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, 2019

OR

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

Commission file number 1-13179

FLOWSERVE CORPORATION
(Exact name of registrant as specified in its charter)

New York	**31-0267900**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
5215 N. O'Connor Boulevard Suite 2300, Irving, Texas	**75039**
(Address of principal executive offices)	(Zip Code)

(972) 443-6500
(Registrant's telephone number, including area code)

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

Title of Each Class	Trading Symbol	**Name of Each Exchange on Which Registered**
Common Stock, $1.25 Par Value	FLS	New York Stock Exchange
1.25% Senior Notes due 2022	FLS22A	New York Stock Exchange

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

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

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

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

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

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

Large accelerated filer	☑	Accelerated filer	☐	Non-accelerated filer	☐	Smaller reporting company	☐
Emerging growth company	☐						

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

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

The aggregate market value of the common stock held by non-affiliates of the registrant, computed by reference to the closing price of the registrant's common stock as reported on June 28, 2019 (the last business day of the registrant's most recently completed second fiscal quarter), was approximately $3,069,855,077. For purposes of the foregoing calculation only, all directors, executive officers and known 5% beneficial owners have been deemed affiliates.

Number of the registrant's common shares outstanding as of February 12, 2020 was 130,901,014.

DOCUMENTS INCORPORATED BY REFERENCE

Certain information contained in the definitive proxy statement for the registrant's 2020 Annual Meeting of Shareholders scheduled to be held on May 21, 2020 is incorporated by reference into Part III hereof.

FLOWSERVE CORPORATION
FORM 10-K

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PART I

ITEM 1. *BUSINESS*

OVERVIEW

Flowserve Corporation is a world leading manufacturer and aftermarket service provider of comprehensive flow control systems. Flowserve Corporation as it exists today was created in 1997 through the merger of two leading fluid motion and control companies — BW/IP and Durco International. Under the name of a predecessor entity, we were incorporated in the State of New York on May 1, 1912, but some of our heritage product brand names date back to our founding in 1790. Over the years, we have evolved through organic growth and strategic acquisitions, and our over 225-year history of Flowserve heritage brands serves as the foundation for the breadth and depth of our products and services today. Unless the context otherwise indicates, references to "Flowserve," "the Company" and such words as "we," "our" and "us" include Flowserve Corporation and its subsidiaries.

We develop and manufacture precision-engineered flow control equipment integral to the movement, control and protection of the flow of materials in our customers' critical processes. Our product portfolio of pumps, valves, seals, automation and aftermarket services supports global infrastructure industries, including oil and gas, chemical, power generation (including nuclear, fossil and renewable) and water management, as well as certain general industrial markets where our products and services add value. Through our manufacturing platform and global network of Quick Response Centers ("QRCs"), we offer a broad array of aftermarket equipment services, such as installation, advanced diagnostics, repair and retrofitting.

We sell our products and services to more than 10,000 companies, including some of the world's leading engineering, procurement and construction firms ("EPC"), original equipment manufacturers, distributors and end users. Our products and services are used in several distinct industries having a broad geographic reach. Our bookings mix by industry in 2019 and 2018 consisted of:

	2019	2018
• oil and gas	41%	38%
• general industries(1)	22%	25%
• chemical(2)	22%	22%
• power generation	11%	11%
• water management	4%	4%

(1) General industries include mining and ore processing, pulp and paper, food and beverage and other smaller applications, as well as sales to distributors whose end customers typically operate in the industries we primarily serve.

(2)Chemical industry is comprised of chemical-based and pharmaceutical products.

We have pursued a strategy of industry diversity and geographic breadth to mitigate the impact on our business of normal economic downturns in any one of the industries or in any particular part of the world we serve. For events that may occur and adversely impact our business, financial condition, results of operations and cash flows, refer to "Item 1A. Risk Factors" of this Annual Report on Form 10-K for the year ended December 31, 2019 ("Annual Report"). For information on our sales and long-lived assets by geographic areas, see Note 18 to our consolidated financial statements included in "Item 8. Financial Statements and Supplementary Data" ("Item 8") of this Annual Report.

During the first quarter of 2019, we determined that there were meaningful operational synergies and benefits to combining our previously reported Engineered Product Division ("EPD") and Industrial Product Division ("IPD") segments into one reportable segment, Flowserve Pump Division ("FPD"). As a result, we implemented a reorganization of our operating segments and report our financial information reflecting two segments: FPD and Flow Control Division ("FCD"). The reorganization of the segments reflects how our chief operating decision maker (Chief Executive Officer) regularly reviews financial information to allocate resources and assess performance. Prior periods' financial information was retrospectively adjusted to reflect the new reportable segment structure. Sales to external customers, intersegment sales, operating profit and the presentation of certain other financial information by segment are reported in Note 18 to our consolidated financial statements included in Item 8 of this Annual Report and in the Management's Discussion and Analysis of Financial Condition and Results of Operations.

Our segments share a focus on industrial flow control technology and benefit from our global footprint and our economies of scale in reducing administrative and overhead costs to serve customers more cost effectively. All segments share certain resources and functions, including elements of research and development ("R&D"), supply chain, safety, quality assurance and administrative functions that provide efficiencies and an overall lower cost structure.

Our operations leadership reports to our Chief Executive Officer and the segments share leadership for operational support functions such as R&D, marketing and supply chain. We believe this leadership structure positions the Company to leverage operational excellence, cost reduction initiatives and internal synergies across our entire operating platform to drive further growth and increase in shareholder value.

In 2018 we launched and committed resources to our Flowserve 2.0 Transformation ("Flowserve 2.0 Transformation"), a program designed to transform our business model to drive operational excellence, reduce complexity, accelerate growth, expand margins, increase capital efficiency and improve organizational health. For further discussion of the Flowserve 2.0 Transformation program refer to Note 20 to our consolidated financial statements included in Item 8 of this Annual Report.

Strategies

Our overarching objectives are to be a leader in each of the market segments we serve and become the employer of choice in the flow control industry. Additionally, we seek to be recognized by our customers as the most trusted brand of flow control technology in terms of reliability and quality, which we believe will help maximize shareholder value.

In pursuit of these objectives, we maintain a rolling, five-year strategic plan that takes a balanced approach to integrating both short-term and long-term initiatives in four key areas: People, Process & Technology, Customer and Finance.

People

With the goal of developing and maintaining a people-first culture that produces the finest talent, we focus on several elements in our strategic efforts to continuously enhance our organizational capability, including: (i) fully committing to providing a safe work environment for all our associates, worldwide, (ii) upholding a high-performance workforce, that is empowered, accountable and flexible, (iii) becoming the employer of choice by fostering a people-first culture and (iv) recruiting, developing and retaining a global and diverse workforce.

Process and Technology

With the goal of improving our productivity and delivering a continuous stream of innovative solutions to our customers, we focus on select strategies relating to: (i) developing and maintaining an enterprise-first business approach across all operating units and functional organizations, (ii) simplifying our business processes and optimizing corporate structural costs, (iii) significantly reducing our product cost and rationalizing our product portfolio and (iv) becoming the technical leader in the flow control industry.

Customer

With the goal of achieving the highest level of customer satisfaction amongst our peers, we focus on select strategies related to rigorous and disciplined selection of target markets and customers, while maintaining competitive lead times and emphasizing the highest levels of on-time delivery and quality. We seek to provide an outstanding experience for our customers over the entire product lifecycle by providing unique, integrated flow-control solutions that solve real-world application problems in our customers' facilities.

Finance

With the goal of growing the value of our enterprise, we focus on select strategies we believe will increase our revenue above the rate of market growth, while optimizing performance in terms of gross margin, selling, general and administrative ("SG&A") expense, operating margin, cash flow and primary working capital.

Flowserve 2.0 Transformation

The goals of the Flowserve 2.0 Transformation are to (i) accelerate revenue growth, (ii) drive margin expansion, (iii) increase capital efficiency and (iv) improve organizational health. The Flowserve 2.0 Transformation consists of over a hundred individual projects spread over six work-streams (operations, commercial, growth, aftermarket, cost structure and working capital). A majority of these projects are primarily focused on accelerating revenue growth, while the balance are primarily focused on cost reduction and capital efficiency. The projects include elements of organizational design, business process definition, process automation and metrics. Individual projects vary in terms of time to execute, ranging from one year for simple quick-fix efforts to five years for more complex infrastructure efforts. A structured process has been created to ensure that each project follows common milestones and delivers value over its lifecycle, with a governance process that oversees the portfolio to ensure that time-phased trade-offs between cost and benefits are proactively managed. The project portfolio is actively covered by a dedicated transformation office to ensure that projects are managed from inception to execution to protect the long-term value of the transformation.

Competition

Despite consolidation activities in past years, the markets for our products remain highly competitive, with primary competitive drivers being price, reputation, project management, timeliness of delivery, quality, proximity to service centers and technical expertise, as well as contractual terms and previous installation history. In the pursuit of large capital projects, competitive drivers and competition vary depending on the industry and products involved. Industries experiencing slow growth generally tend to have a competitive environment more heavily influenced by price due to supply outweighing demand and price competition tends to be more significant for original equipment orders than aftermarket services. Considering the current forecasts for 2020, pricing for original equipment orders may continue to be a particularly influential competitive factor. The unique competitive environments in our business segments are discussed in more detail under the “Business Segments” heading below.

In the aftermarket portion of our business, we compete against large, well-established national and global competitors and, in some markets, against regional and local companies. In the oil and gas and chemical industries, the primary competitors for aftermarket services tend to be customers’ own in-house capabilities. In the nuclear power generation industry, we possess certain competitive advantages due to our "N Stamp" certification, which is a prerequisite to serve customers in that industry, as well as our considerable base of proprietary knowledge. Aftermarket competition for standardized products is aggressive due to the existence of common standards allowing for easier replacement or repair of the installed products.

In the sale of aftermarket products and services, we benefit from our large installed base of pumps, valves and seals, which continually require maintenance, repair and replacement parts due to the nature of the products and the conditions under which they operate. Timeliness of delivery, quality and the proximity of service centers are important customer considerations when selecting a provider for aftermarket products and services. In geographic regions where we are locally positioned to provide a quick response, customers have traditionally relied on us, rather than our competitors, for aftermarket products relating to our highly-engineered and customized products, although we are seeing increased competition in this area.

Generally, our customers attempt to reduce the number of vendors from which they purchase, thereby reducing the size and diversity of their supply chain. Although vendor reduction programs could adversely affect our business, we have been successful in establishing long-term supply agreements with a number of customers. While the majority of these agreements do not provide us with exclusive rights, they can provide us a "preferred" status with our customers and thereby increase opportunities to win future business. We also utilize our LifeCycle Advantage program to establish fee-based contracts to manage customers’ aftermarket requirements. These programs provide an opportunity to manage the customer’s installed base and expand the business relationship with the customer.

Our ability to use our portfolio of products, solutions and services to meet customer needs is a competitive strength. Our market approach is to create value for our customers throughout the life cycle of their investments in flow control management. We continue to explore and develop potential new offerings in conjunction with our customers. In the early phases of project design, we endeavor to create value in optimizing the selection of equipment for the customer’s specific application, as we are capable of providing technical expertise on product and system capabilities even outside the scope of our specific products, solutions and services. After the equipment is constructed and delivered to the customer’s site, we continue to create value through our aftermarket capabilities by optimizing the performance of the equipment over its operational life. Our skilled service personnel can provide these aftermarket services for our products, as well as many competitors’ products, within the installed base. This value is further enhanced by the global reach of our QRCs and, when combined with our other solutions for our customers’ flow control management needs, allows us to create value for our customers during all phases of the capital and operating expenditure cycles.

Customers

We sell to a wide variety of customers globally including leading EPC firms, original equipment manufacturers, distributors and end users in several distinct industries: oil and gas, chemical, power generation, water management and general industries. We do not have sales to any individual customer that represent 10% or more of consolidated 2019 revenues. Customer information relating to each of our business segments is discussed in more detail under the "Business Segments" heading below.

We are not normally required to carry unusually high amounts of inventory to meet customer delivery requirements, although higher backlog levels and longer lead times generally require higher amounts of inventory. We typically require advance cash payments from customers on longer lead time projects to help offset our investment in inventory. We have initiated programs targeted at improving our operational effectiveness to reduce our overall working capital needs. While we do provide cancellation policies through our contractual relationships, we generally do not provide rights of product return for our customers.

Selling and Distribution

We primarily distribute our products through direct sales by employees assigned to specific regions, industries or products. In addition, we use distributors and sales representatives to supplement our direct sales force in countries where it is more appropriate due to business practices or customs, or whenever the use of direct sales staff is not economically efficient. We generate a majority of our sales leads through existing relationships with vendors, customers and prospects or through referrals.

Intellectual Property

We own a number of trademarks and patents relating to the names and designs of our products. We consider our trademarks and patents to be valuable assets of our business. In addition, our pool of proprietary information, consisting of know-how and trade secrets related to the design, manufacture and operation of our products, is considered particularly valuable. Accordingly, we take proactive measures to protect such proprietary information. We generally own the rights to the products that we manufacture and sell and are unencumbered by licensing or franchise agreements. Our trademarks can typically be renewed indefinitely as long as they remain in use, whereas our existing patents generally expire 10 to 20 years from the dates they were filed, which has occurred at various times in the past. We do not believe that the expiration of any individual patent will have a material adverse impact on our business, financial condition or results of operations.

Raw Materials

The principal raw materials used in manufacturing our products are readily available and include ferrous and non-ferrous metals in the form of bar stock, machined castings, fasteners, forgings and motors, as well as silicon, carbon faces, gaskets and fluoropolymer components. A substantial volume of our raw materials is purchased from outside sources, and we have been able to develop a robust supply chain and anticipate no significant shortages of such materials in the future. We continually monitor the business conditions of our suppliers to manage competitive market conditions and to avoid potential supply disruptions. We continue to expand global sourcing to capitalize on localization in emerging markets and low-cost sources of purchased goods balanced with efficient consolidated and compliant logistics.

Metal castings used in the manufacture of our pump, valve, and mechanical seals are purchased from qualified and approved foundry sources. We remain vertically integrated with metal castings in certain strategic product families.

Concerning the products we supply to customers in the nuclear power generation industry, suppliers of raw materials for nuclear power generation markets must be qualified to meet the requirements of nuclear industry standards and governmental regulations. Supply channels for these materials are currently adequate, and we do not anticipate difficulty in obtaining such materials in the future.

Employees and Labor Relations

We have approximately 17,000 employees globally as of December 31, 2019. In the United States ("U.S."), a portion of the hourly employees at our pump manufacturing plant located in Vernon, California, our valve manufacturing plant located in Lynchburg, Virginia and our pattern storage facility located in Dayton, Ohio, are represented by unions. Additionally, some employees at select facilities in the following countries are unionized or have employee works councils: Argentina, Australia, Austria, Brazil, Finland, France, Germany, India, Italy, Japan, Mexico, The Netherlands, South Africa, Spain, Sweden and the United Kingdom ("U.K."). We believe relations with our employees throughout our operations are generally satisfactory, including those employees represented by unions and employee works councils. No unionized facility accounted for more than 10% of our consolidated 2019 revenues.

Environmental Regulations and Proceedings

We are subject to environmental laws and regulations in all jurisdictions in which we have operating facilities. These requirements primarily relate to the generation and disposal of waste, air emissions and waste water discharges. We periodically make capital expenditures to enhance our compliance with environmental requirements, as well as to abate and control pollution. At present, we have no plans for any material capital expenditures for environmental control equipment at any of our facilities. However, we have incurred and continue to incur operating costs relating to ongoing environmental compliance matters. Based on existing and proposed environmental requirements and our anticipated production schedule, we believe that future environmental compliance expenditures will not have a material adverse effect on our financial condition, results of operations or cash flows.

We use hazardous substances and generate hazardous wastes in many of our manufacturing and foundry operations. Most of our current and former properties are or have been used for industrial purposes and some may require clean-up of historical contamination. During the due diligence phase of our acquisitions, we conduct environmental site assessments to identify potential environmental liabilities and required clean-up measures. We are currently conducting follow-up investigation and/or remediation activities at those locations where we have known environmental concerns. We have cleaned up a majority of the sites with known historical contamination and are addressing the remaining identified issues.

Over the years, we have been involved as one of many potentially responsible parties ("PRP") at former public waste disposal sites that are or were subject to investigation and remediation. We are currently involved as a PRP at five Superfund sites. The sites are in various stages of evaluation by government authorities. Our total projected "fair share" cost allocation at these five sites is expected to be immaterial. See "Item 3. Legal Proceedings" included in this Annual Report for more information.

We have established reserves that we currently believe to be adequate to cover our currently identified on-site and off-site environmental liabilities.

Exports

Our export sales from the U.S. to foreign unaffiliated customers were $300.9 million in 2019, $234.3 million in 2018 and $258.3 million in 2017.

Licenses are required from U.S. and other government agencies to export certain products. In particular, products with nuclear power generation and/or military applications are restricted, as are certain other pump, valve and seal products.

BUSINESS SEGMENTS

In addition to the business segment information presented below, Note 18 to our consolidated financial statements in Item 8 of this Annual Report contains additional financial information about our business segments and geographic areas in which we have conducted business in 2019, 2018 and 2017.

FLOWSERVE PUMP DIVISION

Our largest business segment is FPD, through which we design, manufacture, pre-test, distribute and service specialty and highly-engineered custom and pre-configured pumps and pump systems, mechanical seals, auxiliary systems, replacement parts and upgrades and related aftermarket services. FPD also manufactures replacement pumps and upgrades and provides a full array of replacement parts, repair and support services (collectively referred to as "aftermarket"). FPD products and services are primarily used by companies that operate in the oil and gas, petrochemical, chemical, power generation, water management and general industries. We market our pump and mechanical seal products through our global sales force and our regional QRCs and service and repair centers or through independent distributors and sales representatives. A portion of our mechanical seal products are sold directly to other original equipment manufacturers for incorporation into their rotating equipment requiring mechanical seals.

Our pump products are manufactured in a wide range of metal alloys and with a variety of configurations to reliably meet the operating requirements of our customers. Mechanical seals are critical to the reliable operation of rotating equipment in that they prevent leakage and emissions of hazardous substances from the rotating equipment and reduce shaft wear on the equipment caused by the use of non-mechanical seals. We also manufacture a gas-lubricated mechanical seal that is used in high-speed compressors for gas pipelines and in the oil and gas production and process markets. Our products are currently manufactured in 39 manufacturing facilities worldwide, 13 of which are located in Europe, 12 in North America, eight in Asia Pacific and six in Latin America, and we have 144 QRCs, including those co-located in manufacturing facilities and/or shared with FCD.

We also conduct business through strategic foreign joint ventures. We have six unconsolidated joint ventures that are located in Chile, China, India, Saudi Arabia, South Korea and the United Arab Emirates, where a portion of our products are manufactured, assembled or serviced in these territories. These relationships provide numerous strategic opportunities, including increased access to our current and new markets, access to additional manufacturing capacity and expansion of our operational platform to support best-cost sourcing initiatives and balance capacity demands for other markets.

FPD Products

We manufacture more than 40 different active types of pumps and approximately 185 different models of mechanical seals and sealing systems. The following is a summary list of our FPD product types and globally recognized brands:

FPD Product Types

Single and Multistage Between Bearings Pumps
- Single Case — Axially Split
- Single Case — Radially Split
- Double Case

Overhung Pumps
- Chemical Process ASME and ISO
- Industrial Process
- Slurry and Solids Handling
- Metallic & Lined Magnetic Drive Process

Positive Displacement Pumps
- Rotary Multiphase
- Rotary Screw

Vertical Pumps
- Deepwell Submersible
- Slurry and Solids Handling
- Sump & Cantilever
- Vertical Inline
- Vertical Line Shaft
- Vertical Canned Shaft
- Wet Pit, Double Case API & Double

Positive Displacement Pumps
- Gear

Single Stage Overhung Pumps
- API Process

Between Bearings Pumps
- Single Case — Radially Split
- Side Channel Multistage
- Split Case — Axially Split
- Split Case — Radially Split

Mechanical Seals and Seal Support Systems
- Dry-Running Seals
- Barrier Fluids and Lubricants
- Bearing Isolators
- Compressor Seals
- Gas Barrier Seals
- Mixer Seals
- Standard Cartridge Seals
- Seal Support Systems

Vacuum Systems
- Liquid Ring
- LR Systems
- Dry Systems

Specialty Products
- Ag Chem
- Barge Pumps
- Cryogenic Pumps
- Concrete Volute Pumps
- Ebullator Recycle Pumps
- Geothermal Deepwell Pumps
- Molten Salt Pumps
- Nuclear Pumps
- Nuclear Seals
- Submersible Pumps
- Solids Handling Submersible
- Wireless Transmitters
- Power Recovery — DWEER
- Power Recovery — Hydro Turbine
- Energy Recovery Devices
- Hydraulic Decoking Systems
- API Slurry Pumps

FPD Brand Names

- BW Seals
- Byron Jackson
- Calder Energy Recovery Devices
- Durametallic
- Durco
- Five Star Seal
- Flowserve
- GASPAC™
- Halberg
- IDP
- Innomag
- Interseal
- Lawrence
- LifeCycle Advantage
- Labour
- Meregalli
- Niigata Worthington
- QRC™
- Pacific
- Pacific Weitz
- Pac-Seal
- ReadySeal
- Scienco
- SIHI
- TKL
- United Centrifugal
- Western Land Roller
- Worthington
- Worthington-Simpson

FPD Services

We market our pump products through our worldwide sales force, regional service and repair centers, independent distributors and sales representatives. We also provide engineered aftermarket services through our global network of 144 QRCs, some of which are co-located in manufacturing facilities, in 44 countries. Our FPD service personnel provide a comprehensive set of equipment services for flow management control systems, including installation, commissioning services, seal systems spare parts, repairs, advanced diagnostics, re-rate and upgrade solutions and retrofit programs, machining and comprehensive asset management solutions. We provide asset management services and condition monitoring for rotating equipment through special contracts with many of our customers that reduce maintenance costs. A large portion of FPD's service work is performed on a quick response basis, and we offer 24-hour service in all of our major markets.

FPD New Product Development

Our investments in new product R&D continue to focus on increasing the capability of our products as customer applications become more advanced, demanding greater levels of production (i.e., flow and power) and under more extreme conditions (i.e., erosive, corrosive and temperature) beyond the level of traditional technology. We will invest in our product platform to expand and enhance our products offered to the global chemical industry. We continue to develop innovations that improve our competitive position in the engineered equipment industry, specifically upstream, offshore and downstream applications for the oil and gas market. Continued engagement with our end users is exemplified through completion of advancements that significantly improve energy efficiency, reduce total cost-of-ownership and enhance safety.

As new sources of energy generation are explored, we continue to develop new product designs to support the most critical applications in the power generation market. New designs and qualification test programs continue to support the critical services found in the coal fired, combined cycle, small modular nuclear and concentrated solar power generation plant.

We continue to address our core products with design enhancements that improve performance, reduce costs, extend operating life between required maintenance periods and reduce the lead times in which we can deliver our products. Our engineering teams continue to apply and develop sophisticated design technology and methods supporting continuous improvement of our proven technology. Additionally, we are incentivizing our operations and tracking the R&D projects more closely, which is leading to broader engagement in developing new products.

We continue to advance our Intelligent Performance Solutions ("IPS") Insight platform. This platform utilizes a combination of our developed technologies and leading edge technology partners to increase our remote monitoring, diagnostics, asset management and service capabilities for our end-user customers. These technologies include intelligent devices, advanced communication and security protocols, wireless and satellite communications and web-enabled data convergence. Additionally, we have been exploring additive manufacturing opportunities in our products and auxiliary systems.

None of these newly developed products or services required the investment of a material amount of our assets or was otherwise material to our business.

FPD Customers

Our customer mix is diversified and includes leading EPC firms, major national oil companies, international oil companies, equipment end users in our served markets, other original equipment manufacturers, distributors and end users. Our sales mix of original equipment products and aftermarket products and services diversifies our business and helps mitigate the impact of normal economic cycles on our business. Our sales are diversified among several industries, including oil and gas, petrochemical, chemical, power generation, water management and general industries.

FPD Competition

The pump and mechanical seal industry is highly fragmented, with thousands of competitors globally. We compete, however, primarily with a limited number of large companies operating on a global scale. There are also a number of smaller, newer entrants in some of our emerging markets. Competition among our closest competitors is generally driven by delivery times, application knowledge, experience, expertise, price, breadth of product offerings, contractual terms, previous installation history and reputation for quality. Some of our largest industry competitors include: Sulzer Pumps; Ebara Corp.; SPX FLOW, Inc.; Eagle Burgmann, which is a joint venture of two traditional global seal manufacturers, A. W. Chesterton Co. and AES Corp.; John Crane Inc., a unit of Smiths Group Plc; Weir Group Plc.; ITT Industries; and KSB SE & Co. KGaA.

The pump and mechanical seal industry continues to undergo considerable consolidation, which is primarily driven by (i) the need to lower costs through reduction of excess capacity and (ii) customers' preference to align with global full service suppliers to simplify their supplier base. Despite the consolidation activity, the market remains highly competitive.

