employees, including 2,065 domestic employees and 1,985 international employees.

We are party to one collective bargaining agreement with the International Association of Machinists and Aerospace Workers (“IAM”) covering 158 employees at our La Crosse, Wisconsin heat exchanger facility. Effective February 3, 2013, we entered into a five-year agreement with the IAM which expires on February 3, 2018. We have already executed a successor agreement with our unionized employees through 2023, which will replace the collective bargaining agreement that expires in February 2018.

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Environmental Matters

Our operations have historically included and currently include the handling and use of hazardous and other regulated substances, such as various cleaning fluids used to remove grease from metal, that are subject to federal, state, local, and foreign environmental laws and regulations. These regulations impose limitations on the discharge of pollutants into the soil, air, and water and establish standards for their handling, management, use, storage, and disposal. We monitor and review our procedures and policies for compliance with environmental laws and regulations. Our management is familiar with these regulations and supports an ongoing program to maintain our adherence to required standards.

We are involved with environmental compliance, investigation, monitoring, and remediation activities at certain of our owned or formerly owned manufacturing facilities and at one owned facility that is leased to a third party. We believe that we are currently in substantial compliance with all known environmental regulations. We accrue for certain environmental remediation-related activities for which commitments or remediation plans have been developed or for which costs can be reasonably estimated. These estimates are determined based upon currently available facts regarding each facility. Actual costs incurred may vary from these estimates due to the inherent uncertainties involved. Future expenditures relating to these environmental remediation efforts are expected to be made over the next 12 years as ongoing costs of remediation programs. We do not believe that these regulatory requirements have had a material effect upon our capital expenditures, earnings, or competitive position. We are not anticipating any material capital expenditures in 2017 that are directly related to regulatory compliance matters. Although we believe we have adequately provided for the cost of all known environmental conditions, additional contamination, the outcome of disputed matters, or changes in regulatory posture could result in more costly remediation measures than budgeted, or those we believe are adequate or required by existing law. We believe that any additional liability in excess of amounts accrued which may result from the resolution of such matters will not have a material adverse effect on our financial position, liquidity, cash flows, or results of operations.

Available Information

Additional information about the Company is available at www.chartindustries.com. On the Investor Relations page of the website, the public may obtain free copies of the Company's Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and any amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 as soon as reasonably practicable following the time that they are filed with, or furnished to, the Securities and Exchange Commission ("SEC"). Additionally, the Company has posted its Code of Ethical Business Conduct and Officer Code of Ethics on its website, which are also available free of charge to any shareholder interested in obtaining a copy. This Form 10-K and reports filed with the SEC are also accessible through the SEC's website at www.sec.gov. References to our website or the SEC's website do not constitute incorporation by reference of the information contained on such websites, and such information is not part of this Form 10-K.

Item 1A. Risk Factors

Investing in our common stock involves risk. You should carefully consider the risks described below, as well as the other information contained in this Annual Report on Form 10-K in evaluating your investment in us. If any of the following risks actually occur, our business, financial condition, operating results, or cash flows could be harmed materially. Additional risks, uncertainties, and other factors that are not currently known to us or that we believe are not currently material may also adversely affect our business, financial condition, operating results or cash flows. In any of these cases, you may lose all or part of your investment in us.

Risks Related to Our Business

The markets we serve are subject to cyclical demand and vulnerable to economic downturn, which could harm our business and make it difficult to project long-term performance.

Demand for our products depends in large part upon the level of capital and maintenance expenditures by many of our customers and end-users, in particular those customers in the global hydrocarbon and industrial gas markets. These customers' expenditures historically have been cyclical in nature and vulnerable to economic downturns. Decreased capital and maintenance spending by these customers could have a material adverse effect on the demand for our products and our business, financial condition, and results of operations. In addition, this historically cyclical demand

limits our ability to make accurate long-term predictions about the performance of our company. Even if demand improves, it is difficult to predict whether any improvement represents a long-term improving trend or the extent or timing of improvement. There can be no assurance that historically improving cycles are representative of actual future demand.

While we experienced growth in demand from 2003 until mid-2008 in the global hydrocarbon and industrial gas markets, we experienced a significant decline in orders from mid-2008 until mid-2009. Although there was improvement in orders for our businesses, particularly in 2011 through 2013, we have experienced a substantial decline since 2014 in hydrocarbon demand with

the decline in energy prices. Although energy prices have recovered somewhat, we cannot predict whether business performance may be better or worse in the future or whether and to what extent energy prices will continue to recover. The loss of, or significant reduction or delay in, purchases by our largest customers could reduce our sales and profitability.

A small number of customers has accounted for a substantial portion of our historical net sales. For example, sales to our top ten customers accounted for 38%, 36%, and 34% of consolidated sales in 2016, 2015, and 2014, respectively, with sales to one customer approximately 11.5% of consolidated sales revenue in 2016. We expect that a limited number of customers will continue to represent a substantial portion of our sales for the foreseeable future. While our sales to particular customers fluctuate from period to period, the global producers and distributors of hydrocarbon and industrial gases and their suppliers tend to be a consistently large source of our sales.

The loss of any of our major customers, consolidation of our customers, or a decrease or delay in orders or anticipated spending by such customers could materially reduce our sales and profitability. We did experience several delays in customer orders during 2016 given continued energy price volatility and our customers' adjusted project timing as a result. Continued delays in the anticipated timing of LNG infrastructure build out could materially reduce the demand for our products. Our largest customers could also engage in business combinations, which could increase their size, reduce their demand for our products as they recognize synergies or rationalize assets and increase or decrease the portion of our total sales concentration to any single customer. For example, two of our largest customers, Airgas and Air Liquide, combined during 2016. Further industry consolidation, such as the pending Linde and Praxair merger, could further exacerbate our customer concentration risk.

If we are unable to successfully control our costs and efficiently manage our operations, it may place a significant strain on our management and administrative resources and lead to increased costs and reduced profitability.

We have implemented cost savings initiatives to align our business with current and expected economic conditions. Our ability to operate our business successfully and implement our strategies depends, in part, on our ability to allocate our resources optimally in each of our facilities in order to maintain efficient operations. Ineffective management could cause manufacturing inefficiencies, increase our operating costs, place significant strain on our management and administrative resources, and prevent us from being able to take advantage of opportunities as economic conditions improve. If we are unable to align our cost structure in response to prevailing economic conditions on a timely basis, or if implementation or failure to implement any cost structure adjustments has an adverse impact on our business or prospects, then our financial condition, results of operations, and cash flows may be negatively affected.

Similarly, it is critical that we appropriately manage our planned capital expenditures in this challenging economic environment. For example, we have invested or plan to invest approximately \$35 to \$45 million in new capital expenditures in 2017. If we fail to manage the projects related to these capital expenditures in an effective manner, we may lose the opportunity to obtain some new customer orders or the ability to operate our businesses efficiently. Even if we effectively implement these projects, the orders needed to support the capital expenditure may not be obtained, may be delayed, or may be less than expected, which may result in sales or profitability at lower levels than anticipated. For example, while we invested in the expansion of our D&S segment in China in recent years, we have experienced significant delays in some of the related orders anticipated to support that expansion, which has resulted in the underutilization of our capacity in China.

Decreases in energy prices, or a decrease in the cost of oil relative to natural gas, may decrease demand for some of our products and cause downward pressure on the prices we charge, which could harm our business, financial condition, and results of operations.

A significant amount of our sales are to customers in the energy production and supply industry. We estimate that 30% of our sales for the year ended December 31, 2016 were generated by end-users in the energy industry, with many of our products sold for natural gas-related applications. Accordingly, demand for a significant portion of our products depends upon the level of capital expenditures by companies in the oil and gas industry, which depends, in part, on energy prices, as well as the price of oil relative to natural gas for some applications. Some applications for our products could see greater demand when prices for natural gas are relatively low compared to oil prices, but a sustained decline in energy prices generally and a resultant downturn in energy production activities could negatively

affect the capital expenditures of our customers. For example, the sharp decline in oil prices since the fourth quarter of 2014 has had a negative impact on demand for some of our products. Although prices have recovered somewhat from recent lows, any further deterioration and significant decline in the capital expenditures of our customers, whether due to a decrease in the market price of energy or otherwise, may decrease demand for our products and cause downward pressure on the prices we charge. Accordingly, if there is a continued or further downturn in the energy production and supply industry, including a decline in the cost of oil relative to natural gas, our business, financial condition, and results of operations could be adversely affected.

We may be unable to compete successfully in the highly competitive markets in which we operate. Although many of our products serve niche industry areas, a number of our direct and indirect competitors in these areas are major corporations, some of which have substantially greater technical, financial, and marketing resources than Chart, and other competitors enter these areas from time to time. Any increase in competition may cause us to lose market share or compel us to reduce prices to remain competitive, which could result in reduced sales and earnings. We compete with several suppliers owned by global industrial gas producers or large industrial companies and many smaller fabrication-only facilities around the world. Increased competition with these companies could prevent the institution of price increases or could require price reductions or increased spending on research and development and marketing and sales, any of which could materially reduce our sales, profitability, or both. Moreover, during an industry downturn, competition in some of the product lines we serve increases as a result of over-capacity, which may result in downward pricing pressure. Further, customers who typically outsource their need for cryogenic systems to us may use their excess capacity to produce such systems themselves. We also compete in the sale of a limited number of products with certain of our major customers. If we are unable to compete successfully, our results of operations, cash flows, and financial condition could be negatively affected. Federal, state, and local legislative and regulatory initiatives relating to hydraulic fracturing and the potential for related regulatory action or litigation could result in increased costs and additional operating restrictions or delays for our customers, which could negatively impact our business, financial condition, and results of operations. We supply equipment to companies that process, transport, and utilize natural gas, many of which benefit from increased natural gas production resulting from hydraulic fracturing in the oil and natural gas industry. As a result, increased regulation of hydraulic fracturing may adversely impact our business, financial condition, and results of operations. If additional levels of regulation are implemented with respect to hydraulic fracturing, it may make it more difficult to complete natural gas wells in shale formations and discourage exploration of new wells. This could increase our customers' costs of compliance and doing business or otherwise adversely affect the hydraulic fracturing services they perform, which may negatively impact natural gas production and demand for our equipment used in the natural gas industry.

In addition, heightened political, regulatory, and public scrutiny of hydraulic fracturing practices could potentially expose our customers to increased legal and regulatory proceedings, which could negatively impact natural gas production and demand for our equipment used in the natural gas industry. Any such developments could have a material adverse effect on our business, financial condition, and results of operations, whether directly or indirectly. We carry goodwill and indefinite-lived intangible assets on our balance sheet, which are subject to impairment testing and could subject us to significant non-cash charges to earnings in the future if impairment occurs. As of December 31, 2016, we had goodwill and indefinite-lived intangible assets of \$253.6 million, which represented approximately 20.6% of our total assets. Goodwill and indefinite-lived intangible assets are not amortized, but are tested for impairment annually in the fourth quarter or more often if events or changes in circumstances indicate a potential impairment may exist. Factors that could indicate that our goodwill or indefinite-lived intangible assets are impaired include a decline in stock price and market capitalization, lower than projected operating results and cash flows, and slower growth rates in our industry. Our stock price historically has shown volatility and often fluctuates significantly in response to market and other factors. Declines in our stock price, lower operating results and any decline in industry conditions in the future could increase the risk of impairment. Impairment testing incorporates our estimates of future operating results and cash flows, estimates of allocations of certain assets and cash flows among reporting segments, estimates of future growth rates, and our judgment regarding the applicable discount rates used on estimated operating results and cash flows. For example, as a result of our impairment analyses, we recorded an impairment charge related to goodwill and indefinite-lived intangible assets of \$207.7 million during the fourth quarter of 2015. During 2016, there were no further goodwill and indefinite-lived intangible asset impairment charges. If we determine that further impairment exists, it may result in a significant non-cash charge to earnings and lower stockholders' equity.

Our backlog is subject to modification, termination or reduction of orders, which could negatively impact our sales.

Our backlog is comprised of the portion of firm signed purchase orders or other written contractual commitments received from customers that we have not recognized as sales. The dollar amount of backlog as of December 31, 2016 was \$342.6 million. Our backlog can be significantly affected by the timing of orders for large projects, particularly in our E&C segment, and the amount of our backlog at December 31, 2016 is not necessarily indicative of future backlog levels or the rate at which backlog will be recognized as sales. Although modifications and terminations of our orders may be partially offset by cancellation fees, customers can, and sometimes do, terminate or modify these orders. We cannot predict whether cancellations will accelerate or diminish in the future. Cancellations of purchase orders, indications that the customers will not perform or reductions of product quantities in existing contracts could substantially and materially reduce our backlog and, consequently, our future sales. For example, during 2015, D&S segment backlog was reduced by approximately \$150.0 million when circumstances suggested that our customers were not likely to take delivery in the future. Our failure to replace canceled orders could negatively impact our

sales and results of operations. Included in the E&C backlog is approximately \$40 million related to the previously announced Magnolia LNG order where production release is delayed into 2018.

We may fail to successfully acquire or integrate companies that provide complementary products or technologies. A component of our business strategy is the acquisition of businesses that complement our existing products and services. Such a strategy involves the potential risks inherent in assessing the value, strengths, weaknesses, contingent or other liabilities, and potential profitability of acquisition candidates and in integrating the operations of acquired companies. In addition, any acquisitions of businesses with foreign operations or sales may increase our exposure to risks inherent in doing business outside the United States.

From time to time, we may have acquisition discussions with potential target companies both domestically and internationally. If a large acquisition opportunity arises and we proceed, a substantial portion of our cash and surplus borrowing capacity could be used for the acquisition or we may seek additional debt or equity financing.

Potential acquisition opportunities become available to us from time to time, and we periodically engage in discussions or negotiations relating to potential acquisitions, including acquisitions that may be material in size or scope to our business. Any acquisition may or may not occur and, if an acquisition does occur, it may not be successful in enhancing our business for one or more of the following reasons:

- Any business acquired may not be integrated successfully and may not prove profitable;
- The price we pay for any business acquired may overstate the value of that business or otherwise be too high;
- Liabilities we take on through the acquisition may prove to be higher than we expected;
- We may fail to achieve acquisition synergies; or
- The focus on the integration of operations of acquired entities may divert management's attention from the day-to-day operation of our businesses.

Inherent in any future acquisition is the risk of transitioning company cultures and facilities. The failure to efficiently and effectively achieve such transitions could increase our costs and decrease our profitability.

Governmental energy policies could change or expected changes could fail to materialize which could adversely affect our business or prospects.

Energy policy can develop rapidly in the markets we serve, including the United States, Europe, and China. Within the last few years, significant developments have taken place, primarily in international markets that we serve with respect to energy policy and related regulations. We anticipate that energy policy will continue to be an important regulatory priority globally, as well as on a national, state, and local level. As energy policy continues to evolve, the existing rules and incentives that impact the energy-related segments of our business may change. It is difficult, if not impossible, to predict whether changes in energy policy might occur in the future and the timing of potential changes and their impact on our business. The elimination or reduction of favorable policies for our energy-related business, or the failure to adopt expected policies that would benefit our business, could negatively impact our sales and profitability.

Our exposure to fixed-price contracts, including exposure to fixed pricing on long-term customer contracts and performance guarantees, could negatively impact our financial results.

A substantial portion of our sales has historically been derived from fixed-price contracts for large system projects which may involve long-term fixed price commitments to customers or guarantees of equipment or process performance and which are sometimes difficult to execute. To the extent that any of our fixed-price contracts are delayed, we fail to satisfy a performance guarantee, our subcontractors fail to perform, contract counterparties successfully assert claims against us, the original cost estimates in these or other contracts prove to be inaccurate or the contracts do not permit us to pass increased costs on to our customers, profitability from a particular contract may decrease or project losses may be incurred, which, in turn, could decrease our sales and overall profitability. The uncertainties associated with our fixed-price contracts make it more difficult to predict our future results and exacerbate the risk that our results will not match expectations, which has happened in the past.

Downturns in economic and financial conditions have had and may have in the future a negative effect on our business, financial condition, and results of operations.

Demand for our products depends in large part upon the level of capital and maintenance expenditures by many of our customers and end-users. A downturn in economic conditions in industries in which we operate may reduce the

willingness or ability of our customers and prospective customers to commit funds to purchase our products and services and may reduce their ability to pay for our products and services after purchase. Economic conditions that could impact our business include, but are

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not limited to, decreased energy prices, recessionary conditions, slow or negative economic growth rates, the impact of state and sovereign debt defaults or the impact of governmental budgetary pressures. Similarly, our suppliers may not be able to supply us with needed raw materials or components on a timely basis, may increase prices or go out of business, which could result in our inability to meet customer demand, fulfill our contractual obligations or could affect our gross margins. See “We depend on the availability of certain key suppliers; if we experience difficulty with a supplier, we may have difficulty finding alternative sources of supply” below. We cannot predict the timing or duration of negative market conditions. If the economy or industries in which we operate deteriorate or financial markets weaken, our business, financial condition, and results of operations could be adversely impacted.

We depend on the availability of certain key suppliers; if we experience difficulty with a supplier, we may have difficulty finding alternative sources of supply.

The cost, quality, and availability of raw materials, certain specialty metals and specialized components used to manufacture our products are critical to our success. The materials and components we use to manufacture our products are sometimes custom made and may be available only from a few suppliers, and the lead times required to obtain these materials and components can often be significant. We rely on sole suppliers or a limited number of suppliers for some of these materials, including special grades of aluminum used in our brazed aluminum heat exchangers and compressors included in some of our product offerings. While we have not historically encountered problems with availability, this does not mean that we will continue to have timely access to adequate supplies of essential materials and components in the future or that supplies of these materials and components will be available on satisfactory terms when needed. If our vendors for these materials and components are unable to meet our requirements, fail to make shipments in a timely manner, or ship defective materials or components, we could experience a shortage or delay in supply or fail to meet our contractual requirements, which would adversely affect our results of operations and negatively impact our cash flow and profitability.

Health care reform or other changes in government and other third-party payor reimbursement levels and practices could negatively impact our sales and profitability.

Many of our BioMedical segment’s customers are reimbursed for products and services by third-party payors, such as government programs, including Medicare and Medicaid, private insurance plans and managed care programs in the U.S., and by similar programs and entities in the other countries in which we operate or sell our equipment.

In March 2010, the Affordable Care Act was adopted in the U.S. The law includes provisions that, among other things, reduce and/or limit Medicare reimbursement, require all individuals to have health insurance (with limited exceptions) and impose new and/or increased taxes. In addition, the Affordable Care Act requires the Centers for Medicare & Medicaid Services (“CMS”), the agency responsible for administering the Medicare program, to nationalize a competitive bidding process or adjust the prices in non-competitive bidding areas to match competitive bidding prices.

CMS has since implemented a number of payment rules that reduced Medicare payments for oxygen and oxygen equipment. Under the competitive bidding program, CMS selected contract suppliers that agreed to receive as payment the “single payment amount” calculated by CMS in certain geographic regions. In January 2011, round one of competitive bidding significantly reduced the number of homecare oxygen suppliers able to participate in the Medicare program in 91 U.S. Metropolitan Statistical Areas (“MSA”). Round two of competitive bidding was implemented in July 2013 in 91 U.S. MSAs, further decreasing the number of oxygen suppliers. In October 2014, CMS set rules to adjust the fee schedule amounts for the remaining un-bid areas to match bid areas based on regional averages, which were applied partially from January 1, 2016 to June 30, 2016 and fully implemented by July 1, 2016. There remains a significant amount of uncertainty regarding healthcare reform and the effect of competitive bidding on the durable medical equipment industry. The potential impact of new and changing policies on the demand for our products or the prices at which we sell our products could have a material adverse effect on our business, results of operations, and/or financial condition.

Due to the nature of our business and products, we may be liable for damages based on product liability and warranty claims.

Due to the high pressures and low temperatures at which many of our products are used, the inherent risks associated with concentrated industrial and hydrocarbon gases, and the fact that some of our products are relied upon by our

customers or end users in their facilities or operations or are manufactured for relatively broad industrial, medical, transportation, or consumer use, we face an inherent risk of exposure to claims in the event that the failure, use, or misuse of our products results, or is alleged to result, in death, bodily injury, property damage, or economic loss. We believe that we meet or exceed existing professional specification standards recognized or required in the industries in which we operate. We are subject to claims from time to time,

some of which are substantial, including a claim settled in 2015 involving property damage and economic loss where the amount claimed exceeded \$100 million, and we may be subject to claims in the future. Although we currently maintain product liability coverage, which we believe is adequate, it includes customary exclusions and conditions, it may not cover certain specialized applications such as aerospace-related applications, and it generally does not cover warranty claims. Additionally, such insurance may become difficult to obtain or be unobtainable in the future on terms acceptable to us. A successful product liability claim or series of claims against us, including one or more consumer claims purporting to constitute class actions or claims resulting from extraordinary loss events, in excess of or outside our insurance coverage, or a significant warranty claim or series of claims against us, could materially decrease our liquidity, impair our financial condition, and adversely affect our results of operations.

Fluctuations in exchange and interest rates may affect our operating results and impact our financial condition.

Fluctuations in the value of the U.S. dollar may increase or decrease our sales or earnings. Because our consolidated financial results are reported in U.S. dollars, if we generate sales or earnings in other currencies, the translation of those results into U.S. dollars can result in a significant increase or decrease in the amount of those sales or earnings. We also bid for certain foreign projects in U.S. dollars or euros. If the U.S. dollar or euro strengthens relative to the value of the local currency, we may be less competitive on those projects. In addition, our debt service requirements are primarily in U.S. dollars and a portion of our cash flow is generated in euros or other foreign currencies.

Significant changes in the value of the foreign currencies relative to the U.S. dollar could impair our cash flow and financial condition.

In addition, fluctuations in currencies relative to the U.S. dollar may make it more difficult to perform period-to-period comparisons of our reported results of operations. For purposes of accounting, the assets and liabilities of our foreign operations, where the local currency is the functional currency, are translated using period-end exchange rates, and the revenues and expenses of our foreign operations are translated using average exchange rates during each period. For example, we have material euro-denominated net monetary assets and liabilities. If economic circumstances result in a significant devaluation of the euro, the value of our euro-denominated net monetary assets and liabilities would be correspondingly reduced when translated into U.S. dollars for inclusion in our financial statements. Similarly, the re-introduction of certain individual country currencies or the complete dissolution of the euro, could adversely affect the value of our euro-denominated net monetary assets and liabilities. In either case, our business, results of operations, financial condition, and liquidity could be materially adversely affected.

In addition to currency translation risks, we incur currency transaction risk whenever we or one of our subsidiaries enters into either a purchase or a sales transaction using a currency other than the functional currency of the transacting entity. Given the volatility of exchange rates, we may not be able to effectively manage our currency and/or translation risks. Volatility in currency exchange rates may decrease our sales and profitability and impair our financial condition. We have purchased and may continue to purchase foreign currency forward contracts to manage the risk of adverse currency fluctuations and if the contracts are inconsistent with currency trends we could experience exposure related to foreign currency fluctuations.

We are also exposed to general interest rate risk. If interest rates increase, our interest expense could increase significantly, affecting earnings and reducing cash flow available for working capital, capital expenditures, acquisitions, and other purposes. In addition, changes by any rating agency to our outlook or credit ratings could increase our cost of borrowing.

If we lose our key employees, our business may be adversely affected.

Our ability to successfully operate and grow our business and implement our strategies is largely dependent on the efforts, abilities, and services of our key employees. Our future success will also depend on, among other factors, our ability to attract and retain qualified personnel, such as engineers and other skilled labor, either through direct hiring or the acquisition of other businesses employing such professionals. Our products, many of which are highly engineered, represent specialized applications of cryogenic, low temperature or gas processing technologies and know-how; and, many of the markets we serve represent niche markets for these specialized applications.

Accordingly, we rely heavily on engineers, salespersons, business unit leaders, senior management, and other key employees who have experience in these specialized applications and are knowledgeable about these niche markets,

our products, and our company. Additionally, we may modify our management structure from time to time or substantially reduce our overall workforce as we have done during the recent downturn in our business, which may create marketing, operational, and other business risks. The loss of the services of these senior managers or other key employees, the failure to attract or retain other qualified personnel, or the failure to effectively transition certain management functions and roles associated with the announced management succession plans could reduce the competitiveness of our business or otherwise impair our business prospects.

As a global business, we are exposed to economic, political, and other risks in different countries which could materially reduce our sales, profitability or cash flows, or materially increase our liabilities.

Since we manufacture and sell our products worldwide, our business is subject to risks associated with doing business internationally. In 2016, 2015, and 2014, 50%, 51%, and 53%, respectively, of our sales occurred in international markets. Our future results could be harmed by a variety of factors, including:

- changes in foreign currency exchange rates;
- exchange controls and currency restrictions;
- changes in a specific country's or region's political, social or economic conditions, particularly in emerging markets;
- civil unrest, turmoil or outbreak of disease in any of the countries in which we operate or sell our products;
- tariffs, other trade protection measures and import or export licensing requirements;
- potentially negative consequences from changes in U.S. and international tax laws;
- difficulty in staffing and managing geographically widespread operations;
- differing labor regulations;
- requirements relating to withholding taxes on remittances and other payments by subsidiaries;
- different regulatory regimes controlling the protection of our intellectual property;
- restrictions on our ability to own or operate subsidiaries, make investments or acquire new businesses in these jurisdictions;
- restrictions on our ability to repatriate dividends from our foreign subsidiaries;
- difficulty in collecting international accounts receivable;
- difficulty in enforcement of contractual obligations under non-U.S. law;
- transportation delays or interruptions;
- changes in regulatory requirements; and
- the burden of complying with multiple and potentially conflicting laws.

Our international operations and sales also expose us to different local political and business risks and challenges. For example, we are faced with potential difficulties in staffing and managing local operations and we have to design local solutions to manage credit and legal risks of local customers and distributors, which may not be effective. In addition, because some of our international sales are to suppliers that perform work for foreign governments, we are subject to the political risks associated with foreign government projects. For example, certain foreign governments may require suppliers for a project to obtain products solely from local manufacturers or may prohibit the use of products manufactured in certain countries.

Our operations in markets such as China, Central and Eastern Europe, India, the Middle East and Latin America, may cause us difficulty due to greater regulatory barriers than in the United States, the necessity of adapting to new regulatory systems, problems related to entering new markets with different economic, social and political systems and conditions, and significant competition from the primary participants in these markets, some of which may have substantially greater resources than us. In addition, unstable political conditions or civil unrest, including political instability in Eastern Europe, the Middle East or elsewhere, could negatively impact our order levels and sales in a region or our ability to collect receivables from customers or operate or execute projects in a region.

Our international operations and transactions also depend upon favorable trade relations between the United States and those foreign countries in which our customers and suppliers have operations. A protectionist trade environment in either the United States or those foreign countries in which we do business or sell products, such as a change in the current tariff structures, export compliance, government subsidies or other trade policies, may adversely affect our ability to sell our products or do business in foreign markets. Our overall success as a global business depends, in part, upon our ability to succeed in differing economic, social and political conditions. We may not succeed in developing and implementing policies and strategies to counter the foregoing factors effectively in each location where we do business and the foregoing factors may cause a reduction in our sales, profitability or cash flows, or cause an increase in our liabilities.

Our warranty reserves may not adequately cover our warranty obligations and increased or unexpected product warranty claims could adversely impact our financial condition and results of operations.

We provide product warranties with varying terms and durations for the majority of our products and we establish reserves for the estimated liability associated with our product warranties. Our warranty reserves are based on historical trends, as well as our understanding of specifically identified warranty issues. The amounts estimated could differ materially from actual warranty costs that may ultimately be realized. An increase in the rate of warranty claims or the occurrence of unexpected warranty claims could have a material adverse effect on our financial condition or results of operations.

Increased IT security threats and more sophisticated and targeted computer crime could pose a risk to our systems, networks, products, solutions and services.

Increased global IT security threats and more sophisticated and targeted computer crime pose a risk to the security of our systems and networks and the confidentiality, availability and integrity of our data. While we attempt to mitigate these risks by employing a number of measures, including employee training, comprehensive monitoring of our networks and systems, and maintenance of backup and protective systems, our systems, networks, products, solutions and services remain potentially vulnerable to advanced persistent threats. Depending on their nature and scope, such threats could potentially lead to the compromising of confidential information, improper use of our systems and networks, manipulation and destruction of data, defective products, production downtimes and operational disruptions, which in turn could adversely affect our reputation, competitiveness and results of operations.

We are subject to potential insolvency or financial distress of third parties.

We are exposed to the risk that third parties to various arrangements who owe us money or goods and services, or who purchase goods and services from us, will not be able to perform their obligations or continue to place orders due to insolvency or financial distress. If third parties fail to perform their obligations under arrangements with us, we may be forced to replace the underlying commitment at current or above market prices or on other terms that are less favorable to us or we may have to write off receivables in the case of customer failures to pay. If this happens, whether as a result of the insolvency or financial distress of a third party or otherwise, we may incur losses, or our results of operations, financial position or liquidity could otherwise be adversely affected.

Failure to protect our intellectual property and know-how could reduce or eliminate any competitive advantage and reduce our sales and profitability, and the cost of protecting our intellectual property may be significant.

We rely on a combination of internal procedures, nondisclosure agreements and intellectual property rights assignment agreements, as well as licenses, patents, trademarks and copyright law to protect our intellectual property and know-how. Our intellectual property rights may not be successfully asserted in the future or may be invalidated, circumvented or challenged. For example, we frequently explore and evaluate potential relationships and projects with other parties, which often require that we provide the potential partner with confidential technical information. While confidentiality agreements are typically put in place, there is a risk the potential partner could violate the confidentiality agreement and use our technical information for its own benefit or the benefit of others or compromise the confidentiality. In addition, the laws of certain foreign countries in which our products may be sold or manufactured do not protect our intellectual property rights to the same extent as the laws of the United States. In addition, certain provisions of the Leahy-Smith America Invents Act went into effect on March 16, 2013. The Leahy-Smith America Invents Act transitioned the United States from a “first-to-invent” to a “first-to-file” patent system. This change means that between two identical, pending patent applications, the first inventor no longer receives priority on the patent to the invention. As a result, the Leahy-Smith America Invents Act may require us to incur significant additional expense and effort to protect our intellectual property. Failure or inability to protect our proprietary information could result in a decrease in our sales or profitability.

We have obtained and applied for some U.S. and foreign trademark and patent registrations and will continue to evaluate the registration of additional trademarks and patents, as appropriate. We cannot guarantee that any of our pending applications will be approved. Moreover, even if the applications are approved, third parties may seek to oppose or otherwise challenge them. A failure to obtain registrations in the United States or elsewhere could limit our ability to protect our trademarks and technologies and could impede our business. Further, the protection of our intellectual property may require expensive investment in protracted litigation and the investment of substantial

management time and there is no assurance we ultimately would prevail or that a successful outcome would lead to an economic benefit that is greater than the investment in the litigation. The patents in our patent portfolio are scheduled to expire between 2017 and 2037.

In addition, we may be unable to prevent third parties from using our intellectual property rights and know-how without our authorization or from independently developing intellectual property that is the same as or similar to ours, particularly in those countries where the laws do not protect our intellectual property rights as fully as in the United States. We compete in a number of industries (e.g., heat exchangers and cryogenic storage) that are small or specialized, which makes it easier for a competitor to

monitor our activities and increases the risk that ideas will be stolen. The unauthorized use of our know-how by third parties could reduce or eliminate any competitive advantage we have developed, cause us to lose sales or otherwise harm our business or increase our expenses as we attempt to enforce our rights.

Some of our products are subject to regulation by the U.S. Food and Drug Administration and other governmental authorities.

Some of our products are subject to regulation by the U.S. Food and Drug Administration and other national, supranational, federal and state governmental authorities. It can be costly and time consuming to obtain regulatory approvals to market a medical device, such as those sold by our BioMedical segment. Approvals might not be granted for new devices on a timely basis, if at all. Regulations are subject to change as a result of legislative, administrative or judicial action, which may further increase our costs or reduce sales. Our failure to maintain approvals or obtain approval for new products could adversely affect our business, results of operations, financial condition and cash flows.

In addition, we are subject to regulations covering manufacturing practices, product labeling, advertising and adverse-event reporting that apply after we have obtained approval to sell a product. Many of our facilities' procedures and those of our suppliers are subject to ongoing oversight, including periodic inspection by governmental authorities. Compliance with production, safety, quality control and quality assurance regulations is costly and time-consuming, and while we seek to be in full compliance, noncompliance could arise from time to time. If we fail to comply, our operations, financial condition and cash flows could be adversely affected, including through the imposition of fines, costly remediation or plant shutdowns, suspension or delay in product approval, product seizure or recall, or withdrawal of product approval as a result of noncompliance.

Fluctuations in the prices and availability of raw materials could negatively impact our financial results.

The pricing and availability of raw materials for use in our businesses can be volatile due to numerous factors beyond our control, including general, domestic and international economic conditions, labor costs, production levels, competition, consumer demand, import duties and tariffs and currency exchange rates. This volatility can significantly affect the availability and cost of raw materials for us, and may, therefore, increase the short-term or long-term costs of raw materials.

The commodity metals we use, including aluminum and stainless steel, have experienced fluctuations in price in recent years. On average, over half of our cost of sales for many of our product lines has historically been represented by the cost of commodities metals. We have generally been able to recover the cost increases through price increases to our customers; however, during periods of rising prices of raw materials, we may not always be able to pass increases on to our customers on a timely basis. Conversely, when raw material prices decline, customer demands for lower prices could result in lower sale prices and, to the extent we have existing inventory, lower margins. As a result, fluctuations in raw material prices could result in lower sales and profitability.

We may be subject to claims that our products or processes infringe the intellectual property rights of others, which may cause us to pay unexpected litigation costs or damages, modify our products or processes or prevent us from selling our products.

Although it is our intention to avoid infringing or otherwise violating the intellectual property rights of others, third parties may nevertheless claim (and in the past have claimed) that our processes and products infringe their intellectual property and other rights. For example, our BioMedical business manufactures products for relatively broad consumer use, is actively marketing these products in multiple jurisdictions internationally and risks infringing upon technologies that may be protected in one or more of these international jurisdictions as the scope of our international marketing efforts expands. Our strategies of capitalizing on growing international demand, as well as developing new innovative products across multiple business lines present similar infringement claim risks both internationally and in the United States as we expand the scope of our product offerings and markets. We compete with other companies for contracts in some small or specialized industries, which increases the risk that the other companies will develop overlapping technologies leading to an increased possibility that infringement claims will arise. Whether or not these claims have merit, we may be subject to costly and time-consuming legal proceedings, and this could divert our management's attention from operating our businesses. In order to resolve such proceedings, we may need to obtain licenses from these third parties or substantially re-engineer or rename our products in order to

avoid infringement. In addition, we might not be able to obtain the necessary licenses on acceptable terms, or at all, or be able to re-engineer or rename our products successfully.

We may be required to make material expenditures in order to comply with environmental, health and safety laws and climate change regulations, or incur additional liabilities under these laws and regulations.

We are subject to numerous environmental, health and safety laws and regulations that impose various environmental controls on us or otherwise relate to environmental protection and various health and safety matters, including the discharge of pollutants in the air and water, the handling, use, treatment, storage and clean-up of solid and hazardous materials and wastes, the investigation and remediation of soil and groundwater affected by hazardous substances and the requirement to obtain and maintain permits

and licenses. These laws and regulations often impose strict, retroactive and joint and several liability for the costs and damages resulting from cleaning up our or our predecessors' facilities and third party disposal sites. Compliance with these laws generally increases the costs of transportation and storage of raw materials and finished products, as well as the costs of storing and disposing waste, and could decrease our liquidity and profitability and increase our liabilities. Health and safety and other laws in the jurisdictions in which we operate impose various requirements on us including state licensing requirements that may benefit our customers. If we are found to have violated any of these laws, we may become subject to corrective action orders and fines or penalties, and incur substantial costs, including substantial remediation costs and commercial liability to our customers. Further, we also could be subject to future liability resulting from conditions that are currently unknown to us that could be discovered in the future.

We are currently remediating or developing work plans for remediation of environmental conditions involving certain current or former facilities. For example, the discovery of contamination arising from historical industrial operations at our Clarksville, Arkansas property, which is currently being leased to a third party business, has exposed us, and in the future may continue to expose us, to remediation obligations. We have also been subject to environmental liabilities for other sites where we formerly operated or at locations where we or our predecessors did or are alleged to have operated. To date, our environmental remediation expenditures and costs for otherwise complying with environmental laws and regulations have not been material, but the uncertainties associated with the investigation and remediation of contamination and the fact that such laws or regulations change frequently makes predicting the cost or impact of such laws and regulations on our future operations uncertain. Stricter environmental, safety and health laws, regulations or enforcement policies could result in substantial costs and liabilities to us and could subject us to more rigorous scrutiny. Consequently, compliance with these laws could result in significant expenditures, as well as other costs and liabilities that could decrease our liquidity and profitability and increase our liabilities.

There is a growing political and scientific belief that emissions of greenhouse gases alter the composition of the global atmosphere in ways that are affecting the global climate. Various stakeholders, including legislators and regulators, stockholders and non-governmental organizations, as well as companies in many business sectors, are considering ways to reduce greenhouse gas emissions. New regulations could result in product standard requirements for the Company's global businesses but because any impact is dependent on the design of the mandate or standard, the Company is unable to predict its significance at this time. Furthermore, the potential physical impacts of theorized climate change on the Company's customers, and therefore on the Company's operations, are speculative and highly uncertain, and would be particular to the circumstances developing in various geographical regions. These may include changes in weather patterns (including drought and rainfall levels), water availability, storm patterns and intensities, and temperature levels. These potential physical effects may adversely impact the cost, production, sales and financial performance of the Company's operations.

Additional liabilities related to taxes could adversely impact our financial results, financial condition and cash flow. We are subject to tax and related obligations in the jurisdictions in which we operate or do business, including state, local, federal and foreign taxes. The taxing rules of the various jurisdictions in which we operate or do business often are complex and subject to varying interpretations. Tax authorities may challenge tax positions that we take or historically have taken, and may assess taxes where we have not made tax filings or may audit the tax filings we have made and assess additional taxes, as they have done from time to time in the past. Some of these assessments may be substantial, and also may involve the imposition of substantial penalties and interest. In addition, governments could impose new taxes on us in the future. The payment of substantial additional taxes, penalties or interest resulting from tax assessments, or the imposition of any new taxes, could materially and adversely impact our results of operations, financial condition and cash flow.

If we are unable to continue our technological innovation and successful introduction of new commercial products, our profitability could be adversely affected.

The industries we serve, including the energy, industrial gas, respiratory healthcare and life sciences industries, experience ongoing technological change and product improvement. Manufacturers periodically introduce new generations of products or require new technological capacity to develop customized products or respond to industry developments or needs. Our future growth will depend on our ability to gauge the direction of the commercial and technological progress in our markets, as well as our ability to acquire new product technologies or fund and

successfully develop, manufacture and market products in this constantly changing environment. We must continue to identify, develop, manufacture and market innovative products on a timely basis to replace existing products in order to maintain our profit margins and competitive position. We may not be successful in acquiring and developing new products or technologies and any of our new products may not be accepted by our customers. If we fail to keep pace with evolving technological innovations in the markets we serve, our profitability may decrease.

Our pension plan is currently underfunded and we contribute to a multi-employer plan for collective bargaining U.S. employees, which is also underfunded.

Certain U.S. hourly and salaried employees are covered by our defined benefit pension plan. The plan has been frozen since February 2006. As of December 31, 2016, the projected benefit obligation under our pension plan was approximately \$55.5 million and the value of the assets of the plan was approximately \$41.1 million, resulting in our pension plan being underfunded by approximately \$14.4 million. We are also a participant in a multi-employer plan, which is underfunded. Among other risks associated with multi-employer plans, contributions and unfunded obligations of the multi-employer plan are shared by the plan participants and we may inherit unfunded obligations if other plan participants withdraw from the plan or cease to participate. Additionally, if we elect to stop participating in the multi-employer plan, we may be required to pay amounts related to withdrawal liabilities associated with the underfunded status of the plan. If the performance of the assets in our pension plan or the multi-employer plan does not meet expectations or if other actuarial assumptions are modified, our required pension contributions for future years could be higher than we expect, which may negatively impact our results of operations, cash flows and financial condition.

We operate in many different jurisdictions and we could be adversely affected by violations of the U.S. Foreign Corrupt Practices Act and similar worldwide anti-corruption laws.

The U.S. Foreign Corrupt Practices Act (“FCPA”) and similar worldwide anti-corruption laws generally prohibit companies and their intermediaries from making improper payments for the purpose of obtaining or retaining business. Our internal policies mandate compliance with these anti-corruption laws. We operate in many parts of the world that have experienced corruption to some degree, and in certain circumstances, strict compliance with anti-corruption laws may conflict with local customs and practices. Despite our training and compliance programs, we cannot assure you that our internal control policies and procedures always will protect us from reckless or criminal acts committed by our employees or agents. Our continued expansion outside the U.S., including in developing countries, could increase the risk of such violations in the future. Violations of these laws, or allegations of such violations, could disrupt our business and result in a material adverse effect on our results of operations or financial condition.

Increased government regulation could adversely affect our financial results, financial condition and cash flow. The Dodd-Frank Wall Street Reform and Consumer Protection Act (the “Dodd-Frank Act”) institutes a wide range of reforms, some of which may impact us. Among other things, the Dodd-Frank Act contains significant corporate governance and executive compensation-related provisions that authorize or require the SEC to adopt additional rules and regulations in these areas. The impact of these provisions on our business is uncertain. For example, the Dodd-Frank Act provides for statutory and regulatory requirements for derivative transactions, including foreign exchange and interest rate hedging transactions. We enter into foreign exchange contracts, interest rate swaps and forward contracts from time to time to manage our foreign currency exchange and interest rate risk, and exposure to commodity price risk. The Dodd-Frank Act includes extensive provisions regulating the derivatives market, and many of the regulations implementing the derivatives provisions have become effective and additional requirements are expected to become effective in the future. As such, we have become and could continue to become subject to additional regulatory costs, both directly and indirectly, through increased costs of doing business with market intermediaries that are now subject to extensive regulation pursuant to the Dodd-Frank Act. As the regulatory regime is still developing and additional regulations have not been finalized or fully implemented or may be reduced or altered due to proposed U.S. legislative action, the ultimate costs of Dodd-Frank and similar legislation on our business remain uncertain. However, such costs could be significant and have an adverse effect on our financial results, financial condition and cash flow.

Increases in labor costs, potential labor disputes and work stoppage could materially decrease our sales and profitability.

Our financial performance is affected by the availability of qualified personnel and the cost of labor. As of January 31, 2017, we had 4,050 employees, including 158 bargaining unit hourly employees. Employees represented by a union are subject to one collective bargaining agreement in the United States that expires in February 2018. We have experienced one work stoppage in 2007. We have already executed a successor agreement with our unionized

employees through 2023, which will replace the collective bargaining agreement that expires in February 2018. If we are unable to enter into new, satisfactory labor agreements with our unionized employees when necessary in the future or other labor controversies or union organizing efforts arise, we could experience a significant disruption to our operations, lose business or experience an increase in our operating expenses, which could reduce our profit margins. Furthermore, increased U.S. federal regulation or significant modifications to existing labor regulations could potentially increase our labor costs.

Our operations could be impacted by the effects of severe weather, which could be more severe than the damage and impact that our Louisiana operations encountered from hurricanes in prior years.

Some of our operations, including our operations in New Iberia, Louisiana and Houston, Texas, are located in geographic regions and physical locations that are susceptible to physical damage and longer-term economic disruption from hurricanes or

other severe weather. We also could make significant future capital expenditures in hurricane-susceptible or other severe weather locations from time to time. These weather events can disrupt our operations, result in damage to our properties and negatively affect the local economy in which these facilities operate. In September 2008, for example, our New Iberia, Louisiana facility was forced to close as a result of heavy rainfall, evacuations, strong winds and power outages resulting from Hurricane Gustav. Two weeks after Hurricane Gustav, winds and flooding from Hurricane Ike damaged our New Iberia, Louisiana, Houston, Texas and The Woodlands, Texas operations and offices, and those facilities were also closed for a period of time. Future hurricanes or other severe weather may cause production or delivery delays as a result of the physical damage to the facilities, the unavailability of employees and temporary workers, the shortage of or delay in receiving certain raw materials or manufacturing supplies and the diminished availability or delay of transportation for customer shipments, any of which may have an adverse effect on our sales and profitability. Additionally, the potential physical impact of theorized climate change could include more frequent and intense storms, which would heighten the risk to our operations in areas that are susceptible to hurricanes and other severe weather. Although we maintain insurance subject to certain deductibles, which may cover some of our losses, that insurance may become unavailable or prove to be inadequate.

We are subject to regulations governing the export of our products.

Due to our significant foreign sales, our export activities are subject to regulation, including the U.S. Treasury Department's Office of Foreign Assets Control's regulations. We believe we are in compliance with these regulations and maintain robust programs intended to maintain compliance. However, unintentional lapses in our compliance or uncertainties associated with changing regulatory requirements could result in future violations (or alleged violations) of these regulations. Any violations may subject us to government scrutiny, investigation and civil and criminal penalties and may limit our ability to export our products.

As a provider of products to the U.S. government, we are subject to federal rules, regulations, audits and investigations, the violation or failure of which could adversely affect our business.

We sell certain of our products to the U.S. government; and, therefore, we must comply with and are affected by laws and regulations governing purchases by the U.S. government. Government contract laws and regulations affect how we do business with our government customers and, in some instances, impose added costs on our business. For example, a violation of specific laws and regulations could result in the imposition of fines and penalties or the termination of our contracts or debarment from bidding on contracts. In some instances, these laws and regulations impose terms or rights that are more favorable to the government than those typically available to commercial parties in negotiated transactions.

Unanticipated changes in our effective tax rate could adversely affect our future results.

We are subject to income taxes in the United States and various foreign jurisdictions, and our domestic and international tax liabilities are subject to the allocation of expenses in differing jurisdictions. Our effective tax rate could be adversely affected by changes in the mix of earnings and losses in countries with differing statutory tax rates, certain non-deductible expenses arising from share based compensation, the valuation of deferred tax assets and liabilities and changes in federal, state or international tax laws and accounting principles. Increases in our effective tax rate could materially affect our net results. In addition, we are subject to income tax audits by many tax jurisdictions throughout the world. Although we believe our income tax liabilities are reasonably estimated and accounted for in accordance with applicable laws and principles, an adverse resolution of one or more uncertain tax positions in any period could have a material impact on the results of operations for that period.

Risks Related to Our Leverage

Our leverage and future debt service obligations could adversely affect our financial condition, limit our ability to raise additional capital to fund our operations, limit our ability to react to changes in the economy or our industry, impact the way we operate our business, expose us to interest rate risk to the extent of our variable rate debt and prevent us from fulfilling our debt service obligations.

We are leveraged and have future debt service obligations. Our financial performance could be affected by our leverage. As of December 31, 2016, our total indebtedness was \$263.2 million. In addition, at that date, under our senior secured revolving credit facility, we had \$37.2 million of letters of credit and bank guarantees outstanding and

borrowing capacity of approximately \$412.8 million. Through separate facilities, our subsidiaries had \$7.5 million in bank guarantees outstanding at December 31, 2016. While we had \$282.0 million in cash at December 31, 2016, which we believe mitigates the risk related to our leverage, there is no assurance that we will continue to be profitable in the future or that we will not use our available cash in ways other than those that reduce our leverage or mitigate the risk related to our leverage. We may also incur additional indebtedness in the future. Our level of indebtedness could have important negative consequences, including:

- we may have difficulty generating sufficient cash flow to pay interest and satisfy our debt obligations;

we may have difficulty obtaining financing in the future for working capital, capital expenditures, acquisitions or other purposes;

we may need to use a substantial portion of our available cash flow to pay interest and principal on our debt, which would reduce the amount of money available to finance our operations and other business activities;

future borrowings under our senior secured revolving credit facility have variable rates of interest, which could expose us to the risk of increased interest rates;

our debt level increases our vulnerability to general economic downturns and adverse industry conditions;

our debt level could limit our flexibility in planning for, or reacting to, changes in our business and in our industry in general;

our debt and the amount we must pay to service our debt obligations could place us at a competitive disadvantage compared to our competitors that have less debt;

our customers may react adversely to our debt level and seek or develop alternative suppliers; and

our failure to comply with the financial and other restrictive covenants in our debt instruments which, among other things, require us to maintain specified financial ratios and limit our ability to incur debt and sell assets, could result in an event of default that, if not cured or waived, could have a material adverse effect on our business or prospects.

Our business may not generate sufficient cash flow from operations and future borrowings may not be available to us under our senior secured revolving credit facility or otherwise in an amount sufficient to permit us to pay the principal and interest on our indebtedness or fund our other liquidity needs. In addition, borrowings under our senior secured revolving credit facility bear interest at variable rates. If market interest rates increase, debt service on our variable-rate debt will rise, which would adversely affect our cash flow. We may be unable to refinance any of our debt, including our senior secured revolving credit facility or our 2.00% Convertible Senior Subordinated Notes due August 2018, on commercially reasonable terms. See Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations — Liquidity and Capital Resources."

If our cash flows and capital resources are insufficient to fund our debt service obligations, we may be forced to sell assets, seek additional capital or seek to restructure or refinance our indebtedness. These alternative measures may not be successful and may not permit us to meet our scheduled debt service obligations. We may be unable to consummate those asset sales to raise capital or sell assets at prices that we believe are fair and proceeds that we do receive may be inadequate to meet any debt service obligations then due.

We may still be able to incur substantially more debt. This could further exacerbate the risks that we face.

We may be able to incur substantial additional indebtedness in the future. The terms of our debt instruments do not fully prohibit us from doing so. Our senior secured revolving credit facility provides commitments of up to \$450.0 million, approximately \$412.8 million of which would have been available for future borrowings (after giving effect to letters of credit and bank guarantees outstanding) as of December 31, 2016. See Item 7. "Management's Discussion and Analysis of Financial Condition and Results of Operations — Liquidity and Capital Resources — Debt Instruments and Related Covenants." We may also further increase the size of our senior secured revolving credit facility which includes an expansion option permitting us to add up to an aggregate of \$200.0 million in additional borrowings, subject to certain conditions, or we could refinance with higher borrowing limits. If new debt is added to our current debt levels, the related risks that we now face could intensify.

The senior secured revolving credit facility contains a number of restrictive covenants which limit our ability to finance future operations or capital needs or engage in other business activities that may be in our interest.

The senior secured revolving credit facility imposes, and the terms of any future indebtedness may impose, operating and other restrictions on us and our subsidiaries. Such restrictions affect or will affect, and in various circumstances limit or prohibit, among other things, our ability and the ability of our subsidiaries to:

- incur additional indebtedness;
- create liens;
- pay dividends based on our leverage ratio and make other distributions in respect of our capital stock;
- redeem or buy back our capital stock based on our leverage ratio;
- make certain investments or certain other restricted payments;
- sell or transfer certain kinds of assets;

enter into certain types of transactions with affiliates; and
effect mergers or consolidations.

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The senior secured revolving credit facility also requires us to achieve certain financial and operating results and maintain compliance with specified financial ratios. Our ability to comply with these ratios may be affected by events beyond our control.

The restrictions contained in the senior secured revolving credit facility could:

- limit our ability to plan for or react to market or economic conditions or meet capital needs or otherwise restrict our activities or business plans; and

- adversely affect our ability to finance our operations, acquisitions, investments or strategic alliances or other capital needs or to engage in other business activities that would be in our interest.

A breach of any of these covenants or our inability to comply with the required financial ratios could result in a default under our senior secured revolving credit facility. If an event of default occurs under our senior secured revolving credit facility, which includes an event of default under the indenture governing our 2.00% Convertible Senior Subordinated Notes due August 2018, the lenders could elect to:

- declare all borrowings outstanding, together with accrued and unpaid interest, to be immediately due and payable; or

- require us to apply all of our available cash to repay the borrowings,

either of which could result in an event of default under our convertible notes or prevent us from making payments on the convertible notes when due in 2018. The lenders will also have the right in these circumstances to terminate any commitments they have to provide further financing.

If we were unable to repay or otherwise refinance these borrowings when due, our lenders could sell the collateral securing the senior secured revolving credit facility, which constitutes substantially all of our and our domestic wholly-owned subsidiaries' assets.

Our 2.00% Convertible Senior Subordinated Notes due August 2018 have certain fundamental change and conditional conversion features which, if triggered, may adversely affect our financial condition.

If a fundamental change occurs under our 2.00% Convertible Senior Subordinated Notes due August 2018, the holders of the convertible notes may require us to purchase for cash any or all of the convertible notes. However, there can be no assurance that we will have sufficient funds at the time of the fundamental change to purchase all of the convertible notes delivered for purchase, and we may not be able to arrange necessary financing on acceptable terms, if at all.

Likewise, if one of the conversion contingencies of our convertible notes is triggered, holders of convertible notes will be entitled to convert the convertible notes at any time during specified periods. For example, as a result of attaining specified market price triggers, the notes were convertible during several quarters in 2013, although no notes have been converted to date. If one or more holders elects to convert their convertible notes during such future specified periods, we would be required to settle any converted principal through the payment of cash, which could adversely affect our liquidity.

We are subject to counterparty risk with respect to the convertible note hedge and capped call transactions associated with our 2.00% Convertible Senior Subordinated Notes due August 2018.

The option counterparties for our convertible note hedging arrangements are financial institutions, and we will be subject to the risk that any or all of them might default under the convertible note hedge and capped call transactions.

Our exposure to the credit risk of the option counterparties is not secured by any collateral. Global economic conditions during the 2008-2009 economic downturn resulted in the actual or perceived failure or financial difficulties of many financial institutions. If an option counterparty becomes subject to insolvency proceedings, we will become an unsecured creditor in those proceedings with a claim equal to our exposure at that time under the convertible note hedge and capped call transactions with that option counterparty. Our exposure will depend on many factors but, generally, the increase in our exposure will be correlated to the increase in the market price and in the volatility of our common stock. In addition, upon a default by an option counterparty, we may suffer adverse tax consequences and more dilution than we currently anticipate with respect to our common stock. We can provide no assurances as to the financial stability or viability of the option counterparties.

We are a holding company and we may depend upon cash from our subsidiaries to service our debt. If we do not receive cash from our subsidiaries, we may be unable to meet our obligations.

We are a holding company and all of our operations are conducted through our subsidiaries. Accordingly, we may be dependent upon the earnings and cash flows from our subsidiaries to provide the funds necessary to meet our debt

service obligations. If we could not have access to the cash flows of our subsidiaries, we may be unable to pay the principal or interest on our debt. In addition, certain of our subsidiaries are holding companies that rely on subsidiaries of their own as a source of funds to meet any obligations that might arise.

Generally, the ability of a subsidiary to make cash available to its parent is affected by its own operating results and is subject to applicable laws and contractual restrictions contained in its debt instruments and other agreements. Moreover, there may be restrictions on payments by our subsidiaries to us under applicable laws, including laws that require companies to maintain minimum amounts of capital, to make payments to shareholders only from profits and restrictions on our ability to repatriate dividends from our foreign subsidiaries. As a result, although our subsidiaries may have cash, we may be unable to obtain that cash to satisfy our obligations and make payments to our stockholders, if any.

Risks Related to the Trading Market for Our Common Stock

Our common stock has experienced, and may continue to experience, price volatility.

Our common stock has at times experienced substantial price volatility as a result of many factors, including the general volatility of stock market prices and volumes, changes in securities analysts' estimates of our financial performance, variations between our actual and anticipated financial results, fluctuations in order or backlog levels, fluctuations in energy prices, or uncertainty about current global economic conditions. For these reasons, among others, the price of our stock may continue to fluctuate.

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws and other agreements and in Delaware law may discourage a takeover attempt.

Provisions contained in our amended and restated certificate of incorporation and amended and restated bylaws and Delaware law could make it more difficult for a third party to acquire us. Provisions of our amended and restated certificate of incorporation and amended and restated bylaws and Delaware law impose various procedural and other requirements, which could make it more difficult for stockholders to effect certain corporate actions. For example, our amended and restated certificate of incorporation authorizes our board of directors to determine the rights, preferences, privileges and restrictions of unissued series of preferred stock, without any vote or action by our stockholders. Therefore, our board of directors can authorize and issue shares of preferred stock with voting or conversion rights that could adversely affect the voting or other rights of holders of our common stock. These rights may have the effect of delaying or deterring a change of control of our company. These provisions could limit the price that certain investors might be willing to pay in the future for shares of our common stock.

In addition, the terms of our 2.00% Convertible Senior Subordinated Notes may require us to purchase these convertible notes for cash in the event of a takeover of our Company. The indenture governing the convertible notes also prohibits us from engaging in certain mergers or acquisitions unless, among other things, the surviving entity assumes our obligations under the convertible notes. These and other provisions applicable to the convertible notes may have the effect of increasing the cost of acquiring us or otherwise discourage a third party from acquiring us. The issuance of common stock upon conversion of our 2.00% Convertible Senior Subordinated Notes due August 2018 could cause dilution to the interests of our existing stockholders.

As of December 31, 2016, we had \$250.0 million aggregate principal amount of convertible notes outstanding. Prior to the close of business on the business day immediately preceding May 1, 2018, the convertible notes will be convertible only upon satisfaction of certain conditions. As a result of attaining specified market price triggers, the notes were convertible during several quarters in 2013, although no notes have been converted to date. Holders may convert their convertible notes at their option at any time after May 1, 2018. We will settle conversions of convertible notes by paying cash up to the aggregate principal amount of the convertible notes to be converted and paying or delivering, as the case may be, cash, shares of our common stock, or a combination of cash and shares of our common stock, at our election, in respect of the remainder, if any, of our conversion obligation in excess of the aggregate principal amount of the notes being converted. The number of shares issued could be significant and such an issuance could cause significant dilution to the interests of the existing stockholders.

Item 1B. Unresolved Staff Comments

Not applicable.

Item 2. Properties

We occupy 47 facilities among the locations listed below totaling approximately 4.6 million square feet, with the majority devoted to manufacturing, assembly, and storage. Of these facilities, approximately 3.5 million square feet are owned and 1.1 million square feet are occupied under operating leases. We currently lease approximately 32,800 square feet for our corporate office in Garfield Heights, Ohio. We have announced plans to move our corporate headquarters to Canton, Georgia during the fourth quarter of 2017. Our major owned facilities in the United States are subject to mortgages securing our senior secured revolving credit facility.

The following table summarizes certain information about facilities occupied by us as of January 31, 2017:

Location	Segment	Approximate Square Footage	Ownership	Use
Garfield Heights, Ohio	Corporate	32,800	Leased	Office
Luxembourg, Luxembourg	Corporate	1,200	Leased	Office
Aichi, Japan	BioMedical	7,000	Leased	Service
Amherst, New York	BioMedical	150,100	Leased/Owned	Manufacturing/Warehouse/Office
Chengdu, China	BioMedical	176,000	Owned	Manufacturing/Office
Lidcombe, Australia	BioMedical	2,400	Leased	Office/Warehouse
Padova, Italy	BioMedical	11,800	Leased	Service
San Diego, California	BioMedical	24,500	Leased	Manufacturing/Office
Tokyo, Japan	BioMedical	1,600	Leased	Office
Troy, New York	BioMedical	12,000	Leased	Manufacturing/Office
Wokingham, United Kingdom	BioMedical	7,200	Leased	Office/Warehouse/Service
Wuppertal, Germany	BioMedical	104,900	Leased	Office/Warehouse/Service
Decin, Czech Republic	Distribution & Storage	619,000	Owned	Manufacturing/Office
Goch, Germany	Distribution & Storage	258,000	Owned	Manufacturing/Office
Houston, Texas	Distribution & Storage/Energy & Chemicals	50,800	Leased/Owned	Manufacturing/Service
Kuala Lumpur, Malaysia	Distribution & Storage	2,500	Leased	Marketing & Sales/Office
McCarran, Nevada	Distribution & Storage	42,300	Owned	Service
Mumbai, India	Distribution & Storage	100	Leased	Office
Nanjing, China	Distribution & Storage	39,700	Leased/Owned	Manufacturing/Office
Salem, New Hampshire	Distribution & Storage	1,300	Leased	Office
Solingen, Germany	Distribution & Storage	16,000	Leased	Manufacturing/Office/Service/Warehouse
Fremont, California	Distribution & Storage	19,600	Leased	Manufacturing/Office

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Pershore, United Kingdom	Distribution & Storage	2,800	Leased	Office/Warehouse
Bogota, Colombia	Distribution & Storage	500	Leased	Office
East Java, Indonesia	Distribution & Storage	6,800	Leased	Manufacturing/Office
Shanghai, China	Distribution & Storage	400	Leased	Marketing & Sales/Office
Canton, Georgia	Distribution & Storage/BioMedical	337,700	Leased/Owned	Manufacturing/Office/Service/Testing Lab/Warehouse
New Prague, Minnesota	Distribution & Storage/BioMedical	419,300	Leased/Owned	Manufacturing/Office/Service
North Dartmouth, Massachusetts	Distribution & Storage	9,600	Owned	Office
Changzhou, China	Distribution & Storage	1,281,600	Leased/Owned	Manufacturing/Office
Franklin, Indiana	Energy & Chemicals	51,400	Leased	Manufacturing/Office
La Crosse, Wisconsin	Energy & Chemicals	296,000	Leased/Owned	Manufacturing/Office
New Iberia, Louisiana	Energy & Chemicals	108,700	Leased	Manufacturing
The Woodlands, Texas	Energy & Chemicals	33,500	Leased	Office
Tulsa, Oklahoma	Energy & Chemicals	222,800	Leased/Owned	Manufacturing/Office
Wuxi, China	Energy & Chemicals	200,000	Leased	Manufacturing/Office

In addition, we own a 110,000 square foot facility in Clarksville, Arkansas that is leased from the Company. The table above excludes leased facilities covering approximately 151,100 square feet that have been closed.

Regulatory Environment

We are subject to federal, state, and local regulations relating to the discharge of materials into the environment, production and handling of hazardous and regulated materials, and the conduct and condition of our production facilities. We do not believe that these regulatory requirements have had a material effect upon our capital expenditures, earnings, or competitive position. We are not anticipating any material capital expenditures in 2017 that are directly related to regulatory compliance matters. We are also not aware of any pending or potential regulatory changes that would have a material adverse impact on our business.

Item 3. Legal Proceedings

We are occasionally subject to various legal claims related to performance under contracts, product liability, environmental liability, taxes, employment, intellectual property, and other matters, several of which claims assert substantial damages in the ordinary course of our business. Based on the Company's historical experience in litigating these claims, as well as the Company's current assessment of the underlying merits of the claims and applicable insurance, if any, we believe the resolution of these legal claims will not have a material adverse effect on our financial position, liquidity, cash flows or results of operations. Future developments may, however, result in resolution of these legal claims in a way that could have a material adverse effect. See Item 1A. "Risk Factors."

Item 4. Mine Safety Disclosures

Not applicable.

Item 4A. Executive Officers of the Registrant*

The name, age and positions of each Executive Officer of the Company as of February 15, 2017 are as follows:

Name	Age	Position
Samuel F. Thomas ⁽¹⁾	65	Chairman and Chief Executive Officer
William C. Johnson ⁽¹⁾	53	President and Chief Operating Officer
Kenneth J. Webster ⁽²⁾	54	Vice President and Chief Financial Officer
Robert H. Wolfe	67	Vice President, General Counsel and Secretary
Mary C. (Katie) Cook	46	Chief Accounting Officer and Controller
Jillian C. Evanko ⁽²⁾	39	Vice President of Finance

⁽¹⁾ Effective as of the Company's May 25, 2017 Annual Meeting of Stockholders, Mr. Johnson will become the Company's Chief Executive Officer and President and Mr. Thomas will assume the position of Executive Chairman.

⁽²⁾ Effective March 1, 2017, Mr. Webster will cease to be an officer of the Company and Ms. Evanko will become the Company's Chief Financial Officer.

* Included pursuant to Instruction 3 to Item 401(b) of Regulation S-K.

Samuel F. Thomas is our Chairman of the Board and Chief Executive Officer. He has served as Chairman of our Board of Directors since March 2007 and served as our Chief Executive Officer and President and as a member of our Board of Directors since October 2003. Prior to joining our Company, Mr. Thomas was Executive Vice President of Global Consumables at ESAB Holdings Ltd., a provider of welding consumables and equipment. In addition to his most recent position at ESAB, Mr. Thomas was responsible for ESAB North America during his employment at ESAB Holdings Ltd. Prior to joining ESAB in February 1999, Mr. Thomas was Vice President of Friction Products for Federal Mogul, Inc. Prior to its acquisition by Federal Mogul in 1998, Mr. Thomas was employed by T&N plc from 1976 to 1998, where he served from 1991 as chief executive of several global operating divisions, including industrial sealing, camshafts and friction products. Mr. Thomas also serves on the board of Lumentum Holdings Inc. William C. Johnson joined us in July 2016 as President and Chief Operating Officer. Prior to joining our Company, Mr. Johnson served as President and Chief Executive Officer at Dover Refrigeration & Food Equipment, Inc., a subsidiary of Dover Corporation. Mr. Johnson held multiple executive positions at Dover and its manufacturing companies, which he joined in August 2006 as Executive Vice President at Hill Phoenix, Inc. Prior to his tenure with Dover, Mr. Johnson served as President and Chief Executive Officer of Graham Corporation.

Kenneth J. Webster is our Vice President and Chief Financial Officer and has served in that capacity since April 2016. Prior to that, Mr. Webster was Chief Accounting Officer and Controller since March 2008 and Vice President since May 2010. Mr. Webster joined the Company in July 2006 as the Company's Director of Internal Audit. Prior to joining Chart, Mr. Webster served as Assistant Corporate Controller for International Steel Group, an integrated steel manufacturer, from March 2004 to April 2005, at which time International Steel Group was acquired by Mittal Steel USA, Inc. Following the acquisition, Mr. Webster continued to serve in his capacity as Assistant Corporate Controller for Mittal Steel USA, Inc. until July 2006. Before that, Mr. Webster served in various accounting and finance positions with Bethlehem Steel.

Robert H. Wolfe was appointed to serve as the Company's Vice President, General Counsel and Secretary in November 2016. Mr. Wolfe has been employed with the Company since 2011, serving as the Assistant General Counsel of Chart Energy & Chemicals, Inc. Prior to joining the Company, Mr. Wolfe had over 30 years of legal experience with several top engineering, construction and procurement firms including, most recently, URS Energy & Construction, Inc. Mr. Wolfe

also has substantial public company General Counsel experience from his prior tenure at Chicago Bridge & Iron Company, N.V.

Mary C. (Katie) Cook was appointed our Chief Accounting Officer and Controller in April 2016. Prior to that, Ms. Cook was our Assistant Corporate Controller since August 2012. She was previously the Manager of Financial Reporting for Applied Industrial Technologies, Inc. from December 2006 through August 2012. Prior to December 2006, Ms. Cook held various audit and accounting roles for Ernst & Young, LLP, Foseco, Inc. and Bonne Bell, Inc.

Jillian C. Evanko was appointed Vice President of Finance on February 13, 2017. Ms. Evanko served as the Vice President and Chief Financial Officer of Truck-Lite Co., LLC since October 2016, prior to which Ms. Evanko held multiple executive positions at Dover Corporation and its subsidiaries, including the role of Vice President and Chief Financial Officer of Dover Fluids since January 2014. Prior to joining Dover in 2004, Ms. Evanko worked in valuation services at Arthur Andersen, LLP and also held audit and accounting roles for Honeywell and Sony Corporation of America.

PART II

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

The Company's common stock is traded on the NASDAQ Global Select Market under the symbol "GTLS." The high and low sales prices for the shares of common stock for the periods indicated are set forth in the table below:

	High and Low Sales Price			
	2016		2015	
	High	Low	High	Low
First quarter	\$22.05	\$13.27	\$39.93	\$27.34
Second quarter	28.24	20.86	45.62	31.61
Third quarter	33.06	22.74	38.10	17.22
Fourth quarter	40.74	27.01	24.48	15.08
Year	40.74	13.27	45.62	15.08

As of February 1, 2017, there were 182 holders of record of our common stock. Since many holders hold shares in "street name," we believe that there are a significantly larger number of beneficial owners of our common stock than the number of record holders.

We do not currently intend to pay any cash dividends on our common stock, and instead intend to retain earnings, if any, for future operations, potential acquisitions and debt reduction. The amounts available to us to pay future cash dividends may be restricted by our senior secured revolving credit facility to the extent our pro forma leverage ratio exceeds certain targets. Any decision to declare and pay dividends in the future will be made at the discretion of our board of directors and will depend on, among other things, our results of operations, financial condition, cash requirements, contractual restrictions and other factors that our board of directors may deem relevant.

Cumulative Total Return Comparison

Set forth below is a line graph comparing the cumulative total return of a hypothetical investment in the shares of common stock of Chart Industries, Inc. with the cumulative return of a hypothetical investment in each of the S&P SmallCap 600 Index and our Peer Group Index based on the respective market prices of each such investment on the dates shown below, assuming an initial investment of \$100 on December 31, 2011, including reinvestment of dividends, if any.

	December 31,					
	2011	2012	2013	2014	2015	2016
Chart Industries, Inc.	\$100.00	\$123.34	\$176.88	\$63.25	\$33.22	\$66.62
S&P SmallCap 600 Index	100.00	116.33	164.38	173.84	170.41	215.67
Peer Group Index	100.00	131.75	174.46	152.91	135.51	165.64

The Company selects the peer companies that comprise the Peer Group Index solely on the basis of objective criteria. These criteria result in an index composed of oil field equipment/service and other comparable industrial companies. The Peer Group Index ("Peer Group") includes the following companies: Acuity Brands, Inc., Barnes Group Inc., Circor International, Inc., Colfax Corp., Enpro Industries Inc., Ensco plc, Esco Technologies Inc., Graco Inc., IDEX Corp., Nordson Corporation, Powell Industries Inc. and Worthington Industries, Inc. In accordance with SEC rules, the Peer Group Index is represented in the graph above.