We believe that our strongest sources of competitive advantage rest with our extensive range of pumps for the oil and gas, petrochemical, chemical and power generation industries, our large installed base of products, our strong customer relationships, our high technology, our more than 225 years of experience in manufacturing and servicing pumping equipment, our reputation for providing quality engineering solutions and our ability to deliver engineered new seal product orders within 72 hours from the customer's request.

FPD Backlog

FPD's backlog of orders as of December 31, 2019 was $1,560.9 million, compared with $1,286.2 million as of December 31, 2018. We expect to recognize revenue on approximately 88% of December 31, 2019 backlog during 2020.

FLOW CONTROL DIVISION

FCD designs, manufactures, distributes and services a broad portfolio of engineered and industrial valve and automation solutions, including isolation and control valves, actuation, controls and related equipment. FCD leverages its experience and application know-how by offering a complete menu of engineering and project management services to complement its expansive product portfolio. FCD products are used to control, direct and manage the flow of liquids and gases and are an integral part of any flow control system. Our valve products are most often customized or engineered to perform specific functions within each customer's unique flow control environment.

Our flow control products are primarily used by companies operating in the chemical, power generation, oil and gas, water management and general industries. Our products are currently manufactured in 21 principal manufacturing facilities, five of which are located in the U.S., 10 located in Europe, five located in Asia Pacific and one located in Latin America. FCD operates 28 QRCs worldwide, including seven sites in Europe, nine in North America,10 in Asia Pacific and two in Latin America, including those co-located in manufacturing facilities.

FCD Products

Our valve, automation and controls product and solutions portfolio represent one of the most comprehensive in the flow control industry. Our products are used in a wide variety of applications, from general service to the most severe and demanding services, including those involving high levels of corrosion, extreme temperatures and/or pressures, zero fugitive emissions and emergency shutdown.

Our "smart" valve and diagnostic technologies integrate sensors, microprocessor controls and software into high performance integrated control valves, digital positioners and switchboxes for automated on/off valve assemblies and electric actuators. These technologies permit real-time system analysis, system warnings and remote indication of asset health. These technologies have been developed in response to the growing demand for reduced maintenance, improved process control efficiency and digital communications at the plant level. We are committed to further enhancing the quality of our product portfolio by continuing to upgrade our existing offerings with cutting-edge technologies.

Our valve automation products encompass a broad range of pneumatic, electric, hydraulic and stored energy actuation designs to take advantage of whatever power source the customer has available. FCD's actuation products can utilize the process fluid flowing through the pipeline as a source of power to actuate the valve. Our actuation products also cover one of the widest ranges of output torques in the industry, providing the ability to automate anything from the smallest linear globe valve to the largest multi-turn gate valve. Most importantly, FCD combines best-in-class mechanical designs with the latest in digital controls in order to provide complete integrated automation solutions that optimize the combined valve-actuator-controls package.

The following is a summary list of our valve and automation products and globally recognized brands:

FCD Product Types

- Valve Automation Systems
- Control Valves
- Ball Valves
- Gate Valves
- Globe Valves
- Check Valves
- Butterfly Valves
- Lined Plug Valves
- Lined Ball Valves
- Lubricated Plug Valves
- Non-Lubricated Plug Valves
- Integrated Valve Controllers
- Diagnostic Software
- Electro Pneumatic Positioners
- Digital Positioners
- Pneumatic Positioners
- Intelligent Positioners
- Electric/Electronic Actuators
- Pneumatic Actuators
- Hydraulic Actuators
- Diaphragm Actuators
- Direct Gas and Gas-over-Oil Actuators
- Limit Switches
- Digital Communications
- Valve and Automation Repair Services

FCD Brand Names

- Accord
- Anchor/Darling
- Argus
- Atomac
- Automax
- Durco
- Edward
- Flowserve
- Kammer
- Limitorque
- McCANNA/MARPAC
- NAF
- Noble Alloy
- Norbro
- Nordstrom
- PMV
- Serck Audco
- Schmidt Armaturen
- Valbart
- Valtek
- Worcester Controls

FCD Services

Our service personnel provide comprehensive equipment maintenance services for flow control systems, including advanced diagnostics, repair, installation, commissioning, retrofit programs and field machining capabilities. A large portion of our service work is performed on a quick response basis, which includes 24-hour service in all of our major markets. We also provide in-house repair and return manufacturing services worldwide through our manufacturing facilities. We believe our ability to offer comprehensive, quick turnaround services provides us with a unique competitive advantage and unparalleled access to our customers' installed base of flow control products.

FCD New Product Development

Our R&D investment is focused on areas that will advance our technological leadership and further differentiate our competitive advantage from a product perspective. Investment has been focused on significantly enhancing the digital integration and interoperability of valve top-works (e.g., positioners, actuators, limit switches and associated accessories) with Distributed Control Systems ("DCS"). We continue to pursue the development and deployment of next-generation hardware and software for valve diagnostics and the integration of the resulting device intelligence through the DCS to provide a practical and effective asset management capability for the end user. In addition to developing these new capabilities and value-added services, our investments also include product portfolio expansion in the areas of higher tier offering and severe service applications such as noise and cavitation reduction. These investments are made by adding new resources and talent to the organization, as well as leveraging the experience of FPD and increasing our collaboration with third parties. We expect to continue our R&D investments in the areas discussed above.

None of these newly developed valve products or services required the investment of a material amount of our assets or was otherwise material.

FCD Customers

Our customer mix spans several markets, including the chemical, power generation, oil and gas, water management, pulp and paper, mining and other general industries. Our product mix includes original equipment and aftermarket parts and services. FCD contracts with a variety of customers, ranging from EPC firms, to distributors, end users and other original equipment manufacturers.

FCD Competition

While in recent years the valve market has undergone a significant amount of consolidation, the market remains highly fragmented. Some of the largest valve industry competitors include Emerson Electric Co., Cameron International Corp. (a Schlumberger company), Baker Hughes, Rotork plc and Crane Co.

Our market research and assessments indicate that the top 10 global valve manufacturers collectively comprise less than 15% of the total valve market. Based on independent industry sources, we believe that FCD is the second largest industrial valve supplier in the world. We believe that our strongest sources of competitive advantage rest with our comprehensive portfolio of valve products and services, our ability to provide complementary pump and aftermarket products and services, our focus on execution and our expertise in severe corrosion and erosion applications.

FCD Backlog

FCD’s backlog of orders as of December 31, 2019 was $600.1 million, compared with $608.4 million as of December 31, 2018. We expect to recognize revenue on approximately 90% of December 31, 2019 backlog during 2020.

AVAILABLE INFORMATION

We maintain an Internet web site at www.flowserve.com. Our Annual Reports 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) of the Securities Exchange Act of 1934 are made available free of charge through the “Investor Relations” section of our Internet web site as soon as reasonably practicable after we electronically file the reports with, or furnish the reports to, the U.S. Securities and Exchange Commission ("SEC"). Reports, proxy statements and other information filed or furnished with the SEC are also available at www.sec.gov.

Also available on our Internet web site are our Corporate Governance Guidelines for our Board of Directors and Code of Ethics and Business Conduct, as well as the charters of the Audit, Finance and Risk, Organization and Compensation and Corporate Governance and Nominating Committees of our Board of Directors and other important governance documents. All of the foregoing documents may be obtained through our Internet web site as noted above and are available in print without charge to shareholders who request them. Information contained on or available through our Internet web site is not incorporated into this Annual Report or any other document we file with, or furnish to, the SEC.

ITEM 1A. *RISK FACTORS*

When the factors, events, and contingencies discussed below or elsewhere in this Annual Report materialize, our business, financial condition, results of operations, cash flows, reputation or prospects could be materially adversely affected. While we believe all known material risks are disclosed, additional risks and uncertainties not presently known to us, or that we currently deem immaterial, may also materially adversely affect our business, financial condition, results of operations, cash flows, reputation or prospects. Because of the risk factors discussed below and elsewhere in this Annual Report and in other filings we make with the SEC, as well as other variables affecting our operating results, past financial performance may not be a reliable indicator of future performance, historical trends should not be used to anticipate results or trends in future periods and actual results could differ materially from those projected in the forward-looking statements contained in this Annual Report.

Our business depends on our customers' levels of capital investment and maintenance expenditures, which in turn are affected by numerous factors, including changes in the state of domestic and global economies, global energy demand and the liquidity cyclicality and condition of global credit and capital markets, any of which could impact the ability or willingness of our customers to invest in our products and services and adversely affect our financial condition, results of operations and cash flow.

Demand for most of our products and services depends on the level of new capital investment and planned maintenance expenditures by our customers. The level of capital expenditures by our customers depends, in turn, on general economic conditions, availability of credit, economic conditions within their respective industries and expectations of future market behavior. Additionally, volatility in commodity prices can negatively affect the level of these activities and can result in postponement of capital spending decisions or the delay or cancellation of existing orders. The ability of our customers to finance capital investment and maintenance is also affected by factors independent of the conditions in their industry, such as the condition of global credit and capital markets.

The businesses of many of our customers, particularly oil and gas companies, chemical companies and general industrial companies, are to varying degrees cyclical and have experienced periodic downturns. Our customers in these industries, particularly those whose demand for our products and services is primarily profit-driven, historically have tended to delay large capital projects, including expensive maintenance and upgrades, during economic downturns. For example, our chemical customers generally tend to reduce their spending on capital investments and operate their facilities at lower levels in a soft economic environment, which reduces demand for our products and services. Additionally, fluctuating energy demand forecasts and lingering uncertainty concerning commodity pricing, specifically the price of oil, can cause our customers to be more conservative in their capital planning, which reduces demand for our products and services. Reduced demand for our products and services could result in the delay or cancellation of existing orders or lead to excess manufacturing capacity, which unfavorably impacts our absorption of fixed manufacturing costs. This reduced demand may also erode average selling prices in our industry. Any of these results could adversely affect our business, financial condition, results of operations and cash flows.

Additionally, our customers sometimes delay capital investment and maintenance even during favorable conditions in their industries or markets. Despite these favorable conditions, the general health of global credit and capital markets and our customers' ability to access such markets impacts investments in large capital projects, including necessary maintenance and upgrades. In addition, the liquidity and financial position of our customers impacts capital investment decisions and their ability to pay in full and/or on a timely basis. Any of these factors, whether individually or in the aggregate, could have a material adverse effect on our customers and, in turn, our business, financial condition, results of operations and cash flows.

Volatility in commodity prices, effects from credit and capital market conditions and global economic growth forecasts has in the past and may in the future prompt customers to delay or cancel existing orders, which could adversely affect the viability of our backlog and could impede our ability to realize revenues on our backlog.

Our backlog represents the value of uncompleted customer orders. While we cannot be certain that reported backlog will be indicative of future results, our ability to accurately value our backlog can be adversely affected by numerous factors, including the health of our customers' businesses and their access to capital, volatility in commodity prices (e.g., copper, nickel, stainless steel) and economic uncertainty. While we attempt to mitigate the financial consequences of order delays and cancellations through contractual provisions and other means, if we were to experience a significant increase in order delays or cancellations that can result from the aforementioned economic conditions or other factors beyond our control, it could impede or delay our ability to realize anticipated revenues on our backlog. Such a loss of anticipated revenues could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Our inability to deliver our backlog on time could affect our revenues, future sales and profitability and our relationships with customers.

At December 31, 2019, our backlog was $2.2 billion. In 2020, our ability to meet customer delivery schedules for backlog is dependent on a number of factors including, but not limited to, sufficient manufacturing plant capacity, adequate supply channel access to the raw materials and other inventory required for production, an adequately trained and capable workforce, project engineering expertise for certain large projects and appropriate planning and scheduling of manufacturing resources. Our manufacturing plant operations, capacity and supply chain are subject to disruption as a result of equipment failure, severe weather conditions and other natural or manmade disasters, including power outages, fires, explosions, terrorism, cyber-based attacks, conflicts or unrest, epidemics (including the ongoing coronavirus outbreak emanating from China) or pandemics, labor disputes, acts of God, or other reasons. We may also encounter capacity limitations due to changes in demand despite our forecasting efforts. Many of the contracts we enter into with our customers require long manufacturing lead times and contain penalty clauses related to late delivery. Failure to deliver in accordance with contract terms and customer expectations could subject us to financial penalties, damage existing customer relationships, increase our costs, reduce our sales and have a material adverse effect on our business, financial condition, results of operations and cash flows.

Failure to successfully execute and realize the expected financial benefits from our transformation and strategic realignment and other cost-saving initiatives could adversely affect our business.

In the second quarter of 2018, we launched and committed resources to our Flowserve 2.0 Transformation, a program designed to transform our business model to drive operational excellence, reduce complexity, accelerate growth, improve organizational health and better leverage our existing global platform.

While we have experienced significant financial benefits from our Flowserve 2.0 Transformation, we may not realize the full benefits that we currently expect within the anticipated time frame or at all. Adverse effects from our execution of transformation and realignment activities could interfere with our realization of anticipated synergies, customer service improvements and cost savings from these strategic initiatives. Additionally, our ability to fully realize the benefits and implement the transformation and realignment programs is limited by the terms of our credit facilities and other contractual commitments. Moreover, because such expenses are difficult to predict and are necessarily inexact, we may incur substantial expenses in connection with the execution of our transformation and realignment plans in excess of what is currently anticipated. Further, transformation and realignment activities are a complex and time-consuming process that can place substantial demands on management, which could divert attention from other business priorities or disrupt our daily operations. Any of these failures could, in turn, materially adversely affect our business, financial condition, results of operations and cash flows, which could constrain our liquidity.

If these measures are not successful or sustainable, we may undertake additional realignment and cost reduction efforts, which could result in future charges. Moreover, our ability to achieve our other strategic goals and business plans may be adversely affected, and we could experience business disruptions with customers and elsewhere if our transformation and realignment efforts prove ineffective.

We sell our products in highly competitive markets, which results in pressure on our profit margins and limits our ability to maintain or increase the market share of our products.

The markets for our products and services are geographically diverse and highly competitive. We compete against large and well-established national and global companies, as well as regional and local companies, low-cost replicators of spare parts and in-house maintenance departments of our end-user customers. We compete based on price, technical expertise, timeliness of delivery, contractual terms, project management, proximity to service centers, previous installation history and reputation for quality and reliability. Competitive environments in slow-growth industries and for original equipment orders have been inherently more influenced by pricing and domestic and global economic conditions and current economic forecasts suggest that the competitive influence of pricing has broadened. Additionally, some of our customers have been attempting to reduce the number of vendors from which they purchase in order to reduce the size and diversity of their supply chain. To remain competitive, we must invest in manufacturing, technology, marketing, customer service and support and our distribution networks. No assurances can be made that we will have sufficient resources to continue to make the investment required to maintain or increase our market share or that our investments will be successful. In addition, negative publicity or other organized campaigns critical of us, through social media or otherwise, could negatively affect our reputation. If we do not compete successfully, our business, financial condition, results of operations and cash flows could be materially adversely affected.

Failure to successfully develop and introduce new products could limit our ability to grow and maintain our competitive position and adversely affect our financial condition, results of operations and cash flow.

The success of new and improved products and services depends on their initial and continued acceptance by our customers. Our businesses are affected by varying degrees of technological change and corresponding shifts in customer demand, which result in unpredictable product transitions, shortened life cycles and increased importance of being first to market with new products and services. Difficulties or delays in the research, development, production and/or marketing of new products and services may negatively impact our operating results and prevent us from recouping or realizing a return on the investments required to continue to bring these products and services to market.

Our inability to obtain raw materials at favorable prices may adversely affect our operating margins and results of operations.

We purchase substantially all electric power and other raw materials we use in the manufacturing of our products from outside sources. The costs of these raw materials have been volatile historically and are influenced by factors that are outside our control. In recent years, the prices for energy, metal alloys, nickel and certain other of our raw materials have been volatile. While we strive to offset our increased costs through supply chain management, contractual provisions and our Continuous Improvement Process initiative, where gains are achieved in operational efficiencies, our operating margins and results of operations and cash flows may be adversely affected if we are unable to pass increases in the costs of our raw materials on to our customers or operational efficiencies are not achieved.

Economic, political and other risks associated with international operations could adversely affect our business.

A substantial portion of our operations is conducted and located outside the U.S. We have manufacturing, sales or service facilities in more than 50 countries and sell to customers in over 90 countries, in addition to the U.S. Moreover, we primarily source certain of our manufacturing and engineering functions, raw materials and components from China, Eastern Europe, India and Latin America. Accordingly, our business and results of operations are subject to risks associated with doing business internationally, including:

- instability in a specific country's or region's political or economic conditions, particularly economic conditions in Europe and Latin America, and political conditions in Russia, the Middle East, Asia, North Africa, Latin America and other emerging markets;
- trade protection measures, such as tariff increases, and import and export licensing and control requirements;
- political, financial market or economic instability relating to Brexit;
- political, financial market or economic instability relating to epidemics (including the ongoing coronavirus outbreak emanating from China) or pandemics;
- uncertainties related to any geopolitical, economic and regulatory effects or changes due to recent or upcoming domestic and international elections;
- the imposition of governmental economic sanctions on countries in which we do business, including Russia and Venezuela;
- potentially negative consequences from changes in tax laws or tax examinations;
- difficulty in staffing and managing widespread operations;
- increased aging and slower collection of receivables, particularly in Latin America and other emerging markets;
- difficulty of enforcing agreements and collecting receivables through some foreign legal systems;
- differing and, in some cases, more stringent labor regulations;
- potentially negative consequences from fluctuations in foreign currency exchange rates;
- partial or total expropriation;
- differing protection of intellectual property;
- inability to repatriate income or capital; and

- difficulty in administering and enforcing corporate policies, which may be different than the customary business practices of local cultures.

For example, political unrest or work stoppages negatively impact the demand for our products from customers in affected countries and other customers, such as U.S. oil refineries, that are affected by the resulting disruption in the supply of crude oil. Similarly, military conflicts in Russia, the Middle East, Asia and North Africa could soften the level of capital investment and demand for our products and services.

In order to manage our day-to-day operations, we must overcome cultural and language barriers and assimilate different business practices. In addition, we are required to create compensation programs, employment policies and other administrative programs that comply with laws of multiple countries. We also must communicate and monitor standards and directives across our global network. In addition, emerging markets pose other uncertainties, including challenges to our ability to protect our intellectual property, pressure on the pricing of our products and increased risk of political instability, and may prefer local suppliers because of existing relationships, local restrictions or incentives. Our failure to successfully manage our geographically diverse operations could impair our ability to react quickly to changing business and market conditions and to enforce compliance with standards and procedures.

Our future success will depend, in large part, on our ability to anticipate and effectively manage these and other risks associated with our international operations. Any of these factors could, however, materially adversely affect our international operations and, consequently, our financial condition, results of operations and cash flows.

Our operations may be impacted by the United Kingdom's exit from the European Union.

The United Kingdom's June 2016 referendum in which voters approved an exit from the European Union (commonly referred to as "Brexit") and subsequent developments related to the referendum have caused and may continue to cause volatility in the global stock markets, currency exchange rate fluctuations and global economic uncertainty, which could adversely affect our customers' ability to invest in capital expenditures, which may in turn reduce demand for our products and services.

In addition, the withdrawal from the European Union may result on other potential outcomes, adversely affecting the tax, tax treaty, currency, operational, legal and regulatory regimes to which our businesses in the region are subject. The withdrawal could also, among other potential outcomes, disrupt the free movement of goods, services and people between the United Kingdom and the European Union, significantly disrupt trade between the United Kingdom and the European Union and other parties, and result in greater restrictions on imports and exports between the U.K. and other European Union countries, among other regulatory complexities. These potential and unknown outcomes and uncertainties related to Brexit and its impact on the global economic climate could have a material adverse effect on our operations, financial condition, results of operations and cash flows.

Our operations are subject to a variety of complex and continually changing laws, regulations and policies, both internationally and domestically, which could adversely affect our business.

Due to the international scope of our operations, the system of laws, regulations and policies to which we are subject is complex and includes, without limitation, regulations issued by the U.S. Customs and Border Protection, the U.S. Department of Commerce's Bureau of Industry and Security, the U.S. Treasury Department's Office of Foreign Assets Control and various foreign governmental agencies, including applicable export controls, customs, currency exchange control and transfer pricing regulations, as applicable. No assurances can be made that we will continue to be found to be operating in compliance with, or be able to detect violations of, any such laws, regulations or policies. In addition, we cannot predict the nature, scope or effect of future regulatory requirements to which our international operations might be subject or the manner in which existing laws might be administered or interpreted. Compliance with laws and any new laws or regulations may increase our operations costs or require significant capital expenditures. Any failure to comply with applicable laws, regulations or policies in the U.S. or in any other country in which we operate could result in substantial fines and penalties, which could adversely affect our business.

In particular, there is uncertainty related to the current U.S. administration's support or plans for new or existing treaty and trade relationships with other countries, such as the January 2017 U.S. withdrawal from the Trans-Pacific Partnership, which may affect restrictions or tariffs imposed on products we buy or sell. These factors, together with other key global events during 2019 (such as the continuing uncertainty arising from the Brexit transition, as well as ongoing terrorist activity), may adversely impact the ability or willingness of non-U.S. companies to transact business in the U.S. This uncertainty may also affect regulations and trade agreements affecting U.S. companies, global stock markets (including the NYSE, on which our common shares are traded), currency exchange rates, and general global economic conditions. All of these factors are outside of our control, but may nonetheless cause us to adjust our strategy in order to compete effectively in global markets.

Implementation of new tariffs and changes to or uncertainties related to tariffs and trade agreements could adversely affect our business.

The U.S. has recently announced the implementation of certain new tariffs on steel and aluminum imported into the country, and is reportedly also considering additional tariffs. In response, certain foreign governments have implemented or are reportedly considering implementing additional tariffs on U.S. goods. In addition, there have been recent changes to trade agreements, like the U.S. withdrawal from the Trans-Pacific Partnership and the replacement of the North American Free Trade Agreement with the United States-Mexico-Canada Agreement. Uncertainties with respect to tariffs, trade agreements, or any potential trade wars negatively impact the global economic markets and could affect our customers' ability to invest in capital expenditures, which may in turn result in reduced demand for our products and services, and could have a material adverse effect on our financial condition, results of operations and cash flows. Changes in tariffs could also result in changes in supply and demand of our raw material needs, affect our manufacturing capabilities and lead to increased prices that we may not be able to effectively pass on to customers, each of which could materially adversely affect our operating margins, results of operations and cash flows.

Our international operations expose us to fluctuations in foreign currency exchange rates which could adversely affect our business.

A significant portion of our revenue and certain of our costs, assets and liabilities, are denominated in currencies other than the U.S. dollar. The primary currencies to which we have exposure are the Euro, British pound, Mexican peso, Brazilian real, Indian rupee, Japanese yen, Singapore dollar, Argentine peso, Canadian dollar, Australian dollar, Chinese yuan, Colombian peso, Chilean peso and South African rand. Certain of the foreign currencies to which we have exposure, such as the Venezuelan bolivar and Argentine peso, have undergone significant devaluation in the past, which reduce the value of our local monetary assets, reduce the U.S. dollar value of our local cash flow, generate local currency losses that may impact our ability to pay future dividends from our subsidiary to the parent company and potentially reduce the U.S. dollar value of future local net income. Although we enter into forward exchange contracts to economically hedge some of our risks associated with transactions denominated in certain foreign currencies, no assurances can be made that exchange rate fluctuations will not adversely affect our financial condition, results of operations and cash flows.

We could be adversely affected by violations of the U.S. Foreign Corrupt Practices Act and similar worldwide anti-bribery laws and regulations.

The U.S. Foreign Corrupt Practices Act ("FCPA") and similar anti-bribery laws and regulations in other jurisdictions, such as the UK Bribery Act, generally prohibit companies and their intermediaries from making improper payments to government officials for the purpose of obtaining or retaining business or securing an improper advantage. Because we operate in many parts of the world and sell to industries that have experienced corruption to some degree, our policies mandate compliance with applicable anti-bribery laws worldwide. Violation of the FCPA or other similar anti-bribery laws or regulations, whether due to our or others' actions or inadvertence, could subject us to civil and criminal penalties or other sanctions that could have a material adverse impact on our business, financial condition, results of operations and cash flows. In addition, actual or alleged violations could damage our reputation or ability to do business.

Terrorist acts, conflicts, wars, natural or manmade disasters, epidemics or pandemics, acts of God and other such events around the world may materially adversely affect our business, financial condition and results of operations and the market for our common stock.