Purchases of Equity Securities by the Issuer and Affiliated Purchasers

During the fourth quarter of 2016, 1,325 shares of common stock were surrendered to us by participants under our share-based compensation plans to satisfy tax withholding obligations relating to the vesting or payment of equity awards for an aggregate purchase price of approximately \$45,400. The total number of shares repurchased represents the net shares issued to satisfy tax withholdings. All such repurchased shares were subsequently retired during the three months ended December 31, 2016.

Period	Issuer Purchases of Equity Securities			
	Total Number of Shares Purchased	Average Price Paid Per Share	Total Number of Shares Purchased As Part of Publicly Announced Plans or Programs	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Plans or Programs
October 1 — 31, 2016	605	\$ 32.52	—	\$ —
November 1 — 30, 2016	27	31.02	—	—
December 1 — 31, 2016	693	35.93	—	—
Total	1,325	\$ 34.27	—	\$ —

Item 6. Selected Financial Data

The following table sets forth selected historical consolidated financial information as of the dates and for each of the periods indicated. The Company selected historical financial consolidated data as of and for the years ended December 31, 2016, 2015, and 2014 are derived from our audited financial statements for such periods incorporated by reference into Item 8 of this Annual Report on Form 10-K, which have been audited by Ernst & Young LLP. The Company selected historical financial consolidated data as of and for the years ended December 31, 2013 and 2012 are derived from our audited financial statements for such periods, which have been audited by Ernst & Young LLP and which are not included in this Annual Report on Form 10-K.

You should read the following table together with Item 7. “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and our consolidated financial statements and related notes included elsewhere in this Annual Report on Form 10-K (all dollar amounts, except per share data, in thousands):

	Year Ended December 31,				
	2016	2015	2014	2013	2012
Statements of Operations Data:					
Sales	\$859,154	\$1,040,160	\$1,192,952	\$1,177,438	\$1,014,152
Cost of sales ^{(1) (2)}	592,781	751,696	835,098	825,715	708,989
Gross profit	266,373	288,464	357,854	351,723	305,163
Operating expenses ^{(1) (3)}	207,784	218,127	219,697	215,726	180,280
Asset impairments ⁽⁴⁾	1,217	253,560	—	—	3,070
Operating income (loss)	57,372	(183,223)	138,157	135,997	121,813
Interest expense, net (including deferred financing costs amortization)	18,622	17,261	18,023	17,581	17,209
Foreign currency loss (gain)	351	1,348	970	(242)	1,498
Other expense, net	18,973	18,609	18,993	17,339	18,707
Income (loss) before income taxes	38,399	(201,832)	119,164	118,658	103,106
Income tax expense, net	13,702	2,684	36,092	31,296	30,782
Net income (loss)	24,697	(204,516)	83,072	87,362	72,324
Noncontrolling interests, net of taxes	(3,540)	(1,556)	1,208	4,186	1,029
Net income (loss) attributable to Chart Industries, Inc.	\$28,237	\$(202,960)	\$81,864	\$83,176	\$71,295
Earnings Per Share Data:					
Basic earnings (loss) per share	\$0.92	\$(6.66)	\$2.69	\$2.75	\$2.39
Diluted earnings (loss) per share ⁽⁵⁾	\$0.91	\$(6.66)	\$2.67	\$2.60	\$2.36
Weighted-average shares — basic	30,583	30,493	30,384	30,209	29,786
Weighted-average shares — diluted	30,994	30,493	30,666	31,931	30,194
Cash Flow Data:					
Cash provided by operating activities	\$170,814	\$100,966	\$118,619	\$59,508	\$87,339
Cash used in investing activities	(18,081)	(73,524)	(72,485)	(74,981)	(224,347)
Cash provided by (used in) financing activities	7,731	415	(70,695)	8,262	17,743
Other Financial Data:					
Depreciation and amortization ⁽⁶⁾	\$38,793	\$46,738	\$44,568	\$41,695	\$33,726

	As of December 31,				
	2016	2015	2014	2013	2012
Balance Sheet Data:					
Cash and cash equivalents	\$281,959	\$123,708	\$103,656	\$137,345	\$141,498
Working capital ⁽⁷⁾	115,971	207,643	218,092	213,261	144,901
Goodwill ⁽⁴⁾	217,970	218,390	405,522	398,905	398,941
Identifiable intangible assets, net ⁽⁴⁾	93,443	106,714	153,666	172,142	189,463
Total assets ⁽⁴⁾	1,233,082	1,200,140	1,459,517	1,457,410	1,322,622
Long-term debt	233,711	213,798	201,553	60,468	246,802
Total debt	240,198	219,958	206,476	260,935	250,552
Chart Industries, Inc. shareholders' equity ⁽⁴⁾	697,265	670,592	879,879	754,785	696,478

During the third quarter of 2016, the Company recovered for breaches of representations and warranties primarily related to warranty costs for certain product lines acquired in the 2012 acquisition of AirSep Corporation ("AirSep") under the related representation and warranty insurance. For the year ended December 31, 2016, this reduced cost of sales by \$15.1 million and reduced SG&A expenses by \$0.4 million, net of associated legal fees recorded in 2016.

Additionally, the year ended December 31, 2014 included a recovery of \$5.0 million reducing cost of sales for the year ended December 31, 2014 from an escrow settlement for breaches of representations and warranties relating to warranty costs (which are in excess of the settlement amount) for certain product lines acquired from AirSep in 2012.

Operating expenses include selling, general and administrative expenses and amortization expense. Amortization expense related to intangible assets for the years ended December 31, 2016, 2015, 2014, 2013 and 2012 was \$11.9 million, \$17.3 million, \$17.9 million, \$19.2 million, and \$14.8 million, respectively. Also includes a \$4.6 million reduction of expense associated with writing down acquisition related contingent consideration to fair value for the year ended December 31, 2012.

⁽⁴⁾ See Note 3, Asset Impairments, in the consolidated financial statements.

⁽⁵⁾ Zero incremental shares from share-based awards are included in the computation of diluted net loss per share for periods in which a net loss occurs, because to do so would be anti-dilutive.

⁽⁶⁾ Includes financing costs amortization for the years ended December 31, 2016, 2015, 2014, 2013 and 2012 of \$1.3 million, \$1.3 million, \$1.4 million, \$1.3 million, and \$1.5 million, respectively.

⁽⁷⁾ Working capital is defined as current assets excluding cash and cash equivalents minus current liabilities excluding short-term debt and current portion of long-term debt (including current convertible notes, if applicable).

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

You should read the following discussion of our results of operations and financial condition in conjunction with the "Selected Financial Data" section and our consolidated financial statements and related notes appearing elsewhere in this Annual Report on Form 10-K. This discussion contains forward-looking statements. Actual results may differ materially from those discussed below. See "Forward-Looking Statements" at the end of this discussion and Item 1A. "Risk Factors" for a discussion of the uncertainties, risks and assumptions associated with this discussion.

Overview

We are a leading diversified global manufacturer of highly engineered equipment for the industrial gas, energy, and biomedical industries. The largest portion of end-use applications for our products is energy-related. Our equipment and engineered systems are primarily used for low-temperature and cryogenic applications utilizing our expertise in cryogenic systems and equipment, which operate at low temperatures sometimes approaching absolute zero (0 Kelvin; -273° Centigrade; -459° Fahrenheit).

Sales for the year ended December 31, 2016 were \$859.2 million compared to sales of \$1,040.2 million for the year ended December 31, 2015, reflecting a decrease of \$181.0 million, or 17.4%. This decrease was primarily attributable to lower sales in our E&C segment across all product lines given continued challenging energy market conditions. Gross profit for the year ended December 31, 2016 was \$266.4 million, or 31.0% of sales, as compared to \$288.5 million, or 27.7% of sales, for the year ended December 31, 2015. Gross profit decreased during 2016 mainly due to lower volume and highly competitive markets within our E&C segment partially offset by improved product mix in our D&S and BioMedical segments. Also contributing to gross profit was the positive impact of an insurance recovery received by our BioMedical segment during the third quarter of 2016 as a result of the recovery for breaches of representations and warranties related to warranty costs for certain product lines acquired from AirSep Corporation ("AirSep") in 2012. The insurance recovery favorably impacted our gross profit by \$15.1 million and our gross margin percentage by 1.8%. The gross margin was also favorably impacted by improved project mix within our E&C segment, which included several high margin short lead-time replacement equipment projects in addition to contract expiration fees during the second quarter of 2016. The short lead-time projects and contract expiration fees in the second quarter contributed \$31.4 million to our gross profit and improved our gross margin percentage by 2.6% on a consolidated basis. Severance and other restructuring-related costs of \$10.9 million were recorded during 2016 in cost of goods sold (\$4.4 million) and selling, general and administrative expenses (\$6.5 million) as a result of our cost reduction initiatives and facility consolidation efforts. We recorded asset impairments of \$1.2 million and \$253.6 million during 2016 and 2015, respectively. The 2016 impairment charges related to the D&S segment and the 2015 impairment charges were primarily with respect to the BioMedical and Energy & Chemicals segments. During 2015, the drop in our market capitalization along with the macroeconomic trends described below with respect to energy prices, order trends, and weakness in China and in the BioMedical respiratory markets, led to reductions in our forecasts resulting in the non-cash impairment charges. See Note 3 to the accompanying financial statements for further information on the impairment charges for 2016 and 2015. Operating income for the year ended December 31, 2016 was \$57.4 million compared to an operating loss of \$183.2 million for the year ended December 31, 2015, mainly for the reasons discussed above.

Low energy prices and significant recent customer capacity continue to delay upstream LNG opportunities, which has negatively impacted our sales and order trends, particularly in the E&C segment. In addition, global competition and customer consolidation continue to put pressure on pricing generally. Although we are starting to see some rebound in natural gas processing opportunities, we continue to face challenges in the timing of orders. We have continued to implement productivity initiatives in light of recent order trends. We are closely monitoring our end markets and order rates and will continue to take appropriate and timely actions as necessary. Accordingly, 2017 will present performance challenges, particularly in our E&C business, given low energy prices and timing of orders. We expect additional severance and restructuring-related costs in 2017 to be approximately \$10.4 million for actions already implemented. These expected severance and restructuring-related costs include the announced Corporate headquarters and other facility consolidations in an effort to more broadly utilize a shared service model across our business units. We expect these consolidations will equate to annualized savings of approximately \$10 million, approximately \$4 million of which we anticipate realizing in 2017.

Operating Results

The following table sets forth the percentage relationship that each line item in our consolidated statements of operations represents to sales for the years ended December 31, 2016, 2015, and 2014:

	2016	2015	2014
Sales	100.0 %	100.0 %	100.0%
Cost of sales ^{(1) (2)}	69.0	72.3	70.0
Gross profit	31.0	27.7	30.0
Selling, general and administrative expenses ^{(1) (3)}	22.8	19.3	16.9
Amortization expense	1.4	1.7	1.5
Asset impairments ⁽⁴⁾	0.1	24.4	—
Operating income (loss)	6.7	(17.6)	11.6
Interest expense, net ⁽⁵⁾	2.0	1.5	1.4
Financing costs amortization	0.1	0.1	0.1
Foreign currency loss	—	0.1	0.1
Income tax expense, net	1.6	0.3	3.0
Net income (loss)	2.9	(19.7)	7.0
Noncontrolling interests, net of taxes	(0.4)	(0.1)	0.1
Net income (loss) attributable to Chart Industries, Inc.	3.3	(19.5)	6.9

During the third quarter of 2016, the Company recovered for breaches of representations and warranties primarily related to warranty costs for certain product lines acquired in the 2012 acquisition of AirSep under the related representation and warranty insurance. For the year ended December 31, 2016, this reduced cost of sales by \$15.1 million and reduced SG&A expenses by \$0.4 million, net of associated legal fees recorded in 2016.

Included in cost of sales is recovery of \$5.0 million, reducing cost of sales for the year ended December 31, 2014, from an escrow settlement for breaches of representations and warranties relating to warranty costs (which are in excess of the settlement amount) for certain product lines acquired from AirSep in 2012.

⁽²⁾ Includes severance and other restructuring-related costs of \$4.4 million and \$3.5 million for the year ended December 31, 2016 and 2015, respectively.

⁽³⁾ Includes facility shutdown costs, restructuring costs and severance of \$6.5 million and \$8.6 million for the years ended December 31, 2016 and 2015, respectively.

Includes share-based compensation expense of \$10.7 million, \$11.3 million, and \$9.4 million, representing 1.2%, 1.1%, and 0.8% of sales, for the years ended December 31, 2016, 2015, and 2014, respectively.

⁽⁴⁾ See Note 3, Asset Impairments, in the consolidated financial statements.

⁽⁵⁾ Includes \$12.5 million, \$11.5 million, and \$10.7 million of non-cash interest accretion expense related to the carrying amount of the 2.0% Convertible Senior Subordinated Notes due August 2018 (the “Convertible Notes”), representing 1.5%, 1.1%, and 0.9% of sales, for the years ended December 31, 2016, 2015, and 2014, respectively.

Segment Information

Certain consolidated results for our operating segments are presented below (all dollar amounts in thousands). Further detailed information regarding our operating segments is presented in Note 20 of the consolidated financial statements included elsewhere in this report.

	Year Ended December 31,			
	2016	2015	2014	
Sales				
Energy & Chemicals	\$ 154,249	\$ 330,968	\$ 388,018	
Distribution & Storage	497,137	487,557	578,806	
BioMedical	207,768	221,635	226,128	
Consolidated	\$ 859,154	\$ 1,040,160	\$ 1,192,952	
Gross Profit ⁽¹⁾				
Energy & Chemicals	\$ 44,903	\$ 94,605	\$ 113,932	
Distribution & Storage	130,294	123,454	162,191	
BioMedical	91,176	70,405	81,731	
Consolidated	\$ 266,373	\$ 288,464	\$ 357,854	
Gross Profit Margin				
Energy & Chemicals	29.1	% 28.6	% 29.4	%
Distribution & Storage	26.2	% 25.3	% 28.0	%
BioMedical	43.9	% 31.8	% 36.1	%
Consolidated	31.0	% 27.7	% 30.0	%
SG&A Expenses ⁽¹⁾⁽²⁾				
Energy & Chemicals	\$ 29,423	\$ 33,101	\$ 33,435	
Distribution & Storage	72,746	77,252	74,410	
BioMedical	45,691	42,872	46,437	
Corporate	48,051	47,569	47,470	
Consolidated	\$ 195,911	\$ 200,794	\$ 201,752	
SG&A Expenses (% of Sales)				
Energy & Chemicals	19.1	% 10.0	% 8.6	%
Distribution & Storage	14.6	% 15.8	% 12.9	%
BioMedical	22.0	% 19.3	% 20.5	%
Consolidated	22.8	% 19.3	% 16.9	%
Operating Income (Loss) ⁽¹⁾⁽³⁾				
Energy & Chemicals	\$ 13,307	\$ (10,050)	\$ 78,006	
Distribution & Storage	50,435	39,549	82,612	
BioMedical	41,967	(165,336)	25,009	
Corporate	(48,337)	(47,386)	(47,470)	
Consolidated	\$ 57,372	\$ (183,223)	\$ 138,157	
Operating Margin ⁽¹⁾⁽³⁾				
Energy & Chemicals	8.6	% (3.0)	% 20.1	%
Distribution & Storage	10.1	% 8.1	% 14.3	%
BioMedical	20.2	% (74.6)	% 11.1	%
Consolidated	6.7	% (17.6)	% 11.6	%

During the third quarter of 2016, the Company recovered for breaches of representations and warranties primarily related to warranty costs for certain product lines acquired in the 2012 acquisition of AirSep under the related representation and warranty insurance. For the year ended December 31, 2016, this reduced BioMedical cost of sales by \$15,145 and reduced Corporate SG&A expenses by \$376, net of associated legal fees recorded in 2016.

Included in cost of sales is recovery of \$5,003, reducing BioMedical cost of sales for the year ended December 31, 2014, from an escrow settlement for breaches of representations and warranties relating to warranty costs (which are in excess of the settlement amount) for certain product lines acquired from AirSep in 2012.

Beginning in 2016, the Company allocates share-based compensation expense to each operating segment and (2) maintains share-based compensation expense related to Corporate employees at Corporate. Prior to 2016, all share-based compensation expense was recorded at Corporate. Reclassifications from Corporate to the operating segments have been made to the 2015 and 2014 SG&A expenses to conform to the 2016 presentation.

The year ended December 31, 2016 includes asset impairment charges of \$1,217 attributed to D&S. The year (3) ended December 31, 2015 includes asset impairment charges of \$255,116 attributed to E&C - \$68,796, D&S - \$2,020, and BioMedical - \$184,300.

Results of Operations for the Year Ended December 31, 2016 Compared to the Year Ended December 31, 2015

Sales

Sales for 2016 were \$859.2 million compared to \$1,040.2 million for 2015, reflecting a decrease of \$181.0 million, or 17.4%.

E&C segment sales decreased by \$176.7 million, or 53.4%, compared to the prior year. This reduction was due to lower sales of LNG applications of \$97.9 million, a \$75.5 million decrease within natural gas processing (including petrochemical) applications, and a decline in industrial gas applications of \$3.3 million. Low energy prices continue to impact backlog and order trends as customers delay or defer large projects. Additionally, our E&C segment completed several major projects in 2015 with no major projects awarded in 2016 given the volatile energy environment.

D&S segment sales increased by \$9.6 million, or 2.0%, compared to the prior year, primarily attributable to a \$23.8 million increase within bulk industrial gas applications largely due to engineered systems. This increase was partially offset by an \$8.1 million decrease related to packaged gas industrial applications largely due to beverage applications, and a \$6.1 million decrease within LNG applications. Continued weakness in China was offset by improved sales in Europe and the U.S. compared to 2015. The overall currency translation impact on sales attributable to the D&S segment was approximately \$4.9 million unfavorable on a constant currency basis given the strength of the U.S. dollar versus the Chinese yuan.

BioMedical segment sales decreased by \$13.9 million, or 6.3%, compared to the prior year. This decrease was driven by a \$13.4 million decrease in respiratory therapy equipment sales primarily in the U.S. due to competitive pressure and a decrease in commercial oxygen generation systems of \$6.4 million, primarily attributable to a decline in large project revenue. These decreases were partially offset by an increase in life sciences of \$5.9 million during 2016.

Gross Profit and Margin

Gross profit for 2016 was \$266.4 million, or 31.0% of sales compared to \$288.5 million, or 27.7% of sales, for 2015, which reflected a decrease of \$22.1 million, while the related margin percentage increased by 3.3 percentage points. Gross profit and the related margin for the year ended December 31, 2016 were positively impacted by an insurance recovery during the third quarter at our BioMedical segment as further described in this section. For the year ended December 31, 2016, the insurance recovery added 1.8% to the margin. The favorable impact of the insurance recovery was offset by decreased gross profit resulting from lower sales volumes at our E&C segment.

E&C segment gross profit decreased by \$49.7 million primarily due to decreased volume within LNG and natural gas applications, but was favorably impacted by several short-lead time orders and contract expiration fees which improved gross profit by \$31.4 million in the second quarter of 2016 and the gross margin by 18.0 percentage points for the year.

D&S segment gross profit increased by \$6.8 million and the related margin increased by 0.9 percentage points compared to the prior year primarily due to higher volume and productivity initiatives in the U.S. and Europe. The finalization of an insurance claim during the first quarter of 2016 positively impacted gross margin by approximately \$1.0 million. These increases are partially offset by severance costs of \$2.3 million that are reflected in cost of sales, which equates to a 0.5% gross margin impact, along with unfavorable product mix and inventory write-downs in Asia.

BioMedical segment gross profit increased by \$20.8 million and the related margin increased by 12.1 percentage points compared to the prior-year period, primarily due to an insurance recovery, as well as lower warranty expense and favorable product mix. During the third quarter of 2016, we recovered for breaches of representations and warranties primarily related to warranty costs for certain product lines acquired in the 2012 acquisition of AirSep under the related representation and warranty insurance. For the year ended December 31, 2016, this reduced BioMedical's cost of sales by \$15.1 million and added 7.3% to the year-to-date margin. The BioMedical segment's warranty expense as a percent of sales was 1.6% during 2016 compared to 4.1% in the prior-year period. Warranty expense has decreased due to lower return rates on certain products and product mix.

Selling General & Administrative (SG&A) Expenses

SG&A expenses for 2016 were \$195.9 million, or 22.8% of sales, compared to \$200.8 million, or 19.3% of sales, for 2015, representing a decrease of \$4.9 million. SG&A expenses related to restructuring activities were \$6.5 million during 2016, which was primarily comprised of severance costs related to facility consolidation effects. This compares to restructuring costs relating to facility shutdown and headcount reductions of \$8.6 million during 2015.

Additionally, SG&A expenses declined by \$14.9 million due to lower payroll and benefits, professional services, travel and entertainment, commissions, and restructuring-related expenses. This was partially offset by increases of \$10.4 million for variable short-term incentive compensation based on performance, primarily with respect to the D&S, BioMedical, and Corporate segments, and bad debt expense.

Beginning in 2016, we allocated share-based compensation expense to each operating segment and maintained share-based compensation expense related to Corporate employees at Corporate. Prior to 2016, all share-based compensation expense was

recorded at Corporate. Reclassifications from Corporate to the operating segments have been made to the 2015 and 2014 SG&A expenses to conform to the 2016 presentation.

E&C segment SG&A expenses decreased by \$3.7 million compared to the prior year. SG&A expense declined by \$4.5 million due to decreased variable short-term incentive compensation, lower costs related to outside professional services, and reduced employee costs due to headcount reductions. This was partially offset by an increase of \$1.0 million related to bad expense and higher marketing costs.

D&S segment SG&A expenses decreased by \$4.5 million compared to the prior year. The decrease was due to \$10.8 million of lower costs related to restructuring-related expenses, outside professional services, travel and entertainment, employee costs due to headcount reductions, and decreased severance charges, commission expense, and supplies expense. This was partially offset by an increase of \$7.5 million for higher variable short-term incentive compensation and bad debt expense.

BioMedical segment SG&A expenses increased by \$2.8 million compared to the prior year primarily due to \$4.4 million of increases related to higher variable short-term incentive compensation and increased bad debt expense. This was partially offset by decreases of \$2.8 million related to lower restructuring related expenses, lower employee costs due to headcount reductions, and lower commission expense.

Corporate SG&A expenses increased by \$0.5 million compared to the prior year. SG&A expenses increased by \$5.9 million due to higher restructuring-related expenses and variable short-term incentive compensation expense. This was partially offset by lower costs of \$4.6 million related to outside professional services and lower employee costs due to headcount reductions.

Asset Impairments

During 2016, we recorded asset impairment charges of \$1.2 million attributed to our D&S segment. In comparison, during 2015, we recorded asset impairment charges of \$253.6 million attributed to our operating segments as follows: E&C - \$68.8 million, D&S - \$0.5 million, and BioMedical - \$184.3 million. See Note 3, Asset Impairments, to the accompanying financial statements for more information relating to the 2016 and 2015 asset impairments.

Operating Income (Loss)

As a result of the foregoing, operating income for 2016 was \$57.4 million, or 6.7% of sales, compared to operating loss of \$183.2 million, or 17.6% of sales, for the same period in 2015.

Interest Expense, Net and Financing Costs Amortization

Net interest expense for 2016 and 2015 was \$17.3 million and \$16.0 million, respectively. Interest expense for 2016 included \$5.0 million of 2.0% cash interest and \$12.5 million of non-cash interest accretion expense related to the carrying value of the Convertible Notes. For 2016 and 2015, financing costs amortization were \$1.3 million in each period.

Foreign Currency Loss

For 2016 and 2015, foreign currency losses were \$0.4 million and \$1.3 million, respectively. Losses decreased by \$0.9 million during 2016 due to reduced exchange rate volatility, especially with respect to the euro.

Income Tax Expense

Income tax expense of \$13.7 million and \$2.7 million for 2016 and 2015, respectively, represents taxes on both U.S. and foreign earnings at a combined effective income tax rate of 35.7% and (1.3)%, respectively. The favorable impact of an insurance settlement for breaches of representations and warranties that resulted in an adjustment to our purchase price of AirSep shares was offset by valuation allowances recorded against current and accumulated operating losses incurred by certain of the Company's foreign operations (primarily China) for which no benefit was recorded. The change in rate from the prior year was primarily due to the \$67.3 million tax impact in 2015 related to the impairment charges of \$253.6 million.

Net Income (Loss)

As a result of the foregoing, net income attributable to the Company during 2016 was \$28.2 million while the net loss was \$203.0 million during 2015, including asset impairment charges of \$1.2 million and \$255.1 million for 2016 and 2015, respectively.

Results of Operations for the Year Ended December 31, 2015 Compared to the Year Ended December 31, 2014
Sales

Sales for 2015 were \$1,040.2 million compared to \$1,193.0 million for 2014, reflecting a decrease of \$152.8 million, or 12.8%.

E&C segment sales decreased by \$57.0 million, or 14.7%, compared to the prior year. Within natural gas processing (including petrochemical) applications and industrial gas applications, sales decreased by \$27.8 million and \$21.4 million, respectively, due to decreased capital spending by our energy-related customers and highly competitive market conditions. Sales within LNG applications decreased by \$7.8 million as several major projects were completed during the year, which reduced revenue when compared to the twelve months ended December 31, 2014.

D&S segment sales decreased by \$91.3 million, or 15.8%, compared to the prior year, mainly attributable to a \$93.7 million decrease related to LNG applications globally, particularly in China. This was partially offset by an increase of \$2.4 million in industrial applications. Currency was also a factor that negatively impacted D&S sales. The overall currency translation impact on sales attributable to the D&S segment was approximately \$21.0 million unfavorable on a constant currency basis.

BioMedical segment sales decreased by \$4.5 million, or 2.0%, compared to the prior year. Currency and increased competition largely drove the \$9.0 million decrease in respiratory therapy equipment sales. This decrease was partially offset by a \$5.8 million increase in commercial oxygen generation systems. Sales within life sciences decreased by \$1.3 million during the year. The overall currency translation impact on sales attributable to the BioMedical segment was approximately \$10.8 million unfavorable on a constant currency basis.

Gross Profit and Margin

Gross profit for 2015 was \$288.5 million, or 27.7% of sales compared to \$357.9 million, or 30.0% of sales, for 2014, which reflected a decrease of \$69.4 million, and the related margin percentage decreased by 2.3 percentage points.

E&C segment gross profit decreased by \$19.3 million mainly due to decreased volume within industrial gas and natural gas processing applications related to brazed aluminum heat exchangers, partially offset by improved volume and project mix related to air cooled heat exchangers and process systems. The related margin decreased by 0.8 percentage points mainly due to lower volume within brazed aluminum heat exchangers, partially offset by favorable project execution and cost reduction initiatives in all businesses.

D&S segment gross profit decreased by \$38.8 million and the related margin decreased by 2.7 percentage points compared to the prior year mainly due to decreased volume in LNG applications globally, higher costs due to cost reduction initiatives, including the previously disclosed shutdown of the D&S manufacturing facility in Owatonna, Minnesota, severance associated with reductions in headcount, and increases in inventory reserves, primarily associated with inventories in China. Costs associated with facility shutdown, headcount reductions, and inventory reserves impacted the D&S segment margin by 0.6 percentage points.

BioMedical segment gross profit decreased by \$11.3 million mainly due to lower volume in respiratory therapy equipment partially offset by higher volume in commercial oxygen generation systems. Margin decreased by 4.3 percentage points compared to the prior year mainly due to unfavorable product mix within respiratory therapy equipment and higher warranty costs. The BioMedical segment's warranty expense as a percent of sales was 4.1% and 3.8% during 2015 and 2014, respectively. We received \$5.0 million in the fourth quarter of 2014 under an escrow settlement for breaches of representations and warranties relating to warranty costs (which are in excess of the settlement amount) for certain product lines acquired from AirSep in 2012. This improved BioMedical segment margin by 2.2% in 2014.

SG&A Expenses

SG&A expenses for 2015 were \$200.8 million, or 19.3% of sales, compared to \$201.8 million, or 16.9% of sales, for 2014, representing a decrease of \$1.0 million. SG&A expenses relating to facility shutdown and headcount reductions were \$8.6 million during 2015. SG&A expenses relating to acquisition-related costs and retention and severance costs were \$4.5 million during 2014. Excluding these costs, SG&A expenses were down \$5.2 million compared to the prior year, largely due to reduced discretionary spending.

Beginning in 2016, we allocated share-based compensation expense to each operating segment and maintained share-based compensation expense related to Corporate employees at Corporate. Prior to 2016, all share-based compensation expense was recorded at Corporate. Reclassifications from Corporate to the operating segments have been made to the 2015 and 2014 SG&A expenses to conform to the 2016 presentation.

E&C segment SG&A expenses decreased by \$0.3 million compared to the prior year mainly due to lower sales commissions, partially offset by higher variable short-term incentive compensation based on performance.

D&S segment SG&A expenses increased by \$2.8 million compared to the prior year mainly due to \$4.8 million in facility shutdown and severance costs due to headcount reductions, partially offset by lower variable short-term incentive compensation based on performance.

BioMedical segment SG&A expenses decreased by \$3.6 million compared to the prior year mainly due to lower acquisition-related and severance costs.

Corporate SG&A expenses increased by \$0.1 million compared to the prior year mainly due to a \$1.5 million increase in share-based compensation expense mainly due to acceleration of expense based on retirement eligibility provisions, as a greater mix of share-based awards satisfied these provisions during the first quarter of 2015, and also a \$1.3 million increase in severance costs related to cost reductions. These increases were partially offset by lower costs related to outside professional services and discretionary spending.

Asset Impairments

During 2015, we recorded asset impairment charges of \$253.6 million. The amounts are attributed to our operating segments as follows: E&C - \$68.8 million, D&S - \$0.5 million, and BioMedical - \$184.3 million. See Note 3, Asset Impairments, to the accompanying financial statements for more information relating to asset impairments.

Operating (Loss) Income

As a result of the foregoing, operating loss for 2015 was \$183.2 million, or 17.6% of sales compared to operating income of \$138.2 million, or 11.6% of sales, for the same period in 2014.

Interest Expense, Net and Financing Costs Amortization

Net interest expense for 2015 and 2014 was \$16.0 million and \$16.6 million, respectively. Interest expense for 2015 included \$5.0 million of 2.0% cash interest and \$11.5 million of non-cash interest accretion expense related to the carrying value of the Convertible Notes. For 2015 and 2014, financing costs amortization was \$1.3 million and \$1.4 million, respectively.

Foreign Currency Loss

For 2015 and 2014, foreign currency losses were \$1.3 million and \$1.0 million, respectively. Losses increased by \$0.3 million during 2015 due to exchange rate volatility, especially with respect to the Chinese yuan and the euro.

Income Tax Expense

Income tax expense of \$2.7 million and \$36.1 million for 2015 and 2014, respectively, represents taxes on both U.S. and foreign earnings at a combined effective income tax rate of (1.3)% and 30.3%, respectively. The change in rate from the prior year was primarily due to the \$67.3 million tax impact related to the impairment charges of \$253.6 million. Excluding impairment charges, the effective tax rate would have been 42.1%, which is higher than the prior year's effective tax rate due to the establishment of valuation allowances of \$4.7 million against net operating loss carryforwards, as well as other deferred tax assets at some of our Chinese operations and an unfavorable mix of earnings in higher taxed jurisdictions.

Net (Loss) Income

As a result of the foregoing, net loss attributable to the Company during 2015 was \$203.0 million, which included \$255.1 million of asset impairment charges, while net income was \$81.9 million during 2014.

Orders and Backlog

We consider orders to be those for which we have received a firm signed purchase order or other written contractual commitment from the customer. Backlog is comprised of the portion of firm signed purchase orders or other written contractual commitments received from customers that we have not recognized as revenue upon shipment or under the percentage of completion method. Backlog can be significantly affected by the timing of orders for large projects, particularly in the E&C segment, and is not necessarily indicative of future backlog levels or the rate at which backlog will be recognized as sales. Orders included in our backlog may include customary cancellation provisions under which the customer could cancel part or all of the order, potentially subject to the payment of certain costs and/or fees. Our backlog as of December 31, 2016, 2015, and 2014 was \$342.6 million, \$374.6 million and \$640.1 million, respectively.

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The table below represents orders received and backlog by segment for the periods indicated (dollar amounts in thousands):

	Year Ended December 31,		
	2016	2015	2014
Orders			
Energy & Chemicals	\$110,174	\$187,657	\$339,357
Distribution & Storage	531,032	529,080	591,765
BioMedical	213,568	218,090	218,125
Total	\$854,774	\$934,827	\$1,149,247

	As of December 31,		
	2016	2015	2014
Backlog			
Energy & Chemicals	\$99,842	\$151,638	\$294,204
Distribution & Storage	218,210	206,518	328,350
BioMedical	24,571	16,456	17,509
Total	\$342,623	\$374,612	\$640,063

Orders and Backlog for the Year Ended and As of December 31, 2016 Compared to the Year Ended and As of December 31, 2015

Orders for 2016 were \$854.8 million compared to \$934.8 million for 2015, representing a decrease of \$80.1 million, or 8.6%.

E&C orders for 2016 were \$110.2 million compared to \$187.7 million for 2015, a decrease of \$77.5 million. E&C backlog totaled \$99.8 million at December 31, 2016, compared to \$151.6 million as of December 31, 2015. Low energy prices continue to delay natural gas, petrochemical, and LNG-related opportunities and current market conditions reinforce a challenging outlook for project awards given the reduction in capital spending by our energy-related customers. Included in the E&C backlog is approximately \$40 million related to the previously announced Magnolia LNG order where production release is delayed into 2018. E&C backlog at December 31, 2016 was reduced approximately \$6.2 million related to orders received prior to 2016 and cancelled during the year ended December 31, 2016. Order flow in the E&C segment is historically volatile due to project size and it is not unusual to see order intake change significantly year over year.

D&S orders for 2016 were \$531.0 million compared to \$529.1 million for 2015, an increase of \$2.0 million, or 0.4%. D&S backlog totaled \$218.2 million at December 31, 2016 compared to \$206.5 million as of December 31, 2015. The increase in D&S segment orders and backlog was primarily attributable to LNG applications in Europe.

BioMedical orders for 2016 were \$213.6 million compared to \$218.1 million for 2015. The decrease in BioMedical orders was primarily attributable to respiratory therapy applications. BioMedical backlog totaled \$24.6 million at December 31, 2016, compared to \$16.5 million as of December 31, 2015.

Orders and Backlog for the Year Ended and As of December 31, 2015 Compared to the Year Ended and As of December 31, 2014

Orders for 2015 were \$934.8 million compared to \$1,149.2 million for 2014, representing a decrease of \$214.4 million, or 18.7%. In our 2014 Annual Report on Form 10-K, we reported orders of \$1,116.0 million for 2014, which was net of \$33.2 million of adjustments; this was updated in our 2015 Annual Report on Form 10-K and subsequent filings to conform to the current presentation.

E&C orders for 2015 were \$187.7 million compared to \$339.4 million for 2014, a decrease of \$151.7 million. Low energy prices continue to delay natural gas, petrochemical, and LNG-related opportunities, as evidenced by the decline in E&C order trends and backlog. Current market conditions reinforce a challenging outlook for LNG project awards given the reduction in capital spending with our energy-related customers. E&C backlog totaled \$151.6 million at December 31, 2015, compared to \$294.2 million as of December 31, 2014.

D&S orders for 2015 were \$529.1 million compared to \$591.8 million for 2014, a decrease of \$62.7 million, or 10.6%. The decrease in D&S segment orders and backlog year over year was driven primarily by the impact of lower

energy prices and the continued economic slowdown in China. Approximately 23% of the D&S backlog was related to China as of December 31, 2015,

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including approximately \$3.8 million related to PetroChina. D&S segment backlog was reduced by \$150.0 million in 2015 related to previously received orders, primarily in China. While these orders had not been canceled, they exceeded the expected time of performance and circumstances suggested that our customers were not likely to take delivery in the future.

BioMedical orders were \$218.1 million during both 2015 and 2014. BioMedical backlog totaled \$16.5 million at December 31, 2015, compared to \$17.5 million as of December 31, 2014.

Liquidity and Capital Resources

Debt Instruments and Related Covenants

Convertible Notes: The outstanding aggregate principal amount of the Company's Convertible Notes is \$250.0 million. The Convertible Notes bear interest at a fixed rate of 2.0% per year, payable semiannually in arrears on February 1 and August 1 of each year, and will mature on August 1, 2018. The effective interest rate at issuance, under generally accepted accounting principles, was 7.9%. Upon conversion, holders of the Convertible Notes will receive cash up to the principal amount of the Convertible Notes, and it is the Company's intention to settle any excess conversion value in shares of the Company's common stock. However, the Company may elect to settle, at its discretion, any such excess value in cash, shares of the Company's common stock or a combination of cash and shares. The initial conversion price of \$69.03 per share represents a conversion premium of 30% over the last reported sale price of the Company's common stock on July 28, 2011, the date of the Convertible Notes offering, which was \$53.10 per share. At the end of the fourth quarter of 2016, events for early conversion were not met, and thus the Convertible Notes were not convertible as of, and for the fiscal quarter beginning January 1, 2017. There have been no conversions as of the date of this filing. In the event that holders of Convertible Notes elect to convert, the Company expects to fund any cash settlement of any such conversion from cash balances or borrowings under its senior secured revolving credit facility.

Senior Secured Revolving Credit Facility: The Company has a five-year \$450.0 million senior secured revolving credit facility (the "SSRCF") which matures on October 29, 2019. The SSRCF includes a \$25.0 million sub-limit for the issuance of swingline loans and a \$100.0 million sub-limit to be used for letters of credit. There is a foreign currency limit of \$100.0 million under the SSRCF which can be used for foreign currency denominated letters of credit and borrowings in a foreign currency, in each case in currencies agreed upon with the lenders. In addition, the facility permits borrowings up to \$100.0 million made by the Company's wholly-owned subsidiaries, Chart Industries Luxembourg S.à r.l. ("Chart Luxembourg") and Chart Asia Investment Company Limited. The SSRCF also includes an expansion option permitting the Company to add up to an aggregate \$200.0 million in term loans or revolving credit commitments from its lenders. Loans under the SSRCF bear interest at LIBOR or the Adjusted Base Rate as defined in the Debt and Credit Arrangements note (Note 7) to our consolidated financial statements included elsewhere in this report, plus a margin that varies with the Company's leverage ratio. Significant financial covenants for the SSRCF include a leverage ratio and an interest coverage ratio. The Company had \$37.2 million in letters of credit and bank guarantees supported by the SSRCF, which had availability of \$412.8 million, at December 31, 2016. The Company was in compliance with all covenants, including its financial covenants, at December 31, 2016.

Foreign Facilities – China: Chart Cryogenic Engineering Systems (Changzhou) Company Limited ("CCESC"), Chart Energy & Chemicals Wuxi Co., Ltd. ("Wuxi") and Chart Biomedical (Chengdu) Co. Ltd. ("Chengdu"), wholly-owned subsidiaries of the Company, and Chart Cryogenic Distribution Equipment (Changzhou) Company Limited ("CCDEC"), a joint venture of the Company, maintain joint banking facilities (the "China Facilities") which include a revolving facility with 50.0 million Chinese yuan (equivalent to \$7.2 million) in borrowing capacity which can be utilized for either revolving loans, bonds/guarantees, or bank draft acceptances. Any borrowings made by CCESC, CCDEC, Chengdu or Wuxi under the China Facilities are guaranteed by the Company. At December 31, 2016, there were no borrowings outstanding under the revolving facility but, CCESC and CCDEC had 7.5 million Chinese yuan (equivalent to \$1.1 million) and 0.8 million Chinese yuan (equivalent to \$0.1 million) in bank guarantees, respectively.

CCDEC maintains an unsecured credit facility whereby CCDEC may borrow up to 30.0 million Chinese yuan (equivalent to \$4.3 million) for working capital purposes. This credit facility is effective until May 25, 2017. At December 31, 2016, there was 25.0 million Chinese yuan (equivalent to \$3.6 million) outstanding under this facility,

bearing interest at 4.35%.

CCESC entered into a term loan during the second quarter of 2016. The term loan is secured by certain CCESC land use rights and allows for up to 86.6 million Chinese yuan (equivalent to \$12.5 million) in borrowings. The loan has a term of eight years with semi-annual installment payments of at least 10.0 million Chinese yuan and a final maturity date of May 26, 2024. At December 31, 2016, there was 66.6 million Chinese yuan (equivalent to \$9.6 million) outstanding on this loan, bearing interest at 5.39%.

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Foreign Facilities – Europe: Chart Ferox, a.s. (“Ferox”), a wholly-owned subsidiary of the Company, maintains a secured credit facility with capacity of up to 125.0 million Czech koruna (equivalent to \$4.9 million) and two secured credit facilities with capacity of up to 6.5 million euros (equivalent to \$6.9 million). All three facilities allow Ferox to request bank guarantees and letters of credit. None of these facilities allow revolving credit borrowings. Under two of the facilities, Ferox must pay letter of credit and guarantee fees equal to 0.70% per annum on the face amount of each guarantee or letter of credit and under one facility Ferox must pay the letter of credit and guarantee fees equal to 0.50%. Ferox’s land, buildings, and cash collateral secure the credit facilities. As of December 31, 2016, there were bank guarantees of 155.4 million Czech koruna (equivalent to \$6.1 million) supported by the Ferox credit facilities. Chart Luxembourg maintains an overdraft facility with \$5.0 million in borrowing capacity. There were no borrowings under the Chart Luxembourg facility as of December 31, 2016.

Our debt and related covenants are further described in Note 7 to our consolidated financial statements included elsewhere in this report.

Sources and Uses of Cash

Our cash and cash equivalents totaled \$282.0 million as of December 31, 2016, an increase of \$158.3 million from the balance at December 31, 2015. Our foreign subsidiaries held cash of approximately \$72.9 million and \$71.9 million at December 31, 2016 and December 31, 2015, respectively, to meet their liquidity needs. No material restrictions exist in accessing cash held by our foreign subsidiaries. We expect to meet our U.S. funding needs without repatriating non-U.S. cash and incurring incremental U.S. taxes. Cash equivalents are invested in money market funds that invest in high quality, short-term instruments, such as U.S. government obligations, certificates of deposit, repurchase obligations, and commercial paper issued by corporations that have been highly rated by at least one nationally recognized rating organization. We believe that our existing cash and cash equivalents, funds available under our SSRCF and cash provided by operations will be sufficient to finance our normal working capital needs, acquisitions and investments in properties, facilities, and equipment for the foreseeable future.

Years Ended December 31, 2016 and 2015

Cash provided by operating activities during 2016 and 2015 was \$170.8 million and \$101.0 million, respectively. The increase in cash provided by operations is largely due to improvements in working capital, including greater cash collections during 2016, and reductions in inventory. Also, 2016 cash flows reflect the \$16.7 million receipt of the representation and warranty insurance recovery proceeds.

Cash used in investing activities was \$18.1 million and \$73.5 million during 2016 and 2015, respectively. Cash used in investing activities in 2016 was largely for capital expenditures. Investing activities in 2015 included capital expenditures of \$47.0 million and payments for land use rights of \$11.0 million, which were largely attributed to the D&S segment’s capacity expansion project in China. Also, in connection with this expansion, we received an \$8.7 million government grant. Additionally, we used \$24.5 million of cash related to the Thermax Inc. (“Thermax”) acquisition in 2015.

Cash provided by financing activities during 2016 and 2015 was \$7.7 million and \$0.4 million, respectively. During 2016, we borrowed 111.6 million Chinese yuan (equivalent to \$17.0 million) and repaid 60.0 million Chinese yuan (equivalent to \$9.0 million) on our China Facilities. We used \$0.7 million for the purchase of common stock which was surrendered to cover tax withholdings during 2016. Also during 2016, we received \$0.4 million in proceeds from stock option exercises.

Years Ended December 31, 2015 and 2014

Our cash and cash equivalents totaled \$123.7 million as of December 31, 2015, an increase of \$20.0 million from the balance at December 31, 2014.

Cash provided by operating activities during 2015 and 2014 was \$101.0 million and \$118.6 million, respectively. The decrease in cash provided by operations was due to lower income from operations, partially offset by lower investment in working capital.

Cash used in investing activities was \$73.5 million and \$72.5 million during 2015 and 2014, respectively. Capital expenditures and payments for land use rights were \$47.0 million and \$11.0 million, respectively, during 2015, primarily for a D&S segment capacity expansion project in China for which we also received an \$8.7 million government grant. Also during 2015, we used \$24.5 million of cash relating to the Thermax acquisition.

Cash provided by financing activities during 2015 was \$0.4 million and cash used in financing activities during 2014 was \$70.7 million. During 2015, we borrowed and repaid \$66.4 million on our SSRCF. We also borrowed 15.0 million Chinese yuan (equivalent to \$2.4 million) and repaid 5.0 million Chinese yuan (equivalent to \$0.8 million) on our China Facilities. Also during 2015, we received \$0.5 million in proceeds from stock option exercises. We used \$0.9 million for the purchase of common stock

which was surrendered to cover tax withholdings during 2015. Other uses of cash included a \$0.6 million contingent consideration payment related to a prior acquisition.

Cash Requirements

We do not currently anticipate any unusual cash requirements for working capital needs for the year ending December 31, 2017. Management anticipates we will be able to satisfy cash requirements for our ongoing business for the foreseeable future with cash generated by operations, existing cash balances and available borrowings under our credit facilities. We may repurchase a portion of our Convertible Notes on the open market to the extent permitted by our debt covenants with available cash. We expect capital expenditures for 2017 to be in the range of \$35.0 to \$45.0 million, which will be deployed primarily for an expansion of the brazed aluminum heat exchanger facility in La Crosse, Wisconsin, as well as cost saving improvement projects and routine maintenance across all businesses. In January 2017, we used approximately \$22 million to acquire Hetsco, Inc. as further described in the Subsequent Events footnote to the consolidated financial statements. In 2017, we contemplate the use of approximately \$10.0 to \$20.0 million of cash to pay U.S. and foreign income taxes.

Contractual Obligations

Our known contractual obligations as of December 31, 2016 and cash requirements resulting from those obligations are as follows (all dollar amounts in thousands):

	Payments Due by Period				
	Total	Less Than 1 Year	1 – 3 Years	3 – 5 Years	More Than 5 Years
Gross debt ⁽¹⁾	\$263,208	\$6,487	\$256,721	\$—	\$—
Long-term Convertible Notes interest	8,000	5,000	3,000	—	—
Operating leases	41,300	9,800	15,600	9,100	6,800
Severance	7,600	7,600	—	—	—
Pension obligations ⁽²⁾	5,800	—	3,300	2,500	—
Total contractual cash obligations	\$325,908	\$28,887	\$278,621	\$11,600	\$6,800

⁽¹⁾ The \$250,000 principal balance of the Convertible Notes will mature on August 1, 2018.

⁽²⁾ The planned funding of the pension obligations is based upon actuarial and management estimates taking into consideration the current status of the plan.

Not included in the table above are unrecognized tax benefits of \$0.8 million at December 31, 2016 and contingent consideration arrangements from prior acquisitions with a maximum potential payout of \$11.3 million.

Our commercial commitments as of December 31, 2016, which include standby letters of credit and bank guarantees, represent potential cash requirements resulting from contingent events that require performance by us or our subsidiaries pursuant to funding commitments, and are as follows (all dollar amounts in thousands):

	Total	Expiring	
		Expiring in 2017	Expiring in 2018 and beyond
Standby letters of credit	\$28,235	\$9,520	\$18,715
Bank guarantees	16,447	9,152	7,295
Total commercial commitments	\$44,682	\$18,672	\$26,010

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements.

Contingencies

We are involved with environmental compliance, investigation, monitoring, and remediation activities at certain of our operating facilities or formerly owned manufacturing facilities and accrue for these activities when commitments

or remediation plans have been developed and when costs are probable and can be reasonably estimated. Historical annual cash expenditures for these activities have been charged against the related environmental reserves. Future expenditures relating to these environmental remediation efforts are expected to be made over the next 12 years as ongoing costs of remediation programs. Management

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believes that any additional liability in excess of amounts accrued, which may result from the resolution of such matters, should not have a material adverse effect on our financial position, liquidity, cash flows or results of operations.

We are occasionally subject to various legal claims related to performance under contracts, product liability, taxes, employment matters, environmental matters, intellectual property, and other matters, several of which claims assert substantial damages, in the ordinary course of our business. Based on our historical experience in litigating these claims, as well as our current assessment of the underlying merits of the claims and applicable insurance, if any, we believe the resolution of these legal claims will not have a material adverse effect on our financial position, liquidity, cash flows or results of operations. Future developments may, however, result in resolution of these legal claims in a way that could have a material adverse effect. See Item 1A. "Risk Factors" and Item 3. "Legal Proceedings" for further information.

Foreign Operations

During 2016, we had operations in Asia, Australia, Europe, and South America, which accounted for approximately 32% of consolidated sales and 25% of total assets at December 31, 2016. Functional currencies used by these operations include the U.S. dollar, Chinese yuan, the euro, the British pound, and the Japanese yen. We are exposed to foreign currency exchange risk as a result of transactions by these subsidiaries in currencies other than their functional currencies, and from transactions by our domestic operations in currencies other than the U.S. dollar. The majority of these functional currencies and the other currencies in which we record transactions are fairly stable, although we experienced variability in the current year as more fully discussed in Item 7A. The use of these currencies, combined with the use of foreign currency forward purchase and sale contracts, has enabled us to be sheltered from significant gains or losses resulting from foreign currency transactions. This situation could change if these currencies experience significant fluctuations or the volume of forward contracts changes.

Application of Critical Accounting Policies

Our consolidated financial statements have been prepared in accordance with U.S. generally accepted accounting principles and are based on the selection and application of significant accounting policies, which require management to make estimates and assumptions about future events that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ materially from those estimates. Management believes the following are the more critical judgmental areas in the application of its accounting policies that affect its financial position and results of operations.

Goodwill and Indefinite-Lived Intangible Assets. We evaluate goodwill and indefinite-lived intangible assets for impairment on an annual basis, as of October 1 or whenever events or changes in circumstances indicate that an evaluation should be completed. A significant amount of judgment is involved in determining if an indicator of impairment has occurred. Such indicators may include deterioration in general economic conditions, negative developments in equity and credit markets, a decline in stock price and market capitalization, adverse changes in the markets in which we operate, and a trend of negative or declining cash flows over multiple periods. The fair value that could be realized in an actual transaction may differ from that used to evaluate the impairment of goodwill.

Goodwill is analyzed on a reporting unit basis. The reporting units are the same as our operating and reportable segments: E&C, D&S and BioMedical. We first evaluate qualitative factors, such as macroeconomic conditions and our overall financial performance to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount, including goodwill. We then evaluate how significant each of the identified factors could be to the fair value or carrying amount of a reporting unit and weigh these factors in totality in forming a conclusion of whether or not it is more likely than not that the fair value of a reporting unit is less than its carrying amount (the "Step 0 Test"). If we determine that it is not more likely than not that the fair value of a reporting unit is less than its carrying amount, the first and second steps of the goodwill impairment test are not necessary. Otherwise, we would perform the first step of the two-step goodwill impairment test.

Alternatively, we may also bypass the Step 0 Test and proceed directly to the two-step goodwill impairment test.

Under the first step ("Step 1"), we estimate the fair value of our reporting units by considering income and market approaches to develop fair value estimates, which are weighted to arrive at a fair value estimate for each reporting unit. With respect to the income approach, a model has been developed to estimate the fair value of each reporting

unit. This fair value model incorporates estimates of future cash flows, estimates of allocations of certain assets and cash flows among reporting units, estimates of future growth rates, and management's judgment regarding the applicable discount rates to use to discount such estimates of cash flows. With respect to the market approach, a guideline company method is employed whereby pricing multiples are derived from companies with similar assets or businesses to estimate fair value of each reporting unit. If the fair value of the reporting unit exceeds the carrying amount of the net assets assigned to that reporting unit, then goodwill is not impaired and no further testing is required. However, if the fair value of the reporting unit is less than its carrying amount, we perform the second step ("Step 2") of the goodwill impairment test to measure the amount of impairment loss, if any, to recognize.

In Step 2, the implied fair value of the reporting unit's goodwill is determined by allocating the reporting unit's fair value to the assets and liabilities, other than goodwill, in a hypothetical purchase price allocation. The resulting implied fair value is then compared to the carrying amount of the goodwill and if the carrying amount exceeds the implied fair value, an impairment charge is recorded for the difference.

In order to assess the reasonableness of the calculated fair values of our reporting units, we also compare the sum of the reporting units' fair values to our market capitalization and calculate an implied control premium (the excess of the sum of the reporting units' fair values over the market capitalization). We evaluate the control premium by comparing it to control premiums of recent comparable transactions. If the implied control premium is not reasonable in light of this assessment, we reevaluate our fair value estimates of the reporting units by adjusting the discount rates and other assumptions as necessary.

Changes to the assumptions and estimates used throughout the steps described above may result in a significantly different estimate of the fair value of the reporting units, which could result in a different assessment of the recoverability of goodwill and result in future impairment charges.

With respect to indefinite-lived intangible assets, we first evaluate relevant events and circumstances to determine whether it is more likely than not that the fair value of an indefinite-lived intangible asset is less than its carrying amount. If, in weighing all relevant events and circumstances in totality, we determine that it is not more likely than not that an indefinite-lived intangible asset is impaired, no further action is necessary. Otherwise, we would determine the fair value of indefinite-lived intangible assets and perform a quantitative impairment assessment by comparing the indefinite-lived intangible asset's fair value to its carrying amount. We may bypass such a qualitative assessment and proceed directly to the quantitative assessment. We estimate the fair value of our indefinite-lived assets using the income approach. This may include the relief from royalty method or use of a model similar to the one described above related to goodwill which estimates the future cash flows attributed to the indefinite-lived intangible asset and then discounting these cash flows back to a present value. Under the relief from royalty method, fair value is estimated by discounting the royalty savings, as well as any tax benefits related to ownership to a present value. The fair value from either approach is compared to the carrying value and an impairment is recorded if the fair value is determined to be less than the carrying value.

2016 Goodwill and Indefinite-Lived Intangible Assets Impairment Assessment

As of October 1, 2016 ("annual assessment date") we elected to bypass the Step 0 test and based on our Step 1 test, we determined that the fair value of each of our reporting units was greater than its respective carrying value and, therefore, the second step of the goodwill impairment test was not necessary. Our D&S reporting unit passed the Step 1 test with an estimated fair value within 10% to 20% of its carrying value. Furthermore, as of the annual assessment date, we also elected to bypass the qualitative assessment for the indefinite-lived intangible assets and based on our quantitative assessment, we determined that the fair value of each of the indefinite-lived intangible assets was greater than its respective carrying value, therefore, no further action was necessary.

Goodwill at December 31, 2016 is \$218.0 million (attributed to the segments as follows: E&C - \$27.9 million; D&S - \$165.5 million; and BioMedical \$24.6 million).

2015 Goodwill and Indefinite-Lived Intangible Assets Impairment Assessment

We performed an interim impairment assessment in the third quarter of 2015 and as a result of that assessment, we noted that the estimated fair values of our D&S and BioMedical reporting units were within 10% to 20% of their carrying values. We anticipated at that time that the fair values of each reporting unit would increase over time; however, as outlined below, projected additional declines in the operating results of each reporting unit (including E&C) were identified in the annual forecasting process in November and December of 2015.

We quantitatively evaluated indefinite-lived intangible assets as part of the impairment testing. As a result of these tests, we recorded goodwill and indefinite-lived intangible asset impairment charges in the fourth quarter of 2015 as management concluded that the goodwill and certain indefinite-lived intangible assets within each reporting unit were impaired. The total goodwill and indefinite-lived impairment charges in the fourth quarter of 2015 were \$207.7 million (attributed to the segments as follows: E&C - \$65.0 million, D&S - \$0.3 million and BioMedical - \$142.3 million).

Key factors that affected our conclusion that impairment indicators had occurred during the fourth quarter included the continued significant decline in the energy markets, a continued decline in economic activity in China, and the deferral of large capital expenditures by many companies given macroeconomic uncertainties. Each of these factors, as further described below, have a material direct impact on the operating results of our reporting units. These factors contributed significantly to less favorable longer-term forecasted operating results. Management prepares its annual forecast mid-November through December each year. As the 2016 forecast was developed, management considered many factors when assessing the outlook for 2016 and beyond.

Because of these factors, management revised its forecasts down significantly, which led to the impairment charges described below. In addition to the items considered for each reporting unit below, management also considered the sustained decline in the Company's market capitalization. The Company's stock price was \$95.64 on December 31, 2013, \$34.20 on December 31, 2014 and \$17.96 on December 31, 2015.

Based on the results of Step 1, we determined that the E&C and BioMedical reporting units failed Step 1; and, therefore, we performed a Step 2 analysis for these reporting units. Our D&S reporting unit passed the Step 1 test with an estimated fair value within 10% of its carrying value. Discount rates used to present value the forecasted cash flows ranged from 14.0% to 16.5% for the reporting units.

Goodwill and indefinite-lived intangible assets within the E&C reporting unit were impaired \$65.0 million as a result of revised estimates developed during our annual forecasting process. The revised estimates were the result of the following: 1) continued significant decline in energy prices during the fourth quarter which led to a significant reduction in expected order levels as LNG projects were cancelled or deferred, which impacted our longer-term forecasts; 2) in late 2015, the Company received notification of delays in major projects from several large customers; and 3) concerns with global growth, recent negative macroeconomic developments and highly competitive market conditions.

Indefinite-lived intangible assets within the D&S reporting unit were impaired \$0.3 million as a result of revised estimates developed during our annual forecasting process.

Goodwill and indefinite-lived intangible assets within the BioMedical reporting unit were impaired \$142.3 million as a result of revised estimates developed during our annual forecasting process. The revised estimates were the result of the following: 1) realization that the effects of Medicare competitive bidding, including the reduction of reimbursement rates and the subsequent consolidation of our customers, can no longer be considered temporary and will have lasting negative impacts on the growth of the homecare industry and their suppliers; 2) increased rivalry with competitive technology; and 3) concerns with global growth and recent negative macroeconomic developments. Remaining goodwill at December 31, 2015 was \$218.4 million (attributed to the segments as follows: E&C - \$27.9 million, D&S - \$165.9 million, and BioMedical - \$24.6 million). Remaining indefinite-lived intangible assets at December 31, 2015 were \$35.7 million. A significant amount of judgment was used in the analyses prepared for goodwill and indefinite-lived impairment testing. If further indicators of impairment occur, or if results of operations for the reporting units are below the developed forecasts, management may determine that further impairment charges are necessary.

Long-Lived Assets. We monitor our property, plant and equipment, and finite-lived intangible assets for impairment indicators on an ongoing basis. If impairment indicators exist, assets are grouped and tested at the lowest level for which identifiable cash flows are available and the Company performs the required analysis and records impairment charges if applicable. In conducting its analysis, the Company compares the undiscounted cash flows expected to be generated from the long-lived assets to the related net book values. If the undiscounted cash flows exceed the net book value, the long-lived assets are considered not to be impaired. If the net book value exceeds the undiscounted cash flows, an impairment loss is measured and recognized. An impairment loss is measured as the difference between the net book value and the fair value of the long-lived assets. Fair value is estimated from discounted future net cash flows (for assets held for use) or net realizable value (for assets held for sale). In assessing the recoverability of our long-lived assets, a significant amount of judgment is involved in estimating the future cash flows, discount rates and other factors necessary to determine the fair value of the respective assets. If these estimates or the related assumptions change in the future, we may be required to record impairment charges for these assets in the period such determination was made. The Company amortizes intangible assets that have finite lives over their estimated useful lives.

2016 Long-Lived Asset Impairments

During the third quarter of 2016, the Company identified impairment indicators that suggest the carrying value of a certain asset group in China within the D&S segment may not be recoverable. The primary impairment indicators included recently completed projections of future cash flows and the associated impact on the long-range strategic plan forecasts, lower than expected cash flows attributed to this asset group and poor market conditions. An undiscounted cash flow test performed for this asset group indicated it was not recoverable. The fair value of the asset

group was established using a discounted cash flow model which utilized Level 3 inputs in the fair value hierarchy. As a result of the long-lived asset impairment assessment performed, the Company recorded long-lived asset impairment charges on its D&S reporting unit of \$1.2 million. The impairment charges were \$0.5 million related to finite-lived intangible assets and \$0.7 million related to tangible property, plant and equipment. There were no remaining long-lived assets recorded on the consolidated balance sheet for this asset group as of December 31, 2016.

Additionally, during the third quarter of 2016, events and circumstances indicated that other tangible property, plant and equipment in China within our D&S segment might be impaired. However, the Company's estimate of undiscounted cash flows indicated that such carrying values were expected to be recovered. Nonetheless, it is reasonably possible that the estimate of

undiscounted cash flows may negatively change in the near term, which may result in the need to write down these assets to fair value. The Company's estimate of cash flows may change in the future due to poor market conditions and excess capacity in the industry.

2015 Long-Lived Asset Impairments

During the fourth quarter of 2015, we identified impairment indicators described above in the Goodwill and Indefinite-Lived Intangible Assets section that suggest the carrying values of certain asset groups within each segment may not be recoverable. The primary indicators include projections of future cash flows and the associated impact on our long-range strategic plan forecasts, lower than expected cash flows attributed to certain asset groups, increased competition, the continued decline in energy prices, and our lower market capitalization. As a result of the analyses, we recorded \$38.1 million of impairment charges for finite-lived intangible assets related to the BioMedical segment (attributed to customer relationships – \$15.7 million and unpatented technology – \$22.4 million). We also impaired \$3.9 million of BioMedical property, plant and equipment. The BioMedical impairment charges were due to reductions in expected future cash flows associated with the respiratory product lines. We impaired \$3.8 million of E&C property, plant and equipment due to reductions in expected future cash flows associated with certain assets in China. The results of impairment analyses in 2015 for other asset groups in the D&S and E&C segments indicated recoverability of their carrying value.

Defined Benefit Pension Plan. We sponsor one defined benefit pension plan which has been frozen since February 2006. The funded status is measured as the difference between the fair value of the plan assets and the projected benefit obligation. We recognize the change in the funded status of the plan in the year in which the change occurs through accumulated other comprehensive loss. Our funding policy is to contribute at least the minimum funding amounts required by law. We have chosen policies according to accounting guidance that allow the use of a calculated value of plan assets (which is further described below), which generally reduces the volatility of expense (income) from changes in pension liability discount rates and the performance of the pension plans' assets.

A significant element in determining our pension expense in accordance with accounting guidance is the expected return on plan assets. We have assumed that the expected long-term rate of return on plan assets as of December 31, 2016 and 2015 was 7.0% and 7.25%, respectively. The expected return assumptions were developed using an averaging formula based upon the plans' investment guidelines, mix of asset classes, historical returns of equities and bonds, and expected future returns. We believe our assumptions for expected future returns are reasonable. However, we cannot guarantee that we will achieve these returns in the future. The assumed long-term rate of return on assets is applied to the market value of plan assets. This produces the expected return on plan assets that reduces pension expense. The difference between this expected return and the actual return on plan assets is deferred. The net deferral of past asset gains or losses affects future net periodic pension expense.

At the end of each year, we determine the rate to be used to discount plan liabilities. The discount rate reflects the current rate at which the pension liabilities could be effectively settled at the end of the year. In estimating this rate, we look to rates of return on high quality, fixed-income investments that receive one of the two highest ratings given by a recognized rating agency and the expected timing of benefit payments under the plan. At December 31, 2016 and 2015, we determined this rate to be 4.00%. Changes in discount rates over the past three years have not materially affected pension expense (income), and the net effect of changes in the discount rate, as well as the net effect of other changes in actuarial assumptions and experience, have been deferred and amortized over the expected future service of participants.

Assumptions as to the mortality of the plan participants is a key estimate in measuring expected payments a participant may receive over their lifetime and therefore, the amount of pension expense we will recognize. During 2014, the Society of Actuaries released a series of updated mortality tables resulting from recent studies conducted by them measuring mortality rates for various groups of individuals. The updated mortality tables reflected improved trends in longevity and therefore have had the effect of increasing the estimate of benefits to be received by the plan participants. We adopted these updated mortality assumptions which contributed to the increased benefit obligation at December 31, 2014. During 2015 and 2016, the Society of Actuaries updated the mortality tables which reflected additional improvements in mortality than the 2014 mortality tables. We adopted these updated assumptions which did not have a significant impact on the benefit obligation at December 31, 2016.

At December 31, 2016, our consolidated net pension liability recognized was \$14.4 million, a decrease of \$2.9 million from December 31, 2015. This decrease in the liability was due to improved pension asset returns, as well as a contribution of \$1.0 million during 2016. Benefit payments were \$3.9 million in fiscal 2016. We recognized approximately \$1.0 million and \$0.5 million in net periodic pension expense for the year ended December 31, 2016 and 2015, respectively, and \$0.4 million in net periodic pension income for the year ended December 31, 2014. See Note 15 to our consolidated financial statements included elsewhere in this report for further information.

Product Warranties. We provide product warranties with varying terms and durations for the majority of our products. We estimate product warranty costs and accrue for these costs as products are sold with a charge to cost of sales.

Factors considered

in estimating warranty costs include historical and projected warranty claims, historical and projected cost-per-claim and knowledge of specific product issues that are outside of our typical experience. Warranty accruals are evaluated and adjusted as necessary based on actual claims experience and changes in future claim and cost estimates.

As a result of the BioMedical segment's acquisition of AirSep in August 2012, the Company assumed exposure for warranty claims for AirSep's various product lines. One of these product lines in particular experienced high failure rates with respect to certain of its models and designs as compared to AirSep's other products. The Company established a warranty reserve on AirSep's opening balance sheet to account for the cost of satisfying future warranty claims, including a separately calculated warranty reserve for those certain models and designs in the product line that experienced greater warranty return rates (collectively, the "acquired warranty reserve"). The Company has experienced a significant number of warranty claims as AirSep products sold in prior periods run through their respective warranty periods. Usage of the acquired warranty reserve includes claims related to all of AirSep's product lines, including costs associated with the population of units for which a warranty reserve was separately calculated. Usage of the acquired warranty reserve has exceeded warranty expense since the acquisition. The Company has made various design improvements to this product line, revised the warranty claim process, and reduced the average cost to repair units since the 2012 acquisition, all in an effort to mitigate the costs associated with these warranty issues. The Company does not expect future warranty expense to be as significant as it has been since the acquisition.

During the third quarter of 2016, the Company recovered for breaches of representations and warranties primarily related to warranty costs for certain product lines acquired in the acquisition of AirSep under the related representation and warranty insurance. This reduced our BioMedical segment's cost of sales by \$15.1 million.

Changes in assumptions used to calculate the warranty reserve estimates, including the number of expected warranty claims, the costs of satisfying those claims, or other issues, could materially affect our financial position and results from operations in future periods.

Revenue Recognition — Long-Term Contracts. We recognize revenue and gross profit as work on certain long-term contracts progresses using the percentage of completion method of accounting, which relies on estimates of total expected contract revenues and costs. We follow this method since reasonably dependable estimates of the revenue and costs applicable to various stages of a contract can be made. Since the financial reporting of these contracts depends on estimates, which are assessed continually during the term of the contract, recognized revenues and profit are subject to revisions as the contract progresses toward completion. Revisions in profit estimates are reflected in the period in which the facts that give rise to the revision become known. Accordingly, favorable changes in estimates result in additional profit recognition, and unfavorable changes will result in the reversal of previously recognized revenue and profits. When estimates indicate a loss is expected to be incurred under a contract, cost of sales is charged with a provision for the full loss immediately. As work progresses under a loss contract, revenue and cost of sales continue to be recognized in equal amounts, and the excess of costs over revenues is charged to the contract loss reserve. Change orders resulting in additional revenue and profit are recognized upon approval by the customer based on the percentage that incurred costs to date bear to total estimated costs at completion. Pre-contract costs relate primarily to salaries and benefits incurred to support the selling effort and, accordingly, are expensed as incurred. Certain contracts include incentive-fee arrangements clearly defined in the agreement and are not recognized until earned. The percentage of completion method of accounting is primarily used in the E&C segment, although it is used on certain contracts in our D&S and BioMedical segments.

Recent Accounting Standards

Refer to the Significant Accounting Policies note (Note 2) to our consolidated financial statements included elsewhere in this report for disclosure regarding recent accounting standards.

regulations governing the export of our products and other regulations applicable to us as a supplier of products to the U.S. government;

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fluctuations or adjustments in the Company's effective tax rate;
risks associated with our indebtedness, leverage and liquidity;
fluctuations in the price of our stock;
potential dilution to existing holders of our common stock as a result of the conversion of our Convertible Notes and the need to utilize our cash balances and/or credit facility to fund any cash settlement related to such conversions; and
other factors described herein.

There may be other factors that may cause our actual results to differ materially from the forward-looking statements. All forward-looking statements attributable to us or persons acting on our behalf apply only as of the date of this Annual Report and are expressly qualified in their entirety by the cautionary statements included in this Annual Report. We undertake no obligation to update or revise forward-looking statements which may be made to reflect events or circumstances that arise after the filing date of this document or to reflect the occurrence of unanticipated events.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

In the normal course of business, the Company's operations are exposed to fluctuations in interest rates and foreign currency values that can affect the cost of operating and financing. Accordingly, the Company addresses a portion of these risks through a program of risk management.

Interest Rate Risk: The Company's primary interest rate risk exposure results from the SSRCF's various floating rate pricing mechanisms. As of December 31, 2016, there were no borrowings outstanding under the SSRCF. Based on zero borrowings at year-end, as well as historical borrowing practice under the SSRCF, the Company believes that interest rate exposure is not a material risk to the Company at this time.