As a global company with a large international footprint, we are subject to increased risk of damage or disruption to us, our employees, facilities, partners, suppliers, distributors, resellers or customers due to, among other things, terrorist acts, conflicts, wars, severe weather conditions and other natural or manmade disasters, including power outages, fires, explosions, cyber-based attacks, epidemics (including the ongoing coronavirus outbreak emanating from China) or pandemics, labor disputes, and acts of God wherever located around the world. The potential for future such events, the national and international responses to such events or perceived threats to national security, and other actual or potential conflicts or wars, such as the Israeli-Hamas conflict and ongoing instability in Syria and Egypt, have created many economic and political uncertainties. In addition, as a global company with headquarters and significant operations located in the U.S., actions against or by the U.S. may impact our business or employees. Although it is impossible to predict the occurrences or consequences of any such events, they could result in a decrease in demand for our products, make it difficult or impossible to deliver products to our customers or to receive components from our suppliers, create delays and inefficiencies in our supply chain and pose risks to our employees, resulting in the need to impose travel restrictions, any of which could adversely affect our business, financial condition, results of operations and cash flows.

Environmental compliance costs and liabilities could adversely affect our financial condition, results of operations and cash flows.

Our operations and properties are subject to regulation under environmental laws, which can impose substantial sanctions for violations. We must conform our operations to applicable regulatory requirements and adapt to changes in such requirements in all countries in which we operate.

We use hazardous substances and generate hazardous wastes in many of our manufacturing and foundry operations. Most of our current and former properties are or have been used for industrial purposes, and some may require clean-up of historical contamination. We are currently conducting investigation and/or remediation activities at a number of locations where we have known environmental concerns. In addition, we have been identified as one of many PRPs at five Superfund sites. The projected cost of remediation at these sites, as well as our alleged "fair share" allocation, while not anticipated to be material, has been reserved. However, until all studies have been completed and the parties have either negotiated an amicable resolution or the matter has been judicially resolved, some degree of uncertainty remains.

We have incurred, and expect to continue to incur, operating and capital costs to comply with environmental requirements. In addition, new laws and regulations, stricter enforcement of existing requirements, the discovery of previously unknown contamination or the imposition of new clean-up requirements could require us to incur costs or become the basis for new or increased liabilities. Moreover, environmental and sustainability initiatives, practices, rules and regulations are under increasing scrutiny of both governmental and non-governmental bodies, which can cause rapid change in operational practices, standards and expectations and, in turn, increase our compliance costs. Any of these factors could have a material adverse effect on our financial condition, results of operations and cash flows.

We are exposed to certain regulatory and financial risks related to climate change which could adversely affect our financial condition, results of operations and cash flows.

Climate change is receiving ever increasing attention worldwide. Many scientists, legislators and others attribute global warming to increased levels of greenhouse gases, including carbon dioxide, which has led to significant legislative and regulatory efforts to limit greenhouse gas emissions. The U.S. Congress, state and foreign legislatures and federal, state, local and foreign governmental agencies have been considering legislation and regulatory proposals that would regulate and limit greenhouse gas emissions. It is uncertain whether, when and in what form mandatory carbon dioxide emissions reduction programs may be adopted. Similarly, certain countries have adopted the Kyoto Protocol and/or the Paris Climate Agreement and these and other existing international initiatives or those under consideration affect our international operations. When our customers, particularly those involved in the oil and gas, power generation, petrochemical processing or petroleum refining industries, are subject to any of these or other similar proposed or newly enacted laws and regulations, we are exposed to risks that the additional costs by customers to comply with such laws and regulations could impact their ability or desire to continue to operate at similar levels in certain jurisdictions as historically seen or as currently anticipated, which could negatively impact their demand for our products and services. In addition, new laws and regulations that might favor the increased use of non-fossil fuels, including nuclear, wind, solar and bio-fuels or that are designed to increase energy efficiency, could dampen demand for oil and gas production or power generation resulting in lower spending by customers for our products and services. These actions could also increase costs associated with our operations, including costs for raw materials and transportation. Additionally, even without such laws and regulations, increased awareness and adverse publicity in the global marketplace about the levels of greenhouse gas emissions by companies in the manufacturing and energy industry could reduce customer demand for our products and services or harm our reputation. Because it is uncertain what laws will be enacted, we cannot predict the potential impact of such laws on our future financial condition, results of operations and cash flows.

We are party to asbestos-containing product litigation that could adversely affect our financial condition, results of operations and cash flows.

We are a defendant in a substantial number of lawsuits that seek to recover damages for personal injury allegedly resulting from exposure to asbestos-containing products formerly manufactured and/or distributed by us. Such products were used as internal components of process equipment, and we do not believe that there was any significant emission of asbestos-containing fibers during the use of this equipment. Although we are defending these allegations vigorously and believe that a high percentage of these lawsuits are covered by insurance or indemnities from other companies, there can be no assurance that we will prevail or that coverage or payments made by insurance or such other companies would be adequate. Unfavorable rulings, judgments or settlement terms could have a material adverse impact on our business, financial condition, results of operations and cash flows.

Our business may be adversely impacted by work stoppages and other labor matters.

As of December 31, 2019, we had approximately 17,000 employees, of which approximately 5,000 were located in the U.S. Approximately 5% of our U.S. employees are represented by unions. We also have unionized employees or employee work councils in Argentina, Australia, Austria, Brazil, Finland, France, Germany, India, Italy, Japan, Mexico, The Netherlands, South Africa, Spain, Sweden and the U.K. No individual unionized facility produces more than 10% of our revenues. Although we believe that our relations with our employees are generally satisfactory and we have not experienced any material strikes or work stoppages recently, no assurances can be made that we will not in the future experience these and other types of conflicts with labor unions, works councils, other groups representing employees or our employees generally, or that any future negotiations with our labor unions will not result in significant increases in our cost of labor. Our ability to successfully negotiate new and acceptable agreements when the existing agreements with employees covered by collective bargaining expire could result in business disruptions or increased costs.

Our ability to implement our business strategy and serve our customers is dependent upon the continuing ability to employ talented professionals and attract, train, develop and retain a skilled workforce. We are subject to the risk that we will not be able to effectively replace the knowledge and expertise of an aging workforce as workers retire. Without a properly skilled and experienced workforce, our costs, including productivity costs and costs to replace employees may increase, and this could negatively impact our earnings.

In addition, our policies prohibit harassment or discrimination in the workplace. Notwithstanding our conducting training and taking disciplinary action or other actions against or in response to alleged violations, we may encounter additional costs from claims made and/or legal proceedings brought against us, and we could suffer reputational harm.

We depend on key personnel, the loss of whom would harm our business.

Our future success will depend in part on the continued service of key executive officers and personnel. The loss of the services of any key individual could harm our business. Our future success also depends on our ability to recruit, retain and engage our personnel sufficiently, both to maintain our current business and to execute our strategic initiatives. Competition for officers and employees in our industry is intense and we may not be successful in attracting and retaining such personnel.

Inability to protect our intellectual property could negatively affect our competitive position.

We rely on a combination of patents, copyrights, trademarks, trade secrets, confidentiality provisions and licensing arrangements to establish and protect our proprietary rights. We cannot guarantee, however, that the steps we have taken to protect our intellectual property will be adequate to prevent infringement of our rights or misappropriation of our technology. For example, effective patent, trademark, copyright and trade secret protection are unavailable or limited in some of the foreign countries in which we operate. In addition, while we generally enter into confidentiality agreements with our employees and third parties to protect our intellectual property, such confidentiality agreements could be breached or otherwise may not provide meaningful protection for our trade secrets and know-how related to the design, manufacture or operation of our products. Resorting to litigation to protect our intellectual property rights is burdensome and costly, and we may not always prevail. Further, adequate remedies are not always available in the event of an unauthorized use or disclosure of our trade secrets and manufacturing expertise. Failure to successfully enforce our intellectual property rights could harm our competitive position, business, financial condition, results of operations and cash flows.

Significant changes in pension fund investment performance or assumptions changes may have a material effect on the valuation of our obligations under our defined benefit pension plans, the funded status of these plans and our pension expense.

We maintain defined benefit pension plans that are required to be funded in the U.S., Belgium, Canada, India, Mexico, The Netherlands, Switzerland and the U.K., and defined benefit plans that are not required to be funded in Austria, France, Germany, Italy, Japan and Sweden. Our pension liability is materially affected by the discount rate used to measure our pension obligations and, in the case of the plans that are required to be funded, the level of plan assets available to fund those obligations and the expected long-term rate of return on plan assets. A change in the discount rate can result in a significant increase or decrease in the valuation of pension obligations, affecting the reported status of our pension plans and our pension expense. Significant changes in investment performance or a change in the portfolio mix of invested assets can result in increases and decreases in the valuation of plan assets or in a change of the expected rate of return on plan assets. This impact may be particularly prevalent where we maintain significant concentrations of specified investments, such as the U.K. equity and fixed income securities in our non-U.S. defined benefit plans. Changes in the expected return on plan assets assumption can result in significant changes in our pension expense and future funding requirements.

We continually review our funding policy related to our U.S. pension plan in accordance with applicable laws and regulations. U.S. regulations have increased the minimum level of funding for U.S pension plans in prior years, which has at times required significant contributions to our pension plans. Contributions to our pension plans reduce the availability of our cash flows to fund working capital, capital expenditures, R&D efforts and other general corporate purposes.

Increased costs as a result of product liability and warranty claims could adversely affect our financial condition, results of operations and cash flows.

From time to time, we are exposed to product liability and warranty claims when the use of one of our products results in, or is alleged to result in, bodily injury and/or property damage or our products actually or allegedly fail to perform as expected. Some of our products are designed to support the most critical, severe service applications in the markets that we serve and any failure of such products could result in significant product liability and warranty claims, as well as damage to our reputation in the marketplace. While we maintain insurance coverage with respect to certain product liability claims, we may not be able to obtain such insurance on acceptable terms in the future, and any such insurance may not provide adequate coverage against product liability claims. In addition, product liability claims can be expensive to defend and can divert the attention of management and other personnel for significant periods of time, regardless of the ultimate outcome. An unsuccessful defense of a product liability claim could have an adverse effect on our business, financial condition, results of operations and cash flows. Even if we are successful in defending against a claim relating to our products, claims of this nature could cause our customers to lose confidence in our products and our company. Warranty claims are not generally covered by insurance, and we may incur significant warranty costs that are not reimbursable.

The recording of increased deferred tax asset valuation allowances in the future or the impact of tax law changes on such deferred tax assets could affect our operating results.

We currently have significant net deferred tax assets resulting from tax credit carryforwards, net operating losses and other deductible temporary differences that are available to reduce taxable income in future periods. Based on our assessment of our deferred tax assets, we determined, based on projected future income and certain available tax planning strategies, that approximately $113 million of our deferred tax assets will more likely than not be realized in the future, and no valuation allowance is currently required for this portion of our deferred tax assets. Should we determine in the future that these assets will not be realized we will be required to record an additional valuation allowance in connection with these deferred tax assets and our operating results would be adversely affected in the period such determination is made. In addition, tax law changes could negatively impact our deferred tax assets.

Our outstanding indebtedness and the restrictive covenants in the agreements governing our indebtedness limit our operating and financial flexibility.

We are required to make scheduled repayments and, under certain events of default, mandatory repayments on our outstanding indebtedness, which requires us to dedicate a substantial portion of our cash flows from operations to payments on our indebtedness, thereby reducing the availability of our cash flows to fund working capital, capital expenditures, R&D efforts and other general corporate purposes, such as dividend payments and share repurchases, and could generally limit our flexibility in planning for, or reacting to, changes in our business and industry. In addition, we may need new or additional financing in the future to expand our business or refinance our existing indebtedness. Our current senior credit facility matures on July 16, 2024 and our senior notes are due in 2022 and 2023. For additional information regarding our current indebtedness refer to Note 12 to our consolidated financial statements included in Item 8 of this Annual Report. Our inability to timely access capital on satisfactory terms, including as a result of market disruptions, could limit our ability to expand our business as desired and refinance our indebtedness.

In addition, the agreements governing our indebtedness impose certain operating and financial restrictions on us and somewhat limit management's discretion in operating our businesses. These agreements limit or restrict our ability, among other things, to: incur additional debt; fully utilize the capacity under the senior credit facility; pay dividends and make other distributions; prepay subordinated debt; make investments and other restricted payments; create liens; sell assets; and enter into transactions with affiliates.

We are also required to maintain certain debt ratings, comply with leverage and interest coverage financial covenants and deliver to our lenders audited annual and unaudited quarterly financial statements. Our ability to comply with these covenants may be affected by events beyond our control. Failure to comply with these covenants could result in an event of default which, if not cured or waived, may have a material adverse effect on our business, financial condition, results of operations and cash flows.

Our growth strategy depends on our ability to continue to expand our market presence through acquisitions, and any future acquisitions may present unforeseen integration difficulties or costs which could materially affect our business.

Since 1997, we have expanded through a number of acquisitions, and we may pursue strategic acquisitions of businesses in the future. Our ability to implement this growth strategy will be limited by our ability to identify appropriate acquisition candidates, covenants in our credit agreement and other debt agreements and our financial resources, including available cash and borrowing capacity. Acquisitions may require additional debt financing, resulting in higher leverage and an increase in interest expense or may require equity financing, resulting in ownership dilution to existing shareholders. In addition, acquisitions sometimes require large one-time charges and can result in the incurrence of contingent liabilities, adverse tax consequences, substantial depreciation or deferred compensation charges, the amortization of identifiable purchased intangible assets or impairment of goodwill, any of which could have a material adverse effect on our business, financial condition, results of operations and cash flows.

When we acquire another business, the process of integrating acquired operations into our existing operations creates operating challenges and requires significant financial and managerial resources that would otherwise be available for the ongoing development or expansion of existing operations. Some of the more common challenges associated with acquisitions that we may experience, and have experienced in the past, include:

- loss of key employees or customers of the acquired company;
- conforming the acquired company's standards, processes, procedures and controls, including accounting systems and controls, with our operations, which could cause deficiencies related to our internal control over financial reporting;
- coordinating operations that are increased in scope, geographic diversity and complexity;
- retooling and reprogramming of equipment;
- hiring additional management and other critical personnel; and
- the diversion of management's attention from our day-to-day operations.

Further, no guarantees can be made that we would realize the cost savings, synergies or revenue enhancements that we may anticipate from any acquisition, or that we will realize such benefits within the time frame that we expect. If we are not able to timely address the challenges associated with acquisitions and successfully integrate acquired businesses, or if our integrated product and service offerings fail to achieve market acceptance, our business could be adversely affected.

Goodwill impairment could negatively impact our net income and shareholders' equity.

Goodwill is not amortized, but is tested for impairment at the reporting unit level, which is an operating segment or one level below an operating segment. Goodwill is required to be tested for impairment annually and between annual tests if events or circumstances indicate that it is more likely than not that the fair value of a reporting unit is less than its carrying value. Reductions in or impairment of the value of our goodwill or other intangible assets will result in charges against our earnings, which could have a material adverse effect on our reported results of operations and financial position in future periods.

There are numerous risks that may cause the fair value of a reporting unit to fall below its carrying amount, which could lead to the measurement and recognition of goodwill impairment. These risks include, but are not limited to, lowered expectations of future financial results, adverse changes in the business climate, increase in the discount rate, an adverse action or assessment by a regulator, the loss of key personnel, a more-likely-than-not expectation that all or a significant portion of a reporting unit may be disposed of, failure to realize anticipated synergies from acquisitions, a sustained decline in the Company’s market capitalization, and significant, prolonged negative variances between actual and expected financial results. In recent years, the estimated fair value of our Pump reporting unit has fluctuated, partially due to broad-based capital spending declines and heightened pricing pressures experienced in the oil and gas markets. Although we have concluded that there is no impairment on the goodwill associated with our Pump reporting unit as of December 31, 2019, we will continue to monitor their performance and related market conditions for future indicators of potential impairment. For additional information, see the discussion in Item 7 of this Annual Report and under Note 1 to our consolidated financial statements included in Item 8 of this Annual Report.

A significant data breach or disruption to our information technology infrastructure could adversely affect our business operations.

Our information technology networks and related systems and devices and those technology systems under control of third parties with whom we do business are critical to the operation of our business and essential to our ability to successfully perform day-to-day operations. These information technology networks and related systems and devices may be susceptible to damage, disruptions or shutdowns due to programming errors, defects or other vulnerabilities, power outages, hardware failures, computer viruses, cyber-attacks, malware attacks, ransomware attacks, theft, misconduct by employees or other insiders, misuse, human errors or other events. If any of the aforementioned breaches or disruptions occur and our business continuity plans do not effectively resolve the issues in a timely manner, our business, financial condition, results of operations, and liquidity could be materially adversely affected.

In addition, any of the aforementioned breaches or disruptions could expose us to a risk of loss, disclosure, misuse, corruption, or interruption of sensitive and critical data, information and functions, including our proprietary and confidential information and information related to our customers, suppliers and employees. It is also possible a security breach could result in theft of trade secret or other intellectual property. While we devote substantial resources to maintaining adequate levels of cybersecurity, there can be no assurance that we will be able to prevent all of the rapidly evolving forms of increasingly sophisticated and frequent cyberattacks, or avoid or limit a material adverse impact on our systems after such incidents or attacks occur. The potential consequences of a material cybersecurity incident include reputational damage, loss of customers, litigation with third parties, regulatory actions and fines, theft of intellectual property, disruption of manufacturing plant operations and increased cybersecurity protection and remediation costs. If we are unable to prevent, anticipate, detect or adequately respond to security breaches, our operations could be disrupted and our business could be materially and adversely affected.

Recent legal developments in Europe could result in changes to our business practices, penalties, increased cost of operations, or otherwise harm our business. To conduct our operations, we regularly move data across national borders and must comply with increasingly complex and rigorous regulatory standards enacted to protect business and personal data in the U.S. and elsewhere. For example, the E.U. recently adopted the General Data Protection Regulation (the “GDPR”). The GDPR imposes additional obligations on companies regarding the handling of personal data and provides certain individual privacy rights to persons whose data is stored. Compliance with existing, proposed and recently enacted laws and regulations can be costly; any failure to comply with these regulatory standards could subject us to legal and reputational risks, including proceedings against the Company by governmental entities or others, fines and penalties, damage to our reputation and credibility and could have a negative impact on our business and results of operations.

Ineffective internal controls could impact the accuracy and timely reporting of our business and financial results.

Our internal control over financial reporting has not always prevented or detected misstatements because of its inherent limitations, including the possibility of human error, the circumvention or overriding of controls or fraud. Even effective internal controls can provide only reasonable assurance with respect to the preparation and fair presentation of financial statements. Failure to maintain the adequacy of our internal controls, including any failure to implement required new or improved controls, or difficulties in their implementation, could harm our business and financial results and we could fail to meet our financial reporting obligations. For example, during its evaluation of the effectiveness of our internal control over financial reporting as of December 31, 2016 management concluded that a deficiency in our internal controls related to the control environment primarily related to the operation of certain inventory controls or recording of unsupported manual journal entries at one of the non-U.S. sites and the design and maintenance of effective business performance reviews represented material weaknesses in our internal control over financial reporting and, therefore, that we did not maintain effective internal control over financial reporting as of December 31, 2016. Management actively engaged in the planning and implementation of remediation efforts to address these material weaknesses and to strengthen the overall internal control related to the control environment at the one non-U.S. site and the business review controls and believes that such remediation efforts have effectively remediated the material weaknesses.

Changes in accounting principles and guidance could result in unfavorable accounting charges or effects.

We prepare our consolidated financial statements in conformity with accounting principles generally accepted in the U.S. A change in these principles can have a significant effect on our reported financial position and financial results. The adoption of new or revised accounting principles may require us to make changes to our systems, processes and internal controls, which could have a significant effect on our reported financial results and internal controls, cause unexpected financial reporting fluctuations, retroactively affect previously reported results or require us to make costly changes to our operational processes and accounting systems upon our following the adoption of these standards.

Forward-Looking Information is Subject to Risk and Uncertainty

This Annual Report and other written reports and oral statements we make from time-to-time include “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933, Section 21E of the Securities Exchange Act of 1934 and the Private Securities Litigation Reform Act of 1995. All statements other than statements of historical facts included in this Annual Report regarding our financial position, business strategy and expectations, plans and objectives of management for future operations, industry conditions, market conditions and indebtedness covenant compliance are forward-looking statements. Forward-looking statements may include, among others, statements about our goals and strategies, new product introductions, plans to cultivate new businesses, future economic conditions, revenue, pricing, gross profit margin and costs, capital spending, expected cost savings from our realignment programs, depreciation and amortization, research and development expenses, potential impairment of assets, tax rate and pending tax and legal proceedings. In some cases forward-looking statements can be identified by terms such as "may," "should," "expects," "could," "intends," "projects," "predicts," "plans," "anticipates," "estimates," "believes," "forecasts," "seeks" or other comparable terminology. These statements are not historical facts or guarantees of future performance, but instead are based on current expectations and are subject to significant risks, uncertainties and other factors, many of which are outside of our control.

We have identified factors that could cause actual plans or results to differ materially from those included in any forward-looking statements. These factors include those described above under this "Risk Factors" heading, or as may be identified in our other SEC filings from time to time. These uncertainties are beyond our ability to control, and in many cases, it is not possible to foresee or identify all the factors that may affect our future performance or any forward-looking information, and new risk factors can emerge from time to time. Given these risks and uncertainties, undue reliance should not be placed on forward-looking statements as a prediction of actual results.

All forward-looking statements included in this Annual Report are based on information available to us on the date of this Annual Report and the risk that actual results will differ materially from expectations expressed in this report will increase with the passage of time. We undertake no obligation, and disclaim any duty, to publicly update or revise any forward-looking statement or disclose any facts, events or circumstances that occur after the date hereof that may affect the accuracy of any forward-looking statement, whether as a result of new information, future events, changes in our expectations or otherwise. This discussion is provided as permitted by the Private Securities Litigation Reform Act of 1995 and all of our forward-looking statements are expressly qualified in their entirety by the cautionary statements contained or referenced in this section.

ITEM 1B. *UNRESOLVED STAFF COMMENTS*

None.

ITEM 2. *PROPERTIES*

Our principal executive offices, including our global headquarters, are located at 5215 N. O'Connor Boulevard, Suite 2300, Irving, Texas 75039. Our global headquarters is a leased facility, which we began to occupy on January 1, 2004. In December 2018, we extended our original lease term an additional 10 years to December 2028. We have the option to renew the current lease for two additional five-year periods. We currently occupy approximately 151,000 square feet at this facility.

Our major manufacturing facilities (those with 50,000 or more square feet of manufacturing capacity) operating at December 31, 2019 are presented in the table below. See "Item 1. Business" in this Annual Report for further information with respect to all of our manufacturing and operational facilities, including QRCs.

	Number of Facilities	Approximate Aggregate Square Footage
FPD		
U.S.	7	1,198,000
Non-U.S.	20	3,742,000
FCD		
U.S.	5	1,123,000
Non-U.S.	11	1,773,000

We own the majority of our manufacturing facilities, and those manufacturing facilities we do not own are leased. We also maintain a substantial network of U.S. and foreign service centers and sales offices, most of which are leased. The majority of our manufacturing leased facilities are covered by lease agreements with terms ranging from two to seven years, with individual lease terms generally varying based on the facilities' primary usage. We believe we will be able to extend leases on our various facilities as necessary, as they expire.

We believe that our current facilities are adequate to meet the requirements of our present and foreseeable future operations. We continue to review our capacity requirements as part of our strategy to optimize our global manufacturing efficiency. See Note 4 to our consolidated financial statements included in Item 8 of this Annual Report for additional information regarding our lease obligations.

ITEM 3. *LEGAL PROCEEDINGS*

We are party to the legal proceedings that are described in Note 14 to our consolidated financial statements included in Item 8 of this Annual Report, and such disclosure is incorporated by reference into this Item 3. In addition to the foregoing, we and our subsidiaries are named defendants in certain other routine lawsuits incidental to our business and are involved from time to time as parties to governmental proceedings, all arising in the ordinary course of business. Although the outcome of lawsuits or other proceedings involving us, and our subsidiaries cannot be predicted with certainty, and the amount of any liability that could arise with respect to such lawsuits or other proceedings cannot be predicted accurately, management does not currently expect these matters, either individually or in the aggregate, to have a material effect on our financial position, results of operations or cash flows. We have established reserves covering exposures relating to contingencies to the extent believed to be reasonably estimable and probable based on past experience and available facts.

ITEM 4. *MINE SAFETY DISCLOSURES*

Not applicable.

PART II

ITEM 5. *MARKET FOR THE REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES*

Market Information

Our common stock is traded on the New York Stock Exchange ("NYSE") under the symbol "FLS" and our CUSIP number is number is 34354P105. On February 13, 2020, our records showed 952 shareholders of record.

Issuer Purchases of Equity Securities

During the quarter ended December 31, 2019, we repurchased a total of 211,233 shares of our common stock for $9.6 million (representing $45.30 per share) under our current share repurchase program. As of December 31, 2019, we have $145.7 million of remaining capacity under our current share repurchase program. The following table sets forth the repurchase data for each of the three months during the quarter ended December 31, 2019:

Period	Total Number of Shares Purchased		Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plan (4)(5)	Approximate Dollar Value That May Yet Be Purchased Under the Plan
					(In millions)
October 1 - 31	212,361	(1)	$ 45.31	211,233	$ 145.7
November 1 - 30	1,207	(2)	49.37	—	145.7
December 1 - 31	617	(3)	49.84	—	145.7
Total	214,185		$ 45.34	211,233	

(1) Includes 1,128 shares tendered by employees to satisfy minimum tax withholding amounts for restricted stock awards at an average price per share of $45.52.