Foreign Currency Exchange Rate Risk: The Company operates in the United States, Asia, Australia, Europe and South America, creating exposure to foreign currency exchange fluctuations in the normal course of business, which can impact our financial position, results of operations, cash flow and competitive position. The financial statements of foreign subsidiaries are translated into their U.S. dollar equivalents at end-of-period exchange rates for assets and liabilities, while income and expenses are translated at average monthly exchange rates. Translation gains and losses are components of other comprehensive income (loss) as reported in the consolidated statements of operations and comprehensive income (loss). Translation exposure is primarily with the euro, the Chinese yuan, and the Japanese yen. During 2016, the Chinese yuan and euro increased in relation to the U.S. dollar by 7% and 3%, respectively. During 2016, the Japanese yen decreased in relation to the U.S. dollar by 3%. At December 31, 2016, a hypothetical further 10% strengthening of the U.S. dollar would not materially affect the Company's financial statements.

Chart's primary transaction exchange rate exposures are with the euro, the Japanese yen, the Czech koruna, the Australian dollar, the British pound, and the Chinese yuan. Transaction gains and losses arising from fluctuations in currency exchange rates on transactions denominated in currencies other than the functional currency are recognized in the consolidated statements of operations as a component of foreign currency loss (gain). The Company enters into foreign exchange forward contracts to hedge anticipated and firmly committed foreign currency transactions. Chart does not use derivative financial instruments for speculative or trading purposes. The terms of the contracts are generally one year or less. At December 31, 2016, a hypothetical 10% weakening of the U.S. dollar would not materially affect the Company's outstanding foreign exchange forward contracts.

Market Price Sensitive Instruments

In connection with the issuance of the Convertible Notes, the Company entered into privately-negotiated convertible note hedge and capped call transactions with affiliates of certain of the underwriters (the "Option Counterparties"). The convertible note hedge and capped call transactions relate to, collectively, 3.6 million shares, which represents the number of shares of the Company's common stock underlying the Convertible Notes, subject to anti-dilution adjustments substantially similar to those applicable to the Convertible Notes. These convertible note hedge and capped call transactions are expected to reduce the potential dilution with respect to the Company's common stock upon conversion of the Convertible Notes and/or reduce the Company's exposure to potential cash or stock payments that may be required upon conversion of the Convertible Notes, except, in the case of the capped call transactions, to the extent that the market price per share of the Company's common stock exceeds the cap price of the capped call transactions.

The Company also entered into separate warrant transactions with the Option Counterparties initially relating to the number of shares of the Company's common stock underlying the convertible note hedge transactions, subject to customary anti-dilution adjustments. The warrant transactions will have a dilutive effect with respect to the Company's common stock to the extent that the price per share of the Company's common stock exceeds the strike price of the warrants unless the Company elects, subject to certain conditions, to settle the warrants in cash. The cap price of the capped call transactions and the strike price of the warrant

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transactions was initially \$84.96 per share. Further information is located in Note 7 to the Company's consolidated financial statements included in Item 8 of this Annual Report on Form 10-K.

Item 8. Financial Statements and Supplementary Data

Our Financial Statements and the accompanying Notes that are filed as part of this Annual Report are listed under Item 15. "Exhibits and Financial Statement Schedules" and are set forth beginning on page F-1 immediately following the signature page of this Form 10-K and are incorporated into this Item 8 by reference.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure
None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

As of December 31, 2016, an evaluation was performed under the supervision and with the participation of the Company's management including the Company's Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of the Company's disclosure controls and procedures pursuant to Rule 13a-15 under the Securities and Exchange Act of 1934, as amended (the "Exchange Act"). Based upon that evaluation, such officers concluded that the Company's disclosure controls and procedures are effective to ensure that information required to be disclosed by the Company in the reports it files or submits under the Exchange Act (1) is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and (2) is accumulated and communicated to the Company's management including the Chief Executive Officer and Chief Financial Officer, as appropriate to allow for timely decisions regarding required disclosure.

Management's Report on Internal Control Over Financial Reporting

Management's Report on Internal Control Over Financial Reporting is set forth on page F-1 of this Annual Report on Form 10-K and incorporated herein by reference. Management used the updated Internal Control-Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission to perform the evaluation.

The effectiveness of the Company's internal control over financial reporting as of December 31, 2016 has been audited by Ernst & Young LLP, an independent registered public accounting firm, as stated in its report which is set forth in Item 8. "Financial Statements and Supplementary Data," on page F-3 under the caption "Report of Independent Registered Public Accounting Firm" and incorporated herein by reference.

Changes in Internal Control over Financial Reporting

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

Item 9B. Other Information

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

Information required by this item as to the Directors of the Company appearing under the caption “Election of Directors” in the Company’s 2017 Proxy Statement is incorporated herein by reference. Information required by this item as to the Executive Officers of the Company is included as Item 4A of this Annual Report on Form 10-K as permitted by Instruction 3 to Item 401(b) of Regulation S-K. Information required by Item 405 is set forth in the 2017 Proxy Statement under the heading “Section 16(a) Beneficial Ownership Reporting Compliance,” which information is incorporated herein by reference. Information required by Items 406 and 407(c)(3), (d)(4) and (d)(5) of Regulation S-K is set forth in the 2017 Proxy Statement under the headings “Information Regarding Meetings and Committees of the Board of Directors,” “Code of Ethical Business Conduct and Officer Code of Ethics” and “Stockholder Communications with the Board,” which information is incorporated herein by reference.

The Charters of the Audit Committee, Compensation Committee and Nominations and Corporate Governance Committee and the Corporate Governance Guidelines, Officer Code of Ethics and Code of Ethical Business Conduct are available free of charge on the Company’s website at www.chartindustries.com and in print to any stockholder who requests a copy. Requests for copies should be directed to Secretary, Chart Industries, Inc., One Infinity Corporate Centre Drive, Suite 300, Garfield Heights, Ohio 44125. The Company intends to disclose any amendments to the Code of Ethical Business Conduct or Officer Code of Ethics and any waiver of the Code of Ethical Business Conduct or Officer Code of Ethics granted to any Director or Executive Officer of the Company on the Company’s website.

Item 11. Executive Compensation

The information required by Item 402 of Regulation S-K is set forth in the 2017 Proxy Statement under the heading “Executive and Director Compensation,” which information is incorporated herein by reference. The information required by Items 407(e)(4) and 407(e)(5) of Regulation S-K is set forth in the 2017 Proxy Statement under the headings “Compensation Committee Interlocks and Insider Participation” and “Compensation Committee Report,” respectively, which information is incorporated herein by reference.

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

The information required by this item is set forth in the 2017 Proxy Statement under the headings “Security Ownership of Certain Beneficial Owners” and “Equity Compensation Plan Information,” which information is incorporated herein by reference.

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

The information required by this item is set forth in the 2017 Proxy Statement under the headings “Related Party Transactions” and “Director Independence,” which information is incorporated herein by reference.

Item 14. Principal Accounting Fees and Services

The information required by this item is set forth in the 2017 Proxy Statement under the heading “Principal Accounting Fees and Services,” which information is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules

(a) The following documents are filed as part of this 2016 Annual Report on Form 10-K:

1. Financial Statements. The following consolidated financial statements of the Company and its subsidiaries and the reports of the Company's independent registered public accounting firm are incorporated by reference in Item 8:

Management's Report on Internal Control over Financial Reporting

Reports of Independent Registered Public Accounting Firm

Consolidated Balance Sheets at December 31, 2016 and 2015

Consolidated Statements of Operations for the Years Ended December 31, 2016, 2015, and 2014

Consolidated Statements of Comprehensive Income (Loss) for the Years Ended December 31, 2016, 2015, and 2014

Consolidated Statements of Cash Flows for the Years Ended December 31, 2016, 2015, and 2014

Consolidated Statements of Equity for the Years Ended December 31, 2016, 2015, and 2014

Notes to Consolidated Financial Statements

2. Financial Statement Schedules. The following additional information should be read in conjunction with the consolidated financial statements:

Schedule II Valuation and Qualifying Accounts for the Years Ended December 31, 2016, 2015, and 2014

All other financial statement schedules have been omitted since they are either not required, not applicable, or the information is otherwise included.

3. Exhibits. See the Index to Exhibits at page E-1 of this Annual Report on Form 10-K.

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.

CHART INDUSTRIES, INC.

By: /S/ SAMUEL F. THOMAS
Samuel F. Thomas
Chairman and Chief Executive Officer

Date: February 23, 2017

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the Registrant and in the capacities and on the dates indicated.

Signature and Title

/S/ SAMUEL F. THOMAS Samuel F. Thomas	Chairman, Chief Executive Officer and a Director
/S/ WILLIAM C. JOHNSON William C. Johnson	President and Chief Operating Officer
/S/ KENNETH J. WEBSTER Kenneth J. Webster	Vice President and Chief Financial Officer (Principal Financial Officer)
/S/ MARY C. COOK Mary C. (Katie) Cook	Chief Accounting Officer and Controller (Principal Accounting Officer)
/S/ W. DOUGLAS BROWN W. Douglas Brown	Director
/S/ RICHARD E. GOODRICH Richard E. Goodrich	Director
/S/ TERRENCE J. KEATING Terrence J. Keating	Director
/S/ STEVEN W. KRABLIN Steven W. Krablin	Director
/S/ ELIZABETH G. SPOMER Elizabeth G. Spomer	Director
/S/ THOMAS L. WILLIAMS Thomas L. Williams Date: February 23, 2017	Director

INDEX TO FINANCIAL STATEMENTS

Audited Consolidated Financial Statements:

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<u>Reports of Independent Registered Public Accounting Firm</u>	<u>F-2</u>
<u>Consolidated Balance Sheets at December 31, 2016 and 2015</u>	<u>F-4</u>
<u>Consolidated Statements of Operations for the Years Ended December 31, 2016, 2015 and 2014</u>	<u>F-5</u>
<u>Consolidated Statements of Comprehensive Income (Loss) for the Years Ended December 31, 2016, 2015 and 2014</u>	<u>F-6</u>
<u>Consolidated Statements of Cash Flows for the Years Ended December 31, 2016, 2015 and 2014</u>	<u>F-7</u>
<u>Consolidated Statements of Equity for the Years Ended December 31, 2016, 2015 and 2014</u>	<u>F-8</u>
<u>Notes to Consolidated Financial Statements</u>	<u>F-9</u>

MANAGEMENT'S REPORT ON INTERNAL CONTROL OVER
FINANCIAL REPORTING

Management of Chart Industries, Inc. and its subsidiaries (the "Company") is responsible for establishing and maintaining adequate internal control over financial reporting. The Company's internal control over financial reporting is a process designed under the supervision of the Company's principal executive and financial officers to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the Company's financial statements for external reporting purposes in accordance with U.S. generally accepted accounting principles.

The Company's internal control over financial reporting includes policies and procedures that:

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

Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. generally accepted accounting principles, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and the directors of the Company; and

Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the Company's 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 and procedures may deteriorate.

Management has assessed the effectiveness of its internal control over financial reporting as of December 31, 2016 based on the framework established in Internal Control — Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 Framework) (the "COSO criteria").

Based on this assessment, management has determined that the Company's internal control over financial reporting is effective as of December 31, 2016.

The effectiveness of the Company's internal control over financial reporting as of December 31, 2016 has been audited by Ernst & Young LLP, an independent registered public accounting firm, as stated in their report appearing below, which expresses an unqualified opinion on the effectiveness of the Company's internal control over financial reporting as of December 31, 2016.

/S/ SAMUEL F. THOMAS

Samuel F. Thomas

Chairman and Chief Executive Officer

/S/ KENNETH J. WEBSTER

Kenneth J. Webster

Vice President and Chief Financial Officer

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of
Chart Industries, Inc. and Subsidiaries

We have audited the accompanying consolidated balance sheets of Chart Industries, Inc. and Subsidiaries as of December 31, 2016 and 2015, and the related consolidated statements of operations, comprehensive income (loss), equity, and cash flows for each of the three years in the period ended December 31, 2016. Our audits also included the financial statement schedule listed in the index at Item 15(a) 2. 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 Chart Industries, Inc. and Subsidiaries at December 31, 2016 and 2015, and the consolidated results of their operations and their cash flows for each of the three years in the period ended December 31, 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), Chart Industries, Inc. and Subsidiaries' internal control over financial reporting as of December 31, 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 February 23, 2017 expressed an unqualified opinion thereon.

/S/ ERNST & YOUNG LLP
Cleveland, Ohio
February 23, 2017

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of
Chart Industries, Inc. and Subsidiaries

We have audited Chart Industries, Inc. and Subsidiaries' internal control over financial reporting as of December 31, 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). Chart Industries, Inc. and Subsidiaries' 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.

In our opinion, Chart Industries, Inc. and Subsidiaries maintained, in all material respects, effective internal control over financial reporting as of December 31, 2016, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of Chart Industries, Inc. and Subsidiaries as of December 31, 2016 and 2015, and the related consolidated statements of operations, comprehensive income (loss), equity, and cash flows for each of the three years in the period ended December 31, 2016, and our report dated February 23, 2017 expressed an unqualified opinion thereon.

/S/ ERNST & YOUNG LLP

Cleveland, Ohio
February 23, 2017

CHART INDUSTRIES, INC. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(Dollars in thousands, except per share amounts)

	December 31,	
	2016	2015
ASSETS		
Current Assets		
Cash and cash equivalents	\$281,959	\$123,708
Accounts receivable, less allowances of \$10,217 and \$6,965	142,762	183,514
Inventories, net	169,683	199,302
Unbilled contract revenue	26,736	59,283
Prepaid expenses	16,762	8,494
Other current assets	15,075	12,929
Total Current Assets	652,977	587,230
Property, plant and equipment, net	251,049	266,277
Goodwill	217,970	218,390
Identifiable intangible assets, net	93,443	106,714
Other assets	17,643	21,529
TOTAL ASSETS	\$1,233,082	\$1,200,140
LIABILITIES AND EQUITY		
Current Liabilities		
Accounts payable	\$79,953	\$97,413
Customer advances and billings in excess of contract revenue	74,702	71,030
Accrued salaries, wages and benefits	41,746	33,886
Current portion of warranty reserve	15,293	15,341
Short-term debt and current portion of long-term debt	6,487	6,160
Other current liabilities	43,353	38,209
Total Current Liabilities	261,534	262,039
Long-term debt	233,711	213,798
Long-term deferred tax liabilities	4,241	5,146
Long-term portion of warranty reserve	2,978	5,634
Accrued pension liabilities	14,362	17,283
Other long-term liabilities	17,579	20,504
Total Liabilities	534,405	524,404
Equity		
Common stock, par value \$.01 per share — 150,000,000 shares authorized, 30,613,166 and 30,545,657 shares issued and outstanding at December 31, 2016 and 2015, respectively	306	305
Additional paid-in capital	395,843	387,100
Retained earnings	336,328	308,091
Accumulated other comprehensive loss	(35,212)	(24,904)
Total Chart Industries, Inc. Shareholders' Equity	697,265	670,592
Noncontrolling interests	1,412	5,144
Total Equity	698,677	675,736
TOTAL LIABILITIES AND EQUITY	\$1,233,082	\$1,200,140

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

CHART INDUSTRIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS
(Dollars and shares in thousands, except per share amounts)

	Year Ended December 31,		
	2016	2015	2014
Sales	\$859,154	\$1,040,160	\$1,192,952
Cost of sales	592,781	751,696	835,098
Gross profit	266,373	288,464	357,854
Selling, general and administrative expenses	195,911	200,794	201,752
Amortization expense	11,873	17,333	17,945
Asset impairments	1,217	253,560	—
Operating expenses	209,001	471,687	219,697
Operating income (loss)	57,372	(183,223)	138,157
Other expenses:			
Interest expense, net	17,338	15,971	16,631
Financing costs amortization	1,284	1,290	1,392
Foreign currency loss	351	1,348	970
Other expenses, net	18,973	18,609	18,993
Income (loss) before income taxes	38,399	(201,832)	119,164
Income tax expense (benefit):			
Current	16,285	27,087	36,340
Deferred	(2,583)	(24,403)	(248)
Income tax expense, net	13,702	2,684	36,092
Net income (loss)	24,697	(204,516)	83,072
Noncontrolling interests, net of taxes	(3,540)	(1,556)	1,208
Net income (loss) attributable to Chart Industries, Inc.	\$28,237	\$(202,960)	\$81,864
Net income (loss) attributable to Chart Industries, Inc. per common share:			
Basic	\$0.92	\$(6.66)	\$2.69
Diluted	\$0.91	\$(6.66)	\$2.67
Weighted-average number of common shares outstanding:			
Basic	30,583	30,493	30,384
Diluted	30,994	30,493	30,666

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

CHART INDUSTRIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)
(Dollars in thousands)

	Year Ended December 31,		
	2016	2015	2014
Net income (loss)	\$24,697	\$(204,516)	\$83,072
Other comprehensive (loss) income:			
Foreign currency translation adjustments	(12,188)	(16,709)	(14,653)
Defined benefit pension plan:			
Actuarial gain (loss) on remeasurement	1,417	(1,272)	(11,884)
Amortization of prior service cost included in net periodic pension expense	1,537	1,429	320
Defined benefit pension plan	2,954	157	(11,564)
Other comprehensive loss, before tax	(9,234)	(16,552)	(26,217)
Income tax (expense) benefit related to defined benefit pension plan	(1,073)	(54)	4,173
Other comprehensive loss, net of taxes	(10,307)	(16,606)	(22,044)
Comprehensive income (loss)	14,390	(221,122)	61,028
Less: comprehensive loss (income) attributable to noncontrolling interests, net of taxes	3,539	1,944	(1,172)
Comprehensive income (loss) attributable to Chart Industries, Inc.	\$17,929	\$(219,178)	\$59,856

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

CHART INDUSTRIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
(Dollars in thousands)

	Year Ended December 31,		
	2016	2015	2014
OPERATING ACTIVITIES			
Net income (loss)	\$24,697	\$(204,516)	\$83,072
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation and amortization	37,509	45,448	43,176
Asset impairments	1,217	255,116	—
Interest accretion of convertible notes discount	12,481	11,535	10,662
Financing costs amortization	1,284	1,290	1,392
Employee share-based compensation expense	10,679	11,325	9,420
Unrealized foreign currency transaction loss (gain)	544	78	(1,606)
Deferred income tax benefit	(2,583)	(24,403)	(248)
Other non-cash operating activities	1,276	737	(170)
Changes in assets and liabilities, net of acquisitions:			
Accounts receivable	43,618	7,195	43,079
Inventory	25,679	11,988	(8,150)
Unbilled contract revenues and other assets	20,803	12,250	(51,467)
Accounts payable and other liabilities	(11,078)	(17,316)	11,562
Deferred income taxes	(423)	(51)	(3,690)
Customer advances and billings in excess of contract revenue	5,111	(9,710)	(18,413)
Net Cash Provided By Operating Activities	170,814	100,966	118,619
INVESTING ACTIVITIES			
Capital expenditures	(17,785)	(47,039)	(62,135)
Payments for China land use rights	—	(11,043)	—
Government grants	1,055	8,650	—
Proceeds from sale of assets	—	425	1,593
Acquisition of businesses, net of cash acquired	(1,351)	(24,517)	(11,943)
Net Cash Used In Investing Activities	(18,081)	(73,524)	(72,485)
FINANCING ACTIVITIES			
Borrowings on revolving credit facilities	3,820	68,827	88,819
Repayments on revolving credit facilities	(6,061)	(67,196)	(87,162)
Borrowings on term loan	13,167	—	—
Repayments on term loan	(2,949)	—	—
Payments on long-term debt	—	—	(68,437)
Payments for debt issuance costs	—	—	(1,321)
Payment of contingent consideration	—	(611)	(741)
Proceeds from exercise of stock options	354	486	763
Excess tax benefit from share-based compensation	104	133	1,957
Common stock repurchases	(704)	(948)	(3,367)
Dividend distribution to noncontrolling interests	—	(120)	(1,206)
Other financing activities	—	(156)	—
Net Cash Provided By (Used In) Financing Activities	7,731	415	(70,695)
Effect of exchange rate changes on cash and cash equivalents	(2,213)	(7,805)	(9,128)
Net increase (decrease) in cash and cash equivalents	158,251	20,052	(33,689)
Cash and cash equivalents at beginning of period	123,708	103,656	137,345

CASH AND CASH EQUIVALENTS AT END OF PERIOD	\$281,959	\$123,708	\$103,656
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The accompanying notes are an integral part of these consolidated financial statements.

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CHART INDUSTRIES, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF EQUITY
(Dollars and shares in thousands)

	Common Stock			Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Non-controlling Interests	Total Equity
	Shares Outstanding	Amount	Additional Paid-in Capital				
Balance at January 1, 2014	30,379	\$ 304	\$311,972	\$429,187	\$ 13,322	\$ 7,235	\$762,020
Net income	—	—	—	81,864	—	1,208	83,072
Other comprehensive loss	—	—	—	—	(22,008)	(36)	(22,044)
Share-based compensation expense	—	—	9,420	—	—	—	9,420
Common stock issued from share-based compensation plans	141	1	762	—	—	—	763
Excess tax benefit from exercise of stock options	—	—	1,859	—	—	—	1,859
Common stock repurchases	(38)	—	(3,367)	—	—	—	(3,367)
Convertible notes conversion feature	—	—	56,563	—	—	—	56,563
Dividend distribution to noncontrolling interest	—	—	—	—	—	(1,206)	(1,206)
Balance at December 31, 2014	30,482	305	377,209	511,051	(8,686)	7,201	887,080
Net loss	—	—	—	(202,960)	—	(1,556)	(204,516)
Other comprehensive loss	—	—	—	—	(16,218)	(388)	(16,606)
Share-based compensation expense	—	—	11,325	—	—	—	11,325
Common stock issued from share-based compensation plans	94	—	486	—	—	—	486
Excess tax deficiency from exercise of stock options	—	—	(890)	—	—	—	(890)
Common stock repurchases	(31)	—	(948)	—	—	—	(948)
Dividend distribution to noncontrolling interest	—	—	—	—	—	(120)	(120)
Other	—	—	(82)	—	—	7	(75)
Balance at December 31, 2015	30,545	305	387,100	308,091	(24,904)	5,144	675,736
Net income (loss)	—	—	—	28,237	—	(3,540)	24,697
Other comprehensive (loss) income	—	—	—	—	(10,308)	1	(10,307)
Share-based compensation expense	—	—	10,679	—	—	—	10,679
Common stock issued from share-based compensation plans	106	1	358	—	—	—	359
Excess tax deficiency from exercise of stock options	—	—	(1,672)	—	—	—	(1,672)
Common stock repurchases	(38)	—	(704)	—	—	—	(704)
Other	—	—	82	—	—	(193)	(111)
Balance at December 31, 2016	30,613	\$ 306	\$395,843	\$336,328	\$ (35,212)	\$ 1,412	\$698,677

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

CHART INDUSTRIES, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

(Dollars and shares in thousands, except per share amounts)

NOTE 1 — Nature of Operations and Principles of Consolidation

Nature of Operations: Chart Industries, Inc. and its consolidated subsidiaries (herein referred to as the “Company,” “Chart” or “we”), is a leading diversified global manufacturer of highly engineered equipment for the industrial gas, energy, and biomedical industries. Chart’s equipment and engineered systems are primarily used for low-temperature and cryogenic applications utilizing our expertise in cryogenic systems and equipment which operate at low temperatures sometimes approaching absolute zero (0 Kelvin; -273° Centigrade; -459° Fahrenheit). The Company has domestic operations located across the United States, including principal executive offices located in Ohio, and an international presence in Asia, Australia, Europe and South America.

Principles of Consolidation: The consolidated financial statements include the accounts of the Company and its subsidiaries. Intercompany accounts and transactions are eliminated in consolidation.

Reclassifications: Certain reclassifications have been made to the 2015 and 2014 consolidated statements of cash flow in order to conform to the 2016 presentation.

The Company adopted Accounting Standards Update (“ASU”) 2015-03, “Interest–Imputation of Interest: Simplifying the Presentation of Debt Issuance Costs” for the fiscal year beginning January 1, 2016. The new guidance was applied retrospectively for the prior period presented. The impact of the adoption of the guidance resulted in classification of the unamortized debt issuance cost related to the convertible notes on the consolidated balance sheets in long-term debt. The unamortized debt issuance costs reclassified at December 31, 2015 were \$1,836. Debt issuance costs related to the Senior Secured Revolving Credit Facility are classified in other assets on the consolidated balance sheets. Refer to Note 2 for further information on this ASU.

NOTE 2 — Significant Accounting Policies

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 the disclosure of contingent assets and liabilities at the date of the financial statements. These estimates may also affect the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates and assumptions.

Cash and Cash Equivalents: The Company considers all investments with an initial maturity of three months or less when purchased to be cash equivalents.

Accounts Receivable, Net of Allowances: The Company evaluates the collectibility of accounts receivable based on a combination of factors. In circumstances where the Company is aware of a specific customer’s inability to meet its financial obligations (e.g., bankruptcy filings, or substantial downgrading of credit scores), a specific reserve is recorded to reduce the receivable to the amount the Company believes will be collected. The Company also records allowances for doubtful accounts based on historical experience. When collection of a specific amount due is deemed not probable, the account is written off against the allowance.

Inventories: Inventories are stated at the lower of cost or market with cost being determined by the first-in, first-out (“FIFO”) method. The Company determines inventory valuation reserves based on a combination of factors. In circumstances where the Company is aware of a specific problem in the valuation of a certain item, a specific reserve is recorded to reduce the item to its net realizable value. The Company also recognizes reserves based on the actual usage in recent history and projected usage in the near-term.

Property, Plant and Equipment: Capital expenditures for property, plant and equipment are recorded at cost.

Expenditures for maintenance and repairs are charged to expense as incurred, whereas major improvements that extend the useful life are capitalized. The cost of applicable assets is depreciated over their estimated useful lives.

Depreciation is computed using the straight-line method for financial reporting purposes and accelerated methods for income tax purposes.

Guarantees of Third-Party Performance: During the first quarter of 2016, the Company became a member to a consortium agreement relating to a project with a third-party. This agreement entails the Company guaranteeing not only its own performance, but also the work of a third-party consortium partner. In the event of non-fulfillment of contractual obligations by the consortium partner, the Company may be required to perform the obligations of the consortium partner. The agreement term covers the project through completion, approximately 1.5 years. At December 31, 2016, the estimated cost of the performance under this guarantee was 14.6 million euros (equivalent to \$15.4 million). If losses are incurred under the guarantee due to third-party non-performance,

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CHART INDUSTRIES, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

the Company has certain rights that would allow it to mitigate such losses. If necessary, the carrying amount of any liability recorded in the consolidated balance sheet would reflect the Company's best estimate of future payments which it may incur as part of fulfilling its guarantee obligation. There is no liability recorded at December 31, 2016.

Long-lived Assets: The Company monitors its property, plant, equipment, and finite-lived intangible assets for impairment indicators on an ongoing basis. If impairment indicators exist, assets are grouped and tested at the lowest level for which identifiable cash flows are available. The Company performs the required analysis and records impairment charges, if applicable. In conducting its analysis, the Company compares the undiscounted cash flows expected to be generated from the long-lived assets to the related net book values. If the undiscounted cash flows exceed the net book value, the long-lived assets are considered not to be impaired. If the net book value exceeds the undiscounted cash flows, an impairment loss is measured and recognized. An impairment loss is measured as the difference between the net book value and the fair value of the long-lived assets. Fair value is estimated from discounted future net cash flows (for assets held and used) or net realizable value (for assets held for sale). Changes in economic or operating conditions impacting these estimates and assumptions could result in the impairment of long-lived assets. The Company amortizes intangible assets that have finite lives over their estimated useful lives. See Note 3, Asset Impairments, for more information relating to finite-lived intangible asset impairment losses recorded during 2016 and 2015.

Goodwill and Indefinite-Lived Intangible Assets: Goodwill is recognized as the excess cost of an acquired entity over the net amount assigned to assets acquired and liabilities assumed. The Company does not amortize goodwill or indefinite-lived intangible assets, but reviews them for impairment annually in the fourth quarter or whenever events or changes in circumstances indicate that an evaluation should be completed.

Goodwill is analyzed on a reporting unit basis. The reporting units are the same as the operating and reportable segments: Energy & Chemicals ("E&C"), Distribution & Storage ("D&S") and BioMedical. The Company first evaluates qualitative factors, such as macroeconomic conditions and the Company's overall financial performance to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount, including goodwill. The Company then evaluates how significant each of the identified factors could be to the fair value or carrying amount of a reporting unit and weigh these factors in totality in forming a conclusion of whether or not it is more likely than not that the fair value of a reporting unit is less than its carrying amount (the "Step 0 Test"). If the Company determines that it is not more likely than not that the fair value of a reporting unit is less than its carrying amount, the first and second steps of the goodwill impairment test are not necessary. Otherwise, the Company would perform the first step of the two-step goodwill impairment test.

Alternatively, the Company may also bypass the Step 0 Test and proceed directly to the two-step goodwill impairment test. Under the first step ("Step 1"), the Company estimates the fair value of the reporting units by considering income and market approaches to develop fair value estimates, which are weighted to arrive at a fair value estimate for each reporting unit. With respect to the income approach, a model has been developed to estimate the fair value of each reporting unit. This fair value model incorporates estimates of future cash flows, estimates of allocations of certain assets and cash flows among reporting units, estimates of future growth rates and management's judgment regarding the applicable discount rates to use to discount such estimates of cash flows. With respect to the market approach, a guideline company method is employed whereby pricing multiples are derived from companies with similar assets or businesses to estimate fair value of each reporting unit. If the fair value of the reporting unit exceeds the carrying amount of the net assets assigned to that reporting unit, then goodwill is not impaired and no further testing is required. However, if the fair value of the reporting unit is less than its carrying amount, the Company performs the second step ("Step 2") of the goodwill impairment test to measure the amount of impairment loss, if any, to recognize. In Step 2, the implied fair value of the reporting unit's goodwill is determined by allocating the reporting unit's fair value to the assets and liabilities, other than goodwill, in a hypothetical purchase price allocation. The resulting implied fair value is then compared to the carrying amount of the goodwill and if the carrying amount exceeds the implied fair value, an impairment charge is recorded for the difference.

In order to assess the reasonableness of the calculated fair values of the reporting units, the Company also compares the sum of the reporting units' fair values to the market capitalization and calculates an implied control premium (the excess of the sum of the reporting units' fair values over the market capitalization). The Company evaluates the control premium by comparing it to control premiums of recent comparable transactions. If the implied control premium is not reasonable in light of this assessment, the Company reevaluates the fair value estimates of the reporting units by adjusting the discount rates and other assumptions as necessary.

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CHART INDUSTRIES, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

Changes to the assumptions and estimates used throughout the steps described above may result in a significantly different estimate of the fair value of the reporting units, which could result in a different assessment of the recoverability of goodwill and result in future impairment charges.

With respect to indefinite-lived intangible assets, the Company first evaluates relevant events and circumstances to determine whether it is more likely than not that the fair value of an indefinite-lived intangible asset is less than its carrying amount. If, in weighing all relevant events and circumstances in totality, the Company determines that it is more likely than not that an indefinite-lived intangible asset is not impaired, no further action is necessary. Otherwise, the Company would determine the fair value of indefinite-lived intangible assets and perform a quantitative impairment assessment by comparing the indefinite-lived intangible asset's fair value to its carrying amount. The Company may bypass such a qualitative assessment and proceed directly to the quantitative assessment. The Company estimates the fair value of the indefinite-lived assets using the income approach. This may include the relief from royalty method or use of a model similar to the one described above related to goodwill which estimates the future cash flows attributed to the indefinite-lived intangible asset and then discounting these cash flows back to a present value. Under the relief from royalty method, fair value is estimated by discounting the royalty savings, as well as any tax benefits related to ownership to a present value. The fair value from either approach is compared to the carrying value and an impairment is recorded if the fair value is determined to be less than the carrying value. See Note 3, Asset Impairments, and Note 6, Goodwill and Intangible Assets, for more information relating to goodwill and indefinite-lived intangible assets and the asset impairment charges recorded during 2016 and 2015.

Convertible Debt: The Company determined that the embedded conversion feature within the Company's 2.0% Convertible Senior Subordinated Notes due August 2018 (the "Convertible Notes") was clearly and closely related to the Company's common stock and therefore exempt from separate accounting treatment. Convertible Notes exempt from derivative accounting are recognized by bifurcating the principal balance into a liability component and an equity component where the fair value of the liability component is estimated by calculating the present value of its cash flows discounted at an interest rate that the Company would have received for similar debt instruments that have no conversion rights (the "straight-debt rate") and the equity component is the residual amount, net of tax, which creates a discount on the Convertible Notes. The Company recognizes non-cash interest accretion expense related to the carrying amount of the Convertible Notes which is accreted back to its principal amount over the expected life of the debt, which is also the stated life of the debt.

Financial Instruments: The fair values of cash equivalents, accounts receivable, accounts payable and short-term bank debt approximate their carrying amount because of the short maturity of these instruments.

To minimize credit risk from trade receivables, the Company reviews the financial condition of potential customers in relation to established credit requirements before sales credit is extended and monitors the financial condition and payment history of customers to help ensure timely collections and to minimize losses. Additionally, for certain domestic and foreign customers, particularly in the E&C segment, the Company requires advance payments, letters of credit, bankers' acceptances, and other such guarantees of payment. Certain customers also require the Company to issue letters of credit or performance bonds, particularly in instances where advance payments are involved, as a condition of placing the order.

Derivative Financial Instruments: The Company utilizes certain derivative financial instruments to enhance its ability to manage foreign currency risk that exists as part of ongoing business operations. Derivative instruments are entered into for periods consistent with related underlying exposures and do not constitute positions independent of those exposures. The Company does not enter into contracts for speculative purposes nor is it a party to any leveraged derivative instrument. The Company is exposed to foreign currency exchange risk as a result of transactions in currencies other than the functional currency of certain subsidiaries. The Company utilizes foreign currency forward purchase and sale contracts to manage the volatility associated with foreign currency purchases and certain intercompany transactions in the normal course of business. Contracts typically have maturities of less than one year. Principal currencies include the U.S. dollar, the euro, the Chinese yuan, the Czech koruna, the Australian dollar, the

British pound, the Canadian dollar, and the Japanese yen. The Company's foreign currency forward contracts do not qualify as hedges as defined by accounting guidance. Foreign currency forward contracts are measured at fair value and recorded on the consolidated balance sheets as other current liabilities or assets. Changes in their fair value are recorded in the consolidated statements of operations as foreign currency gains or losses. The Company's foreign currency forward contracts are not exchange traded instruments and, accordingly, the valuation is performed using Level 2 inputs as defined in Note 11. Gains or losses on settled or expired contracts are recorded in the consolidated statements of operations as foreign currency gains or losses.

Product Warranties: The Company provides product warranties with varying terms and durations for the majority of its products. The Company estimates product warranty costs and accrues for these costs as products are sold with a charge to cost

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of sales. Factors considered in estimating warranty costs include historical and projected warranty claims, historical and projected cost-per-claim, and knowledge of specific product issues that are outside of typical experience. Warranty accruals are evaluated and adjusted as necessary based on actual claims experience and changes in future claim and cost estimates.

Revenue Recognition: For the majority of the Company's products, revenue is recognized when products are shipped, title has transferred, and collection is reasonably assured. For these products, there is also persuasive evidence of an arrangement and the selling price to the buyer is fixed or determinable. For brazed aluminum heat exchangers, cold boxes, liquefied natural gas fueling stations, engineered tanks, and commercial oxygen generation systems, the Company primarily uses the percentage of completion method of accounting. Earned revenue is based on the percentage of incurred costs to date compared to total estimated costs at completion after giving effect to the most current estimates. Timing of amounts billed on contracts varies from contract to contract and could cause significant variation in working capital needs. The cumulative impact of revisions in total cost estimates during the progress of work is reflected in the period in which these changes become known. Earned revenue reflects the original contract price adjusted for agreed upon claims and change orders, if any. Losses expected to be incurred on contracts in process, after consideration of estimated minimum recoveries from claims and change orders, are charged to operations as soon as such losses are known. Pre-contract costs relate primarily to salaries and benefits incurred to support the selling effort and are expensed as incurred. Change orders resulting in additional revenue and profit are recognized upon approval by the customer based on the percentage of incurred costs to date compared to total estimated costs at completion. Certain contracts include incentive-fee arrangements. The incentive fees in such contracts can be based on a variety of factors, but the most common are the achievement of target completion dates, target costs, and/or other performance criteria. Incentive-fee revenue is not recognized until it is earned.

The Company reports sales net of tax assessed by governmental authorities.

Cost of Sales: Manufacturing expenses associated with sales are included in cost of sales. Cost of sales includes all materials, direct and indirect labor, inbound freight, purchasing and receiving, inspection, internal transfers, and distribution and warehousing of inventory. In addition, shop supplies, facility maintenance costs, manufacturing engineering, project management, and depreciation expense for assets used in the manufacturing process are included in cost of sales on the consolidated statements of operations.

Selling, General and Administrative Expenses ("SG&A"): SG&A expenses include selling, marketing, customer service, product management, design engineering, and other administrative expenses not directly supporting the manufacturing process, as well as depreciation and amortization expense associated with non-manufacturing assets. In addition, SG&A expenses include corporate operating expenses for executive management, accounting, tax, treasury, corporate development, human resources, information technology, investor relations, legal, internal audit and risk management.

Shipping and Handling Costs: Amounts billed to customers for shipping are classified as sales, and the related costs are classified as cost of sales on the consolidated statements of operations. Shipping revenue of \$8,683, \$11,592, and \$8,855 for the years ended December 31, 2016, 2015, and 2014, respectively, are included in sales. Shipping costs of \$12,233, \$15,245, and \$15,913 for the years ended December 31, 2016, 2015, and 2014, respectively, are included in cost of sales.

Advertising Costs: The Company incurred advertising costs of \$4,702, \$5,074, and \$3,914 for the years ended December 31, 2016, 2015, and 2014, respectively. Such costs are expensed as incurred and included in SG&A expenses on the consolidated statements of operations.

Research and Development Costs: The Company incurred research and development costs of \$18,097, \$15,842, and \$15,588 for the years ended December 31, 2016, 2015, and 2014, respectively. Such costs are expensed as incurred and included in SG&A expenses on the consolidated statements of operations.

Foreign Currency Translation: The functional currency for the majority of the Company's foreign operations is the applicable local currency. The translation from the applicable foreign currencies to U.S. dollars is performed for asset

and liability accounts using exchange rates in effect at the balance sheet date and for revenue and expense accounts using the average exchange rate during the period. The resulting translation adjustments are recorded as a component of other comprehensive income (loss) in the consolidated statements of comprehensive income (loss). Remeasurement from local to functional currencies is included in cost of goods sold or foreign currency loss (gain) on the consolidated statements of operations. Gains or losses resulting from foreign currency transactions are charged to operations as incurred.

Income Taxes: The Company and its U.S. subsidiaries file a consolidated federal income tax return. Deferred income taxes are provided for temporary differences between financial reporting and the consolidated tax return in accordance with the liability

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method. A valuation allowance is provided against net deferred tax assets when conditions indicate that it is more likely than not that the benefit related to such assets will not be realized. In assessing the need for a valuation allowance against deferred tax assets, the Company considers all available evidence, including past operating results, estimates of future taxable income, and the feasibility of tax planning strategies. In the event that the Company changes its determination as to the amount of deferred tax assets that can be realized, the valuation allowance will be adjusted with a corresponding impact to the provision for income taxes in the period in which such determination is made.

The Company utilizes a two-step approach for the recognition and measurement of uncertain tax positions. The first step is to evaluate the tax position and determine whether it is more likely than not that the position will be sustained upon examination by tax authorities. The second step is to measure the tax benefit as the largest amount that is more likely than not of being realized upon settlement.

Interest and penalties related to income taxes are accounted for as income tax expense on the consolidated statements of income.

Share-based Compensation: The Company measures share-based compensation expense for share-based payments to employees and directors, including grants of employee stock options, restricted stock, restricted stock units, performance units, and leveraged restricted share units based on the grant-date fair value. The fair value of stock options is calculated using the Black-Scholes pricing model and is recognized on an accelerated basis over the vesting period. The grant-date fair value calculation under the Black-Scholes pricing model requires the use of variables such as exercise term of the option, future volatility, dividend yield, and risk-free interest rate. The fair value of restricted stock and restricted stock units is based on the Company's market price on the date of grant and is generally recognized on an accelerated basis over the vesting period. The fair value of performance units is based on the Company's market price on the date of grant and pre-determined performance conditions as determined by the Compensation Committee of the Board of Directors and is recognized on straight-line basis over the performance measurement period based on the probability that the performance conditions will be achieved. The Company reassesses the vesting probability of performance units each reporting period and adjusts share-based compensation expense based on the Company's probability assessment. The fair value of leveraged restricted share units is based on market conditions, calculated using a Monte Carlo simulation model, and is recognized on a straight-line basis over the vesting period. Share-based compensation expense for all awards considers estimated forfeitures.

During the year, the Company may repurchase shares of common stock from equity plan participants to satisfy tax withholding obligations relating to the vesting or payment of equity awards. All such repurchased shares are retired in the period in which the repurchases occur.

Beginning in 2016, the Company allocates share-based compensation expense to each operating segment and maintains share-based compensation expense related to Corporate employees at Corporate. Prior to 2016, all share-based compensation expense was recorded at Corporate. Reclassifications from Corporate to the operating segments have been made to the 2015 and 2014 SG&A expenses to conform to the 2016 presentation.

Defined Benefit Pension Plan: The Company sponsors a defined benefit plan which is frozen, which covers certain U.S. employees. The funded status is measured as the difference between the fair value of the plan assets and the projected benefit obligation. The change in the funded status of the plan is recognized in the year in which the change occurs through accumulated other comprehensive loss. The Company's funding policy is to contribute at least the minimum funding amounts required by law. Management has chosen policies according to accounting guidance that allow the use of a calculated value of plan assets, which generally reduces the volatility of expense (income) from changes in pension liability discount rates and the performance of the pension plan's assets.

Recently Issued Accounting Standards: In January 2017, the Financial Accounting Standards Board ("FASB") issued ASU 2017-04, "Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment." The new guidance eliminates the requirement to calculate implied fair value of goodwill (Step 2 of the current guidance's goodwill impairment test) to measure a goodwill impairment charge. Instead, entities will record an impairment

charge based on the excess of a reporting unit's carrying amount over its fair value (i.e. measure the charge based on current guidance's Step 1). The guidance will be applied prospectively for annual and interim impairment tests beginning after December 15, 2019. Early adoption is permitted for annual and interim goodwill impairment testing dates after January 1, 2017. The adoption of the provisions of this ASU would not materially impact the Company's consolidated financial statements unless Step 1 of the annual goodwill impairment test fails.

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In August 2016, the FASB issued ASU 2016-15, “Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments.” The FASB issued the update to clarify how entities should classify certain cash receipts and cash payments on the statement of cash flows. The new guidance also clarifies how the predominance principle should be applied when cash receipts and cash payments have aspects of more than one class of cash flows. The standard will be effective for fiscal years beginning after December 15, 2017 and interim periods within those years and the guidance will generally be applied retroactively. Early adoption is permitted with all of the amendments adopted in the same period. If an entity early adopts the guidance in an interim period, any adjustments must be reflected as of the beginning of the fiscal year that includes that interim period. The Company is currently assessing the effect that the ASU will have on the Company’s cash flows.

In March 2016, the FASB issued ASU 2016-09, “Compensation – Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting.” The FASB issued the update to change certain aspects of accounting for share-based payments to employees. The update eliminates additional paid-in-capital pools and requires all income tax effects of awards to be recognized in the statements of operations when the awards vest or settle. ASU 2016-09 allows companies to make an accounting policy election to estimate forfeitures, as required today, or record them when they occur and allows companies to withhold an amount up to the maximum statutory tax rate without causing the award to be classified as a liability. Within the statement of cash flows, ASU 2016-09 requires excess tax benefits to be classified as an operating activity and cash payments to tax authorities in connection with shares withheld to be classified as a financing activity. The standard will be effective for fiscal years beginning after December 15, 2016, including interim periods within such fiscal years. The Company adopted this guidance for the fiscal year beginning January 1, 2017. The Company has elected to continue to estimate the number of share-based awards expected to vest, as permitted by ASU 2016-09, rather than electing to account for forfeitures as they occur. The impact of ASU 2016-09 will generally be dependent on the amount of employee exercises of share-based awards and the value of share-based awards at vesting, which will result in increased volatility in income tax expense on a prospective basis.

In February 2016, the FASB issued ASU 2016-02, “Leases (Topic 842).” The FASB issued the update to require the recognition of lease assets and lease liabilities on the balance sheet of lessees. The standard will be effective for fiscal years beginning after December 15, 2018, including interim periods within such fiscal years. The ASU requires a modified retrospective transition method with the option to elect a package of practical expedients. Early adoption is permitted. The Company is currently assessing the effect that the ASU will have on the Company’s financial position, results of operations, cash flows and disclosures.

In July 2015, the FASB issued ASU 2015-11, “Simplifying the Measurement of Inventory.” The amendments require an entity to measure inventory at the lower of cost and net realizable value. Net realizable value is the estimated selling prices in the ordinary course of business, less reasonably predictable costs of completion, disposal and transportation. The amendments do not apply to inventory that is measured using the last-in, first-out cost method. The amendments apply to all other inventory, which includes inventory that is measured using first-in, first-out or average cost. This ASU is effective for fiscal years beginning after December 15, 2016. The Company adopted this guidance prospectively for the fiscal year beginning January 1, 2017. The adoption of the guidance will not have a material impact on the Company’s consolidated financial statements.

In May 2014, the FASB issued ASU 2014-09, “Revenue from Contracts with Customers.” The amendments require entities to recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. In August 2015, the FASB issued ASU 2015-14, which deferred the effective date of the new standard by one year. As a result, the standard will be effective for fiscal years beginning after December 15, 2017, including interim periods within such fiscal years. In March 2016, the FASB issued ASU 2016-08, which amended the principal versus agent guidance in the new revenue standard. This amended guidance is intended to result in more consistent application and reduce the cost and complexity of applying the new standard. In April 2016, the FASB issued ASU 2016-10, which amended the guidance to clarify accounting for licenses of intellectual property and to clarify the guidance on performance

obligations. In May 2016, the FASB issued ASU 2016-12, which provided narrow-scope amendments and practical expedients for the new revenue standard and is intended to reduce the cost and complexity of applying the new standard. In December 2016, the FASB issued ASU 2016-20, which is intended to clarify or correct narrow aspects of the guidance issued in ASU 2014-09. The new revenue recognition ASU allows full retrospective or modified retrospective adoption. Early adoption is permitted as of fiscal years beginning after December 15, 2016; the Company has not elected to early adopt this standard. The Company has developed an implementation plan to adopt this new guidance. As part of this plan, the Company has identified its revenue streams and is in the process of performing contract reviews to assess the impact of the new guidance on its results of operations. The Company intends to adopt this ASU on January 1, 2018. The Company has not yet selected a transition method, but expects to do so in 2017 upon completion of further analysis.

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CHART INDUSTRIES, INC. AND SUBSIDIARIES
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(Dollars and shares in thousands, except per share amounts)

NOTE 3 — Asset Impairments

The following tables summarize information about the impairment charges recorded in 2016 and 2015. These charges relate to non-financial assets that were measured at fair value on a non-recurring basis using Level 3 inputs according to the fair value hierarchy as described further in Note 11, Fair Value Measurements.

	Year ended December 31, 2016			
	Goodwill	Finite-lived Property, Indefinite-lived Intangible Assets	Plant & Equipment	Total
Distribution & Storage	\$ 542	\$ 675		\$ 1,217
Consolidated	\$ 542	\$ 675		\$ 1,217
	Year Ended December 31, 2015			
	Goodwill	Finite-lived Property, Indefinite-lived Intangible Assets	Plant & Equipment	Total
Energy & Chemicals	\$65,023	\$ —	\$ 3,773	\$68,796
Distribution & Storage ⁽¹⁾	316	—	1,704	2,020
BioMedical	142,333	38,083	3,884	184,300
Consolidated	\$207,672	\$ 38,083	\$ 9,361	\$255,116

⁽¹⁾ Asset impairments of \$1,556 were included in cost of sales on the consolidated statement of operations for the year ended December 31, 2015.

Goodwill and Indefinite-lived Intangible Assets

The Company recorded goodwill and indefinite-lived asset impairment charges in the fourth quarter of 2015 as management concluded that the goodwill and certain indefinite-lived intangible assets within certain reporting units were impaired. The total goodwill and indefinite-lived intangible asset impairment charges were \$207,672.

Management prepares its annual forecast mid-November through December each year. As the 2016 forecast was developed, management considered several factors when assessing the outlook for 2016 and beyond. Because of those factors, management revised its forecasts down significantly which led to the impairment charges described below. In addition to the items considered for each reporting unit below, management also considered the sustained decline in the Company's market capitalization. The Company's stock price was \$95.64 on December 31, 2013, \$34.20 on December 31, 2014 and \$17.96 on December 31, 2015.

Goodwill and indefinite-lived intangible assets within the E&C reporting unit were impaired \$65,023 as a result of revised estimates developed during the Company's annual forecasting process. The revised estimates were the result of the following: 1) continued significant decline in energy prices during the fourth quarter which led to a significant reduction in expected order levels as Liquefied Natural Gas ("LNG") projects were cancelled or deferred, which impacts our longer-term forecasts; 2) in late 2015, the Company received notification of delays in major projects from several large customers; and 3) concerns with global growth, recent negative macroeconomic developments and highly competitive market conditions.

Indefinite-lived intangible assets within the D&S reporting unit were impaired \$316 as a result of revised estimates developed during our annual forecasting process.

Goodwill and indefinite-lived intangible assets within the BioMedical reporting unit were impaired \$142,333 as a result of revised estimates developed during our annual forecasting process. The revised estimates were the result of the following: 1) realization that the effects of Medicare competitive bidding, including the reduction of

reimbursement rates and the subsequent consolidation of our customers, can no longer be considered temporary and will have lasting negative impacts on the growth of the homecare industry and their suppliers; 2) increased rivalry with competitive technology; and 3) concerns with global growth and recent negative macroeconomic developments. There were no goodwill and indefinite-lived asset impairment charges for the year ended December 31, 2016.

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Long-lived Asset Impairments

2016 Long-lived Asset Impairments: During the third quarter of 2016, the Company identified impairment indicators that suggest the carrying value of a certain asset group in China within the D&S segment may not be recoverable. The primary impairment indicators included recently completed projections of future cash flows and the associated impact on the long-range strategic plan forecasts, lower than expected cash flows attributed to this asset group, and poor market conditions. An undiscounted cash flow test performed for this asset group indicated it was not recoverable. The fair value of the asset group was established using a discounted cash flow model which utilized Level 3 inputs in the fair value hierarchy. As a result of the long-lived asset impairment assessment performed, the Company recorded long-lived asset impairment charges on its D&S reporting unit as described further below. There were no remaining long-lived assets recorded on the consolidated balance sheet for this asset group as of December 31, 2016.

Additionally, during the third quarter of 2016, events and circumstances indicated that other tangible property, plant and equipment in China within the D&S segment might be impaired. However, the Company's estimate of undiscounted cash flows indicated that such carrying values were expected to be recovered. Nonetheless, it is reasonably possible that the estimate of undiscounted cash flows may negatively change in the near term, which may result in the need to write down these assets to fair value. The Company's estimate of cash flows may change in the future due to poor market conditions and excess capacity in the industry.

2015 Long-lived Asset Impairments: During the fourth quarter of 2015, the Company identified impairment indicators described above in the Goodwill and Indefinite-Lived Intangible Assets section that suggested the carrying values of certain asset groups within each reporting unit may not be recoverable. The primary indicators included projections of future cash flows and the associated impact on the long-range strategic plan forecasts, lower than expected cash flows attributed to certain asset groups, increased competition, the continued decline in energy prices, and the Company's lower market capitalization. As a result of the long-lived asset impairment assessments performed, the Company recorded long-lived asset impairments described further below.

The BioMedical long-lived asset impairment charges were due to declines in estimated fair value resulting from reductions in expected future cash flows associated with the respiratory product lines. The E&C long-lived asset impairment charges were due to reductions in expected future cash flows associated with certain assets in China.

Finite-lived Intangible Assets: For the year ended December 31, 2016, the Company recorded impairment charges of \$542 related to finite-lived intangible assets in its D&S reporting unit, attributed to customer relationships, trademarks, technology and patents. For the year ended December 31, 2015, the Company recorded impairment charges of \$38,083 related to finite-lived intangible assets in its BioMedical reporting unit, attributed to customer relationships – \$15,667 and unpatented technology – \$22,417.

Property, Plant & Equipment: As a result of long-lived asset impairment assessments performed in the third quarter of 2016, the Company recorded long-lived asset impairment charges for certain tangible property, plant and equipment of \$675 attributed to D&S. As a result of long-lived asset impairment assessments performed in the fourth quarter of 2015, the Company recorded long-lived asset impairment charges for certain tangible property, plant and equipment of \$7,657; \$3,773 attributed to E&C and \$3,884 attributed to BioMedical. Additionally, as a result of restructuring activities in 2015 within the D&S segment, the Company recorded \$1,704 of asset impairment charges to record certain property, plant and equipment at fair value.

NOTE 4 — Inventories

The following table summarizes the components of inventory:

	December 31,	
	2016	2015
Raw materials and supplies	\$65,719	\$76,680
Work in process	31,576	33,721
Finished goods	72,388	88,901
Total inventories, net	\$169,683	\$199,302

The allowance for excess and obsolete inventory balance at December 31, 2016 and 2015 was \$10,069 and \$11,269, respectively.

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NOTE 5 — Property, Plant and Equipment

The following table summarizes the components of property, plant and equipment:

Classification	Estimated Useful Life	December 31,	
		2016	2015
Land and buildings	20-35 years	\$ 162,999	\$ 164,181
Machinery and equipment	3-12 years	169,408	163,200
Computer equipment, furniture and fixtures	3-7 years	35,398	33,993
Construction in process		50,855	52,815
Total property, plant and equipment, gross		418,660	414,189
Less: accumulated depreciation		(167,611)	(147,912)
Total property, plant and equipment, net		\$ 251,049	\$ 266,277

Depreciation expense was \$25,636, \$28,115 and \$25,231 for the years ended December 31, 2016, 2015, and 2014, respectively. Included in construction in progress at December 31, 2016 and 2015 was approximately \$46,000 in each period, related to the plant expansion in Changzhou, China.

Included in property, plant & equipment and accounts payable in the consolidated balance sheet at December 31, 2015 is \$6,791 related to property purchases which were unpaid at December 31, 2015. These amounts were paid in 2016. See Note 3, Asset Impairments, for information regarding property, plant and equipment impaired in 2016 and 2015.

NOTE 6 — Goodwill and Intangible Assets

During the 2015 annual assessment of goodwill, management determined that it was more likely than not that the fair value was less than the carrying amount of certain reporting units and, therefore, the two-step goodwill impairment test was necessary. Additionally, management quantitatively evaluated indefinite-lived intangible assets as part of the impairment testing. Furthermore, management identified indicators of impairment on certain finite-lived intangible assets which were evaluated for impairment. As a result of these evaluations, the Company recorded goodwill, intangible asset and long-lived asset impairment charges in the fourth quarter of 2015 as management concluded that certain assets within each reporting unit were impaired.

During the third quarter of 2016, as a result of the long-lived asset impairment assessment, the Company recorded long-lived asset impairment charges on its D&S reporting unit related to finite-lived intangible assets and tangible property, plant and equipment.

See Note 3, Asset Impairments, for further information related to the impairment charges recorded in 2016 and 2015.

Goodwill

The following table presents the changes in goodwill:

	December 31,	
	2016	2015
Beginning balance	\$ 218,390	\$ 405,522
Foreign currency translation adjustments and other	(420)	(1,887)
Goodwill acquired during the year	—	10,601
Impairment loss	—	(195,846)
Ending balance	\$ 217,970	\$ 218,390
Accumulated goodwill impairment loss	\$ 195,846	\$ 195,846

CHART INDUSTRIES, INC. AND SUBSIDIARIES
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Intangible Assets

The following table displays the gross carrying amount and accumulated amortization for finite-lived intangible assets and indefinite-lived intangible assets (exclusive of goodwill)⁽¹⁾:

	December 31, 2016		December 31, 2015	
	Gross Carrying Amount	Accumulated Amortization	Gross Carrying Amount	Accumulated Amortization
Finite-lived intangible assets:				
Unpatented technology	\$8,186	\$ (3,132)	\$8,530	\$ (2,660)
Patents	1,235	(695)	7,770	(6,753)
Trademarks and trade names	4,918	(2,198)	10,052	(6,886)
Customer relationships	119,320	(81,614)	138,223	(90,180)
Land use rights	12,650	(860)	13,484	(567)
Total finite-lived intangible assets	\$146,309	\$ (88,499)	\$178,059	\$ (107,046)
Indefinite-lived intangible assets:				
Trademarks and trade names	\$35,633		\$35,701	

⁽¹⁾ Amounts include the impact of foreign currency translation. Fully amortized or impaired amounts are written off. Amortization expense for intangible assets subject to amortization was \$11,873, \$17,333 and \$17,945 for the years ended December 31, 2016, 2015, and 2014, respectively. The Company estimates amortization expense to be recognized during the next five years as follows:

For the Year Ending December 31,

2017	\$10,400
2018	9,800
2019	9,800
2020	8,200
2021	2,100

Government Grants

The Company received \$1,055 and \$8,650 in government grants during 2016 and 2015, respectively, related to property, plant and equipment and land use rights related to the expansion in China. The grants are recorded in other current liabilities and other long-term liabilities in the consolidated balance sheets and recognized into income over the useful life of the associated assets (10 to 50 years). At December 31, 2016, \$446 and \$8,153 was recorded in other current liabilities and other long-term liabilities, respectively, related to the government grants. At December 31, 2015, \$368 and \$8,133 was recorded in other current liabilities and other long-term liabilities, respectively, related to the government grants.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
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NOTE 7 — Debt and Credit Arrangements

Summary of Outstanding Borrowings

The following table represents the components of the Company's borrowings:

	December 31,	
	2016	2015
Convertible notes, due August 2018, effective interest rate of 7.9%	\$228,115	\$215,634
Foreign facilities	13,208	6,160
Total debt	241,323	221,794
Unamortized debt issuance costs	(1,125)	(1,836)
Total debt, net of unamortized debt issuance costs	240,198	219,958
Less: current maturities	(6,487)	(6,160)
Long-term debt	\$233,711	\$213,798

 Convertible Notes

The outstanding aggregate principal amount of the Company's Convertible Notes is \$250,000. The Convertible Notes bear interest at a fixed rate of 2.0% per year, payable semiannually in arrears on February 1 and August 1 of each year, and will mature on August 1, 2018. The effective interest rate at issuance was 7.9%.

The Convertible Notes are senior subordinated unsecured obligations of the Company and are not guaranteed by any of the Company's subsidiaries. The Convertible Notes are senior in right of payment to the Company's future subordinated debt, equal in right of payment with the Company's future senior subordinated debt and are subordinated in right of payment to the Company's existing and future senior indebtedness, including indebtedness under the Company's existing credit agreement.

In connection with the issuance of the Convertible Notes, the Company entered into privately-negotiated convertible note hedge and capped call transactions with affiliates of certain of the underwriters (the "Option Counterparties"). The convertible note hedge and capped call transactions relate to, collectively, 3,622 shares, which represents the number of shares of the Company's common stock underlying the Convertible Notes, subject to anti-dilution adjustments substantially similar to those applicable to the Convertible Notes. These convertible note hedge and capped call transactions are expected to reduce the potential dilution with respect to the Company's common stock upon conversion of the Convertible Notes and/or reduce the Company's exposure to potential cash or stock payments that may be required upon conversion of the Convertible Notes, except, in the case of the capped call transactions, to the extent that the market price per share of the Company's common stock exceeds the cap price of the capped call transactions. The Company also entered into separate warrant transactions with the Option Counterparties initially relating to the number of shares of the Company's common stock underlying the convertible note hedge transactions, subject to customary anti-dilution adjustments. The warrant transactions will have a dilutive effect with respect to the Company's common stock to the extent that the price per share of the Company common stock exceeds the strike price of the warrants unless the Company elects, subject to certain conditions, to settle the warrants in cash. These warrants were exercisable as of the issuance date of the Convertible Notes. The cap price of the capped call transactions and the strike price of the warrant transactions was initially \$84.96 per share. Proceeds received from the issuance of the warrants totaled approximately \$48,848 and were recorded as an addition to additional paid-in-capital. The net cost of the convertible note hedge and capped call transactions, taking into account the proceeds from the issuance of the warrants, was approximately \$17,638.

In accordance with ASC 815, contracts are initially classified as equity if (1) the contract requires physical settlement or net-share settlement, or (2) the contract gives the entity a choice of net-cash settlement in its own shares (physical settlement or net-share settlement). The Company concluded that the settlement terms of the convertible note hedge, capped call and warrant transactions permit net-share settlement. As such, the convertible note hedge, capped call and

warrant transactions were recorded in equity.

Upon issuance of the Convertible Notes, the Company bifurcated the \$250,000 principal balance of the Convertible Notes into a liability component of \$170,885, which was recorded as long-term debt, and an equity component of \$79,115, which was initially recorded as additional paid-in-capital. The liability component was recognized at the present value of its associated cash

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CHART INDUSTRIES, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

flows using a 7.9% straight-debt rate which represented the Company's interest rate for similar debt instruments at that time without a conversion feature and is being accreted to interest expense over the term of the Convertible Notes. At December 31, 2016 and 2015, the carrying amount of the liability component was \$228,115 less debt issuance costs of \$1,125 and \$215,634 less debt issuance costs of \$1,836, respectively, and the unamortized debt discount of the Convertible Notes was \$21,885 and \$34,366, respectively.

For the years ended December 31, 2016, 2015, and 2014, interest expense for the Convertible Notes was \$17,481, \$16,535, and \$15,662, respectively, which included \$12,481, \$11,535, and \$10,662 of non-cash interest accretion expense related to the carrying amount of the Convertible Notes, respectively, and \$5,000 of 2.0% cash interest in each year. In accordance with ASC 470-20, which requires issuers to separately account for the liability and equity components of convertible debt instruments that may be settled in cash upon conversion, the Company allocated debt issuance costs to the liability and equity components in proportion to their allocated value. Debt issuance costs were \$7,277, with \$2,303 recorded as a reduction in additional paid-in-capital. The remaining \$4,974 is being amortized over the term of the Convertible Notes. Total expense associated with the amortization of these debt issuance costs was \$711 in each of the years ended December 31, 2016, 2015, and 2014.

Prior to May 1, 2018, the Convertible Notes will be convertible at the option of the holders thereof only under the following circumstances: (1) during any fiscal quarter commencing after September 30, 2011 (and only during such fiscal quarter), if the last reported sale price of the Company's common stock for at least 20 trading days (whether or not consecutive) during the period of 30 consecutive trading days ending on the last trading day of the immediately preceding fiscal quarter is greater than or equal to 130% of the applicable conversion price (currently \$69.03) for the Convertible Notes on each applicable trading day; (2) during the five business day period after any five consecutive trading day period (the "Measurement Period") in which, as determined following a request by a holder of Convertible Notes as provided in the bond indenture (the "Indenture"), the trading price per \$1,000 principal amount of Convertible Notes for each trading day of such Measurement Period was less than 97% of the product of the last reported sale price of the Company's common stock and the applicable conversion rate for the Convertible Notes on each such trading day; or (3) upon the occurrence of specified corporate events pursuant to the terms of the Indenture. On or after May 1, 2018, until the close of business on the second scheduled trading day immediately preceding the maturity date of the Convertible Notes, holders of the Convertible Notes may convert their Convertible Notes at any time, regardless of the foregoing circumstances. Upon conversion, the Company will pay cash up to the aggregate principal amount of the Convertible Notes to be converted and pay or deliver, as the case may be, cash, shares of the Company's common stock or a combination of cash and shares of the Company's common stock, at the Company's election, in respect of the remainder, if any, of the Company's conversion obligation in excess of the aggregate principal amount of the Convertible Notes being converted. It is the Company's intention to settle any excess conversion value in shares of the Company's common stock.

The conversion rate on the Convertible Notes will be subject to adjustment upon the occurrence of certain events, but will not be adjusted for any accrued and unpaid interest. In addition, following the occurrence of a make-whole fundamental change, the Company will, in certain circumstances, increase the conversion rate for a holder that converts its Convertible Notes in connection with such make-whole fundamental change. The Company may not redeem the Convertible Notes prior to maturity. If the Company undergoes a fundamental change, subject to certain conditions, holders may require the Company to purchase the Convertible Notes in whole or in part for cash at a fundamental change purchase price equal to 100% of the principal amount of the Convertible Notes to be purchased, plus accrued and unpaid interest, if any, to, but excluding, the fundamental change purchase date. For purposes of calculating earnings per share, if the average market price of the Company's common stock exceeds the applicable conversion price during the periods reported, shares contingently issuable under the Convertible Notes will have a dilutive effect with respect to the Company's common stock.

The Company reassesses the convertibility of the Convertible Notes and the related balance sheet classification on a quarterly basis. As of December 31, 2016 and December 31, 2015, events for early conversion were not met, and thus

the Convertible Notes were not convertible as of and for the fiscal quarter beginning January 1, 2017 or January 1, 2016, respectively. There have been no conversions as of the date of this filing.

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CHART INDUSTRIES, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(Dollars and shares in thousands, except per share amounts)

Senior Secured Revolving Credit Facility

The Company has a five-year \$450,000 senior secured revolving credit facility (the “SSRCF”) which matures on October 29, 2019. The SSRCF includes a \$25,000 sub-limit for the issuance of swingline loans and a \$100,000 sub-limit to be used for letters of credit. There is a foreign currency limit of \$100,000 under the SSRCF which can be used for foreign currency denominated letters of credit and borrowings in a foreign currency, in each case in currencies agreed upon with the lenders. In addition, the facility permits borrowings up to \$100,000 made by the Company’s wholly-owned subsidiaries, Chart Industries Luxembourg S.à r.l. (“Chart Luxembourg”) and Chart Asia Investment Company Limited (“Chart Asia”). The SSRCF also includes an expansion option permitting the Company to add up to an aggregate \$200,000 in term loans or revolving credit commitments from its lenders.

The Company recorded \$2,869 in deferred debt issuance costs associated with the SSRCF which are being amortized over the five-year term of the SSRCF. For the years ended December 31, 2016, 2015, and 2014, total expense associated with the amortization of these debt issuance costs was \$573, \$579, and \$586, respectively.

Revolving loans under the SSRCF bear interest, at the applicable Borrower’s election, at either LIBOR or the greatest of (a) the JPMorgan prime rate in effect on such day, (b) the Federal Funds Effective Rate in effect on such day plus 1/2 of 1% or (c) the Adjusted LIBOR Rate (as defined in the SSRCF) for the relative interest period on such day (or if such day is not a business day, the immediately preceding business day) plus 1% (the “Adjusted Base Rate”), plus a margin that varies with the Company’s leverage ratio. In addition, the Company is required to pay a commitment fee of between 0.25% and 0.40% of the unused revolver balance and a letter of credit participation fee equal to the daily aggregate letter of credit exposure at the rate per annum equal to the Applicable Margin for Eurocurrency Revolving Facility Borrowings (ranging from 1.5% to 2.75%, depending on the leverage ratio calculated at each fiscal quarter end). A fronting fee must be paid on each letter of credit that is issued equal to 0.125% per annum of the stated dollar amount of the letter of credit.

Significant financial covenants for the SSRCF include a minimum liquidity requirement equal to the principal amount of the Convertible Notes outstanding six months prior to the maturity date of the Convertible Notes and when holders of the Convertible Notes have the option to require the Company to repurchase the Convertible Notes, a maximum leverage ratio of 3.25 and a minimum interest coverage to EBITDA ratio of 3.0. The required leverage ratio can be relaxed on up to two occasions, upon notification to the lenders, to 3.75 for up to four consecutive fiscal quarters, for acquisitions and plant expansions of \$100,000 or greater. The SSRCF contains a number of other customary covenants including, but not limited to, restrictions on the Company’s ability to incur additional indebtedness, create liens or other encumbrances, sell assets, enter into sale and lease-back transactions, make certain payments, investments, loans, advances or guarantees, make acquisitions and engage in mergers or consolidations and pay dividends or distributions. At December 31, 2016, the Company was in compliance with all covenants.

At December 31, 2016, there were no borrowings outstanding under the SSRCF. The Company had \$37,196 in letters of credit issued and bank guarantees supported by the SSRCF, which had availability of \$412,804 at December 31, 2016. The obligations under the SSRCF are guaranteed by the Company and substantially all of its U.S. subsidiaries and secured by substantially all of the assets of the Company and its U.S. subsidiaries and 65% of the capital stock of the Company’s material non-U.S. subsidiaries (as defined by the SSRCF) that are owned by U.S. subsidiaries.

Foreign Facilities – China

Chart Cryogenic Engineering Systems (Changzhou) Company Limited (“CCESC”), Chart Energy & Chemicals Wuxi Co., Ltd. (“Wuxi”) and Chart Biomedical (Chengdu) Co. Ltd. (“Chengdu”), wholly-owned subsidiaries of the Company, and Chart Cryogenic Distribution Equipment (Changzhou) Company Limited (“CCDEC”), a joint venture of the Company, maintain joint banking facilities (the “China Facilities”) which include a revolving facility with 50.0 million Chinese yuan (equivalent to \$7,208) in borrowing capacity which can be utilized for either revolving loans, bonds/guarantees, or bank draft acceptances. Any borrowings made by CCESC, CCDEC, Chengdu or Wuxi under the China Facilities are guaranteed by the Company. At December 31, 2016, there were no borrowings outstanding under the revolving facility but, CCESC and CCDEC had 7.5 million Chinese yuan (equivalent to \$1,075) and 0.8 million

Chinese yuan (equivalent to \$115) in bank guarantees, respectively.