(2) Includes 43 shares that were tendered by employees to satisfy minimum tax withholding amounts for Restricted Shares at an average price per share of $48.85 and 1,164 shares purchased at a price of $49.39 per share by a rabbi trust that we established in connection with our director deferral plans, pursuant to which non-employee directors may elect to defer directors' quarterly cash compensation to be paid at a later date in the form of common stock.

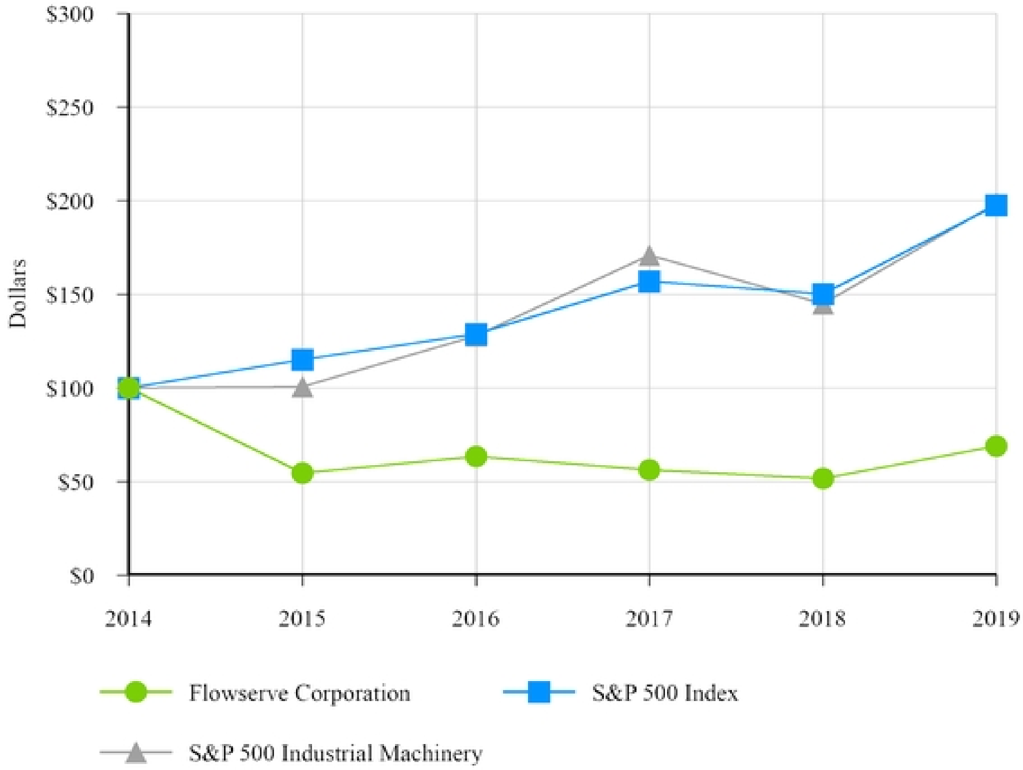
(3) Shares tendered by employees to satisfy minimum tax withholding amounts for Restricted Shares.

(4) On November 13, 2014, our Board of Directors approved a $500.0 million share repurchase authorization. Our share repurchase program does not have an expiration date, and we reserve the right to limit or terminate the repurchase program at any time without notice.

(5) Note 16 to our consolidated financial statements included in Item 8 of this Annual Report provides additional information regarding our share repurchase activity.

Stock Performance Graph

The following graph depicts the most recent five-year performance of our common stock with the S&P 500 Index and S&P 500 Industrial Machinery. The graph assumes an investment of $100 on December 31, 2014, and assumes the reinvestment of any dividends over the following five years. The stock price performance shown in the graph is not necessarily indicative of future price performance.



	Base Period	December 31,				
Company/Index	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Flowserve Corporation	$100.00	$54.70	$63.46	$56.36	$51.74	$69.16
S&P 500 Index	100.00	115.24	129.02	157.17	150.27	197.58
S&P 500 Industrial Machinery	100.00	100.89	128.07	170.93	145.07	198.55

ITEM 6. *SELECTED FINANCIAL DATA*

	Year Ended December 31,				
	2019(a)	2018(b)	2017(c)	2016(d)	2015(e)
	(Amounts in thousands, except per share data and ratios)				
RESULTS OF OPERATIONS					
Sales	$ 3,944,850	$ 3,832,666	$ 3,660,831	$ 3,990,487	$ 4,557,791
Gross profit	1,295,370	1,187,836	1,088,953	1,236,798	1,481,125
Selling, general and administrative expense	(899,813)	(943,714)	(901,727)	(965,376)	(970,608)
Gain (loss) on sale of businesses	—	(7,727)	141,317	(7,664)	—
Operating income	406,040	247,538	341,135	276,684	520,377
Interest expense	(54,980)	(58,160)	(59,730)	(60,137)	(65,270)
Provision for income taxes(f)	(80,070)	(51,224)	(258,679)	(77,380)	(148,351)
Net earnings attributable to Flowserve Corporation	253,668	119,671	2,652	132,455	258,411
Net earnings per share of Flowserve Corporation common shareholders (basic)	1.94	0.91	0.02	1.02	1.94
Net earnings per share of Flowserve Corporation common shareholders (diluted)	1.93	0.91	0.02	1.01	1.93
Cash flows from operating activities	312,741	190,831	311,066	240,476	440,759
Cash dividends declared per share	0.76	0.76	0.76	0.76	0.72
FINANCIAL CONDITION					
Working capital	$ 1,392,482	$ 1,302,170	$ 1,315,837	$ 1,119,251	$ 1,106,946
Total assets(g)	4,919,642	4,616,277	4,910,474	4,708,923	4,963,106
Total debt	1,377,249	1,483,047	1,575,257	1,570,623	1,620,996
Retirement obligations and other liabilities(g)	624,818	459,693	496,954	407,839	387,786
Total equity	1,815,959	1,660,780	1,670,954	1,637,388	1,664,382
FINANCIAL RATIOS					
Return on average net assets(g)(h)	9.7%	5.4%	0.2%	5.2%	9.4%
Net debt to net capital ratio(i)	28.0%	34.2%	34.3%	42.4%	43.0%

(a) Results of operations in 2019 include costs of $32.0 million resulting from realignment and transformation initiatives, resulting in a reduction of after tax net earnings of $21.7 million.

(b) Results of operations in 2018 include costs of $95.1 million resulting from realignment and transformation initiatives, resulting in a reduction of after tax net earnings of $72.4 million.

(c) Results of operations in 2017 include costs of $71.3 million resulting from realignment initiatives, resulting in a reduction of after tax net earnings of $54.3 million.

(d) Results of operations in 2016 include costs of $94.8 million resulting from realignment initiatives, resulting in a reduction of after tax net earnings of $75.8 million.

(e) Results of operations in 2015 include costs of $108.1 million resulting from realignment initiatives, resulting in a reduction of after tax net earnings of $85.0 million.

(f) Provision for income taxes in 2017 was impacted by the Tax Reform Act. See Note 17 to our consolidated financial statements included in Item 8 of this Annual Report.

(g) Impacted by our adoption of ASC 842, Leases (Topic 842) ("New Lease Standard") effective January 1, 2019. See Note 2 to our consolidated financial statements included in Item 8 of this Annual Report.

(h) Calculated as adjusted net income divided by adjusted net assets, where (i) adjusted net income is the sum of earnings before income taxes, plus interest expense, multiplied by one minus our effective tax rate, and (ii) adjusted net assets is the average of beginning of year and end of year net assets, excluding cash and cash equivalents and debt due in one year.

(i) Calculated as total debt minus cash and cash equivalents divided by the sum of total debt and shareholders' equity minus cash and cash equivalents.

ITEM 7. *MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS*

The following discussion and analysis is provided to increase the understanding of, and should be read in conjunction with, the accompanying consolidated financial statements and notes. See “Item 1A. Risk Factors” and the section titled “Forward-Looking Information is Subject to Risk and Uncertainty” included in this Annual Report on Form 10-K for the year ended December 31, 2019 ("Annual Report") for a discussion of the risks, uncertainties and assumptions associated with these statements. Unless otherwise noted, all amounts discussed herein are consolidated.

EXECUTIVE OVERVIEW

Our Company

We believe that we are a world-leading manufacturer and aftermarket service provider of comprehensive flow control systems. We develop and manufacture precision-engineered flow control equipment integral to the movement, control and protection of the flow of materials in our customers’ critical processes. Our product portfolio of pumps, valves, seals, automation and aftermarket services supports global infrastructure industries, including oil and gas, chemical, power generation and water management, as well as general industrial markets where our products and services add value. Through our manufacturing platform and global network of Quick Response Centers ("QRCs"), we offer a broad array of aftermarket equipment services, such as installation, advanced diagnostics, repair and retrofitting. We employ approximately 17,000 employees in more than 50 countries as of December 31, 2019.

Our business model is significantly influenced by the capital spending of global infrastructure industries for the placement of new products into service and maintenance spending for aftermarket services for existing operations. The worldwide installed base of our products is an important source of aftermarket revenue, where products are expected to ensure the maximum operating time of many key industrial processes. Over the past several years, we have significantly invested in our aftermarket strategy to provide local support to drive customer investments in our offerings and use of our services to replace or repair installed products. The aftermarket portion of our business also helps provide business stability during various economic periods. The aftermarket business, which is primarily served by our network of 171 QRCs located around the globe, provides a variety of service offerings for our customers including spare parts, service solutions, product life cycle solutions and other value-added services. It is generally a higher margin business compared to our original equipment business and a key component of our profitable growth strategy.

Our operations are conducted through two business segments that are referenced throughout this Management’s Discussion and Analysis of Financial Condition and Results of Operations ("MD&A"):

- FPD for custom, highly-engineered pumps, pre-configured industrial pumps, pump systems, mechanical seals, auxiliary systems and replacement parts and related services; and
- FCD for engineered and industrial valves, control valves, actuators and controls and related services.

Our business segments share a focus on industrial flow control technology and have a high number of common customers. These segments also have complementary product offerings and technologies that are often combined in applications that provide us a net competitive advantage. Our segments also benefit from our global footprint, our economies of scale in reducing administrative and overhead costs to serve customers more cost effectively and shared leadership for operational support functions, such as research and development, marketing and supply chain.

The reputation of our product portfolio is built on more than 50 well-respected brand names such as Worthington, IDP, Valtek, Limitorque, Durco, Argus, Edward, Valbart and Durametallic, which we believe to be one of the most comprehensive in the industry. Our products and services are sold either directly or through designated channels to more than 10,000 companies, including some of the world’s leading engineering, procurement and construction ("EPC") firms, original equipment manufacturers, distributors and end users.

We continue to leverage our QRC network to be positioned as near to customers as possible for service and support in order to capture valuable aftermarket business. Along with ensuring that we have the local capability to sell, install and service our equipment in remote regions, we continuously improve our global operations. We also continue to expand our global supply chain capability to meet global customer demands and ensure the quality and timely delivery of our products. We are focusing on our ongoing low-cost sourcing, including greater use of third-party suppliers and increasing our lower-cost, emerging market capabilities. Additionally, we continue to devote resources to improving the supply chain processes across our business segments to find areas of synergy and cost reduction and to improve our supply chain management capability to ensure it can meet global customer demands. We also remain focused on improving on-time delivery and quality, while managing warranty costs as a percentage of sales across our global operations, through the assistance of a focused Continuous Improvement Process ("CIP") initiative. The goal of the CIP initiative, which includes lean manufacturing, six sigma business management strategy and value engineering, is to maximize service fulfillment to customers through on-time delivery, reduced cycle time and quality at the highest internal productivity.

Over the past year we have experienced continued stabilization in business and improved conditions in certain of our key markets. With continued stability in oil prices at improved levels through the middle of 2018 and 2019, our large-project business is showing continued signs of recovery and we anticipate that customers will continue to invest in maintenance and short cycle equipment during 2020.

In the second quarter of 2018, we launched and committed resources to our Flowserve 2.0 Transformation, a program designed to transform our business model to drive operational excellence, reduce complexity, accelerate growth, expand margins, increase capital efficiency and improve organizational health. For further information regarding our Flowserve 2.0 Transformation, see “Our Results of Operations” below and Note 20 to our consolidated financial statements included in Item 8 of this Annual Report.

Our Markets

The following discussion should be read in conjunction with the "Outlook for 2020" section included below in this MD&A.

Our products and services are used in several distinct industries: oil and gas, chemical, power generation, water management, and several other industries, such as mining, steel and paper, that are collectively referred to as "general industries."

Demand for most of our products depends on the level of new capital investment as well as planned and unplanned maintenance expenditures by our customers. The level of new capital investment depends, in turn, on capital infrastructure projects driven by the need for products that rely on oil and gas, chemicals, power generation and water resource management, as well as general economic conditions. These drivers are generally related to the phase of the business cycle in their respective industries and the expectations of future market behavior. The levels of maintenance expenditures are additionally driven by the reliability of equipment, planned and unplanned downtime for maintenance and the required capacity utilization of the process.

Sales to EPC firms and original equipment manufacturers are typically for large project orders and critical applications, as are certain sales to distributors. Project orders are typically procured for customers either directly from us or indirectly through contractors for new construction projects or facility enhancement projects.

The quick turnaround business, which we also refer to as "short-cycle," is defined as orders that are received from the customer (booked) and shipped generally within six months of receipt. These orders are typically for more standardized, general purpose products, parts or services. Each of our two business segments generate certain levels of this type of business.

In the sale of aftermarket products and services, we benefit from a large installed base of our original equipment, which requires periodic maintenance, repair and replacement parts. We use our manufacturing platform and global network of QRCs to offer a broad array of aftermarket equipment services, such as installation, advanced diagnostics, repair and retrofitting. In geographic regions where we are positioned to provide quick response, we believe customers have traditionally relied on us, rather than our competitors, for aftermarket products due to our highly engineered and customized products. However, the aftermarket for standard products is competitive, as the existence of common standards allows for easier replacement of the installed products. As proximity of service centers, timeliness of delivery and quality are important considerations for all aftermarket products and services, we continue to selectively expand our global QRC capabilities to improve our ability to capture this important aftermarket business.

Oil and Gas

The oil and gas industry, which represented approximately 41% and 38% of our bookings in 2019 and 2018, respectively, experienced an increase in capital spending in 2019 compared to the previous year. The increase was primarily due to increased project activity and short cycle investment. Aftermarket opportunities in this industry remained stable throughout 2019 following increased spending in 2018 due to catch up of deferred spending on our customers' repair and maintenance budgets from previous years.

The outlook for the oil and gas industry is heavily dependent on the demand growth from both mature markets and developing geographies as well as changes in the regulatory environment. In the short-term, we believe that stable oil prices will support oil and gas upstream and mid-stream investment and we further expect continued investment in later cycle downstream oil and gas and petrochemical projects due to emerging market growth and certain regulatory requirements, such as IMO 2020. We also believe stable oil prices support increased demand for our aftermarket products and services. We believe the medium and long-term fundamentals for this industry remain attractive and see a stabilized environment as the industry works through current excess supply. In addition, we believe projected depletion rates of existing fields and forecasted long-term demand growth will require additional investments. With our long-standing reputation in providing successful solutions for upstream, mid-stream and downstream applications, along with the advancements in our portfolio of offerings, we believe that we continue to be well-positioned to assist our customers in this improving environment.

Chemical

The chemical industry represented approximately 22% of our bookings in both 2019 and 2018. The chemical industry is comprised of chemical-based and pharmaceutical products. Capital spending in 2019 increased primarily due to global economic growth and forecasted demand for chemical-based products. The aftermarket opportunities remained stable throughout 2019 following increased spending in 2018 due to catch up of deferred spending of our customers' repair and maintenance budgets from previous years.

The outlook for the chemical industry remains heavily dependent on global economic conditions. As global economies and unemployment conditions improve, a rise in consumer spending should follow. An increase in spending would drive greater demand for chemical-based products supporting improved levels of capital investment. We believe the chemical industry in the near-term will continue to invest in North America and Middle East capacity additions, maintenance and upgrades for optimization of existing assets and that developing regions will selectively invest in capital infrastructure to meet current and future indigenous demand. We believe our global presence and our localized aftermarket capabilities are well-positioned to serve the potential growth opportunities in this industry.

Power Generation

The power generation industry represented approximately 11% of our bookings in both 2019 and 2018. In 2019, the power generation industry continued to experience softness in thermal power generation capital spending in the mature and key developing markets. China continued to curtail the construction of new coal-fired power generation over the last year, while in India and southeast Asia capital investment remained in place driven by increased demand forecasts.

Natural gas-fired combined cycle (“NGCC”) plants increased their share of the energy mix, driven by market prices for gas remaining low and stable (partially due to the increasing global availability of liquefied natural gas (“LNG”)), low capital expenditures, and the ability of NGCC to stabilize unpredictable renewable sources. With the potential of unconventional sources of gas, the global power generation industry is forecasting an increased use of this form of fuel for power generation plants.

Despite fewer new nuclear plants being constructed, nuclear power remains an important contributor to the global energy mix. We continue to support our significant installed base in the global nuclear fleet by providing aftermarket and life extension products and services. Due to our extensive history, we believe we are well positioned to take advantage of this ongoing source of aftermarket and new construction opportunities.

Political efforts to limit the emissions of carbon dioxide may have some adverse effect on thermal power investment plans depending on the potential requirements imposed and the timing of compliance by country. However, many proposed methods of capturing and limiting carbon dioxide emissions offer business opportunities for our products and services. At the same time, we continue to take advantage of new investments in concentrated solar power generating capacity, where our pumps, valves, and seals are uniquely positioned for both molten salt applications as well as the traditional steam cycle.

We believe the long-term fundamentals for the power generation industry remain solid based on projected increases in demand for electricity driven by global population growth, growth of urbanization in developing markets and the increased use of electricity driven transportation. We also believe that our long-standing reputation in the power generation industry, our portfolio of offerings for the various generating methods, our advancements in serving the renewable energy market and carbon capture methodologies, as well as our global service and support structure, position us well for the future opportunities in this important industry.

Water Management

The water management industry represented approximately 4% our bookings in both 2019 and 2018. Water management industry activity levels increased in 2019 as worldwide demand for fresh water, water treatment and re-use, desalination and flood control continued to create requirements for new facilities or for upgrades of existing systems, many of which require products that we offer, particularly pumps. Capital and aftermarket spending are on the rise in developed and emerging markets with governments and private industry providing funding for critical projects.

The proportion of people living in regions that find it difficult to meet water requirements is expected to double by 2025. We believe that the persistent demand for fresh water during all economic cycles supports continued investments, especially in North America and developing regions.

General Industries

General industries represented, in the aggregate, approximately 22% and 25% of our bookings in 2019 and 2018, respectively. General industries comprise a variety of different businesses, including mining and ore processing, pulp and paper, food and beverage and other smaller applications, none of which individually represented more than 5% of total bookings in 2019 and 2018. General industries also include sales to distributors, whose end customers operate in the industries we primarily serve. Sales to distributors in 2019 were negatively impacted by decreased upstream oil and gas activity in North America.

The outlook for this group of industries is heavily dependent upon the condition of global economies and consumer confidence levels. The long-term fundamentals of many of these industries remain sound, as many of the products produced by these industries are common staples of industrialized and urbanized economies. We believe that our specialty product offerings designed for these industries and our aftermarket service capabilities will provide continued business opportunities.

OUR RESULTS OF OPERATIONS

Throughout this discussion of our results of operations, we discuss the impact of fluctuations in foreign currency exchange rates. We have calculated currency effects on operations by translating current year results on a monthly basis at prior year exchange rates for the same periods.

In the second quarter of 2018, we launched and committed resources to our Flowserve 2.0 Transformation, a program designed to transform our business model to drive operational excellence, reduce complexity, accelerate growth, improve organizational health and better leverage our existing global platform, which is further discussed in Note 20 to our consolidated financial statements included in Item 8 of this Annual Report. For the year ended December 31, 2019 and 2018, we incurred Flowserve 2.0 Transformation related expenses of $28.0 million and $41.2 million, respectively. The Flowserve 2.0 Transformation expenses incurred primarily consist of professional services, project management and related travel costs recorded in SG&A.

In 2015, we initiated Realignment Programs that consist of both restructuring and non-restructuring charges that are further discussed in Note 20 to our consolidated financial statements included in Item 8 of this Annual Report. As of December 31, 2019, the Realignment Programs are substantially complete and we have incurred charges of $351.7 million to date. The total charges for Realignment Programs and Flowserve 2.0 Transformation by segment are detailed below for the years ended December 31, 2019 and 2018:

	December 31, 2019				
(Amounts in thousands)	FPD	FCD	Subtotal–Reportable Segments	Eliminations and All Other	Consolidated Total
Total Realignment and Transformation Program Charges					
COS	$ 12,587	$ 4,395	$ 16,982	$ 255	$ 17,237
SG&A(1)	(14,506)	774	(13,732)	32,467	18,735
Income tax expense(2)	(4,000)	—	(4,000)	—	(4,000)
Total	$ (5,919)	$ 5,169	$ (750)	$ 32,722	$ 31,972

(1) Includes gains from the sales of non-strategic manufacturing facilities that are included in our Realignment Programs.
(2) Income tax expense (benefit) includes exit taxes.

	December 31, 2018				
(Amounts in thousands)	FPD	FCD	Subtotal–Reportable Segments	Eliminations and All Other	Consolidated Total
Total Realignment and Transformation Program Charges					
COS	$ 39,477	$ 3,221	$ 42,698	$ —	$ 42,698
SG&A	5,910	(294)	5,616	46,786	52,402
Income tax expense(1)	(1,000)	—	(1,000)	—	(1,000)
Total	$ 44,387	$ 2,927	$ 47,314	$ 46,786	$ 94,100

(1) Income tax expense (benefit) includes exit taxes.

Bookings and Backlog

	2019	2018	2017
		(Amounts in millions)	
Bookings	$ 4,238.3	$ 4,019.8	$ 3,803.9
Backlog (at period end)	2,157.0	1,891.6	2,033.4

We define a booking as the receipt of a customer order that contractually engages us to perform activities on behalf of our customer in regard to the manufacture, delivery, and/or support of products or the delivery of service. Bookings recorded and subsequently canceled within the same fiscal period are excluded from reported bookings. Bookings of $4.2 billion in 2019 increased by $218.5 million, or 5.4%, as compared with 2018. The increase included negative currency effects of approximately $108 million. The increase was primarily driven by customer original equipment bookings. The increase was driven by higher bookings in the oil and gas, power generation, chemical and water management industries, partially offset by decreased bookings in the general industries. Bookings in 2018 included approximately $31 million related to the two FPD locations and associated product lines that were divested in the third quarter of 2018.

Bookings of $4.0 billion in 2018 increased by $215.9 million, or 5.7%, as compared with 2017. The increase included currency benefits of approximately $30 million. The increase was primarily driven by the oil and gas, general and chemical industries, partially offset by a decrease in the power generation industry. The increase was more heavily-weighted towards customer aftermarket bookings.

Backlog represents the aggregate value of booked but uncompleted customer orders and is influenced primarily by bookings, sales, cancellations and currency effects. Backlog of $2.2 billion at December 31, 2019 increased by $265.4 million, or 14.0%, as compared with December 31, 2018. Currency effects provided an increase of less than $1 million (currency effects on backlog are calculated using the change in period end exchange rates). Backlog related to aftermarket orders was approximately 33% and 36% of the backlog at December 31, 2019 and 2018, respectively. We expect to recognize revenue on approximately 88% of December 31, 2019 backlog during 2020. Backlog includes our unsatisfied (or partially unsatisfied) performance obligations related to contracts having an original expected duration in excess of one year of approximately $709 million as discussed in Note 2 to our consolidated financial statements included in Item 8 of this Annual Report.

Backlog of $1.9 billion at December 31, 2018 decreased by $141.8 million, or 7.0%, as compared with December 31, 2017. Currency effects provided a decrease of approximately $83 million. Backlog related to aftermarket orders was approximately 36% and 31% of the backlog at December 31, 2018 and 2017, respectively. We expected to recognize revenue on approximately 89% of December 31, 2018 backlog during 2019.

Sales

	2019	2018	2017
	(Amounts in millions)		
Sales	$ 3,944.9	$ 3,832.7	$ 3,660.8

Sales in 2019 increased by $112.2 million, or 2.9%, as compared with 2018. The increase included negative currency effects of approximately $94 million. The increase was more heavily-weighted to aftermarket sales, with increased sales into North America, Europe and Asia Pacific, partially offset by decreased sales into Latin America, Africa and the Middle East. Sales in 2018 included approximately $30 million related to the two FPD locations and associated product lines that were divested in the third quarter of 2018.

Sales in 2018 increased by $171.9 million, or 4.7%, as compared with 2017. The increase included currency benefits of approximately $31 million. The increase was more heavily-weighted to aftermarket sales, with increased sales into North America, Asia Pacific and Africa, partially offset by decreased sales in the Middle East and Europe.