CCDEC maintains an unsecured credit facility whereby CCDEC may borrow up to 30.0 million Chinese yuan (equivalent to \$4,325) for working capital purposes. This credit facility is effective until May 25, 2017. At December 31, 2016, there was 25.0 million Chinese yuan (equivalent to \$3,604) outstanding under this facility, bearing interest at 4.35%.

CCESC entered into a term loan during the second quarter of 2016. The term loan is secured by certain CCESC land use rights and allows for up to 86.6 million Chinese yuan (equivalent to \$12,487) in borrowings. The loan has a term of eight years with semi-annual installment payments of at least 10.0 million Chinese yuan and a final maturity date of May 26, 2024. At December 31, 2016, there was 66.6 million Chinese yuan (equivalent to \$9,604) outstanding on this loan, bearing interest at 5.39%.

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CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
 (Dollars and shares in thousands, except per share amounts)

Foreign Facilities – Europe

Chart Ferox, a.s. (“Ferox”), a wholly-owned subsidiary of the Company, maintains a secured credit facility with capacity of up to 125.0 million Czech koruna (equivalent to \$4,876) and two secured credit facilities with capacity of up to 6.5 million euros (equivalent to \$6,851). All three facilities allow Ferox to request bank guarantees and letters of credit. None of these facilities allow revolving credit borrowings. Under two of the facilities, Ferox must pay letter of credit and guarantee fees equal to 0.70% per annum on the face amount of each guarantee or letter of credit and under one facility Ferox must pay the letter of credit and guarantee fees equal to 0.50%. Ferox’s land, buildings, and cash secure the credit facilities. As of December 31, 2016, there were bank guarantees of 155.4 million Czech koruna (equivalent to \$6,062) supported by the Ferox credit facilities.

Chart Luxembourg maintains an overdraft facility with \$5,000 in borrowing capacity. There were no borrowings under the Chart Luxembourg facility as of December 31, 2016.

Scheduled Annual Maturities

The scheduled annual maturities of debt at December 31, 2016, are as follows:

Year	Amount
2017	\$6,487
2018	255,766
2019	955
Total	\$263,208

Cash paid for interest during the years ended December 31, 2016, 2015, and 2014 was \$5,584, \$5,113, and \$6,838, respectively.

Fair Value Disclosures

The fair value of the Convertible Notes was approximately 96% of their par value as of December 31, 2016 and approximately 88% of their par value as of December 31, 2015. The Convertible Notes are actively quoted instruments and, accordingly, the fair value of the Convertible Notes was determined using Level 1 inputs as defined in Note 11.

NOTE 8 — Financial Instruments and Derivative Financial Instruments

Concentrations of Credit Risks: The Company sells its products to gas producers, distributors and end-users across the industrial gas, hydrocarbon, chemical processing, respiratory therapy, and life sciences industries in countries all over the world. Approximately 50%, 51%, and 53% of sales were to customers in foreign countries in 2016, 2015, and 2014, respectively. One customer exceeded ten percent of consolidated sales in 2016. Total sales revenue from this customer represents approximately \$98,919 of total consolidated sales revenue and is attributable to the E&C, D&S, and BioMedical segments. No single customer exceeded ten percent of consolidated sales in 2015 and 2014. Sales to the Company’s top ten customers accounted for 38%, 36% and 34% of consolidated sales in 2016, 2015, and 2014, respectively. The Company’s sales to particular customers fluctuate from period to period, but the large industrial gas producer and distributor customers of the Company tend to be a consistently large source of revenue for the Company. The Company is also subject to concentrations of credit risk with respect to its cash and cash equivalents and forward foreign currency exchange contracts. To minimize credit risk from these financial instruments, the Company enters into arrangements with major banks and other quality financial institutions and invests only in high-quality instruments. The Company does not expect any counterparties to fail to meet their obligations.

The changes in fair value with respect to the Company’s foreign currency forward contracts generated a net loss of \$765 for the year ended December 31, 2016 and net gains of \$2,673 and \$2,670 for the years ended December 31, 2015 and 2014, respectively.

CHART INDUSTRIES, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

NOTE 9 — Product Warranties

The Company provides product warranties with varying terms and durations for the majority of its products. The Company estimates its warranty reserve by considering historical and projected warranty claims, historical and projected cost-per-claim, and knowledge of specific product issues that are outside its typical experience. The Company records warranty expense in cost of sales in the consolidated statement of operations. Product warranty claims not expected to occur within one year are recorded in the long-term portion of the warranty reserve in the consolidated balance sheets.

The following table represents changes in the Company's consolidated warranty reserve:

	Year Ended December 31,		
	2016	2015	2014
Beginning balance	\$20,975	\$24,246	\$33,827
Warranty expense	9,962	16,705	14,463
Warranty usage	(12,666)	(19,976)	(24,044)
Ending balance	\$18,271	\$20,975	\$24,246

As a result of the BioMedical segment's acquisition of AirSep Corporation ("AirSep") in August 2012, the Company assumed exposure for warranty claims for AirSep's various product lines. One of these product lines in particular experienced high failure rates with respect to certain of its models as compared to AirSep's other products. The Company established a warranty reserve on AirSep's opening balance sheet to account for the cost of satisfying future warranty claims, including a separately calculated warranty reserve for those certain models in the product line that experienced greater warranty return rates (collectively, the "acquired warranty reserve"). The Company has experienced a significant number of warranty claims as AirSep products sold in prior periods run through their respective warranty periods. Usage of the acquired warranty reserve includes claims related to all of AirSep's product lines, including costs associated with the population of units for which a warranty reserve was separately calculated. Usage of the acquired warranty reserve has exceeded warranty expense since the acquisition. The Company has made various design improvements to this product line, revised the warranty claim process, and reduced the average cost to repair units since the 2012 acquisition, all in an effort to mitigate the costs associated with these warranty issues. The Company does not expect future warranty expense to be as significant as it has been since the acquisition. During the third quarter of 2016, the Company recovered for breaches of representations and warranties primarily related to warranty costs for certain product lines acquired from AirSep under the related representation and warranty insurance. For the year ended December 31, 2016, this reduced our BioMedical segment's cost of sales by \$15,145.

Warranty expense for 2016 does not include the impact of the \$15,145 the Company recovered during 2016 for breaches of representations and warranties primarily related to warranty costs for certain product lines acquired in the 2012 acquisition of AirSep under the related representation and warranty insurance. Warranty expense for 2014 does not include the impact of the Company's recovery of \$5,003 during 2014 from an escrow settlement relating to excess warranty costs for certain product lines acquired from AirSep in 2012.

NOTE 10 — Business Combinations

Thermax Acquisition

On July 1, 2015, the Company acquired 100% of the equity interests of Thermax, Inc. ("Thermax") for an estimated purchase price of \$29,687 after working capital adjustments, of which \$24,197 was paid at closing (net of \$2,307 in cash acquired). The purchase price was subject to post-closing adjustments. As a result of these post-closing adjustments, the final working capital adjustment of \$1,383 was paid during the second quarter of 2016. The remainder of the purchase price represents the estimated fair value of the contingent consideration to be paid over four years based on the achievement of certain earnings targets. The fair value of the net assets acquired and goodwill at the date of acquisition was \$19,332 and \$10,355, respectively. Net assets includes \$10,000 in intangible assets, which consists of customer relationships, unpatented technology and trademarks and trade names.

Thermax, headquartered in Dartmouth, Massachusetts, designs and sells cryogenic fluid vaporizers and other ambient and powered vaporizer products used in industrial gas, petrochemical, and liquefied natural gas applications. Thermax's results are included in the Company's D&S business segment from the date of acquisition.

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CHART INDUSTRIES, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

Contingent Consideration

The estimated fair value of contingent consideration relating to the Thermax acquisition was \$1,800 at the date of acquisition and was valued according to a discounted cash flow approach, which includes assumptions regarding the probability of achieving certain earnings targets and a discount rate applied to the potential payments. Potential payments may be paid between July 1, 2017 and July 1, 2019 based on the attainment of certain earnings targets. The potential payment related to Thermax contingent consideration is between \$0 and \$11,288.

The potential contingent consideration related to a prior BioMedical segment acquisition expired at the end of March 2016 with no additional payment.

Valuations are performed using Level 3 inputs as defined in Note 11 and are evaluated on a quarterly basis based on forecasted sales and earnings targets. Contingent consideration liabilities are classified as other current liabilities and other long-term liabilities in the consolidated balance sheets. Changes in fair value of contingent consideration, including accretion, are recorded as selling, general and administrative expenses in the consolidated statements of operations and comprehensive income (loss).

The following table represents the changes in contingent consideration liabilities by segment:

	Distribution & Storage	BioMedical	Total
Balance at January 1, 2014	\$ —	\$ 2,289	\$ 2,289
Decrease in fair value of contingent consideration liabilities	—	(474)	(474)
Payment of contingent consideration	—	(741)	(741)
Balance at December 31, 2014	—	1,074	1,074
Fair value of contingent consideration at inception	1,800	—	1,800
Decrease in fair value of contingent consideration liabilities	(39)	(463)	(502)
Payment of contingent consideration	—	(611)	(611)
Balance at December 31, 2015	1,761	—	1,761
Increase in fair value of contingent consideration liabilities	162	—	162
Balance at December 31, 2016	\$ 1,923	\$ —	\$ 1,923

NOTE 11 — Fair Value Measurements

The Company measures its financial assets and liabilities at fair value on a recurring basis using a three-tier fair value hierarchy, which prioritizes the inputs used in the valuation methodologies. The three levels of inputs used to measure fair value are as follows:

Level 1 — Valuations based on quoted prices for identical assets and liabilities in active markets.

Level 2 — Valuations based on observable inputs other than quoted prices included in Level 1, such as quoted prices for similar assets and liabilities in active markets, quoted prices for identical or similar assets and liabilities in markets that are not active, or other inputs that are observable or can be corroborated by observable market data.

Level 3 — Valuations based on unobservable inputs reflecting our own assumptions, consistent with reasonably available assumptions made by other market participants. These valuations require significant judgment.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

Recurring Fair Value Measurements

Financial assets and liabilities measured at fair value on a recurring basis and presented in the Company's consolidated balance sheets are as follows:

	December 31, 2016		
	Total	Level 2	Level 3
Foreign currency forward contracts	\$39	\$ 39	\$—
Total financial assets	\$39	\$ 39	\$—
Foreign currency forward contracts	\$92	\$ 92	\$—
Contingent consideration liabilities	1,923	—	1,923
Total financial liabilities	\$2,015	\$ 92	\$1,923
	December 31, 2015		
	Total	Level 2	Level 3
Foreign currency forward contracts	\$561	\$561	\$—
Total financial assets	\$561	\$561	\$—
Foreign currency forward contracts	\$470	\$470	\$—
Contingent consideration liabilities	1,761	—	1,761
Total financial liabilities	\$2,231	\$470	\$1,761

Refer to Note 8 for further information regarding foreign currency forward contracts and Note 10 for further information regarding contingent consideration liabilities.

Non-Recurring Fair Value Measurements

During 2016 and 2015, the Company recorded asset impairment charges of \$1,217 and \$255,116, respectively. Refer to Note 3, Asset Impairments, for further information regarding these charges and the associated significant unobservable inputs.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
 (Dollars and shares in thousands, except per share amounts)

NOTE 12 — Accumulated Other Comprehensive Loss

The components of accumulated other comprehensive loss are as follows:

	December 31, 2016		
	Foreign currency translation adjustments	Pension liability adjustments, net of taxes	Accumulated other comprehensive loss
Beginning Balance	\$(12,513)	\$ (12,391)	\$ (24,904)
Other comprehensive (loss) income before reclassifications, net of taxes of \$535	(12,188)	881	(11,307)
Amounts reclassified from accumulated other comprehensive loss, net of taxes of \$538 ⁽¹⁾	—	999	999
Net current-period other comprehensive (loss) income, net of taxes	(12,188)	1,880	(10,308)
Ending Balance	\$(24,701)	\$ (10,511)	\$ (35,212)
	December 31, 2015		
	Foreign currency translation adjustments	Pension liability adjustments, net of taxes	Accumulated other comprehensive loss
Beginning Balance	\$3,808	\$ (12,494)	\$ (8,686)
Other comprehensive loss before reclassifications, net of taxes of \$447	(16,321)	(825)	(17,146)
Amounts reclassified from accumulated other comprehensive loss, net of taxes of \$501 ⁽¹⁾	—	928	928
Net current-period other comprehensive (loss) income, net of taxes	(16,321)	103	(16,218)
Ending Balance	\$(12,513)	\$ (12,391)	\$ (24,904)

Amounts reclassified from accumulated other comprehensive loss were expensed and included in cost of sales ⁽¹⁾ (\$605 and \$562 for the years ended December 31, 2016 and 2015, respectively) and selling, general and administrative expenses (\$932 and \$867 for the years ended December 31, 2016 and 2015, respectively) in the consolidated statements of operations.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
 (Dollars and shares in thousands, except per share amounts)

NOTE 13 — Earnings (Loss) Per Share

The following table presents calculations of net income (loss) per share of common stock:

	Year Ended December 31,		
	2016	2015	2014
Net income (loss) attributable to Chart Industries, Inc.	\$28,237	\$(202,960)	\$81,864
Net income (loss) attributable to Chart Industries, Inc. per common share:			
Basic	\$0.92	\$(6.66)) \$2.69
Diluted	\$0.91	\$(6.66)) \$2.67
Weighted average number of common shares outstanding — basic	30,583	30,493	30,384
Incremental shares issuable upon assumed conversion and exercise of share-based awards	411	—	282
Weighted average number of common shares outstanding — diluted	30,994	30,493	30,666
Diluted earnings per share does not consider the following potential common shares as the effect would be anti-dilutive:			

	Year Ended December 31,		
	2016	2015	2014
Share-based awards	563	943	48
Warrants	3,368	3,368	3,368
Total anti-dilutive securities	3,931	4,311	3,416

NOTE 14 — Income Taxes

Income (Loss) Before Income Taxes

Income (loss) before income taxes consists of the following:

	For the Year Ended December 31,		
	2016	2015	2014
United States	\$40,471	\$(187,252)	\$87,505
Foreign	(2,072)	(14,580)) 31,659
Income (loss) before income taxes	\$38,399	\$(201,832)	\$119,164

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

Provision

Significant components of the provision for income taxes are as follows:

	Year Ended December 31,		
	2016	2015	2014
Current:			
Federal	\$9,977	\$22,846	\$22,608
State and local	1,009	1,138	1,406
Foreign	5,299	3,103	12,326
Total current	16,285	27,087	36,340
Deferred:			
Federal	(3,334)	(25,707)	3,135
State and local	(206)	(619)	180
Foreign	957	1,923	(3,563)
Total deferred	(2,583)	(24,403)	(248)
Total provision	\$13,702	\$2,684	\$36,092

Effective Tax Rate Reconciliation

The reconciliation of income taxes computed at the U.S. federal statutory tax rate to income tax expense is as follows:

	Year Ended December 31,		
	2016	2015	2014
Income tax expense at U.S. statutory rate	\$13,440	\$(70,641)	\$41,708
State income taxes, net of federal tax benefit	694	361	841
Foreign income, net of credit on foreign taxes	164	12	(245)
Effective tax rate differential of earnings outside of U.S.	513	(46)	(5,411)
Change in valuation allowance	6,581	5,658	—
Research & experimentation credits	(896)	(860)	(1,150)
Non-deductible items	756	2,745	1,947
Change in uncertain tax positions	(158)	60	(52)
Domestic production activities deduction	(1,236)	(2,133)	(2,093)
Tax effect of asset impairments	—	67,340	—
Tax effect of insurance proceeds	(5,845)	—	—
Other items	(311)	188	547
Income tax expense	\$13,702	\$2,684	\$36,092

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

Deferred Taxes

Deferred income taxes reflect the net tax effect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes. Significant components of the Company's deferred tax assets and liabilities are as follows:

	December 31,	
	2016	2015
Deferred tax assets:		
Accruals and reserves	\$24,076	\$23,363
Pensions	5,298	6,276
Inventory	6,835	6,768
Share-based compensation	9,347	8,593
Tax credit carryforwards	2,179	1,046
Foreign net operating loss carryforwards	5,903	2,454
State net operating loss carryforwards	1,646	1,922
Other — net	889	2,714
Total deferred tax assets before valuation allowance	56,173	53,136
Valuation allowance	(15,051)	(8,842)
Total deferred tax assets, net of valuation allowance	\$41,122	\$44,294
Deferred tax liabilities:		
Property, plant and equipment	\$19,446	\$20,482
Goodwill and intangible assets	22,894	25,474
Convertible notes	1,023	1,586
Total deferred tax liabilities	\$43,363	\$47,542
Net deferred tax liabilities	\$2,241	\$3,248
The net deferred tax liability is classified as follows:		
Other assets	(2,000)	(1,898)
Long-term deferred tax liabilities	4,241	5,146
Net deferred tax liabilities	\$2,241	\$3,248

Federal, State and Local Net Operating Loss Carryforwards: As a result of the Company's acquisition of SeQual in 2010, the Company has \$22,418 of state net operating losses. California tax law limits the use of these state net operating losses. The remaining state net operating losses expire between 2017 and 2030. In addition, the Company has state net operating losses in various other states which begin to expire in 2017. The gross deferred tax asset for the state net operating losses of \$1,646 is substantially offset by a valuation allowance of \$1,454.

Foreign Net Operating Loss and Tax Credit Carryforwards: As of December 31, 2016, cumulative foreign operating losses of \$28,912 generated by the Company were available to reduce future taxable income. Approximately \$27,494 of these operating losses expire between 2019 and 2024. The remaining \$1,418 can be carried forward indefinitely. The deferred tax asset for the foreign operating losses of \$5,903 is substantially offset by a valuation allowance of \$5,700. As of December 31, 2016, the Company has \$828 of investment tax credits available to reduce its future tax liability. The gross deferred tax asset of \$828 is fully offset by a valuation allowance due to uncertainties relating to the Company's ability to fully use these credits prior to expiration.

Other Tax Information

The Company has not provided for income taxes on approximately \$190,419 of foreign subsidiaries' undistributed earnings as of December 31, 2016, since the earnings retained have been reinvested indefinitely by the subsidiaries. It is not practicable to estimate the additional income taxes and applicable foreign withholding taxes that would be payable on the remittance of such undistributed earnings.

Cash paid for income taxes during the years ended December 31, 2016, 2015, and 2014 was \$17,576, \$30,492, and \$31,208, respectively.

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CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
 (Dollars and shares in thousands, except per share amounts)

Unrecognized Income Tax Benefits

The reconciliation of beginning to ending unrecognized tax benefits is as follows:

	Year Ended December 31,		
	2016	2015	2014
Unrecognized tax benefits at beginning of the year	\$1,024	\$948	\$941
Additions for tax positions of prior years	—	98	358
Reductions for tax positions of prior years	(17)	—	(329)
Lapse of statutes of limitation	(219)	(22)	(22)
Unrecognized tax benefits at end of the year	\$788	\$1,024	\$948

Included in the balance of unrecognized tax benefits at December 31, 2016 and 2015 were \$579 and \$714, respectively, of income tax benefits which, if ultimately recognized, would impact the Company's annual effective tax rate.

The Company had accrued approximately \$86 and \$121 for the payment of interest and penalties at December 31, 2016 and 2015, respectively. The Company accrued approximately \$21 and \$27 during the years ended December 31, 2016 and 2015, respectively in additional interest associated with uncertain tax positions.

The Company is subject to income taxes in the U.S. federal jurisdiction and various state and foreign jurisdictions. Tax regulations within each jurisdiction are subject to the interpretation of the related tax laws and regulations and require significant judgment to apply. With few exceptions, the Company is no longer subject to U.S. federal, state and local or non-U.S. income tax examinations by tax authorities for years prior to 2012.

Due to the expiration of various statutes of limitation, it is reasonably possible the Company's unrecognized tax benefits at December 31, 2016 may decrease within the next twelve months by approximately \$77.

NOTE 15 — Employee Benefit Plans

Defined Benefit Plan

The Company has a defined benefit pension plan which is frozen, that covers certain U.S. hourly and salary employees. The defined benefit plan provides benefits based primarily on the participants' years of service and compensation.

The components of net periodic pension expense (income) are as follows:

	Year Ended December 31,		
	2016	2015	2014
Interest cost	\$2,285	\$2,289	\$2,360
Expected return on plan assets	(2,789)	(3,199)	(3,105)
Amortization of net loss	1,537	1,429	320
Total net periodic pension expense (income)	\$1,033	\$519	\$(425)

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

The changes in the projected benefit obligation and plan assets, the funded status of the plans and the amounts recognized in the consolidated balance sheets are as follows:

	December 31,	
	2016	2015
Change in projected benefit obligation:		
Projected benefit obligation at beginning of year	\$58,273	\$62,107
Interest cost	2,285	2,289
Benefits paid	(3,857)	(3,088)
Actuarial gains	(1,237)	(3,035)
Projected benefit obligation at year end	\$55,464	\$58,273
Change in plan assets:		
Fair value of plan assets at beginning of year	\$40,990	\$45,187
Actual return (loss)	2,969	(1,109)
Employer contributions	1,000	—
Benefits paid	(3,857)	(3,088)
Fair value of plan assets at year end	\$41,102	\$40,990
Funded status (Accrued pension liabilities)	\$(14,362)	\$(17,283)

Unrecognized actuarial loss recognized in accumulated other comprehensive loss \$16,704 \$19,657

The estimated net loss for the defined benefit pension plan that will be amortized from accumulated other comprehensive loss into net periodic benefit cost over the next fiscal year is \$1,240.

The actuarial assumptions used in determining pension plan information are as follows:

	December 31,		
	2016	2015	2014
Assumptions used to determine benefit obligation at year end:			
Discount rate	4.00%	4.00%	3.75%
Assumptions used to determine net periodic benefit cost:			
Discount rate	4.00%	3.75%	4.75%
Expected long-term weighted-average rate of return on plan assets	7.00%	7.25%	7.25%

The discount rate reflects the current rate at which the pension liabilities could be effectively settled at year end. In estimating this rate, the Company looks to rates of return on high quality, fixed-income investments that receive one of the two highest ratings given by a recognized rating agency and the expected timing of benefit payments under the plan.

The expected return assumptions were developed using an averaging formula based upon the plans' investment guidelines, mix of asset classes, historical returns of equities and bonds, and expected future returns. The Company employs a total return investment approach whereby a mix of equities and fixed income investments are used to maximize the long-term return of plan assets for a prudent level of risk. Risk tolerance is established through careful consideration of short and long-term plan liabilities, plan funded status and corporate financial condition. The investment portfolio contains a diversified blend of equity and fixed-income investments. Furthermore, equity investments are diversified across U.S. and non-U.S. stocks, as well as growth, value, and small and large capitalizations. Investment risk is measured and monitored on an ongoing basis through quarterly investment portfolio reviews, annual liability measurements, and periodic asset/liability studies.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

The target allocations by asset category and fair values of the plan assets by asset class at December 31 are as follows:

	Target Allocations by Asset Category		Fair Value					
			Total		Level 2		Level 3	
			2016	2015	2016	2015	2016	2015
Plan Assets:								
Equity funds	60	%	\$28,103	\$27,814	\$28,103	\$27,814	\$—	\$—
Fixed income funds	30	%	11,737	12,846	11,737	12,846	—	—
Other investments	10	%	1,262	330	—	—	1,262	330
Total	100	%	\$41,102	\$40,990	\$39,840	\$40,660	\$1,262	\$330

The plan assets are primarily invested in pooled separate funds. The fair values of equity securities and fixed income securities held in pooled separate funds are based on net asset value of the units of the funds as determined by the fund manager. These funds are similar in nature to retail mutual funds, but are typically more efficient for institutional investors. The fair value of pooled funds is determined by the value of the underlying assets held by the fund and the units outstanding. The value of the pooled funds is not directly observable, but is based on observable inputs. As such, these plan assets are valued using Level 2 inputs as defined in Note 11. Certain plan assets in the other investments asset category are invested in a general investment account where the fair value is derived from the liquidation value based on an actuarial formula as defined under terms of the investment contract. These plan assets were valued using unobservable inputs and, accordingly, the valuation was performed using Level 3 inputs as defined in Note 11.

The following table represents changes in the fair value of plan assets categorized as Level 3 from the preceding table:

Balance at January 1, 2015	\$1,986
Return on plan assets	89
Purchases, sales and settlements, net	(3,486)
Transfers, net	1,741
Balance at December 31, 2015	\$330
Return on plan assets	23
Purchases, sales and settlements, net	(4,231)
Transfers, net	5,140
Balance at December 31, 2016	\$1,262

The Company's funding policy is to contribute at least the minimum funding amounts required by law. Based upon current actuarial estimates, the Company does not expect to contribute to its defined benefit pension plan until 2018. The following benefit payments are expected to be paid by the plan in each of the next five years and in the aggregate for the subsequent five years:

2017	\$2,442
2018	2,631
2019	2,806
2020	2,850
2021	3,009
In aggregate during five years thereafter	16,310

Multi-Employer Plan

The Company contributes to a multi-employer plan for certain collective bargaining U.S. employees. The risks of participating in this multi-employer plan are different from a single employer plan in the following aspects:

- (a) Assets contributed to the multi-employer by one employer may be used to provide benefits to employees of other participating employers.

CHART INDUSTRIES, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

(b) If a participating employer ceases contributing to the plan, the unfunded obligations of the plan may be inherited by the remaining participating employers.

(c) If the Company chooses to stop participating in the multi-employer plan, the Company may be required to pay those plans an amount based on the underfunded status of the plan, referred to as a withdrawal liability.

The Company has assessed and determined that the multi-employer plan to which it contributes is not significant to the Company's financial statements. The Company does not expect to incur a withdrawal liability or expect to significantly increase its contribution over the remainder of the current contract period, which ends in February 2018. The Company made contributions to the bargaining unit supported multi-employer pension plan resulting in expense of \$287, \$739, and \$992 for the years ended December 31, 2016, 2015, and 2014, respectively. The reduction in contributions is due to fewer employees participating in this plan.

Defined Contribution Savings Plan

The Company has a defined contribution savings plan that covers most of its U.S. employees. Company contributions to the plan are based on employee contributions, and include a Company match and discretionary contributions. Expenses under the plan totaled \$9,989, \$10,818, and \$10,773 for the years ended December 31, 2016, 2015, and 2014, respectively.

Voluntary Deferred Income Plan

The Company provides additional retirement plan benefits to certain members of management under the Amended and Restated Chart Industries, Inc. Voluntary Deferred Income Plan. This is an unfunded plan. The Company recorded \$257, \$255, and \$409 of expense associated with this plan for the years ended December 31, 2016, 2015, and 2014, respectively.

NOTE 16 — Share-based Compensation

Under the Amended and Restated 2005 Stock Incentive Plan (“Stock Incentive Plan”) which became effective in October 2005, the Company could grant stock options, stock appreciation rights (“SARs”), restricted stock units (“RSUs”), stock awards, and performance based stock awards to employees and directors. The Stock Incentive Plan had reserved 3,421 shares of the Company's common stock for issuance. As of December 31, 2016, 102 options were outstanding under the Stock Incentive Plan. The Company no longer grants awards under this plan.

Under the Amended and Restated 2009 Omnibus Equity Plan (“Omnibus Equity Plan”) which was originally approved by the shareholders in May 2009 and reapproved by shareholders in May 2012 as amended and restated, the Company may grant stock options, SARs, RSUs, restricted stock, performance shares, leveraged restricted shares, and common shares to employees and directors. The maximum number of shares available for grant is 3,350, which may be treasury shares or unissued shares. As of December 31, 2016, 1,011 stock options, 329 shares of restricted stock and RSUs, 58 performance units, and 10 leveraged restricted share units were outstanding under the Omnibus Equity Plan. The Company recognized share-based compensation expense of \$10,679, \$11,325, and \$9,420 for the years ended December 31, 2016, 2015, and 2014, respectively. This expense is included in selling, general and administrative expenses in the consolidated statements of operations. The Company also recognized a related tax deficiency of \$1,672 and \$890 during the years ended December 31, 2016 and 2015, respectively, and a tax benefit of \$1,859 for the year ended December 31, 2014. As of December 31, 2016, total share-based compensation of \$5,133 is expected to be recognized over the remaining weighted-average period of approximately 1.9 years.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

Stock Options

The Company uses a Black-Scholes option pricing model to estimate the fair value of stock options. The expected volatility is based on historical information. For 2016 and 2015, the expected term is based on the historical average life of stock options. Prior to 2015, the Company used the simplified method as defined in SEC Staff Accounting Bulletin No. 107 to determine the expected term. The risk-free rate is based on the U.S. Treasury yield in effect at the time of the grant. Weighted-average grant-date fair values of stock options and the assumptions used in estimating the fair values are as follows:

	Year Ended December 31,					
	2016	2015	2014			
Weighted-average grant-date fair value per share	\$10.36	\$19.04	\$56.15			
Expected term (years)	5.20	5.60	6.25			
Risk-free interest rate	1.66	% 1.70	% 1.00	%		
Expected volatility	61.40	% 61.54	% 63.73	%		

Under the terms of the Omnibus Equity Plan, stock options generally have a 4 year graded vesting period, an exercise price equal to the fair market value of a share of common stock on the date of grant, and a contractual term of 10 years. The following table summarizes the Company's stock option activity:

	December 31, 2016			
	Number of Shares	Weighted-average Exercise Price	Aggregate Intrinsic Value	Weighted-average Remaining Contractual Term
Outstanding at beginning of year	698	\$ 41.52		
Granted	561	19.33		
Exercised	(18)	20.17		
Forfeited	(128)	37.56		
Outstanding at end of year	1,113	\$ 31.13	\$ 11,881	6.6 years
Vested and expected to vest at end of year	1,096	\$ 31.25	\$ 4,005	6.6 years
Exercisable at end of year	495	\$ 37.36	\$ 11,659	4.4 years

As of December 31, 2016, total unrecognized compensation cost related to stock options expected to be recognized over the weighted-average period of approximately 2.3 years is \$2,281.

The total intrinsic value of options exercised during the years ended December 31, 2016, 2015, and 2014 was \$218, \$740, and \$940, respectively. The total fair value of stock options vested during the years ended December 31, 2016, 2015, and 2014 was \$3,914, \$3,625, and \$3,163, respectively.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

Restricted Stock and RSUs

Restricted stock and RSUs generally vest ratably over a three-year period and are valued based on the Company's market price on the date of grant. The following table summarizes the Company's unvested restricted stock and RSUs activity:

	December 31, 2016	
	Number	Weighted-Average
	of Shares	Grant-Date Fair
		Value
Unvested at beginning of year	145	\$ 46.40
Granted	283	19.08
Forfeited	(35)	26.45
Vested	(64)	50.66
Unvested at end of year	329	\$ 24.06

As of December 31, 2016, total unrecognized compensation cost related to unvested restricted stock and RSUs expected to be recognized over the weighted-average period of approximately 1.7 years is \$2,112.

The weighted-average grant-date fair value of restricted stock and RSUs granted during the years ended December 31, 2016, 2015, and 2014 was \$19.08, \$34.15, and \$92.17, respectively. The total fair value of restricted stock and RSUs that vested during the years ended December 31, 2016, 2015, and 2014 was \$1,182, \$1,563, and \$3,930, respectively.

Performance Units

Performance units are earned over a three-year period. Based on the attainment of pre-determined performance condition targets as determined by the Compensation Committee of the Board of Directors, performance units earned may be in the range of between 0% and 200%. The following table summarizes the Company's performance units activity:

	December 31, 2016	
	Number	Weighted-Average
	of Shares	Grant-Date Fair
		Value
Unvested at beginning of year	59	\$ 59.15
Granted	58	19.94
Forfeited	(13)	37.72
Vested	(46)	41.25
Unvested at end of year	58	\$ 32.39

As of December 31, 2016, total unrecognized compensation cost related to performance units expected to be recognized over a weighted-average period of approximately 1.8 years is \$530.

The weighted-average grant-date fair value of performance units granted during the years ended December 31, 2016, 2015, and 2014 was \$19.94, \$28.25, and \$93.34, respectively. The total fair value of performance units that vested during the years ended December 31, 2016, 2015, and 2014 was \$1,843, \$842, and \$2,650, respectively.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

Leveraged Restricted Share Units

Leveraged restricted share unit awards vest based on the attainment of pre-determined market condition targets as determined by the Compensation Committee of the Board of Directors over a three-year performance period. Units earned may be in the range of between 50% and 150%. The Company valued the leverage restricted share unit awards based on market conditions using a Monte Carlo Simulation model. The following table summarizes the Company's leveraged restricted share unit awards activity:

	December 31, 2016	
	Number of Shares	Weighted-average Grant-Date Fair Value
Unvested at beginning of year	41	\$ 92.66
Forfeited	(3)	106.90
Vested	(28)	68.85
Unvested at end of year	10	\$ 106.90

As of December 31, 2016, total unrecognized compensation cost related to leveraged restricted share awards of \$210 will be recognized during 2017.

The weighted-average grant-date fair value of leveraged restricted share awards granted during the year ended December 31, 2014 was \$106.90. The total fair value of leveraged restricted share awards that vested during the years ended December 31, 2016 and 2015 was \$1,028 and \$619, respectively. No leveraged restricted share awards vested during the year ended December 31, 2014.

Directors' Stock Grants

In 2016, 2015, and 2014, the Company granted the non-employee directors stock awards covering 28, 23, and 8 shares of common stock, respectively, which had fair values of \$633, \$682, and \$588, respectively. These stock awards were fully vested on the grant date. Likewise, the fair values were recognized immediately on the grant date.

NOTE 17 — Lease Commitments

The Company incurred \$9,527, \$11,147, and \$11,375 of rental expense under operating leases for the years ended December 31, 2016, 2015, and 2014, respectively. Certain leases contain rent escalation clauses and lease concessions that require additional rental payments in the later years of the term. Rent expense for these types of leases is recognized on a straight-line basis over the minimum lease term. In addition, the Company has the right, but no obligation, to renew certain leases for various renewal terms.

The following table summarizes the future minimum lease payments for non-cancelable operating leases as of December 31, 2016:

2017	\$9,800
2018	8,400
2019	7,200
2020	5,300
2021	3,800
Thereafter	6,800
Total future minimum lease payments	\$41,300

NOTE 18 — Commitments and Contingencies

Environmental

The Company is subject to federal, state, local, and foreign environmental laws and regulations concerning, among other matters, waste water effluents, air emissions, and handling and disposal of hazardous materials, such as cleaning fluids. The Company is involved with environmental compliance, investigation, monitoring, and remediation activities at certain of its owned

CHART INDUSTRIES, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(Dollars and shares in thousands, except per share amounts)

and formerly owned manufacturing facilities and at one owned facility that is leased to a third party, and, except for these continuing remediation efforts, believes it is currently in substantial compliance with all known environmental regulations. At December 31, 2016 and 2015, the Company had undiscounted accrued environmental reserves of \$3,003 and \$3,226, respectively. The Company accrues for certain environmental remediation-related activities for which commitments or remediation plans have been developed and for which costs can be reasonably estimated. These estimates are determined based upon currently available facts and circumstances regarding each facility. Actual costs incurred may vary from these estimates due to the inherent uncertainties involved. Future expenditures relating to these environmental remediation efforts are expected to be made over the next 12 years as ongoing costs of remediation programs.