Sales to international customers, including export sales from the U.S., were approximately 63% of total sales in both 2019 and 2018 and 64% for 2017. Sales into Europe, the Middle East and Africa ("EMA") were approximately 32% of total sales in both 2019 and 2018 and 36% in 2017. Sales into Asia Pacific were approximately 21% of total sales for 2019, 20% for 2018 and 19% for 2017. Sales into Latin America were approximately 6% of total sales in 2019, 2018 and 2017.

Gross Profit and Gross Profit Margin

	2019	2018	2017
	(Amounts in millions, except percentages)		
Gross profit	$ 1,295.4	$ 1,187.8	$ 1,089.0
Gross profit margin	32.8%	31.0%	29.7%

Gross profit in 2019 increased by $107.6 million, or 9.1%, as compared with 2018. Gross profit margin in 2019 of 32.8% increased from 31.0% in 2018. The increase in gross profit margin was primarily attributed to the favorable impact of revenue recognized on higher margin projects, lower realignment charges associated with our Realignment Programs, improvements in operational efficiency and a $7.7 million charge related to the write-down of inventory in the second quarter of 2018 that did not recur. Aftermarket sales represent approximately 50% of total sales in both 2019 and 2018.

Gross profit in 2018 increased by $98.8 million, or 9.1%, as compared with 2017. Gross profit margin in 2018 of 31.0% increased from 29.7% in 2017. The increase in gross profit margin was primarily attributable to a $16.9 million charge for costs related to a contract to supply oil and gas platform equipment to an end user in Latin America in 2017 that did not recur, revenue recognized on higher margin projects, a mix shift to higher margin aftermarket sales, favorable impact of increased sales on our absorption of fixed manufacturing costs and increased savings related to our Realignment Programs, partially offset by a $7.7 million charge for cost incurred related to the write-down of inventory associated with the divestiture of two FPD locations and related product lines in the second quarter of 2018. Aftermarket sales increased to approximately 50% of total sales, as compared with approximately 48% of total sales in 2017.

SG&A

	2019	2018	2017
	(Amounts in millions, except percentages)		
SG&A	$ 899.8	$ 943.7	$ 901.7
SG&A as a percentage of sales	22.8%	24.6%	24.6%

SG&A in 2019 decreased by $43.9 million, or 4.7%, as compared with 2018. Currency effects yielded a decrease of approximately $18 million. In 2019, SG&A as a percentage of sales decreased 180 basis points as compared with the same period in 2018 primarily due to lower charges related to our Flowserve 2.0 Transformation and Realignment Programs, decreased broad-based annual incentive compensation expense, gains from the sales of non-strategic manufacturing facilities during the year, favorable impacts resulting from the 2018 divestiture of two FPD locations and a $9.7 million impairment charge related to long-lived assets in the second quarter of 2018 that did not recur.

SG&A in 2018 increased by $42.0 million, or 4.7%, as compared with 2017. Currency effects yielded an increase of approximately $7 million. In 2018, SG&A as a percentage of sales remained relatively unchanged as compared with 2017. SG&A was favorably impacted by increased sales leverage, a $26.0 million impairment charge related to our manufacturing facility in Brazil in 2017 that did not recur, lower stock-based compensation expense, lower bad debt expense and lower charges and increased savings related to our Realignment Programs. These favorable cost impacts were substantially offset by charges related to the Flowserve 2.0 Transformation program, implementation costs associated with our adoption of the New Revenue Standard, increased accrued broad-based annual incentive compensation expense and an impairment charge of $9.7 million related to the long-lived assets associated with the divestiture of two FPD locations and related product lines in the second quarter of 2018.

(Loss) Gain on Sale of Businesses

	2019	2018	2017
	(Amounts in millions)		
(Loss) gain on sale of businesses	$ —	$ (7.7)	$ 141.3

The loss on sale of businesses in 2018 of $7.7 million resulted from the divestiture of two FPD locations and related product lines. The gain on sale of businesses in 2017 was the result of the $141.3 million gain from the sales of the Gestra and Vogt businesses. See Note 3 to our consolidated financial statements included in Item 8 of this Annual Report for additional information on these sales.

Net Earnings from Affiliates

	2019	2018	2017
	(Amounts in millions)		
Net earnings from affiliates	$ 10.5	$ 11.1	$ 12.6

Net earnings from affiliates represents our net income from investments in six joint ventures (one located in each of Chile, China, India, Saudi Arabia, South Korea and the United Arab Emirates) that are accounted for using the equity method of accounting. Net earnings from affiliates in 2019 decreased by $0.6 million, or 5.4%, as compared to the prior year, primarily as a result of decreased earnings of our FPD joint venture in India. Net earnings from affiliates in 2018 decreased by $1.5 million, or 11.9%, as compared to the prior year, primarily as a result of decreased earnings of our FPD joint venture in South Korea.

Operating Income

	2019	2018	2017
	(Amounts in millions, except percentages)		
Operating income	$ 406.0	$ 247.5	$ 341.1
Operating income as a percentage of sales	10.3%	6.5%	9.3%

Operating income in 2019 increased by $158.5 million, or 64.0%, as compared with 2018. The increase included negative currency effects of approximately $12 million. The increase was primarily a result of the $107.6 million increase in gross profit, the $43.9 million decrease in SG&A and the loss of $7.7 million from the divestiture of two FPD locations and related product lines in the third quarter of 2018 that did not recur.

Operating income in 2018 decreased by $93.6 million, or 27.4%, as compared with 2017. The decrease included currency benefits of approximately $2 million. The decrease was primarily a result of the $141.3 million gain from the sales of the Gestra and Vogt businesses in 2017 that did not recur, the $42.0 million increase in SG&A and the loss of $7.7 million from the divestiture of two FPD locations and related product lines, partially offset by the $98.8 million increase in gross profit discussed above.

Interest Expense and Interest Income

	2019	2018	2017
	(Amounts in millions)		
Interest expense	$ (55.0)	$ (58.2)	$ (59.7)
Interest income	8.4	6.5	3.4

Interest expense in 2019 decreased by $3.2 million as compared with 2018. The decrease was primarily attributable to lower borrowings in 2019 and currency impacts on interest expense associated with our outstanding Euro-denominated senior notes, as compared to the same period in 2018. Interest income in 2019 increased by $1.9 million as compared to 2018 . The increase in interest income was primarily attributable to higher average cash balances compared with same period in 2018.

Interest expense in 2018 decreased by $1.5 million as compared with 2017. The decrease was primarily attributable to lower borrowings in 2018, as compared to the same period in 2017. Interest income in 2018 increased by $3.1 million as compared with 2017. The increase in interest income was primarily attributable to higher average cash balances compared with 2017.

Other Income (Expense), net

	2019	2018	2017
	(Amounts in millions)		
Other income (expense), net	$ (17.6)	$ (19.6)	$ (21.8)

Other expense, net decreased $2.0 million as compared to 2018, due to a $7.6 million decrease in losses from transactions in currencies other than our sites' functional currencies, partially offset by a $3.3 million increase in losses from foreign exchange contracts. The net change was primarily due to the foreign currency exchange rate movements in the Euro, Indian rupee, Singapore dollar and Mexican peso in relation to the U.S. dollar during the year ended December 31, 2019, as compared with the same period in 2018.

Other expense, net decreased $2.2 million in 2018, due to a $6.4 million decrease in net periodic benefit costs for pensions and post retirement obligations, partially offset by a $5.3 million increase in losses from foreign exchange contracts. The net change was primarily due to the foreign currency exchange rate movements in the Euro, Indian rupee, Mexican peso and Argentinian peso in relation to the U.S. dollar during the year ended December 31, 2018, as compared with the same period in 2017.

Tax Expense and Tax Rate

	2019	2018	2017
	(Amounts in millions, except percentages)		
Provision for income taxes	$ 80.1	$ 51.2	$ 258.7
Effective tax rate	23.4%	29.1%	98.4%

On December 22, 2017, the U.S. enacted the 2017 the Tax Cuts and Jobs Act of 2017 ("Tax Reform Act"), which significantly changed U.S. tax law. The Tax Reform Act, among other things, lowered the Company's U.S. statutory federal income tax rate from 35% to 21% effective January 1, 2018, while imposing a deemed repatriation tax on deferred foreign income and implementing a modified territorial tax system. The Tax Reform Act also provides for a one-time transition tax on certain foreign earnings and the acceleration of depreciation for certain assets placed into service after September 27, 2017 as well as prospective changes which began in 2018, including repeal of the domestic manufacturing deduction, capitalization of research and development expenditures, additional limitations on executive compensation and limitations on the deductibility of interest.

Our effective tax rate of 23.4% for the year ended December 31, 2019 decreased from 29.1% in 2018 primarily due to the net impact of foreign operations. The 2019 tax rate differed from the federal statutory rate of 21% primarily due to state tax and foreign audit assessments, partially offset by the net impact of foreign operations. The 2018 tax rate differed from the federal statutory rate of 21% primarily due to the net impact of foreign operations, including losses in certain foreign jurisdictions for which no tax benefit was provided. The 2017 tax rate differed from the federal statutory rate of 35% primarily due to the impacts pursuant to enactment of the Tax Reform Act, the net impact of foreign operations, the establishment of a valuation allowance against our deferred tax assets in various foreign jurisdictions, primarily Germany and Mexico, and taxes related to the sale of the Gestra and Vogt businesses.

Our effective tax rate is based upon current earnings and estimates of future taxable earnings for each domestic and international location. Changes in any of these and other factors, including our ability to utilize foreign tax credits and net operating losses or results from tax audits, could impact the tax rate in future periods. As of December 31, 2019, we have foreign tax credits of $29.1 million, expiring in 2026, 2028 and 2029 tax years, against which we recorded a valuation allowance of $29.1 million. Additionally, we have recorded other net deferred tax assets of $55.0 million, which relate to net operating losses, tax credits and other deductible temporary differences that are available to reduce taxable income in future periods, most of which do not have a definite expiration. Should we not be able to utilize all or a portion of these credits and losses, our effective tax rate would increase.

Net Earnings and Earnings Per Share

	2019	2018	2017
	(Amounts in millions, except per share amounts)		
Net earnings attributable to Flowserve Corporation	$ 253.7	$ 119.7	$ 2.7
Net earnings per share — diluted	$ 1.93	$ 0.91	$ 0.02
Average diluted shares	131.7	131.3	131.4

Net earnings in 2019 increased by $134.0 million to $253.7 million, or to $1.93 per diluted share, as compared with 2018. The increase was primarily attributable to an increase in operating income of $158.5 million, a $2.0 million decrease in other expense, net and a $5.1 million decrease in interest expense, net, partially offset by a $28.9 million increase in tax expense.

Net earnings in 2018 increased by $117.0 million to $119.7 million, or to $0.91 per diluted share, as compared with 2017. The increase was primarily attributable to a $207.5 million decrease in tax expense, a $2.2 million decrease in other expense net, and a $1.5 million decrease in interest expense, partially offset by a decrease in operating income of $93.6 million.

Other Comprehensive Income (Loss)

	2019	2018	2017
	(Amounts in millions)		
Other comprehensive income (loss)	$ (9.8)	$ (67.8)	$ 119.8

Other comprehensive loss in 2019 decreased by $58.0 million as compared with 2018. The decreased loss was primarily due to foreign currency translation adjustments resulting primarily from exchange rate movements of the Euro, British pound, Chinese yuan and Indian rupee versus the U.S. dollar at December 31, 2019 as compared with 2018.

Other comprehensive loss in 2018 increased by $187.6 million to $67.8 million from income of $119.8 million in 2017. The loss was primarily due to foreign currency translation adjustments resulting primarily from exchange rate movements of the Euro, Argentinian peso, Indian rupee and British pound versus the U.S. dollar at December 31, 2018 as compared with 2017.

Business Segments

We conduct our operations through two business segments based on type of product and how we manage the business. We evaluate segment performance and allocate resources based on each segment's operating income. See Note 18 to our consolidated financial statements included in Item 8 of this Annual Report for further discussion of our segments. The key operating results for our two business segments, FPD and FCD, are discussed below.

Flowserve Pump Division Segment Results

Our largest business segment is FPD, through which we design, manufacture, pre-test, distribute and service specialty and highly-engineered custom and pre-configured pumps and pump systems, mechanical seals and auxiliary systems (collectively referred to as "original equipment"). FPD includes longer lead time, highly-engineered pump products and mechanical seals that are generally manufactured within shorter lead times. FPD also manufactures replacement parts and related equipment and provides aftermarket services. FPD primarily operates in the oil and gas, petrochemical, chemical, power generation, water management and general industries. FPD operates in 49 countries with 39 manufacturing facilities worldwide, 13 of which are located in Europe, 12 in North America, eight in Asia Pacific and six in Latin America, and we have 144 QRCs, including those co-located in manufacturing facilities and/or shared with FCD.

	FPD		
	2019	2018	2017
	(Amounts in millions, except percentages)		
Bookings	$ 3,007.9	$ 2,753.5	$ 2,587.4
Sales	2,706.3	2,623.3	2,478.7
Gross profit	899.3	775.7	692.1
Gross profit margin	33.2%	29.6%	27.9%
SG&A	566.3	578.9	593.0
Loss on sale of business	—	(7.7)	—
Segment operating income	343.5	201.0	112.3
Segment operating income as a percentage of sales	12.7%	7.7%	4.5%
Backlog (at period end)	1,560.9	1,286.2	1,421.8

Bookings in 2019 increased by $254.4 million, or 9.2%, as compared with 2018. The increase included negative currency effects of approximately $79 million. Bookings in 2018 included approximately $31 million related to the two FPD locations and associated product lines that were divested in the third quarter of 2018. The increase in customer bookings was primarily driven by the oil and gas, chemical and power generation industries, partially offset by decreased bookings in the general industries. Increased customer bookings of $100.4 million into North America, $78.1 million into the Middle East, $72.1 million into Asia Pacific, $18.6 million in Latin America and $11.5 million into Africa, were partially offset by decreased customer bookings of $49.9 million into Europe. The increase was primarily driven by customer original equipment bookings. Of the $3.0 billion of bookings in 2019, approximately 44% were from oil and gas, 22% from general industries, 19% from chemical, 10% from power generation and 5% from water management.

Bookings in 2018 increased by $166.1 million, or 6.4%, as compared with 2017 and included an order for approximately $80 million to provide pumps and related equipment for the Hengli Integrated Refining Complex Project in China, and was partially offset by approximately $23 million in reduced bookings due to the divestiture of two FPD locations and related product lines in the third quarter of 2018. The increase included currency benefits of approximately $19 million. The increase in customer bookings was primarily driven by the oil and gas, general and chemical industries. Customer bookings increased $91.4 million into Europe, $61.7 million into the Middle East, $43.6 million into North America and $3.4 million into Latin America and were partially offset by decreased customer bookings of $18.7 million into Africa and $5.1 million into Asia Pacific. The increase was primarily in aftermarket bookings. Of the $2.8 billion of bookings in 2018, approximately 41% were from oil and gas, 25% from general industries, 18% from chemical, 11% from power generation and 5% from water management.

Sales in 2019 increased $83.0 million, or 3.2%, as compared with 2018. The increase included negative currency effects of approximately $66 million. Sales in 2018 included approximately $30 million related to the two FPD locations and associated product lines that were divested in the third quarter of 2018. The increase was primarily driven by aftermarket sales, resulting from increased customer sales of $45.3 million into North America, $28.6 million into Europe, $16.8 million into the Middle East and $8.8 million into Africa, partially offset by decreased sales of $17.8 million into Latin America and $4.0 million into Asia Pacific.

Sales in 2018 increased $144.6 million, or 5.8%, as compared with 2017. The increase included currency benefits of approximately $23 million and was partially offset by approximately $19 million in reduced sales due to the divestiture of two FPD locations and related product lines in the third quarter of 2018. The increase was more heavily-weighted towards aftermarket sales, resulting from increased customer sales of $69.9 million into North America, $58.4 million into Asia Pacific, $55.8 million into Africa and $50.9 million into Latin America, partially offset by decreased sales of $82.4 million into the Middle East and $2.6 million into Europe.

Gross profit in 2019 increased by $123.6 million, or 15.9%, as compared with 2018. Gross profit margin in 2019 of 33.2% increased from 29.6% in 2018. The increase in gross profit margin was primarily attributable to revenue recognized on higher margin projects, lower realignment charges associated with our Realignment Programs, sales mix shift to higher margin aftermarket sales, improvements in operational efficiency and a $7.7 million charge related to the write-down of inventory in the second quarter of 2018 that did not recur.

Gross profit in 2018 increased by $83.6 million, or 12.1%, as compared with 2017. Gross profit margin in 2018 of 29.6% increased from 27.9% in 2017. The increase in gross profit margin was primarily attributable to the favorable impact of increased sales on our absorption of fixed manufacturing costs, a $16.9 million charge for costs related to a contract to supply oil and gas platform equipment to an end user in Latin America in 2017 that did not recur, lower charges and increased savings related to our Realignment Programs and revenue recognized on higher margin projects, partially offset by a $7.7 million charge for cost incurred related to the write-down of inventory associated with the divestiture of two FPD locations and related product lines.

SG&A in 2019 decreased by $12.6 million, or 2.2%, as compared with 2018. Currency effects provided a decrease of approximately $13 million. The decrease in SG&A, including currency, was due to favorable impacts on SG&A due to gains from the sales of non-strategic manufacturing facilities during the year, the 2018 divestiture of two FPD locations and a $9.7 million impairment charge related to the long-lived assets in the second quarter of 2018 that did not recur, substantially offset by an increase in selling-related expenses and collections of previously reserved bad debts in 2018 that did not recur.

SG&A in 2018 decreased by $14.1 million, or 2.4%, as compared with 2017. Currency effects provided an increase of approximately $5 million. The decrease in SG&A was primarily attributable to a $26.0 million impairment charge related to our manufacturing facility in Brazil in 2017 that did not recur, lower bad debt expense and decreased charges related to our Realignment Programs, partially offset by higher selling and administrative related expenses and an impairment charge on long-lived assets related to the divestiture of two FPD locations and related product lines of $9.7 million.

The loss on sale of businesses in 2018 of $7.7 million resulted from the divestiture of two FPD locations and related product lines. Refer to Note 3 to our consolidated financial statements included in Item 8 of this Annual Report for additional information on this divestiture.

Operating income in 2019 increased by $142.5 million, or 70.9%, as compared with 2018. The increase included negative currency effects of approximately $10 million. The increase was due to the $123.6 million increase in gross profit, the $12.6 million decrease in SG&A and the $7.7 million loss from the divestiture of two FPD locations and related product lines in the third quarter of 2018 that did not recur.

Operating income in 2018 increased by $88.7 million, or 79.0%, as compared with 2017. The increase included negative currency effects of approximately $1 million. The increase was due to the $83.6 million increase in gross profit and the $14.1 million decrease in SG&A, partially offset by the $7.7 million loss from the divestiture of two FPD locations and related product lines in the third quarter of 2018 that did not recur.

Backlog of $1.6 billion at December 31, 2019 increased by $274.7 million, or 21.4%, as compared with December 31, 2018. Currency effects provided an increase of approximately $5 million. Backlog of $1.3 billion at December 31, 2018 decreased by $135.6 million, or 9.5%, as compared with December 31, 2017. Currency effects provided a decrease of approximately $66 million.

Flow Control Division Segment Results

FCD designs, manufactures, distributes and services a broad portfolio of engineered and industrial valve and automation solutions, including isolation and control valves, actuation, controls and related equipment. FCD leverages its experience and application know-how by offering a complete menu of engineering and project management services to complement its expansive product portfolio. FCD has a total of 49 manufacturing facilities and QRCs in 22 countries around the world, with five of its 21 manufacturing operations located in the U.S., 10 located in Europe, five located in Asia Pacific and one located in Latin America. We believe that FCD is the second largest industrial valve supplier in the world.

	FCD		
	2019	2018	2017
	(Amounts in millions, except percentages)		
Bookings	$ 1,240.9	$ 1,274.3	$ 1,225.7
Sales	1,244.0	1,215.8	1,188.1
Gross profit	411.6	416.9	396.7
Gross profit margin	33.1%	34.3%	33.4%
SG&A	213.6	215.0	213.6
Gain on sale of businesses	—	—	141.3
Segment operating income	198.0	201.2	323.7
Segment operating income as a percentage of sales	15.9%	16.5%	27.2%
Backlog (at period end)	600.1	608.4	617.4

Bookings in 2019 decreased $33.4 million, or 2.6%, as compared with 2018. The decrease included negative currency effects of approximately $29 million. The decrease in customer bookings in the general and chemical industries were partially offset by increases in the power generation, oil and gas and water management industries. Decreased customer bookings of $27.3 million into North America, $8.2 million into Asia Pacific and $2.6 million into Europe were partially offset by increased bookings of $24.1 million into the Middle East. The decrease was more heavily weighted towards customer aftermarket bookings. Of the $1.2 billion of bookings in 2019, approximately 34% were from oil and gas, 29% from chemical, 24% from general industries and 13% from power generation.

Bookings in 2018 increased $48.6 million, or 4.0%, as compared with 2017. The increase included currency benefits of approximately $11 million. The increase in customer bookings in the general, oil and gas and chemical industries were partially offset by decreases in the power generation and water management industries. Increased customer bookings of $78.7 million into North America and $17.4 million into Asia Pacific were partially offset by decreased bookings of $27.7 million into Europe and $18.0 million into the Middle East. The increase was driven by both customer original equipment and aftermarket bookings. Of the $1.3 billion of bookings in 2018, approximately 33% were from oil and gas, 29% from chemical, 27% from general industries and 11% from power generation.

Sales in 2019 increased by $28.2 million, or 2.3%, as compared with 2018. The increase included negative currency effects of approximately $28 million and was driven by increased customer original equipment sales. Sales increased $40.2 million into Asia Pacific, $17.6 million into Europe, $6.5 million into Latin America and $3.5 million into North America and were partially offset by decreased customer sales of $23.5 million into the Middle East and $15.9 million into Africa.

Sales in 2018 increased by $27.7 million, or 2.3%, as compared with 2017. The increase included currency benefits of approximately $8 million and was driven by increased customer original equipment sales. Sales increased $62.4 million into North America, $40.1 million into Asia Pacific and $7.9 million into Africa and were partially offset by a decrease in customer sales of $46.0 million into Europe, $25.1 million into the Middle East and $10.8 million into Latin America.

Gross profit in 2019 decreased by $5.3 million, or 1.3%, as compared with 2018. Gross profit margin in 2019 of 33.1% decreased from 34.3% in 2018. The decrease in gross profit margin was primarily attributed to a mix shift to more original equipment sales and revenue recognized on lower margin original equipment orders as compared to the same period in 2018.

Gross profit in 2018 increased by $20.2 million, or 5.1%, as compared with 2017. Gross profit margin in 2018 of 34.3% increased from 33.4% in 2017. The increase in gross profit margin was primarily attributable to the positive impact of increased sales on our absorption of fixed manufacturing costs and decreased charges and increased savings achieved related to our Realignment Programs compared to the same period in 2017.

SG&A in 2019 decreased by $1.4 million, or 0.7% as compared with 2018. Currency effects provided a decrease of approximately $4 million. The decrease in SG&A was primarily due to currency effects as compared to 2018.

SG&A in 2018 increased by $1.4 million, or 0.7%, as compared with 2017. Currency effects provided an increase of approximately $2 million. The increase in SG&A was primarily due to higher selling and administrative related expenses, partially offset by lower charges and increased savings related to our Realignment Programs compared to 2017.

The gain on sale of businesses in 2017 was the result of the $141.3 million gain from the sales of the Gestra and Vogt businesses. See Note 3 to our consolidated financial statements included in Item 8 of this Annual Report for additional information on these sales.

Operating income in 2019 decreased by $3.2 million, or 1.6%, as compared with 2018. The decrease included negative currency effects of approximately $3 million. The decrease was primarily due to the $5.3 million decrease in gross profit, partially offset by the decrease in SG&A of $1.4 million.

Operating income in 2018 decreased by $122.5 million, or 37.8%, as compared with 2017. The decrease included negative currency effects of approximately $1 million. The decrease was due to the $141.3 million gain from the sales of the Gestra and Vogt businesses in 2017, which was partially offset by the $20.2 million increase in gross profit

Backlog of $600.1 million at December 31, 2019 decreased by $8.3 million, or 1.4%, as compared with December 31, 2018. Currency effects provided a decrease of approximately $5 million. Backlog of $608.4 million at December 31, 2018 decreased by $9.0 million, or 1.5%, as compared with December 31, 2017. Currency effects provided a decrease of approximately $17 million.