Although the Company believes it has adequately provided for the cost of all known environmental conditions, the applicable regulatory agencies could insist upon different and more costly remediation than those the Company believes are adequate or required by existing law or third parties may seek to impose environmental liabilities on the Company. The Company believes that any additional liability in excess of amounts accrued which may result from the resolution of such matters will not have a material adverse effect on the Company's financial position, liquidity, cash flows or results of operations.

Legal Proceedings

The Company is occasionally subject to various legal claims related to performance under contracts, product liability, taxes, employment matters, environmental matters, intellectual property, and other matters incidental to the normal course of its business. Based on the Company's historical experience in litigating these claims, as well as the Company's current assessment of the underlying merits of the claims and applicable insurance, if any, management believes that the final resolution of these matters will not have a material adverse effect on the Company's financial position, liquidity, cash flows, or results of operations. Future developments may, however, result in resolution of these legal claims in a way that could have a material adverse effect.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

NOTE 19 — Restructuring Activities

Due to economic conditions, including low energy prices and global competition, the Company implemented a number of cost reduction or avoidance actions during 2015 and 2016, including headcount reductions. During the year ended December 31, 2016, the Company incurred severance and other restructuring charges of \$10,928 associated with headcount reductions in all of its segments. These charges were recorded in cost of sales (\$4,412) and selling, general, and administrative expenses (\$6,516) in the consolidated statement of operations. For the year ended December 31, 2015, the Company incurred severance expense of \$7,448, primarily recorded in selling, general and administrative expenses in the consolidated statement of operations. The Company currently expects additional severance and restructuring charges in 2017 to be approximately \$10,400 (Corporate - \$3,300, BioMedical - \$2,900, E&C - \$3,000 and D&S - \$1,200). The Company is closely monitoring its end markets and order rates and will continue to take appropriate and timely actions as necessary.

During 2015, Chart announced its intention to close certain D&S leased facilities. These closures were cost reduction measures in response to lower orders within D&S. Total cost incurred during 2015 related to these closures was \$4,810 and include lease exit costs, long-lived asset impairment charges, and other miscellaneous costs.

Approximately \$1,700 of these costs were included in cost of sales, \$2,960 of these costs were included in selling, general and administrative expenses and \$150 of these costs were included in asset impairment in the consolidated statements of operations. The remaining accrual for the facility restructuring costs within the D&S segment as of December 31, 2016 was \$2,152. These costs are expected to be paid out over the terms of the associated leases which are expected to end in 2023.

The following tables summarize the Company's restructuring activities for the year ended December 31, 2016:

	Energy & Chemicals	Distribution & Storage	BioMedical	Corporate	Total
Balance as of December 31, 2015	\$ 1,106	\$ 3,446	\$ 430	\$ 850	\$ 5,832
Restructuring charges	962	3,842	1,957	4,167	10,928
Cash payments and other	(1,941)	(4,424)	(1,079)	(1,992)	(9,436)
Balance as of December 31, 2016	\$ 127	\$ 2,864	\$ 1,308	\$ 3,025	\$ 7,324

NOTE 20 — Segment and Geographic Information

The structure of the Company's internal organization is divided into the following reportable segments, which are also the Company's operating segments: E&C, D&S, and BioMedical. The Company's reportable segments are business units that are each managed separately because they manufacture, offer, and distribute distinct products with different production processes and sales and marketing approaches. The E&C and D&S segments manufacture products used primarily in energy-related and industrial applications, such as the separation, liquefaction, distribution, and storage of hydrocarbon and industrial gases. The BioMedical segment supplies cryogenic and other equipment used in the medical, biological research, and animal breeding industries. Due to the nature of the products that each segment sells, intersegment sales are not material. Corporate includes operating expenses for executive management, accounting, tax, treasury, corporate development, human resources, information technology, investor relations, legal, internal audit, and risk management.

The Company evaluates performance and allocates resources based on operating income or loss from continuing operations before interest expense, net, financing costs amortization, foreign currency loss (gain), income tax expense, net, and noncontrolling interests, net of taxes. The accounting policies of the reportable segments are the same as those described in Note 2.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

Segment Financial Information

	Year Ended December 31, 2016				
	Energy & Chemicals	Distribution & Storage	BioMedical	Corporate	Total
Sales to external customers	\$ 154,249	\$ 497,137	\$ 207,768	\$ —	\$ 859,154
Depreciation and amortization expense	9,984	18,432	5,953	3,140	37,509
Operating income (loss) ⁽¹⁾⁽²⁾	13,307	50,435	41,967	(48,337)	57,372
Total assets ⁽³⁾	177,514	657,599	178,747	219,222	1,233,082
Capital expenditures	3,316	11,706	2,303	460	17,785
	Year Ended December 31, 2015				
	Energy & Chemicals	Distribution & Storage	BioMedical	Corporate	Total
Sales to external customers	\$ 330,968	\$ 487,557	\$ 221,635	\$ —	\$ 1,040,160
Depreciation and amortization expense	11,805	18,289	12,039	3,315	45,448
Operating (loss) income ⁽²⁾⁽⁴⁾	(10,050)	39,549	(165,336)	(47,386)	(183,223)
Total assets ⁽³⁾	251,810	689,112	224,443	34,775	1,200,140
Capital expenditures	4,074	36,835	3,849	2,281	47,039
	Year Ended December 31, 2014				
	Energy & Chemicals	Distribution & Storage	BioMedical	Corporate	Total
Sales to external customers	\$ 388,018	\$ 578,806	\$ 226,128	\$ —	\$ 1,192,952
Depreciation and amortization expense	9,649	16,749	13,842	2,936	43,176
Operating income (loss) ⁽²⁾⁽⁵⁾	78,006	82,612	25,009	(47,470)	138,157
Total assets ⁽³⁾	322,936	666,451	396,320	73,810	1,459,517
Capital expenditures	24,834	29,583	3,484	4,234	62,135

During the third quarter of 2016, the Company recovered for breaches of representations and warranties primarily related to warranty costs for certain product lines acquired in the 2012 acquisition of AirSep under the related ⁽¹⁾ representation and warranty insurance. For the year ended December 31, 2016, this reduced BioMedical segment's cost of sales by \$15,145 and Corporate SG&A expenses by \$376, net of associated legal fees recorded in 2016.

The 2016 operating income also includes asset impairment charges of \$1,217 attributed to D&S.

Beginning in 2016, the Company allocates share-based compensation expense to each operating segment and ⁽²⁾ maintains share-based compensation expense related to Corporate employees at Corporate. Prior to 2016, all share-based compensation expense was recorded at Corporate. Reclassifications from Corporate to the operating segments have been made to the 2015 and 2014 SG&A to conform to the 2016 presentation.

⁽³⁾ Corporate assets consist primarily of cash, cash equivalents, and deferred income taxes.

⁽⁴⁾ Includes asset impairment charges of \$255,116 for the year ended December 31, 2015, attributed to E&C - \$68,796, D&S - \$2,020, and BioMedical - \$184,300.

⁽⁵⁾ The BioMedical segment's operating income included recovery of \$5,003 increasing operating income for the year ended December 31, 2014 from an escrow settlement for breaches of representations and warranties relating to warranty costs (which are in excess of the settlement amount) for certain product lines acquired from AirSep in 2012.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

The following table represents the changes in goodwill by segment:

	Energy & Chemicals	Distribution & Storage	BioMedical	Total
Balance at January 1, 2015	\$ 92,638	\$ 157,248	\$ 155,636	\$ 405,522
Foreign currency translation adjustments and other	(162)	(1,909)	184	(1,887)
Goodwill acquired during the year	—	10,601	—	10,601
Impairment loss	(64,603)	—	(131,243)	(195,846)
Balance at December 31, 2015	27,873	165,940	24,577	218,390
Foreign currency translation adjustments and other	—	(420)	—	(420)
Balance at December 31, 2016	\$ 27,873	\$ 165,520	\$ 24,577	\$ 217,970

Accumulated goodwill impairment loss	\$ 64,603	\$ —	\$ 131,243	\$ 195,846
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Product Sales Information

	Year Ended December 31,		
	2016	2015	2014
Energy & Chemicals			
Natural gas processing (including petrochemical) applications	\$ 105,372	\$ 180,909	\$ 208,706
Liquefied natural gas applications	38,184	136,049	143,870
Industrial gas applications	10,693	14,010	35,442
Total Energy & Chemicals	154,249	330,968	388,018
Distribution & Storage			
Bulk industrial gas applications	227,650	203,834	204,214
Packaged gas industrial applications	159,681	167,814	164,966
Liquefied natural gas applications	109,806	115,909	209,626
Total Distribution & Storage	497,137	487,557	578,806
BioMedical			
Respiratory therapy	118,926	132,321	141,273
Life sciences	70,572	64,641	65,948
Commercial oxygen generation	18,270	24,673	18,907
Total BioMedical	207,768	221,635	226,128
Total	\$ 859,154	\$ 1,040,160	\$ 1,192,952

In 2016, one customer accounted for more than 10 percent of our consolidated sales. Total sales revenue from this customer represents approximately \$98,919 of our total consolidated sales revenue and is attributable to our E&C, D&S and BioMedical segments. No customer accounted for more than 10 percent of our consolidated sales revenue in 2015 or 2014.

CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
 (Dollars and shares in thousands, except per share amounts)

Geographic Information

Net sales by geographic area are reported by the destination of sales. Net property, plant and equipment by geographic area are reported by country of domicile.

	Sales for the Year Ended		
	December 31,		
	2016	2015	2014
United States	\$425,985	\$513,691	\$560,846
Foreign			
China	147,720	109,978	188,047
Other foreign countries	285,449	416,491	444,059
Total Foreign	433,169	526,469	632,106
Total	\$859,154	\$1,040,160	\$1,192,952
	Property, plant and		
	equipment, net as of		
	December 31,		
	2016	2015	
United States	\$145,014	\$153,987	
Foreign			
Czech Republic	18,454	19,742	
China	75,409	79,691	
Germany	11,572	12,246	
Other foreign countries	600	611	
Total Foreign	106,035	112,290	
Total	\$251,049	\$266,277	

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CHART INDUSTRIES, INC. AND SUBSIDIARIES
 NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)

(Dollars and shares in thousands, except per share amounts)

NOTE 21 — Quarterly Data (Unaudited)

Selected quarterly data for the years ended December 31, 2016 and 2015 are as follows:

	Year Ended December 31, 2016				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total
Sales	\$ 193,757	\$ 247,095	\$ 203,930	\$ 214,372	\$ 859,154
Gross profit	52,701	86,951	69,623	57,098	266,373
Operating income ⁽¹⁾	37	34,939	20,064	2,332	57,372
Net (loss) income	(4,672)	19,563	13,684	(3,878)	24,697
Net (loss) income attributable to Chart Industries, Inc.	(4,651)	21,153	15,025	(3,290)	28,237
Net (loss) income attributable to Chart Industries, Inc. per share—basic ⁽²⁾	\$(0.15)	\$0.69	\$0.49	\$(0.11)	\$0.92
Net income (loss) attributable to Chart Industries, Inc. per share—diluted ⁽³⁾	\$(0.15)	\$0.68	\$0.48	\$(0.11)	\$0.91

During the third quarter of 2016, the Company recovered for breaches of representations and warranties primarily related to warranty costs for certain product lines acquired in the 2012 acquisition of AirSep under the related representation and warranty insurance. For the year ended December 31, 2016, this reduced BioMedical segment's cost of sales by \$15,145 and Corporate SG&A expenses by \$376, net of associated legal fees recorded in 2016. The 2016 operating income also includes impairment of goodwill and intangible assets totaling \$1,217 as described in Note 3, Asset Impairments, to the consolidated financial statements.

(1) During the third quarter of 2016, the Company recovered for breaches of representations and warranties primarily related to warranty costs for certain product lines acquired in the 2012 acquisition of AirSep under the related representation and warranty insurance. For the year ended December 31, 2016, this reduced BioMedical segment's cost of sales by \$15,145 and Corporate SG&A expenses by \$376, net of associated legal fees recorded in 2016. The 2016 operating income also includes impairment of goodwill and intangible assets totaling \$1,217 as described in Note 3, Asset Impairments, to the consolidated financial statements.

Basic and diluted (loss) earnings per share are computed independently for each of the quarters presented. As such,

(2) the sum of quarterly basic and diluted (loss) earnings per share may not equal reported annual basic and diluted (loss) earnings per share.

(3) Zero incremental shares from share-based awards are included in the computation of diluted net loss per share for periods in which a net loss occurs, because to do so would be anti-dilutive.

	Year Ended December 31, 2015				
	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Total
Sales	\$ 245,105	\$ 270,252	\$ 264,047	\$ 260,756	\$ 1,040,160
Gross profit	72,523	74,880	68,289	72,772	288,464
Operating income ⁽¹⁾	14,957	25,129	15,609	(238,918)	(183,223)
Net income (loss)	5,275	17,082	4,271	(231,144)	(204,516)
Net income (loss) attributable to Chart Industries, Inc.	5,246	17,157	4,760	(230,123)	(202,960)
Net income (loss) attributable to Chart Industries, Inc. per share—basic ⁽²⁾	\$0.17	\$0.56	\$0.16	\$(7.54)	\$(6.66)
Net income (loss) attributable to Chart Industries, Inc. per share—diluted ⁽³⁾	\$0.17	\$0.56	\$0.15	\$(7.54)	\$(6.66)

(1) Includes impairment of goodwill and intangible assets totaling \$253,560 as described in Note 3, Asset Impairments, to the consolidated financial statements.

Basic and diluted (loss) earnings per share are computed independently for each of the quarters presented. As such,

(2) the sum of quarterly basic and diluted (loss) earnings per share may not equal reported annual basic and diluted (loss) earnings per share.

(3)

Zero incremental shares from share-based awards are included in the computation of diluted net loss per share for periods in which a net loss occurs, because to do so would be anti-dilutive.

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CHART INDUSTRIES, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS—(Continued)
(Dollars and shares in thousands, except per share amounts)

NOTE 22 — Subsequent Events

The Company closed the acquisition of Hetsco, Inc. on January 13, 2017. The Company acquired Hetsco, Inc. from Global Power Equipment Group, Inc. for approximately \$22 million. Hetsco, Inc. provides emergency, specialty welding, and construction services to natural gas processing, petrochemical, and air gas separation industries and will be included in the E&C operating segment.

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CHART INDUSTRIES, INC. AND SUBSIDIARIES
SCHEDULE II – VALUATION AND QUALIFYING ACCOUNTS

(Dollars in thousands)

	Balance at beginning of period	Additions Charged to costs and expenses	Deductions	Translations	Balance at end of period
Year Ended December 31, 2016:					
Allowance for doubtful accounts	\$ 6,965	\$ 4,718	\$ (1,270) ⁽¹⁾	\$ (196)	\$ 10,217
Allowance for obsolete and excess inventory	11,269	3,824	(4,708) ⁽²⁾	(316)	10,069
Deferred tax assets valuation allowance	8,842	6,959	(132) ⁽³⁾	(618)	15,051
Year Ended December 31, 2015:					
Allowance for doubtful accounts	\$ 6,475	\$ 1,597	\$ (953) ⁽¹⁾	\$ (154)	\$ 6,965
Allowance for obsolete and excess inventory	5,233	14,802	(8,351) ⁽²⁾	(415)	11,269
Deferred tax assets valuation allowance	1,982	7,190	(129) ⁽³⁾	(201)	8,842
Year Ended December 31, 2014:					
Allowance for doubtful accounts	\$ 5,654	\$ 1,505	\$ (633) ⁽¹⁾	\$ (51)	\$ 6,475
Allowance for obsolete and excess inventory	6,556	4,087	(5,158) ⁽²⁾	(252)	5,233
Deferred tax assets valuation allowance	1,250	1,089	(290) ⁽³⁾	(67)	1,982

⁽¹⁾ Reversal of amounts previously recorded as bad debt and uncollectible accounts written off.

⁽²⁾ Inventory items written off against the allowance.

⁽³⁾ Deductions to the deferred tax assets valuation allowance relate to decreased deferred tax assets and the release of the valuation allowance.

INDEX TO EXHIBITS

Exhibit No. Description

- 3.1 Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to Amendment No. 5 to the Registrant's Registration Statement on Form S-1 (File No. 333-133254)).
- 3.2 Amended and Restated By-Laws, as amended (incorporated by reference to Exhibit 3.1 to the Registrant's current report on Form 8-K, filed with the SEC on December 19, 2008 (File No. 001-11442)).
- 4.1 Form of Certificate (incorporated by reference to Exhibit 4.1 to Amendment No. 4 to the Registrant's Registration Statement on Form S-1 (File No. 333-133254)).
- 4.2 Indenture, dated August 3, 2011 by and between Chart Industries, Inc. and Wells Fargo Bank, National Association (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K filed with the SEC on August 5, 2011 (File No. 001-11442)).
- 4.3 Supplemental Indenture, dated August 3, 2011 by and between Chart Industries, Inc. and Wells Fargo Bank, National Association (incorporated by reference to Exhibit 4.2 to the Registrant's Current Report on Form 8-K filed with the SEC on August 5, 2011 (File No. 001-11442)).
- 4.4 Form of 2.00% Convertible Senior Subordinated Notes due 2018 (incorporated by reference to Exhibit 4.3 to the Registrant's Current Report on Form 8-K filed with the SEC on August 5, 2011 (File No. 001-11442)).
- 10.1 Form of Amended and Restated Management Stockholders Agreement (incorporated by reference to Exhibit 10.10 to Amendment No. 3 to the Registrant's Registration Statement on Form S-1 (File No. 333-133254)).
- 10.2 Amended and Restated Chart Industries, Inc. 2005 Stock Incentive Plan (incorporated by reference to Exhibit 10.3 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2008 (File No. 001-11442)).*
- 10.2.1 Form of Restricted Stock Unit Agreement (for non-employee directors) under the Amended and Restated Chart Industries, Inc. 2005 Stock Incentive Plan (incorporated by reference to Exhibit 10.22 to Amendment No. 4 to the Registrant's Registration Statement on Form S-1 (File No. 333-133254)).*
- 10.2.2 Form of Nonqualified Stock Option Agreement (2007 and 2008 grants) under the Amended and Restated Chart Industries, Inc. 2005 Stock Incentive Plan (incorporated by reference to Exhibit 10.2 to the Registrant's current report on Form 8-K, filed with the SEC on August 7, 2007 (File No. 001-11442)).*
- 10.2.3 Form of Nonqualified Stock Option Agreement (2009 grants) under the Amended and Restated Chart Industries, Inc. 2005 Stock Incentive Plan (incorporated by reference to Exhibit 10.3.7 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2008 (File No. 001-11442)).*
- 10.2.4 Forms of Stock Award Agreement and Deferral Election Form (for non-employee directors) (2008 grants) under the Amended and Restated Chart Industries, Inc. 2005 Stock Incentive Plan (incorporated by reference to Exhibit 10.4.6 to the Registrant's Annual Report on Form 10-K for the year ended

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December 31, 2007 (File No. 001-11442)).*

- 10.2.5 Forms of Stock Award Agreement and Deferral Election Form (for non-employee directors) (2009 grants) under the Amended and Restated Chart Industries, Inc. 2005 Stock Incentive Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2008 (File No. 001-11442)).*
- 10.3 Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Appendix A to the Registrant's definitive proxy statement filed with the Securities and Exchange Commission on April 10, 2012 (File No. 001-11442)).*
- 10.3.1 Amendment No. 1 to the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2012 (File No. 001-11442)).*
- 10.3.2 Form of Nonqualified Stock Option Agreement (2010 grants) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.4.1 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2009 (File No. 001-11442)).*
- 10.3.3 Forms of Stock Award Agreement and Deferral Election Form (for eligible directors) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.4.3 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2009 (File No. 001-11442)).*

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- 10.3.4 Form of Nonqualified Stock Option Agreement (2011 grants) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.4 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2010 (File No. 001-11442)).*
- 10.3.5 Form of Restricted Stock Agreement (2011 grants) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.5 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2010 (File No. 001-11442)).*
- 10.3.6 Form of Performance Unit Agreement (2011 grants) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.6 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2010 (File No. 001-11442)).*
- 10.3.7 Form of Leveraged Restricted Share Unit Agreement (2013 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.5 to the Registrant's Current Report on Form 8-K filed with the SEC on January 5, 2012 (File No. 001-11442)).*
- 10.3.8 Form of Nonqualified Stock Option Agreement (2012 grants) under the Chart Industries, Inc. 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.8 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2011 (File No. 001-11442)).*
- 10.3.9 Form of Nonqualified Stock Option Agreement (2013 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.11 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2012 (File No. 001-11442)).*
- 10.3.10 Form of Performance Unit Agreement (2013 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.12 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2012 (File No. 001-11442)).*
- 10.3.11 Form of Nonqualified Stock Option Agreement (2014 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.13 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2013 (File No. 001-11442)).*
- 10.3.12 Form of Performance Unit Agreement (2014 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.14 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2013 (File No. 001-11442)).*
- 10.3.13 Form of Leveraged Restricted Share Unit Agreement (2014 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.15 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2013 (File No. 001-11442)).*
- 10.3.14 Form of Nonqualified Stock Option Agreement (2015 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.16 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2014 (File No. 001-11442)).*
- 10.3.15 Form of Performance Unit Agreement (2015 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.17 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2014 (File No. 001-11442)).*
- 10.3.16

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Form of Restricted Share Unit Agreement (2015 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan (incorporated by reference to Exhibit 10.3.18 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2014 (File No. 001-11442)).*

10.3.17 Form of Nonqualified Stock Option Agreement (2016 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan. (incorporated by reference to Exhibit 10.3.18 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2015 (File No. 001-11442)).*

10.3.18 Form of Performance Unit Agreement (2016 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan. (incorporated by reference to Exhibit 10.3.19 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2015 (File No. 001-11442)).*

10.3.19 Form of Performance Unit Agreement (2016 Thomas grant) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan. (incorporated by reference to Exhibit 10.3.20 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2015 (File No. 001-11442)).*

10.3.20 Form of Restricted Share Unit Agreement (2016 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan. (incorporated by reference to Exhibit 10.3.21 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2015 (File No. 001-11442)).*

10.3.21 Form of Nonqualified Stock Option Agreement (2017 grants) under the Chart Industries, Inc. Amended and Restated 2009 Omnibus Equity Plan.* (x)

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Form of Performance Unit Agreement (2017 grants) under the Chart Industries, Inc. Amended and Restated
10.3.22 2009 Omnibus Equity Plan.* (x)

Form of Restricted Share Unit Agreement (2017 grants) under the Chart Industries, Inc. Amended and
10.3.23 Restated 2009 Omnibus Equity Plan.* (x)

Amended and Restated Chart Industries, Inc. Voluntary Deferred Income Plan (incorporated by reference to
10.4 Exhibit 10.1 to the Registrant's current report on Form 8-K, filed with the SEC on June 28, 2010 (File No. 001-11442)).*

Amendment No. 1 to the Amended and Restated Chart Industries, Inc. Voluntary Deferred Income Plan
10.4.1 (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2016 (File No. 001-11442)).*

Amendment No. 2 to the Amended and Restated Chart Industries, Inc. Voluntary Deferred Income Plan
10.4.2 (incorporated by reference to Exhibit 10.2 to the Registrant's current report on Form 8-K, filed with the SEC on July 14, 2016 (File No. 001-11442)).*

Chart Industries, Inc. 2009 Incentive Compensation Plan (incorporated by reference to Appendix B to the
10.5 Registrant's definitive proxy statement filed with the Securities and Exchange Commission on April 7, 2009 (File No. 001-11442)).*

Second Amended and Restated Credit Agreement, dated October 29, 2014, among Chart Industries, Inc.,
10.6 Chart Industries Luxembourg S.à r.l., Chart Asia Investment Company Limited, the lenders from time to time party thereto, and JPMorgan Chase Bank, N.A. as Administrative Agent (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K, filed with the SEC on November 3, 2014 (File No. 001-11442)).

Amendment No. 1, dated December 23, 2015, to the Second Amended and Restated Credit Agreement, dated
10.6.1 October 29, 2014, among Chart Industries, Inc., Chart Industries Luxembourg S.à r.l., Chart Asia Investment Company Limited, the lenders from time to time party thereto, and JPMorgan Chase Bank, N.A. as Administrative Agent. (x)

Employment Agreement, dated February 26, 2008, by and between Chart Industries, Inc. and Samuel
10.7 F. Thomas (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2008 (File No. 001-11442)).*

Amendment No. 1, effective January 1, 2009, to the Employment Agreement dated February 26, 2008 by and
10.7.1 between Chart Industries, Inc. and Samuel F. Thomas (incorporated by reference to Exhibit 10.9.1 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2008 (File No. 001-11442)).*

Amendment No. 2, effective January 1, 2010, to the Employment Agreement dated February 26, 2008 by and
10.7.2 between Chart Industries, Inc. and Samuel F. Thomas (incorporated by reference to Exhibit 10.1 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2010 (File No. 001-11442)).*

Amendment No. 3, dated January 1, 2012, to the Employment Agreement dated February 26, 2008 by and
10.7.3 between Chart Industries, Inc. and Samuel F. Thomas (incorporated by reference to Exhibit 10.1 to the

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- 10.7.4 Registrant's Current Report on Form 8-K filed with the SEC on January 5, 2012 (File No. 001-11442)). *
Amendment No. 4, dated January 1, 2013, to the Employment Agreement dated February 26, 2008 by and
between Chart Industries, Inc. and Samuel F. Thomas (incorporated by reference to Exhibit 10.1 to the
Registrant's Current Report on Form 8-K filed with the SEC on January 4, 2013 (File No. 001-11442)). *
- 10.7.5 Amendment No. 5, dated January 1, 2014, to the Employment Agreement dated February 26, 2008 by and
between Chart Industries, Inc. and Samuel F. Thomas (incorporated by reference to Exhibit 10.1 to the
Registrant's Current Report on Form 8-K filed with the SEC on January 6, 2014 (File No. 001-11442)). *
- 10.8 Employment Agreement, dated February 26, 2008, by and between Chart Industries, Inc. and Michael
F. Biehl (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the
quarter ended March 31, 2008 (File No. 001-11442)).*
- 10.8.1 Amendment No. 1, effective January 1, 2009, to the Employment Agreement dated February 26, 2008 by and
between Chart Industries, Inc. and Michael F. Biehl (incorporated by reference to Exhibit 10.10.1 to the
Registrant's Annual Report on Form 10-K for the year ended December 31, 2008 (File No. 001-11442)).*
- 10.8.2 Amendment No. 2, dated January 1, 2012, to the Employment Agreement dated February 26, 2008 by and
between Chart Industries, Inc. and Michael F. Biehl (incorporated by reference to Exhibit 10.2 to the
Registrant's Current Report on Form 8-K filed with the SEC on January 5, 2012 (File No. 001-11442)).*

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- 10.8.3 Amendment No. 3, dated January 1, 2013, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Michael F. Biehl (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed with the SEC on January 4, 2013 (File No. 001-11442)).*
- 10.8.4 Amendment No. 4, dated January 1, 2014, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Michael F. Biehl (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed with the SEC on January 6, 2014 (File No. 001-11442)).*
- 10.9 Employment Agreement, dated February 26, 2008, by and between Chart Industries, Inc. and Matthew J. Klaben (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2008 (File No. 001-11442)).*
- 10.9.1 Amendment No. 1, effective January 1, 2009, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Matthew J. Klaben (incorporated by reference to Exhibit 10.11.1 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2008 (File No. 001-11442)).*
- 10.9.2 Amendment No. 2, dated January 1, 2012, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Matthew J. Klaben (incorporated by reference to Exhibit 10.3 to the Registrant's Current Report on Form 8-K filed with the SEC on January 5, 2012 (File No. 001-11442)).*
- 10.9.3 Amendment No. 3, dated January 1, 2013, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Matthew J. Klaben (incorporated by reference to Exhibit 10.3 to the Registrant's Current Report on Form 8-K filed with the SEC on January 4, 2013 (File No. 001-11442)).*
- 10.9.4 Amendment No. 4, dated January 1, 2014, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Matthew J. Klaben (incorporated by reference to Exhibit 10.3 to the Registrant's Current Report on Form 8-K filed with the SEC on January 6, 2014 (File No. 001-11442)).*
- 10.10 Employment Agreement, dated February 26, 2008, by and between Chart Industries, Inc. and Kenneth J. Webster (incorporated by reference to Exhibit 10.5 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2008 (File No. 001-11442)).*
- 10.10.1 Amendment No. 1, effective January 1, 2009, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Kenneth J. Webster (incorporated by reference to Exhibit 10.13.1 to the Registrant's Annual Report on Form 10-K for the year ended December 31, 2008 (File No. 001-11442)).*
- 10.10.2 Amendment No. 2, effective January 1, 2010, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Kenneth J. Webster (incorporated by reference to Exhibit 10.4 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended June 30, 2010 (File No. 001-11442)).*
- 10.10.3 Amendment No. 3, dated January 1, 2012, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Kenneth J. Webster (incorporated by reference to Exhibit 10.4 to the Registrant's Current Report on Form 8-K filed with the SEC on January 5, 2012 (File No. 001-11442)).*
- 10.10.4 Amendment No. 4, dated January 1, 2013, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Kenneth J. Webster (incorporated by reference to Exhibit 10.4 to the Registrant's Current Report on Form 8-K filed with the SEC on January 4, 2013 (File No. 001-11442)).*
- 10.10.5 Amendment No. 5, dated January 1, 2014, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Kenneth J. Webster (incorporated by reference to Exhibit 10.4 to the

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Registrant's Current Report on Form 8-K filed with the SEC on January 6, 2014 (File No. 001-11442)).*

10.10.6 Amendment No. 6, dated April 15, 2016, to the Employment Agreement dated February 26, 2008 by and between Chart Industries, Inc. and Kenneth J. Webster (incorporated by reference to Exhibit 10.2 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2016 (File No. 001-11442)).*

10.11 Employment Agreement, dated July 13, 2016, by and between Chart Industries, Inc. and William C. Johnson (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the SEC on July 14, 2016 (File No. 001-11442)).*

10.12 Employment Agreement, dated November 4, 2016, by and between Chart Industries, Inc. and Robert H. Wolfe.* (x)

10.13 Employment Agreement, dated April 15, 2016, by and between Chart Industries, Inc. and Mary C. Cook (incorporated by reference to Exhibit 10.3 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended March 31, 2016 (File No. 001-11442)).*

10.14 Form of Indemnification Agreement (incorporated by reference to Exhibit 10.20 to the Registrant's Registration Statement on Form S-1 (File No. 333-133254)).

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- 10.15 Base Call Option Transaction Confirmation, dated as of July 28, 2011, by and between Chart Industries, Inc. and JPMorgan Chase Bank, National Association, London Branch (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed with the SEC on August 3, 2011 (File No. 001-11442)).
- 10.15.1 Base Call Option Transaction Confirmation, dated as of July 28, 2011, by and between Chart Industries, Inc. and Morgan Stanley & Co. International plc (incorporated by reference to Exhibit 10.2 to the Registrant's Current Report on Form 8-K filed with the SEC on August 3, 2011 (File No. 001-11442)).
- 10.15.2 Base Warrants Transaction Confirmation, dated as of July 28, 2011, by and between Chart Industries, Inc. and JPMorgan Chase Bank, National Association, London Branch (incorporated by reference to Exhibit 10.3 to the Registrant's Current Report on Form 8-K filed with the SEC on August 3, 2011 (File No. 001-11442)).
- 10.15.3 Base Warrants Transaction Confirmation, dated as of July 28, 2011, by and between Chart Industries, Inc. and Morgan Stanley & Co. International plc (incorporated by reference to Exhibit 10.4 to the Registrant's Current Report on Form 8-K filed with the SEC on August 3, 2011 (File No. 001-11442)).
- 10.15.4 Base Capped Call Option Transaction Confirmation, dated as of July 28, 2011, by and between Chart Industries, Inc. and JPMorgan Chase Bank, National Association, London Branch (incorporated by reference to Exhibit 10.5 to the Registrant's Current Report on Form 8-K filed with the SEC on August 3, 2011 (File No. 001-11442)).
- 10.15.5 Base Capped Call Option Transaction Confirmation, dated as of July 28, 2011, by and between Chart Industries, Inc. and Morgan Stanley & Co. International plc (incorporated by reference to Exhibit 10.6 to the Registrant's Current Report on Form 8-K filed with the SEC on August 3, 2011 (File No. 001-11442)).
- 10.16 Agreement and Plan of Merger, dated as of July 23, 2012 by and among Chart Inc., Bison Corp., AirSep Corporation, Joseph L. Priest, as Representative, for purposes of Section 4.10 only, Joseph L. Priest and Ravinder K. Bansal, and for purposes of Section 9.14 only, Chart Industries, Inc. (incorporated by reference to Exhibit 2.1 to the Registrant's Current Report on 8-K filed with the SEC on July 23, 2012 (File No. 001-11442)).
- 10.16.1 Amendment No. 1 to Agreement and Plan of Merger, dated as of August 30, 2012 by and among Chart Inc., Bison Corp., AirSep Corporation, Joseph L. Priest, as Representative, for purposes of Section 4.10 only, Joseph L. Priest and Ravinder K. Bansal, and for purposes of Section 9.14 only, Chart Industries, Inc. (incorporated by reference to Exhibit 2.2 to the Registrant's Quarterly Report on Form 10-Q for the quarter ended September 30, 2012 (File No. 001-11442)).
- 10.17 Chart Industries, Inc. Cash Incentive Plan (incorporated by reference to Appendix A to the Registrant's definitive proxy statement filed with the SEC on April 8, 2014 (File No. 001-11442)).*
- 21.1 List of Subsidiaries. (x)
- 23.1 Consent of Independent Registered Public Accounting Firm. (x)
- 31.1 Rule 13a-14(a) Certification of the Company's Chief Financial Officer. (x)
- 31.2 Rule 13a-14(a) Certification of the Company's Chief Executive Officer. (x)

32.1 Section 1350 Certification of the Company's Chief Financial Officer. (xx)

32.2 Section 1350 Certification of the Company's Chief Executive Officer. (xx)

101.INS XBRL Instance Document (xxx)

101.SCH XBRL Taxonomy Extension Schema Document (xxx)

101.CAL XBRL Taxonomy Extension Calculation Linkbase Document (xxx)

101.DEF XBRL Taxonomy Extension Definition Linkbase Document (xxx)

101.LAB XBRL Taxonomy Extension Label Linkbase Document (xxx)

101.PRE XBRL Taxonomy Extension Presentation Linkbase Document (xxx)

(x) Filed herewith.

(xx) Furnished herewith.

In accordance with Rule 406T of Regulation S-T, the XBRL related information in Exhibit 101 to this Form 10-K shall not be deemed to be "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, or (xxx) otherwise subject to the liability of that section, and shall not be part of any registration statement or other document filed under the Securities Act of 1933 or Securities Exchange Act of 1934, except as shall be expressly set forth by specific reference in such filing.

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*Management contract or compensatory plan or arrangement.

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