LIQUIDITY AND CAPITAL RESOURCES

Cash Flow Analysis

	2019	2018	2017
	(Amounts in millions)		
Net cash flows provided (used) by operating activities	$ 312.7	$ 190.8	$ 311.1
Net cash flows provided (used) by investing activities	(23.8)	(81.5)	176.6
Net cash flows provided (used) by financing activities	(229.7)	(173.3)	(185.4)

Existing cash, cash generated by operations and borrowings available under our senior credit facility are our primary sources of short-term liquidity. We monitor the depository institutions that hold our cash and cash equivalents on a regular basis, and we believe that we have placed our deposits with creditworthy financial institutions. Our sources of operating cash generally include the sale of our products and services and the conversion of our working capital, particularly accounts receivable and inventories. Our total cash balance at December 31, 2019 was $671.0 million, compared with $619.7 million at December 31, 2018 and $703.4 million at December 31, 2017.

Our cash provided by operating activities was $312.7 million, $190.8 million and $311.1 million in 2019, 2018 and 2017, respectively, which provided cash to support short-term working capital needs. Cash flow used by working capital increased in 2019 due primarily to cash used by higher contract assets of $45.9 million and higher inventory of $31.1 million, partially offset by higher accounts payable of $22.9 million, higher accrued liabilities and income taxes payable of $4.2 million, higher contract liabilities of $14.4 million and lower accounts receivable of $2.9 million. Cash flow used by working capital increased in 2018 due primarily to cash used by higher inventory of $29.3 million, higher accounts receivables of $25.4 million, higher contract assets of $23.7 million and lower accrued liabilities and income taxes payable of $18.2 million, partially offset by cash provided by higher contract liabilities of $33.7 million. During 2019, we contributed $37.3 million to our defined benefit pension plans as compared to $48.1 million in 2018.

Decreases in accounts receivable provided $2.9 million of cash flow in 2019, as compared with cash flow used of $25.4 million in 2018 and cash flow provided of $60.2 million in 2017, respectively. For the fourth quarter of 2019 our days' sales outstanding ("DSO") was 67 days as compared to 72 days for 2018 and 75 days for 2017. We have not experienced a significant increase in customer payment defaults in 2019.

Increases in inventory used $31.1 million of cash flow in 2019 as compared with $29.3 million in 2018 and cash provided of $48.6 million in 2017. The use of cash from inventory in 2019 was primarily due to an increase in raw materials and work in process and in 2018 the cash used was due to decreased progress billings. Inventory turns were 4.3 times at December 31, 2019, as compared with 4.2 times for 2018 and 3.3 times for 2017. Our calculation of inventory turns does not reflect the impact of advanced cash received from our customers.

Increases in contract assets used $45.9 million of cash flow and increases in contact liabilities provided $14.4 million of cash flow in 2019. Increases in contract assets used $23.7 million of cash flow and increases in contact liabilities provided $33.7 million of cash flow in 2018.

Increases in accounts payable provided $22.9 million of cash flow in 2019 compared with cash used of $4.8 million in 2018 and cash provided of $12.4 million in 2017. Increases in accrued liabilities and income taxes payable provided $4.2 million of cash flow in 2019 compared with cash used of $18.2 million and $3.4 million in 2018 and 2017, respectively.

Cash used by investing activities were $23.8 million in 2019, as compared to $81.5 million in 2018 and cash provided of $176.6 million in 2017. The decrease of cash used in 2019 was primarily due to a decrease in capital expenditures and proceeds from the disposal of assets during the year which provided $42.3 million, primarily from the sale of non-strategic manufacturing facilities that are included in our Realignment Programs. Capital expenditures were $66.2 million, $84.0 million and $61.6 million in 2019, 2018 and 2017, respectively. In 2020, we currently estimate capital expenditures to be between $90 million and $100 million before consideration of any acquisition activity.

Cash used by financing activities were $229.7 million in 2019 compared to $173.3 million and $185.4 million in 2018 and 2017, respectively. Cash outflows during 2019 resulted primarily from the $105.0 million in payments on long-term debt, $99.6 million of dividend payments and the repurchase of $15.0 million of our common stock. Cash outflows during 2018 resulted primarily from $99.4 million of dividend payments and $60.0 million in payments on long-term debt. Cash outflows during 2017 resulted primarily from $99.2 million of dividend payments and $60.0 million in payments on long-term debt.

In 2019 we repurchased 324,889 shares of our outstanding common stock for $15.0 million. As of December 31, 2019, we had $145.7 million of remaining capacity under our share repurchase plan previously approved by the Board of Directors.

Our cash needs for the next 12 months are expected to be lower than those of 2019 due to our Realignment Programs being substantially completed and anticipated benefits from working capital reductions. We believe cash flows from operating activities, combined with availability under our senior credit facility and our existing cash balances, will be sufficient to enable us to meet our cash flow needs for the next 12 months. However, cash flows from operations could be adversely affected by a decrease in the rate of general global economic growth and an extended decrease in capital spending of our customers, as well as economic, political and other risks associated with sales of our products, operational factors, competition, regulatory actions, fluctuations in foreign currency exchange rates and fluctuations in interest rates, among other factors. We believe that cash flows from operating activities and our expectation of continuing availability to draw upon our credit agreements are also sufficient to meet our cash flow needs for periods beyond the next 12 months.

Acquisitions and Dispositions

We regularly evaluate acquisition opportunities of various sizes. The cost and terms of any financing to be raised in conjunction with any acquisition, including our ability to raise economical capital, is a critical consideration in any such evaluation.

Note 3 to our consolidated financial statements included in Item 8 of this Annual Report contains a discussion of our disposition activity.

Financing

Our credit agreement provides for a $800.0 million unsecured senior credit facility with a maturity date of July 16, 2024 (“Senior Credit Facility”). The Senior Credit Facility includes a $750.0 million sublimit for the issuance of letters of credit and a $30.0 million sublimit for swing line loans. We have the right to increase the amount of the Senior Credit Facility by an aggregate amount not to exceed $400.0 million, subject to certain conditions, including each Lender's approval providing any increase.

The interest rates per annum applicable to the Senior Credit Facility (other than with respect to swing line loans) are LIBOR plus between 1.000% to 1.750%, depending on our debt rating by either Moody’s Investors Service, Inc. or Standard & Poor’s ("S&P") Ratings, or, at our option, the Base Rate (as defined in the Senior Credit Agreement) plus between 0.000% to 0.750% depending on our debt rating by either Moody’s Investors Service, Inc. or S&P Global Ratings. At December 31, 2019 the interest rate on the Senior Credit Facility was LIBOR plus 1.375% in the case of LIBOR loans and the Base Rate plus 0.375% in the case of Base Rate loans. In addition, a commitment fee is payable quarterly in arrears on the daily unused portions of the Senior Credit Facility. The commitment fee will be between 0.090% and 0.300% of unused amounts under the Senior Credit Facility depending on our debt rating by either Moody's Investors Service, Inc. or S&P's Ratings. Certain financing arrangements contain provisions that may result in an event of default if there was a failure under other financing arrangements to meet payment terms. Such provisions are referred to as "cross default" provisions. A discussion of our debt and related covenants is included in Note 12 to our consolidated financial statements included in Item 8 of this Annual Report. We were in compliance with the covenants as of December 31, 2019.

Liquidity Analysis

Our cash balance increased by $51.3 million to $671.0 million as of December 31, 2019 as compared with December 31, 2018. The cash increase included $312.7 million in operating cash inflows and $42.3 million from the sale of non-strategic manufacturing facilities that are included in our Realignment Programs, partially offset by $105.0 million in payments on long-term debt, $99.6 million in dividend payments, $66.2 million in capital expenditures and the repurchase of $15.0 million of our common stock.

At December 31, 2019 and 2018, as a result of the values of the plan's assets and our contributions to the plan, our U.S. pension plan was fully-funded as defined by applicable law. After consideration of our intent to maintain fully funded status, we contributed $20.0 million to our U.S. pension plan in 2019, excluding direct benefits paid of $0.6 million. We continue to maintain an asset allocation consistent with our strategy to maximize total return, while reducing portfolio risks through asset class diversification.

OUTLOOK FOR 2020

Our future results of operations and other forward-looking statements contained in this Annual Report, including this MD&A, involve a number of risks and uncertainties — in particular, the statements regarding our goals and strategies, new product introductions, plans to cultivate new businesses, future economic conditions, revenue, pricing, gross profit margin and costs, capital spending, expected cost savings from our transformation and realignment programs, global economic and political risk, depreciation and amortization, research and development expenses, potential impairment of assets, tax rate and pending tax and legal proceedings. Our future results of operations may also be affected by employee incentive compensation including our annual program and the amount, type and valuation of share-based awards granted, as well as the amount of awards forfeited due to employee turnover. In addition to the various important factors discussed above, a number of other factors could cause actual results to differ materially from our expectations. See the risks described in "Item 1A. Risk Factors" as well as the section titled "Forward-Looking Information is Subject to Risk and Uncertainty" of this Annual Report.

Our bookings were $4,238.3 million during 2019. Because a booking represents a contract that can be, in certain circumstances, modified or canceled, and can include varying lengths between the time of booking and the time of revenue recognition, there is no guarantee that bookings will result in comparable revenues or otherwise be indicative of future results.

We expect a continued competitive economic environment in 2020. We anticipate benefits from the continuation of our Flowserve 2.0 Transformation efforts, end-user strategies, the strength of our high margin aftermarket business, continued disciplined cost management, our diverse customer base, our broad product portfolio and our unified operating platform. Similar to prior years, we expect our results will be weighted towards the second half of the year. While we believe that our primary markets continue to provide opportunities, we remain cautious in our outlook for 2020 given the continuing uncertainty of capital spending in many of our markets as well as economic and political risk associated with our international operations which could have a negative effect on global economic conditions.

On December 31, 2019, we had $1,354.1 million of fixed-rate Senior Notes outstanding. We expect our interest expense in 2020 will be modestly lower compared with amounts incurred in 2019. Our results of operations may also be impacted by unfavorable foreign currency exchange rate movements. See "Item 7A. Quantitative and Qualitative Disclosures about Market Risk" of this Annual Report.

We expect to generate sufficient cash from operations and have sufficient capacity under our Senior Credit Facility to fund our working capital, capital expenditures, dividend payments, share repurchases, debt payments and pension plan contributions in 2020. The amount of cash generated or consumed by working capital is dependent on our level of revenues, customer cash advances, backlog, customer-driven delays and other factors. We will seek to improve our working capital utilization, with a particular focus on improving the management of accounts receivable and inventory. In 2020, our cash flows for investing activities will be focused on strategic initiatives, information technology infrastructure, general upgrades and cost reduction opportunities and we currently estimate capital expenditures to be between $90 million and $100 million, before consideration of any acquisition activity.

We currently anticipate that our minimum contribution to our qualified U.S. pension plan will be approximately $20 million, excluding direct benefits paid, in 2020 in order to maintain fully-funded status as defined by applicable law. We currently anticipate that our contributions to our non-U.S. pension plans will be approximately $2 million in 2020, excluding direct benefits paid.

CONTRACTUAL OBLIGATIONS AND COMMERCIAL COMMITMENTS

The following table presents a summary of our contractual obligations at December 31, 2019:

	Payments Due By Period				
	Within 1 Year	1-3 Years	3-5 Years	Beyond 5 Years	Total
	(Amounts in millions)				
Senior Notes	$ —	$ 1,055.9	$ 298.2	$ —	$ 1,354.1
Fixed interest payments(1)	36.5	62.3	10.5	—	109.3
Other debt	11.3	11.8	—	—	23.1
Leases:					
Operating	42.2	83.3	18.2	84.7	228.4
Finance	4.9	7.2	0.3	0.1	12.5
Purchase obligations:(2)					
Inventory	496.3	8.9	0.2	—	505.4
Non-inventory	48.0	0.2	0.3	—	48.5
Pension and postretirement benefits(3)	61.7	125.1	125.3	300.7	612.8
Total	$ 700.9	$ 1,354.7	$ 453.0	$ 385.5	$ 2,894.1

(1) Fixed interest payments represent interest payments on the Senior Notes as defined in Note 12 to our consolidated financial statements included in Item 8 of this Annual Report.

(2) Purchase obligations are presented at the face value of the purchase order, excluding the effects of early termination provisions. Actual payments could be less than amounts presented herein.

(3) Retirement and postretirement benefits represent estimated benefit payments for our U.S. and non-U.S. defined benefit plans and our postretirement medical plans, as more fully described below and in Note 13 to our consolidated financial statements included in Item 8 of this Annual Report.

As of December 31, 2019, the gross liability for uncertain tax positions was $40.6 million. We do not expect a material payment related to these obligations to be made within the next twelve months. We are unable to provide a reasonably reliable estimate of the timing of future payments relating to the uncertain tax positions.

The following table presents a summary of our commercial commitments at December 31, 2019:

	Commitment Expiration By Period				
	Within 1 Year	1-3 Years	3-5 Years	Beyond 5 Years	Total
	(Amounts in millions)				
Letters of credit	$ 343,407	$ 148,665	$ 14,050	$ 52,395	$ 558,517
Surety bonds	70,445	11,889	196	3,526	86,056
Total	$ 413,852	$ 160,554	$ 14,246	$ 55,921	$ 644,573

We expect to satisfy these commitments through performance under our contracts.

PENSION AND POSTRETIREMENT BENEFITS OBLIGATIONS

Plan Descriptions

We and certain of our subsidiaries have defined benefit pension plans and defined contribution plans for full-time and part-time employees. Approximately 65% of total defined benefit pension plan assets and approximately 53% of defined benefit pension obligations are related to the U.S. qualified plan as of December 31, 2019. Unless specified otherwise, the references in this section are to all of our U.S. and non-U.S. plans. None of our common stock is directly held by these plans.

Our U.S. defined benefit plan assets consist of a balanced portfolio of equity and fixed income securities. Our non-U.S. defined benefit plan assets include a significant concentration of United Kingdom ("U.K.") fixed income securities, as discussed in Note 13 to our consolidated financial statements included in Item 8 of this Annual Report. We monitor investment allocations and manage plan assets to maintain an acceptable level of risk. At December 31, 2019, the estimated fair market value of U.S. and non-U.S. plan assets for our defined benefit pension plans increased to $745.1 million from $658.0 million at December 31, 2018. Assets were allocated as follows:

	U.S. Plan	
Asset category	**2019**	**2018**
Cash and Cash Equivalents	1%	1%
Global Equity	28%	30%
Global Real Assets	12%	13%
Equity securities	40%	43%
Diversified Credit	12%	13%
Liability-Driven Investment	47%	43%
Fixed income	59%	56%

	Non-U.S. Plans	
Asset category	**2019**	**2018**
Cash and Cash Equivalents	2%	7%
North American Companies	1%	3%
Global Equity	1%	2%
Equity securities	2%	5%
U.K. Government Gilt Index	43%	43%
Global Fixed Income Bond	—%	2%
Liability-Driven Investment	7%	9%
Fixed income	50%	54%
Multi-asset	19%	19%
Buy-in Contract	21%	10%
Other	6%	5%
Other types	46%	34%

The projected benefit obligation ("Benefit Obligation") for our defined benefit pension plans was $897.1 million and $809.2 million as of December 31, 2019 and 2018, respectively. Benefits under our defined benefit pension plans are based primarily on participants' compensation and years of credited service.

The estimated prior service cost and the estimated actuarial net loss for the defined benefit pension plans that will be amortized from accumulated other comprehensive loss into net pension expense in 2020 is approximately $0.5 million and $10.9 million, respectively. We amortize any estimated net gains or losses over the remaining expected service period or over the remaining expected lifetime for plans with only inactive participants.

We sponsor defined benefit postretirement medical plans covering certain current retirees and a limited number of future retirees in the U.S. These plans provide for medical and dental benefits and are administered through insurance companies. We fund the plans as benefits are paid, such that the plans hold no assets in any period presented. Accordingly, we have no investment strategy or targeted allocations for plan assets. The benefits under the plans are not available to new employees or most existing employees.

The Benefit Obligation for our defined benefit postretirement medical plans was $18.9 million and $18.8 million as of December 31, 2019 and 2018, respectively. The estimated actuarial net gain and the estimated prior service cost for the defined benefit postretirement medical plans that are expected to be amortized from accumulated other comprehensive loss into net pension expense in 2020 are immaterial. We amortize any estimated net gain or loss over the remaining average life expectancy of approximately 11 years.

Accrual Accounting and Significant Assumptions

We account for pension benefits using the accrual method, recognizing pension expense before the payment of benefits to retirees. The accrual method of accounting for pension benefits requires actuarial assumptions concerning future events that will determine the amount and timing of the benefit payments.

Our key assumptions used in calculating our cost of pension benefits are the discount rate, the rate of compensation increase and the expected long-term rate of return on plan assets. We, in consultation with our actuaries, evaluate the key actuarial assumptions and other assumptions used in calculating the cost of pension and postretirement benefits, such as discount rates, expected return on plan assets for funded plans, mortality rates, retirement rates and assumed rate of compensation increases, and determine such assumptions as of December 31 of each year to calculate liability information as of that date and pension and postretirement expense for the following year. See discussion of our accounting for and assumptions related to pension and postretirement benefits in the "Our Critical Accounting Estimates" section of this MD&A.

In 2019, the service cost component of the pension expense for our defined benefit pension plans included in operating income was $29.0 million compared with $29.4 million in 2018 and $29.5 million in 2017. The non-service cost portion of net pension expense (e.g., interest cost, actuarial gains and losses and expected return on plan assets) for our defined benefit pension plans included in other income (expense), net was $1.8 million, compared to a benefit of $1.2 million in 2018 and an expense of $5.7 million in 2017.

The following are assumptions related to our defined benefit pension plans as of December 31, 2019:

	U.S. Plan	**Non-U.S. Plans**
Weighted average assumptions used to determine Benefit Obligation:		
Discount rate	3.41%	1.61%
Rate of increase in compensation levels	3.50	3.12
Weighted average assumptions used to determine 2019 net pension expense:		
Long-term rate of return on assets	6.00%	3.37%
Discount rate	4.34	2.42
Rate of increase in compensation levels	3.50	3.28

The following provides a sensitivity analysis of alternative assumptions on the U.S. qualified and aggregate non-U.S. pension plans and U.S. postretirement plans.

Effect of Discount Rate Changes and Constancy of Other Assumptions:

	0.5% Increase	**0.5% Decrease**
	(Amounts in millions)	
U.S. defined benefit pension plan:		
Effect on net pension expense	$ (1.9)	$ 2.0
Effect on Benefit Obligation	(18.5)	20.1
Non-U.S. defined benefit pension plans:		
Effect on net pension expense	(0.6)	0.8
Effect on Benefit Obligation	(31.7)	36.0
U.S. Postretirement medical plans:		
Effect on Benefit Obligation	(0.5)	0.6

Effect of Changes in the Expected Return on Assets and Constancy of Other Assumptions:

	0.5% Increase	0.5% Decrease
	(Amounts in millions)	
U.S. defined benefit pension plan:		
Effect on net pension expense	$ (2.1)	$ 2.1
Non-U.S. defined benefit pension plans:		
Effect on net pension expense	(1.1)	1.1

As discussed below, accounting principles generally accepted in the U.S. ("U.S. GAAP") provide that differences between expected and actual returns are recognized over the average future service of employees or over the remaining expected lifetime for plans with only inactive participants.

At December 31, 2019, as compared with December 31, 2018, we decreased our discount rate for the U.S. plan from 4.34% to 3.41% based on an analysis of publicly-traded investment grade U.S. corporate bonds, which had lower yields due to current market conditions. The average discount rate for the non-U.S. plans decreased from 2.42% to 1.61% based on analysis of bonds and other publicly-traded instruments, by country, which had lower yields due to market conditions. The average assumed rate of compensation remained unchanged at 3.50% for the U.S. plan and decreased to 3.12% from 3.28% for our non-U.S. plans. To determine the 2019 pension expense, the expected rate of return on U.S. plan assets remained constant at 6.00% and we decreased our average rate of return on non-U.S. plan assets from 3.62% to 3.37%, primarily based on our target allocations and expected long-term asset returns. As the expected rate of return on plan assets is long-term in nature, short-term market fluctuations do not significantly impact the rate. For all U.S. plans, we adopted the Pri-2012 mortality tables and the MP-2019 improvement scale published in October 2019. We applied the Pri-2012 tables based on the constituency of our plan population for union and non-union participants. We adjusted the improvement scale to utilize 75% of the ultimate improvement rate, consistent with assumptions adopted by the Social Security Administration trustees, based on long-term historical experience. Currently, we believe this approach provides the best estimate of our future obligation. Most plan participants elect to receive plan benefits as a lump sum at the end of service, rather than an annuity. As such, the updated mortality tables had an immaterial effect on our pension obligation.

We expect that the net pension expense for our defined benefit pension plans included in earnings before income taxes will be approximately $3.6 million higher in 2020 than the $30.8 million in 2019, primarily due to an increase in the amortization of actuarial losses and no anticipated special events. We have used discount rates of 3.41%, 1.61% and 3.27% at December 31, 2019, in calculating our estimated 2020 net pension expense for the U.S. pension plans, non-U.S. pension plans and postretirement medical plans, respectively.

The assumed ranges for the annual rates of increase in health care costs were 7.5% for 2019, 7.0% for 2018 and 7% for 2017, with a gradual decrease to 5.0% for 2029 and future years. If actual costs are higher than those assumed, this will likely put modest upward pressure on our expense for retiree health care.

Plan Funding

Our funding policy for defined benefit plans is to contribute at least the amounts required under applicable laws and local customs. We contributed $37.3 million, $48.1 million and $44.9 million to our defined benefit plans in 2019, 2018 and 2017, respectively. After consideration of our intent to remain fully-funded based on standards set by law, we currently anticipate that our contribution to our U.S. pension plan in 2020 will be approximately $20 million, excluding direct benefits paid. We expect to contribute approximately $2 million to our non-U.S. pension plans in 2020, excluding direct benefits paid.

For further discussion of our pension and postretirement benefits, see Note 13 to our consolidated financial statements included in Item 8 of this Annual Report.

OUR CRITICAL ACCOUNTING ESTIMATES

The process of preparing financial statements in conformity with U.S. GAAP requires the use of estimates and assumptions to determine reported amounts of certain assets, liabilities, revenues and expenses and the disclosure of related contingent assets and liabilities. These estimates and assumptions are based upon information available at the time of the estimates or assumptions, including our historical experience, where relevant. The most significant estimates made by management include: timing and amount of revenue recognition; deferred taxes, tax valuation allowances and tax reserves; reserves for contingent loss; pension and postretirement benefits; and valuation of goodwill, indefinite-lived intangible assets and other long-lived assets. The significant estimates are reviewed at least annually if not quarterly by management. Because of the uncertainty of factors surrounding the estimates, assumptions and judgments used in the preparation of our financial statements, actual results may differ from the estimates, and the difference may be material.

Our critical accounting policies are those policies that are both most important to our financial condition and results of operations and require the most difficult, subjective or complex judgments on the part of management in their application, often as a result of the need to make estimates about the effect of matters that are inherently uncertain. We believe that the following represent our critical accounting policies. For a summary of all of our significant accounting policies, see Note 1 to our consolidated financial statements included in Item 8 of this Annual Report. Management and our external auditors have discussed our critical accounting estimates and policies with the Audit Committee of our Board of Directors.

Revenue Recognition

We recognize revenue when (or as) we satisfy a performance obligation by transferring control to a customer. Transfer of control is evaluated based on the customer’s ability to direct the use of and obtain substantially all of the benefits of a performance obligation. Revenue is recognized either over time or at a point in time, depending on the specific facts and circumstances for each contract, including the terms and conditions of the contract as agreed with the customer and the nature of the products or services to be provided.

Our primary method for recognizing revenue over time is the percentage of completion (“POC”) method, whereby progress towards completion is measured by applying an input measure based on costs incurred to date relative to total estimated costs at completion. If control of the products and/or services does not transfer over time, then control transfers at a point in time. We determine the point in time that control transfers to a customer based on the evaluation of specific indicators, such as title transfer, risk of loss transfer, customer acceptance and physical possession. For a discussion related to revenue recognition refer to Note 2 included in Item 8 of this Annual Report.

Deferred Taxes, Tax Valuation Allowances and Tax Reserves

We recognize valuation allowances to reduce the carrying value of deferred tax assets to amounts that we expect are more likely than not to be realized. Our valuation allowances primarily relate to the deferred tax assets established for certain tax credit carryforwards and net operating loss carryforwards for non-U.S. subsidiaries, and we evaluate the realizability of our deferred tax assets by assessing the related valuation allowance and by adjusting the amount of these allowances, if necessary. We assess such factors as our forecast of future taxable income and available tax planning strategies that could be implemented to realize the net deferred tax assets in determining the sufficiency of our valuation allowances. Failure to achieve forecasted taxable income in the applicable tax jurisdictions could affect the ultimate realization of deferred tax assets and could result in an increase in our effective tax rate on future earnings. Implementation of different tax structures in certain jurisdictions could, if successful, result in future reductions of certain valuation allowances.

The amount of income taxes we pay is subject to ongoing audits by federal, state and foreign tax authorities, which often result in proposed assessments. Significant judgment is required in determining income tax provisions and evaluating tax positions. We establish reserves for open tax years for uncertain tax positions that may be subject to challenge by various tax authorities. The consolidated tax provision and related accruals include the impact of such reasonably estimable losses and related interest and penalties as deemed appropriate. Tax benefits recognized in the financial statements from uncertain tax positions are measured based on the largest benefit that has a greater than fifty percent likelihood of being realized upon ultimate settlement.

While we believe we have adequately provided for any reasonably foreseeable outcome related to these matters, our future results may include favorable or unfavorable adjustments to our estimated tax liabilities. To the extent that the expected tax outcome of these matters changes, such changes in estimate will impact the income tax provision in the period in which such determination is made.

Reserves for Contingent Loss

Liabilities are recorded for various contingencies arising in the normal course of business when it is both probable that a loss has been incurred and such loss is reasonably estimable. Assessments of reserves are based on information obtained from our independent and in-house experts, including recent legal decisions and loss experience in similar situations. The recorded legal reserves are susceptible to changes due to new developments regarding the facts and circumstances of each matter, changes in political environments, legal venue and other factors. Recorded environmental reserves could change based on further analysis of our properties, technological innovation and regulatory environment changes.

Estimates of liabilities for unsettled asbestos-related claims are based on known claims and on our experience during the preceding two years for claims filed, settled and dismissed, with adjustments for events deemed unusual and unlikely to recur. A substantial majority of our asbestos-related claims are covered by insurance or indemnities. Estimated indemnities and receivables from insurance carriers for unsettled claims and receivables for settlements and legal fees paid by us for asbestos-related claims are estimated using our historical experience with insurance recovery rates and estimates of future recoveries, which include estimates of coverage and financial viability of our insurance carriers. We have claims pending against certain insurers that, if resolved more favorably than estimated future recoveries, would result in discrete gains in the applicable quarter. We are currently unable to estimate the impact, if any, of unasserted asbestos-related claims, although future claims would also be subject to existing indemnities and insurance coverage. Changes in claims filed, settled and dismissed and differences between actual and estimated settlement costs and insurance or indemnity recoveries could impact future expense.

Pension and Postretirement Benefits

We provide pension and postretirement benefits to certain of our employees, including former employees, and their beneficiaries. The assets, liabilities and expenses we recognize and disclosures we make about plan actuarial and financial information are dependent on the assumptions and estimates used in calculating such amounts. The assumptions include factors such as discount rates, health care cost trend rates, inflation, expected rates of return on plan assets, retirement rates, mortality rates, turnover, rates of compensation increases and other factors.

The assumptions utilized to compute expense and benefit obligations are shown in Note 13 to our consolidated financial statements included in Item 8 of this Annual Report. These assumptions are assessed annually in consultation with independent actuaries and investment advisors as of December 31 and adjustments are made as needed. We evaluate prevailing market conditions and local laws and requirements in countries where plans are maintained, including appropriate rates of return, interest rates and medical inflation (health care cost trend) rates. We ensure that our significant assumptions are within the reasonable range relative to market data. The methodology to set our significant assumptions includes:

- Discount rates are estimated using high quality debt securities based on corporate or government bond yields with a duration matching the expected benefit payments. For the U.S. the discount rate is obtained from an analysis of publicly-traded investment-grade corporate bonds to establish a weighted average discount rate. For plans in the U.K. and the Eurozone we use the discount rate obtained from an analysis of AA-graded corporate bonds used to generate a yield curve. For other countries or regions without a corporate AA bond market, government bond rates are used. Our discount rate assumptions are impacted by changes in general economic and market conditions that affect interest rates on long-term high-quality debt securities, as well as the duration of our plans’ liabilities.
- The expected rates of return on plan assets are derived from reviews of asset allocation strategies, expected long-term performance of asset classes, risks and other factors adjusted for our specific investment strategy. These rates are impacted by changes in general market conditions, but because they are long-term in nature, short-term market changes do not significantly impact the rates. Changes to our target asset allocation also impact these rates.
- The expected rates of compensation increase reflect estimates of the change in future compensation levels due to general price levels, seniority, age and other factors.

Depending on the assumptions used, the pension and postretirement expense could vary within a range of outcomes and have a material effect on reported earnings. In addition, the assumptions can materially affect benefit obligations and future cash funding. Actual results in any given year may differ from those estimated because of economic and other factors.

We evaluate the funded status of each retirement plan using current assumptions and determine the appropriate funding level considering applicable regulatory requirements, tax deductibility, reporting considerations, cash flow requirements and other factors. We discuss our funding assumptions with the Finance Committee of our Board of Directors.

Valuation of Goodwill, Indefinite-Lived Intangible Assets and Other Long-Lived Assets

The initial recording of goodwill and intangible assets requires subjective judgments concerning estimates of the fair value of the acquired assets. We test the value of goodwill and indefinite-lived intangible assets for impairment as of December 31 each year or whenever events or circumstances indicate such assets may be impaired.

The test for goodwill impairment involves significant judgment in estimating projections of fair value generated through future performance of each of the reporting units. The identification of our reporting units began at the operating segment level and considered whether components one level below the operating segment levels should be identified as reporting units for purpose of testing goodwill for impairment based on certain conditions. These conditions included, among other factors,

(i) the extent to which a component represents a business and (ii) the aggregation of economically similar components within the operating segments and resulted in four reporting units. Other factors that were considered in determining whether the aggregation of components was appropriate included the similarity of the nature of the products and services, the nature of the production processes, the methods of distribution and the types of industries served.

An impairment loss for goodwill is recognized if the implied fair value of goodwill is less than the carrying value. We estimate the fair value of our reporting units based on an income approach, whereby we calculate the fair value of a reporting unit based on the present value of estimated future cash flows. A discounted cash flow analysis requires us to make various judgmental assumptions about future sales, operating margins, growth rates and discount rates, which are based on our budgets, business plans, economic projections, anticipated future cash flows and market participants. We did not record an impairment of goodwill in 2019, 2018 or 2017.

We also considered our market capitalization in our evaluation of the fair value of our goodwill. Our market capitalization increased as compared with 2018 and did not indicate a potential impairment of our goodwill as of December 31, 2019.

Impairment losses for indefinite-lived intangible assets are recognized whenever the estimated fair value is less than the carrying value. Fair values are calculated for trademarks using a "relief from royalty" method, which estimates the fair value of a trademark by determining the present value of estimated royalty payments that are avoided as a result of owning the trademark. This method includes judgmental assumptions about sales growth and discount rates that have a significant impact on the fair value and are substantially consistent with the assumptions used to determine the fair value of our reporting unit discussed above. We did not record a material impairment of our trademarks in 2019, 2018 or 2017.

The recoverable value of other long-lived assets, including property, plant and equipment and finite-lived intangible assets, is reviewed when indicators of potential impairments are present. The recoverable value is based upon an assessment of the estimated future cash flows related to those assets, utilizing assumptions similar to those for goodwill. Additional considerations related to our long-lived assets include expected maintenance and improvements, changes in expected uses and ongoing operating performance and utilization.

Due to uncertain market conditions and potential changes in strategy and product portfolio, it is possible that forecasts used to support asset carrying values may change in the future, which could result in non-cash charges that would adversely affect our financial condition and results of operations.

ACCOUNTING DEVELOPMENTS

We have presented the information about accounting pronouncements not yet implemented in Note 1 to our consolidated financial statements included in Item 8 of this Annual Report.

ITEM 7A. *QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK*

We have market risk exposure arising from changes in foreign currency exchange rate movements. We are exposed to credit-related losses in the event of non-performance by counterparties to financial instruments, but we currently expect all counterparties will continue to meet their obligations given their current creditworthiness.

Foreign Currency Exchange Rate Risk

A substantial portion of our operations are conducted by our subsidiaries outside of the U.S. in currencies other than the U.S. dollar. The primary currencies in which we operate, in addition to the U.S. dollar, are the Argentine peso, Australian dollar, Brazilian real, British pound, Canadian dollar, Chinese yuan, Colombian peso, Euro, Hungarian forint, Indian rupee, Japanese yen, Mexican peso, Singapore dollar, Swedish krona, Russian ruble, Malaysian ringgit and Venezuelan bolivar. Almost all of our non-U.S. subsidiaries conduct their business primarily in their local currencies, which are also their functional currencies. Foreign currency exposures arise from translation of foreign-denominated assets and liabilities into U.S. dollars and from transactions, including firm commitments and anticipated transactions, denominated in a currency other than a non-U.S. subsidiary's functional currency. In March 2015, we designated €255.7 million of our €500.0 million 2022 EUR Senior Notes as a net investment hedge of our investments in certain of our international subsidiaries that use the Euro as their functional currency. Generally, we view our investments in foreign subsidiaries from a long-term perspective and use capital structuring techniques to manage our investment in foreign subsidiaries as deemed necessary. We realized net gains (losses) associated with foreign currency translation of $6.6 million, $(63.1) million and $98.8 million for the years ended December 31, 2019, 2018 and 2017, respectively, which are included in other comprehensive income (loss). The net gain in 2019 was primarily driven by the weakening of the Euro, British pound, Chinese yuan and Indian rupee versus the U.S. dollar at December 31, 2019 as compared with December 31, 2018.

We employ a foreign currency risk management strategy to minimize potential changes in cash flows from unfavorable foreign currency exchange rate movements. Where available, the use of forward exchange contracts allows us to mitigate transactional exposure to exchange rate fluctuations as the gains or losses incurred on the forward exchange contracts will offset, in whole or in part, losses or gains on the underlying foreign currency exposure. Our policy allows foreign currency coverage only for identifiable foreign currency exposures. As of December 31, 2019, we had a U.S. dollar equivalent of $398.5 million in aggregate notional amount outstanding in foreign exchange contracts with third parties, compared with $280.9 million at December 31, 2018. Transactional currency gains and losses arising from transactions outside of our sites' functional currencies and changes in fair value of foreign exchange contracts are included in our consolidated results of operations. We recognized foreign currency net losses of $14.5 million, $18.7 million and $14.0 million for the years ended December 31, 2019, 2018 and 2017, respectively, which are included in other income (expense), net in the accompanying consolidated statements of income.

Based on a sensitivity analysis at December 31, 2019, a 10% change in the foreign currency exchange rates for the year ended December 31, 2019 would have impacted our net earnings by approximately $17 million. At December 31, 2018, a 10% change in the foreign currency exchange rates for the year ended December 31, 2018 would have impacted our net earnings by approximately $3 million. This calculation assumes that all currencies change in the same direction and proportion relative to the U.S. dollar and that there are no indirect effects, such as changes in non-U.S. dollar sales volumes or prices. This calculation does not take into account the impact of the foreign currency forward exchange contracts discussed above.

ITEM 8. ***FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA***

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors and Shareholders of Flowserve Corporation

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Flowserve Corporation and its subsidiaries (the “Company”) as of December 31, 2019 and 2018, and the related consolidated statements of income, of comprehensive income, of shareholders' equity and of cash flows for each of the three years in the period ended December 31, 2019, including the related notes and schedule of valuation and qualifying accounts for each of the three years in the period ended December 31, 2019 listed in the index appearing under Item 15(a)(2) (collectively referred to as the “consolidated financial statements”). We also have audited the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2019 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2019, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Notes 1 and 2 to the consolidated financial statements, the Company changed the manner in which it accounts for sales from contracts with customers in 2018.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management’s Report on Internal Control Over Financial Reporting appearing under Item 9A. Our responsibility is to express opinions on the Company’s consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

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

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

Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Goodwill Impairment Test

As described in Notes 1 and 5 to the consolidated financial statements, the Company's consolidated goodwill balance was $1,193.0 million as of December 31, 2019. The Company conducts an impairment test as of December 31 each year or whenever events or circumstances indicate goodwill may be impaired. An impairment loss for goodwill is recognized if the implied fair value of goodwill is less than the carrying value. Fair value is estimated using a discounted cash flow analysis, which requires management to make various judgmental assumptions about future sales, operating margins, growth rates and discount rates.

The principal considerations for our determination that performing procedures relating to the goodwill impairment test is a critical audit matter are there was significant judgment by management when determining the fair value of the reporting units using a discounted cash flow analysis. This in turn led to a high degree of auditor judgment, subjectivity and effort in performing procedures and in evaluating management's discounted cash flow analysis, including significant assumptions about future sales, operating margins, growth rates and discount rates. In addition, the audit effort included the involvement of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating audit evidence obtained.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's goodwill impairment test, including controls over the determination of the fair value of the Company's reporting units. These procedures also included, among others, (i) testing management's process for developing the fair value estimate, (ii) evaluating the appropriateness of the discounted cash flow analysis, (iii) testing the completeness, accuracy and relevance of underlying data used in the analysis, and (iv) evaluating the significant assumptions used in the discounted cash flow analysis by management in developing the fair value estimate, including future sales, operating margins, growth rates and discount rates. Evaluating management's assumptions related to future sales, operating margins and growth rates involved evaluating whether the assumptions used by management were reasonable considering current and past performance of the reporting units and whether these assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in evaluating the reasonableness of the discount rates.

Income Tax - Valuation Allowances on Deferred Tax Assets

As described in Notes 1 and 17 to the consolidated financial statements, the Company's consolidated net deferred tax assets of $113 million includes valuation allowances of $266 million, primarily related to the deferred tax assets established for U.S. foreign tax credit carryforwards of $29.1 million, foreign capital loss carryforwards of $102.6 million, and other foreign deferred tax assets of $134.7 million. Management records valuation allowances to reduce the carrying value of deferred tax assets to amounts that are more likely than not to be realized. Management assesses existing deferred tax assets, net operating losses and tax credits by jurisdiction and expectations of the Company's ability to utilize these tax attributes through a review of past, current and estimated future taxable income and establishment of tax planning strategies.

The principal considerations for our determination that performing procedures relating to the income tax valuation allowances on deferred tax assets is a critical audit matter are there was significant judgment by management when estimating future taxable income, including tax planning strategies. This in turn led to a high degree of auditor judgment, subjectivity and effort in performing procedures and in evaluating audit evidence relating to future taxable income, including tax planning strategies and application of foreign tax regulations. In addition, the audit effort involved the use of professionals with specialized skill and knowledge to assist in performing these procedures and evaluating the audit evidence obtained.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the valuation allowances on deferred tax assets, including controls over the review of management's analysis by jurisdiction of cumulative taxable income (loss) and controls over management's estimate by jurisdiction of future taxable income. Our procedures also included, among others, (i) testing underlying historical data used in calculating the cumulative taxable income (loss), (ii) assessing the effect of other events, such as past Company transactions, and (iii) testing management's estimate of future taxable income, which included evaluating the reasonableness of significant assumptions and appropriateness of available tax planning strategies. Professionals with specialized skill and knowledge were used to assist in evaluating management's analysis, including cumulative taxable income (loss) as well as the reasonableness of management's judgments and estimates, including management's application of foreign tax regulations.

/s/ PricewaterhouseCoopers LLP

PricewaterhouseCoopers LLP

Dallas, Texas

February 17, 2020

We have served as the Company's auditor since 2000.

FLOWSERVE CORPORATION

CONSOLIDATED BALANCE SHEETS

	December 31, 2019	December 31, 2018
	(Amounts in thousands, except per share data)	
ASSETS		
Current assets:		
Cash and cash equivalents	$ 670,980	$ 619,683
Accounts receivable, net	795,538	792,434
Contract assets, net	272,914	228,579
Inventories, net	660,837	633,871
Prepaid expenses and other	105,101	108,578
Total current assets	2,505,370	2,383,145
Property, plant and equipment, net	572,175	610,096
Operating lease right-of-use assets, net	186,218	—
Goodwill	1,193,010	1,197,640
Deferred taxes	54,879	44,682
Other intangible assets, net	180,805	190,550
Other assets, net	227,185	190,164
Total assets	$ 4,919,642	$ 4,616,277
LIABILITIES AND EQUITY		
Current liabilities:		
Accounts payable	$ 447,582	$ 418,893
Accrued liabilities	401,385	391,406
Contract liabilities	216,541	202,458
Debt due within one year	11,272	68,218
Operating lease liabilities	36,108	—
Total current liabilities	1,112,888	1,080,975
Long-term debt due after one year	1,365,977	1,414,829
Operating lease liabilities	151,523	—
Retirement obligations and other liabilities	473,295	459,693
Commitments and contingencies (See Note 14)		
Shareholders' equity:		
Common shares, $1.25 par value	220,991	220,991
Shares authorized — 305,000		
Shares issued — 176,793 and 176,793, respectively		
Capital in excess of par value	501,045	494,551
Retained earnings	3,695,862	3,543,007
Treasury shares, at cost — 46,262 and 46,237 shares, respectively	(2,051,583)	(2,049,404)
Deferred compensation obligation	8,334	7,117
Accumulated other comprehensive loss	(584,292)	(573,947)
Total Flowserve Corporation shareholders' equity	1,790,357	1,642,315
Noncontrolling interests	25,602	18,465
Total equity	1,815,959	1,660,780
Total liabilities and equity	$ 4,919,642	$ 4,616,277

See accompanying notes to consolidated financial statements.

FLOWSERVE CORPORATION

CONSOLIDATED STATEMENTS OF INCOME

	Year Ended December 31,		
	2019	2018	2017
	(Amounts in thousands, except per share data)		
Sales	$ 3,944,850	$ 3,832,666	$ 3,660,831
Cost of sales	(2,649,480)	(2,644,830)	(2,571,878)
Gross profit	1,295,370	1,187,836	1,088,953
Selling, general and administrative expense	(899,813)	(943,714)	(901,727)
Gain (loss) on sale of businesses	—	(7,727)	141,317
Net earnings from affiliates	10,483	11,143	12,592
Operating income	406,040	247,538	341,135
Interest expense	(54,980)	(58,160)	(59,730)
Interest income	8,409	6,465	3,429
Other income (expense), net	(17,619)	(19,569)	(21,827)
Earnings before income taxes	341,850	176,274	263,007
Provision for income taxes	(80,070)	(51,224)	(258,679)
Net earnings, including noncontrolling interests	261,780	125,050	4,328
Less: Net earnings attributable to noncontrolling interests	(8,112)	(5,379)	(1,676)
Net earnings attributable to Flowserve Corporation	$ 253,668	$ 119,671	$ 2,652
Net earnings per share attributable to Flowserve Corporation common shareholders:			
Basic	$ 1.94	$ 0.91	$ 0.02
Diluted	1.93	0.91	0.02

See accompanying notes to consolidated financial statements.

FLOWSERVE CORPORATION

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

	Year Ended December 31,		
	2019	2018	2017
	(Amounts in thousands)		
Net earnings, including noncontrolling interests	$ 261,780	$ 125,050	$ 4,328
Other comprehensive income (loss):			
Foreign currency translation adjustments, net of deferred taxes of $(740), $(490) and $19,593 in 2019, 2018 and 2017, respectively	6,561	(63,146)	98,830
Pension and other postretirement effects, net of deferred taxes of $(598), $3,103 and $(14,228) in 2019, 2018 and 2017, respectively	(16,514)	(4,892)	20,775
Cash flow hedging activity, net of deferred taxes of $(38) in 2017	187	232	148
Other comprehensive income (loss)	(9,766)	(67,806)	119,753
Comprehensive income, including noncontrolling interests	252,014	57,244	124,081
Comprehensive income attributable to noncontrolling interests	(8,691)	(6,047)	(2,114)
Comprehensive income attributable to Flowserve Corporation	$ 243,323	$ 51,197	$ 121,967

See accompanying notes to consolidated financial statements.

FLOWSERVE CORPORATION

CONSOLIDATED STATEMENTS OF SHAREHOLDERS' EQUITY

	Total Flowserve Corporation Shareholders' Equity									
	Common Stock		Capital in Excess of Par Value	Retained Earnings	Treasury Stock		Deferred Compensation Obligation	Accumulated Other Comprehensive Loss	Noncontrolling Interests	Total Equity
	Shares	Amount			Shares	Amount				
	(Amounts in thousands)									
Balance, as reported — January 1, 2017	176,793	$ 220,991	$ 488,882	$ 3,601,362	(46,980)	$ (2,078,527)	$ 8,507	$ (624,788)	$ 20,961	$ 1,637,388
Stock activity under stock plans	—	—	(23,479)	—	509	18,969	—	—	—	(4,510)
Stock-based compensation	—	—	22,820	—	—	—	—	—	—	22,820
Tax benefit associated with stock-based compensation	—	—	103	—	—	—	—	—	—	103
Net earnings	—	—	—	2,652	—	—	—	—	1,676	4,328
Cash dividends declared	—	—	—	(100,067)	—	—	—	—	—	(100,067)
Other comprehensive income, net of tax	—	—	—	—	—	—	—	119,315	438	119,753
Other, net	—	—	—	—	—	—	(2,153)	—	(6,708)	(8,861)
Balance — December 31, 2017	176,793	220,991	488,326	3,503,947	(46,471)	(2,059,558)	6,354	(505,473)	16,367	1,670,954
ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606)	—	—	—	19,642	—	—	—	—	—	19,642
Stock activity under stock plans	—	—	(13,687)	—	234	10,154	—	—	—	(3,533)
Stock-based compensation	—	—	19,912	—	—	—	—	—	—	19,912
Net earnings	—	—	—	119,671	—	—	—	—	5,379	125,050
Cash dividends declared	—	—	—	(100,253)	—	—	—	—	—	(100,253)
Other comprehensive loss, net of tax	—	—	—	—	—	—	—	(68,474)	668	(67,806)
Other, net	—	—	—	—	—	—	763	—	(3,949)	(3,186)
Balance — December 31, 2018	176,793	$ 220,991	$ 494,551	$ 3,543,007	(46,237)	$ (2,049,404)	$ 7,117	$ (573,947)	$ 18,465	$ 1,660,780
Stock activity under stock plans	—	—	(17,388)	—	300	12,821	1,217	—	—	(3,350)
Stock-based compensation	—	—	23,882	—	—	—	—	—	—	23,882
Net earnings	—	—	—	253,668	—	—	—	—	8,112	261,780
Cash dividends declared	—	—	—	(100,813)	—	—	—	—	—	(100,813)
Repurchases of common shares	—	—	—	—	(325)	(15,000)	—	—	—	(15,000)
Other comprehensive loss, net of tax	—	—	—	—	—	—	—	(10,345)	579	(9,766)
Other, net	—	—	—	—	—	—	—	—	(1,554)	(1,554)
Balance — December 31, 2019	176,793	$ 220,991	$ 501,045	$ 3,695,862	(46,262)	$ (2,051,583)	$ 8,334	$ (584,292)	$ 25,602	$ 1,815,959

See accompanying notes to consolidated financial statements.

FLOWSERVE CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS

	Year Ended December 31,		
	2019	**2018**	**2017**
	(Amounts in thousands)		
Cash flows — Operating activities:			
Net earnings, including noncontrolling interests	$ 261,780	$ 125,050	$ 4,328
Adjustments to reconcile net earnings to net cash provided by operating activities:			
Depreciation	90,619	95,820	101,438
Amortization of intangible and other assets	13,862	16,653	17,016
Loss (gain) on disposition of businesses	—	7,727	(141,317)
Stock-based compensation	23,882	19,912	22,820
Provision for U.S. Tax Cuts and Jobs Act of 2017	—	(5,654)	115,320
Foreign currency, asset impairment and other non-cash adjustments	(11,224)	36,052	33,087
Change in assets and liabilities:			
Accounts receivable, net	2,883	(25,448)	60,216
Inventories, net	(31,058)	(29,314)	48,642
Contract assets, net	(45,939)	(23,693)	—
Prepaid expenses and other assets, net	13,289	(7,869)	32,935
Contract liabilities	14,390	33,710	—
Accounts payable	22,870	(4,823)	12,403
Accrued liabilities and income taxes payable	4,184	(18,248)	(3,383)
Retirement obligations and other	(39,881)	(44,314)	(43,431)
Net deferred taxes	(6,916)	15,270	50,992
Net cash flows provided (used) by operating activities	312,741	190,831	311,066
Cash flows — Investing activities:			
Capital expenditures	(66,170)	(83,993)	(61,602)
Proceeds from disposal of assets	42,333	6,190	5,435
(Payments for) proceeds from disposition of businesses	—	(3,663)	232,767
Net cash flows provided (used) by investing activities	(23,837)	(81,466)	176,600
Cash flows — Financing activities:			
Payments on long-term debt	(105,000)	(60,000)	(60,000)
Payments of deferred loan costs	—	—	(1,503)
Proceeds from short-term financing	75,000	—	—
Payments on short-term financing	(75,000)	—	—
Proceeds under other financing arrangements	4,639	3,377	7,359
Payments under other financing arrangements	(9,281)	(9,853)	(19,030)
Payments related to tax withholding for stock-based compensation	(3,900)	(3,061)	(6,238)
Repurchases of common shares	(15,000)	—	—
Payments of dividends	(99,557)	(99,416)	(99,233)
Other	(1,555)	(4,331)	(6,708)
Net cash flows provided (used) by financing activities	(229,654)	(173,284)	(185,353)
Effect of exchange rate changes on cash	(7,953)	(19,843)	33,970
Net change in cash and cash equivalents	51,297	(83,762)	336,283
Cash and cash equivalents at beginning of year	619,683	703,445	367,162
Cash and cash equivalents at end of year	$ 670,980	$ 619,683	$ 703,445
Income taxes paid (net of refunds)	$ 66,372	$ 87,009	$ 59,409
Interest paid	53,607	54,576	56,808

See accompanying notes to consolidated financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS AS OF DECEMBER 31, 2019 AND 2018 AND FOR THE THREE YEARS ENDED DECEMBER 31, 2019

1. SIGNIFICANT ACCOUNTING POLICIES AND ACCOUNTING DEVELOPMENTS

We are principally engaged in the worldwide design, manufacture, distribution and service of industrial flow management equipment. We provide long lead time, custom and other highly-engineered pumps; standardized, general-purpose pumps; mechanical seals; engineered and industrial valves; related automation products; and services and solutions primarily for oil and gas, chemical, power generation, water management and other general industries requiring flow management products and services. Equipment manufactured and serviced by us is predominantly used in industries that deal with difficult-to-handle and corrosive fluids, as well as environments with extreme temperatures, pressure, horsepower and speed. Our business is affected by economic conditions in the United States ("U.S.") and other countries where our products are sold and serviced, by the cyclical nature and competitive environment of our industries served, by the relationship of the U.S. dollar to other currencies and by the demand for and pricing of our customers' end products.

Resegmentation — We have determined that there are meaningful operational synergies and benefits to combining our previously reported Engineered Product Division ("EPD") and Industrial Product Division ("IPD") segments into one reportable segment, Flowserve Pump Division ("FPD"). During the first quarter of 2019, we implemented a reorganization of our operating segments and as a result we report our financial information reflecting two operating segments, FPD and Flow Control Division ("FCD"). The reorganization of the segments reflects how our chief operating decision maker (Chief Executive Officer) regularly reviews financial information to allocate resources and assess performance. Prior periods' financial information were retrospectively adjusted to conform to the new reportable segment composition.

Principles of Consolidation — The consolidated financial statements include the accounts of our company and our wholly and majority-owned subsidiaries. In addition, we would consolidate any variable interest entities for which we are deemed to be the primary beneficiary. Noncontrolling interests of non-affiliated parties have been recognized for all majority-owned consolidated subsidiaries. Intercompany profits/losses, transactions and balances among consolidated entities have been eliminated from our consolidated financial statements. Investments in unconsolidated affiliated companies, which represent noncontrolling ownership interests between 20% and 50%, are accounted for using the equity method, which approximates our equity interest in their underlying equivalent net book value under accounting principles generally accepted in the U.S. ("U.S. GAAP"). Investments in interests where we own less than 20% of the investee are accounted for by the cost method, whereby income is only recognized in the event of dividend receipt. Investments accounted for by the cost method are tested for impairment if an impairment indicator is present.

Use of Estimates — The process of preparing financial statements in conformity with U.S. GAAP requires us to make estimates and assumptions that affect reported amounts of certain assets, liabilities, revenues and expenses. We believe our estimates and assumptions are reasonable; however, actual results may differ materially from such estimates. The most significant estimates and assumptions are used in determining:

- Timing and amount of revenue recognition;
- Deferred taxes, tax valuation allowances and tax reserves;
- Reserves for contingent loss;
- Pension and postretirement benefits; and
- Valuation of goodwill, indefinite-lived intangible assets and other long-lived assets.

Argentina Highly Inflationary — Effective July 1, 2018, Argentina was designated as hyperinflationary, and as a result, we began using the U.S. dollar as our functional currency in Argentina. Our Argentinian subsidiary's sales for the year ended December 31, 2019 represented approximately 1% of consolidated sales and its assets at December 31, 2019 represented approximately 2% of total consolidated assets. Assets primarily consisted of U.S. dollar-denominated monetary assets and Argentinian peso-denominated non-monetary assets at December 31, 2019. In addition, certain of our operations in other countries sell equipment and parts that are typically denominated in U.S. dollars directly to Argentinian customers.

Revenue Recognition — We adopted Accounting Standards Update ("ASU") No. 2014-09, "Revenue from Contracts with Customers (Topic 606)" ("New Revenue Standard") on January 1, 2018, using the modified retrospective method for transition; periods prior to January 1, 2018, are presented in accordance with "Revenue Recognition (Topic 605)" ("Topic 605"). The majority of our revenues relate to customer orders that typically contain a single commitment of goods or services which have lead times under a year. Longer lead time, more complex contracts with our customers typically have multiple commitments of goods and services, including any combination of designing, developing, manufacturing, modifying, installing and commissioning of flow management equipment and providing services and parts related to the performance of such products. We recognize revenue when (or as) we satisfy a performance obligation by transferring control to a customer. Transfer of control is evaluated based on the customer’s ability to direct the use of and obtain substantially all of the benefits of a performance obligation. Revenue is recognized either over time or at a point in time, depending on the specific facts and circumstances for each contract, including the terms and conditions of the contract as agreed with the customer and the nature of the products or services to be provided.

Our primary method for recognizing revenue over time is the percentage of completion (“POC”) method, whereby progress towards completion is measured by applying an input measure based on costs incurred to date relative to total estimated costs at completion. If control of the products and/or services does not transfer over time, then control transfers at a point in time. We determine the point in time that control transfers to a customer based on the evaluation of specific indicators, such as title transfer, risk of loss transfer, customer acceptance and physical possession. For a detailed discussion related to revenue recognition refer to Note 2.

Cash and Cash Equivalents — We place temporary cash investments with financial institutions and, by policy, invest in those institutions and instruments that have minimal credit risk and market risk. These investments, with an original maturity of three months or less when purchased, are classified as cash equivalents. They are highly liquid and principal values are not subject to significant risk of change due to interest rate fluctuations.

Allowance for Doubtful Accounts and Credit Risk — The allowance for doubtful accounts is established based on estimates of the amount of uncollectible accounts receivable, which is determined principally based upon the aging of the accounts receivable, but also customer credit history, industry and market segment information, economic trends and conditions and credit reports. Customer credit issues, customer bankruptcies or general economic conditions may also impact our estimates.

Credit risks are mitigated by the diversity of our customer base across many different geographic regions and industries and by performing creditworthiness analyses on our customers. Additionally, we mitigate credit risk through letters of credit and advance payments received from our customers. We do not believe that we have any other significant concentrations of credit risk.

Inventories and Related Reserves — Inventories are stated at the lower of cost and net realizable value. Cost is determined by the first-in, first-out method. Reserves for excess and obsolete inventories are based upon our assessment of market conditions for our products determined by historical usage and estimated future demand. Due to the long life cycles of our products, we carry spare parts inventories that have historically low usage rates and provide reserves for such inventory based on demonstrated usage and aging criteria.

Income Taxes, Deferred Taxes, Tax Valuation Allowances and Tax Reserves — We account for income taxes under the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and operating loss and tax credit carryforwards. Deferred tax assets and liabilities are calculated using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in the period that includes the enactment date. We record valuation allowances to reduce the carrying value of deferred tax assets to amounts that we expect are more likely than not to be realized. We assess existing deferred tax assets, net operating losses and tax credits by jurisdiction and expectations of our ability to utilize these tax attributes through a review of past, current and estimated future taxable income and establishment of tax planning strategies.

We provide deferred taxes for the temporary differences associated with our investment in foreign subsidiaries that have a financial reporting basis that exceeds tax basis, unless we can assert permanent reinvestment in foreign jurisdictions. Financial reporting basis and tax basis differences in investments in foreign subsidiaries consist of both unremitted earnings and losses, as well as foreign currency translation adjustments.

The amount of income taxes we pay is subject to ongoing audits by federal, state, and foreign tax authorities, which often result in proposed assessments. We establish reserves for open tax years for uncertain tax positions that may be subject to challenge by various tax authorities. The consolidated tax provision and related accruals include the impact of such reasonably estimable losses and related interest and penalties as deemed appropriate.

We recognize the tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by the taxing authorities. The determination is based on the technical merits of the position and presumes that each uncertain tax position will be examined by the relevant taxing authority that has full knowledge of all relevant information. The tax benefits recognized in the financial statements from such a position are measured based on the largest benefit that has a greater than fifty percent likelihood of being realized upon ultimate settlement.

Legal and Environmental Contingencies — Legal and environmental reserves are recorded based upon a case-by-case analysis of the relevant facts and circumstances and an assessment of potential legal obligations and costs. Amounts relating to legal and environmental liabilities are recorded when it is probable that a loss has been incurred and such loss is reasonably estimable. Assessments of legal and environmental costs are based on information obtained from our independent and in-house experts and our loss experience in similar situations. Estimates are updated as applicable when new information regarding the facts and circumstances of each matter becomes available. Legal fees associated with legal and environmental liabilities are expensed as incurred.

Estimates of liabilities for unsettled asbestos-related claims are based on known claims and on our experience during the preceding two years for claims filed, settled and dismissed, with adjustments for events deemed unusual and unlikely to recur, and are included in retirement obligations and other liabilities in our consolidated balance sheets. A substantial majority of our asbestos-related claims are covered by insurance or indemnities. Estimated indemnities and receivables from insurance carriers for unsettled claims and receivables for settlements and legal fees paid by us for asbestos-related claims are estimated using our historical experience with insurance recovery rates and estimates of future recoveries, which include estimates of coverage and financial viability of our insurance carriers. Estimated receivables are included in other assets, net in our consolidated balance sheets. We have claims pending against certain insurers that, if resolved more favorably than estimated future recoveries, would result in discrete gains in the applicable quarter. We are currently unable to estimate the impact, if any, of unasserted asbestos-related claims, although future claims would also be subject to existing indemnities and insurance coverage.

Warranty Accruals — Warranty obligations are based upon product failure rates, materials usage, service delivery costs, an analysis of all identified or expected claims and an estimate of the cost to resolve such claims. The estimates of expected claims are generally a factor of historical claims and known product issues. Warranty obligations based on these factors are adjusted based on historical sales trends for the preceding 24 months.

Insurance Accruals — Insurance accruals are recorded for wholly or partially self-insured risks such as medical benefits and workers' compensation and are based upon an analysis of our claim loss history, insurance deductibles, policy limits and other relevant factors that are updated annually and are included in accrued liabilities in our consolidated balance sheets. The estimates are based upon information received from actuaries, insurance company adjusters, independent claims administrators or other independent sources. Receivables from insurance carriers are estimated using our historical experience with insurance recovery rates and estimates of future recoveries, which include estimates of coverage and financial viability of our insurance carriers. Estimated receivables are included in accounts receivable, net and other assets, net, as applicable, in our consolidated balance sheets.

Pension and Postretirement Obligations — Determination of pension and postretirement benefits obligations is based on estimates made by management in consultation with independent actuaries and investment advisors. Inherent in these valuations are assumptions including discount rates, expected rates of return on plan assets, retirement rates, mortality rates and rates of compensation increase and other factors all of which are reviewed annually and updated if necessary. Current market conditions, including changes in rates of return, interest rates and medical inflation rates, are considered in selecting these assumptions.

Actuarial gains and losses and prior service costs are recognized in accumulated other comprehensive loss as they arise and we amortize these costs into net pension expense over the remaining expected service period.

Property, Plant and Equipment and Depreciation — Property, plant and equipment are stated at historical cost, less accumulated depreciation. If asset retirement obligations exist, they are capitalized as part of the carrying amount of the asset and depreciated over the remaining useful life of the asset. The useful lives of leasehold improvements are the lesser of the remaining lease term or the useful life of the improvement. When assets are retired or otherwise disposed of, their costs and related accumulated depreciation are removed from the accounts and any resulting gains or losses are included in income from operations for the period. Depreciation is computed by the straight-line method based on the estimated useful lives of the depreciable assets, or in the case of assets under finance leases, over the related lease term. Generally, the estimated useful lives of the assets are:

Buildings and improvements	10 to 40 years
Machinery, equipment and tooling	3 to 14 years
Software, furniture and fixtures and other	3 to 7 years

Costs related to routine repairs and maintenance are expensed as incurred.

Leases — We have operating and finance leases for certain manufacturing facilities, offices, service and quick response centers, machinery, equipment and automobiles. Our leases have remaining lease terms of up to 34 years. The terms and conditions of our leases may include options to extend or terminate the lease which are considered and included in the lease term when these options are reasonably certain of exercise.

We determine if a contract is (or contains) a lease at inception by evaluating whether the contract conveys the right to control the use of an identified asset. For all classes of leased assets, we account for any non-lease components in the contract together with the related lease component in the same unit of account. For lease contracts containing more than one lease component, we allocate the contract consideration to each of the lease components on the basis of relative standalone prices in order to identify the lease payments for each lease component.

ROU assets and lease liabilities are recognized in our consolidated balance sheets at the commencement date based on the present value of remaining lease payments over the lease term. Additionally, ROU assets include any lease payments made at or before the commencement date, as well as any initial direct costs incurred, and are reduced by any lease incentives received. For a detailed discussion related to leases refer to Note 4.

Internally Developed Software — We capitalize certain costs associated with the development of internal-use software. Generally, these costs are related to significant software development projects and are amortized over their estimated useful life, typically three to five years, upon implementation of the software.

Intangible Assets — Intangible assets, excluding trademarks (which are considered to have an indefinite life), consist primarily of engineering drawings, patents, existing customer relationships, software, distribution networks and other items that are being amortized over their estimated useful lives generally ranging from four to 40 years. These assets are reviewed for impairment whenever events and circumstances indicate impairment may have occurred.

Valuation of Goodwill, Indefinite-Lived Intangible Assets and Other Long-Lived Assets — The value of goodwill and indefinite-lived intangible assets is tested for impairment as of December 31 each year or whenever events or circumstances indicate such assets may be impaired. The identification of our reporting units began at the operating segment level and considered whether components one level below the operating segment levels should be identified as reporting units for purpose of testing goodwill for impairment based on certain conditions. These conditions included, among other factors, (i) the extent to which a component represents a business and (ii) the aggregation of economically similar components within the operating segments and resulted in four reporting units. Other factors that were considered in determining whether the aggregation of components was appropriate included the similarity of the nature of the products and services, the nature of the production processes, the methods of distribution and the types of industries served.

An impairment loss for goodwill is recognized if the implied fair value of goodwill is less than the carrying value. We estimate the fair value of our reporting units based on an income approach, whereby we calculate the fair value of a reporting unit based on the present value of estimated future cash flows. A discounted cash flow analysis requires us to make various judgmental assumptions about future sales, operating margins, growth rates and discount rates, which are based on our budgets, business plans, economic projections, anticipated future cash flows and market participants. We did not record an impairment of goodwill in 2019, 2018 or 2017.

We also considered our market capitalization in our evaluation of the fair value of our goodwill. Our market capitalization increased as compared with 2018 and did not indicate a potential impairment of our goodwill as of December 31, 2019.

Impairment losses for indefinite-lived intangible assets are recognized whenever the estimated fair value is less than the carrying value. Fair values are calculated for trademarks using a "relief from royalty" method, which estimates the fair value of a trademark by determining the present value of estimated royalty payments that are avoided as a result of owning the trademark. This method includes judgmental assumptions about sales growth and discount rates that have a significant impact on the fair value and are substantially consistent with the assumptions used to determine the fair value of our reporting unit discussed above. We did not record a material impairment of our trademarks in 2019, 2018 or 2017.

The recoverable value of other long-lived assets, including property, plant and equipment and finite-lived intangible assets, is reviewed when indicators of potential impairments are present. The recoverable value is based upon an assessment of the estimated future cash flows related to those assets, utilizing assumptions similar to those for goodwill. Additional considerations related to our long-lived assets include expected maintenance and improvements, changes in expected uses and ongoing operating performance and utilization.

Deferred Loan Costs — Deferred loan costs, consisting of fees and other expenses associated with debt financing, are amortized over the term of the associated debt using the effective interest method. Additional amortization is recorded in periods where optional prepayments on debt are made.

Fair Values of Financial Instruments — Our financial instruments are presented at fair value in our consolidated balance sheets, with the exception of our long-term debt. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Where available, fair value is based on observable market prices or parameters or derived from such prices or parameters. Where observable prices or inputs are not available, valuation models may be applied.

Assets and liabilities recorded at fair value in our consolidated balance sheets are categorized based upon the level of judgment associated with the inputs used to measure their fair values. Hierarchical levels, as defined by Accounting Standards Codification ("ASC") 820, "Fair Value Measurements and Disclosures," are directly related to the amount of subjectivity associated with the inputs to fair valuation of these assets and liabilities. An asset or a liability's categorization within the fair value hierarchy is based on the lowest level of significant input to its valuation. Hierarchical levels are as follows:

Level I — Inputs are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date.

Level II — Inputs (other than quoted prices included in Level I) are either directly or indirectly observable for the asset or liability through correlation with market data at the measurement date and for the duration of the instrument's anticipated life.

Level III — Inputs reflect management's best estimate of what market participants would use in pricing the asset or liability at the measurement date. Consideration is given to the risk inherent in the valuation technique and the risk inherent in the inputs to the model.

Recurring fair value measurements are limited to investments in derivative instruments and certain equity securities. The fair value measurements of our derivative instruments are determined using models that maximize the use of the observable market inputs including interest rate curves and both forward and spot prices for currencies, and are classified as Level II under the fair value hierarchy. The fair values of our derivative instruments are included in Note 8. The fair value measurements of our investments in equity securities are determined using quoted market prices and are classified as Level I. The fair values of our investments in equity securities, and changes thereto, are immaterial to our consolidated financial position and results of operations.

Derivatives and Hedging Activities — We have a foreign currency derivatives and hedging policy outlining the conditions under which we can enter into financial derivative transactions. We do not use derivative instruments for trading or speculative purposes. All derivative instruments are recognized on the balance sheet at their fair values.

We employ a foreign currency economic hedging strategy to mitigate certain financial risks resulting from foreign currency exchange rate movements that impact foreign currency denominated receivables and payables, firm committed transactions and forecasted sales and purchases. The changes in the fair values are recognized immediately in other income (expense), net in the consolidated statements of income. See Note 8 for further discussion of forward exchange contracts.

We are exposed to risk from credit-related losses resulting from nonperformance by counterparties to our financial instruments. We perform credit evaluations of our counterparties under forward exchange contracts and expect all counterparties to meet their obligations. If necessary, we would adjust the values of our derivative contracts for our or our counterparties' credit risks.

Foreign Currency Translation — Assets and liabilities of our foreign subsidiaries are translated to U.S. dollars at exchange rates prevailing at the balance sheet date, while income and expenses are translated at average rates for each month. Translation gains and losses are reported as a component of accumulated other comprehensive loss. Transactional currency gains and losses arising from transactions in currencies other than our sites' functional currencies are included in our consolidated results of operations.

Transaction and translation gains and losses arising from intercompany balances are reported as a component of accumulated other comprehensive loss when the underlying transaction stems from a long-term equity investment or from debt designated as not due in the foreseeable future. Otherwise, we recognize transaction gains and losses arising from intercompany transactions as a component of income. Where intercompany balances are not long-term investment related or not designated as due beyond the foreseeable future, we may mitigate risk associated with foreign currency fluctuations by entering into forward exchange contracts.

Stock-Based Compensation — Stock-based compensation is measured at the grant-date fair value. The exercise price of stock option awards and the value of restricted share, restricted share unit and performance-based unit awards (collectively referred to as "Restricted Shares") are set at the closing price of our common stock on the New York Stock Exchange on the date of grant, which is the date such grants are authorized by our Board of Directors. Restricted share units and performance-based units refer to restricted awards that do not have voting rights and accrue dividends, and are forfeited if vesting does not occur.

The intrinsic value of Restricted Shares, which is typically the product of share price at the date of grant and the number of Restricted Shares granted, is amortized on a straight-line basis to compensation expense over the periods in which the restrictions lapse based on the expected number of shares that will vest. We account for forfeitures as they occur resulting in the reversal of cumulative expense previously recognized.

Earnings Per Share — We use the two-class method of calculating Earnings Per Share ("EPS"), which determines earnings per share for each class of common stock and participating security as if all earnings for the period had been distributed. Unvested restricted share awards that earn non-forfeitable dividend rights qualify as participating securities and, accordingly, are included in the basic computation as such. Our unvested Restricted Shares participate on an equal basis with common shares; therefore, there is no difference in undistributed earnings allocated to each participating security. Accordingly, the presentation below is prepared on a combined basis and is presented as earnings per common share.

The following is a reconciliation of net earnings of Flowserve Corporation and weighted average shares for calculating net earnings per common share:

	Year Ended December 31,		
	2019	2018	2017
	(Amounts in thousands, except per share data)		
Net earnings of Flowserve Corporation	$ 253,668	$ 119,671	$ 2,652
Dividends on restricted shares not expected to vest	—	—	—
Earnings attributable to common and participating shareholders	$ 253,668	$ 119,671	$ 2,652
Weighted average shares:			
Common stock	131,012	130,794	130,600
Participating securities	22	29	103
Denominator for basic earnings per common share	131,034	130,823	130,703
Effect of potentially dilutive securities	685	448	655
Denominator for diluted earnings per common share	131,719	131,271	131,358
Net earnings per share attributable to Flowserve Corporation common shareholders:			
Basic	$ 1.94	$ 0.91	$ 0.02
Diluted	1.93	0.91	0.02

Diluted earnings per share is based upon the weighted average number of shares as determined for basic earnings per share plus shares potentially issuable in conjunction with stock options, restricted shares, restricted share units and performance share units.

Research and Development Expense — Research and development costs are charged to expense when incurred. Aggregate research and development costs included in SG&A were $42.0 million, $39.6 million and $38.6 million in 2019, 2018 and 2017, respectively. Costs incurred for research and development primarily include salaries and benefits and consumable supplies, as well as rent, professional fees, utilities and the depreciation of property and equipment used in research and development activities.

Accounting Developments

Pronouncements Implemented

In February 2016, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2016-02, Leases (Topic 842) ("New Lease Standard"). The New Lease Standard increases transparency and comparability by requiring lessees to recognize right-of-use (“ROU”) assets and lease liabilities for operating leases on their consolidated balance sheets. Additionally, expanded disclosures are required to enable users of financial statements to understand the amount, timing and uncertainty of cash flows arising from leases.

We adopted the New Lease Standard effective January 1, 2019, utilizing the modified retrospective approach and elected an initial application date of January 1, 2019. The adoption resulted in an increase to total assets and liabilities due to the recording of lease ROU assets and lease liabilities of approximately $225 million as of January 1, 2019. The adoption did not materially impact our consolidated results of operations or cash flows. Refer to Note 4 for further discussion of our adoption of the New Lease Standard.

On July 13, 2017, the FASB issued ASU No. 2017-11, “Earnings Per Share (Topic 260); Distinguishing Liabilities from Equity (Topic 480); Derivatives and Hedging (Topic 815): (Part I) Accounting for Certain Financial Instruments with Down Round Features, (Part II) Replacement of the Indefinite Deferral for Mandatory Redeemable Financial Instruments of Certain Nonpublic Entities and Certain Mandatory Redeemable Noncontrolling Interests with a Scope Exception.” The ASU amends guidance in FASB Accounting Standards Codification ("ASC") 260, Earnings Per Share, FASB ASC 480, Distinguishing Liabilities from Equity, and FASB ASC 815, Derivatives and Hedging. The amendments in Part I of this ASU change the classification analysis of certain equity-linked financial instruments (or embedded features) with down round features. The amendments in this ASU must be applied to annual reporting periods beginning after December 15, 2018. Our adoption of

ASU No. 2017-11 effective January 1, 2019 did not have an impact on our consolidated financial condition and results of operations.

On August 28, 2017, the FASB issued ASU No. 2017-12, "Derivatives and Hedging (Topic 815): Targeted improvements of Accounting for Hedging Activities." The purpose of this ASU is to better align a company's risk management activities and financial reporting for hedging relationships. Additionally, the ASU simplifies the hedge accounting requirements and improve the disclosures of hedging arrangements. The amendments in this ASU must be applied to annual reporting periods beginning after December 15, 2019. Early adoption is permitted. Our adoption of ASU No. 2017-12 effective January 1, 2019 did not have an impact on our consolidated financial condition and results of operations.

In February 2018, the FASB issued ASU No. 2018-02, "Income Statement - Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Comprehensive Income ("AOCI")." The ASU and its amendments were issued as a result of the enactment of the U.S. Tax Cuts and Jobs Act of 2017. The amendments of this ASU address the available options to reclassify stranded tax effects within AOCI to retained earnings in each period in which the effect of the change (or portion thereof) is recorded. Additionally, the ASU outlines the disclosure requirements for releasing income tax effects from AOCI. The ASU is effective for fiscal years beginning after December 15, 2018. The ASU should be applied either in the period of adoption or retrospectively to each period (or periods) in which the effect of the change in the U.S. federal corporate income tax rate in the Tax Cuts and Jobs Act is recognized. We adopted this ASU effective January 1, 2019 and elected not to reclassify the income tax effects of the Tax Cuts and Jobs Act from accumulated comprehensive income to retained earnings.

In July 2018, the FASB issued ASU No. 2018-07, "Compensation - Stock Compensation (Topic 718) - Improvements to Non-employee Share-based Payment Accounting." The amendments of this ASU apply to all share-based payment transactions to non-employees, in which a grantor acquires goods or services to be used or consumed in a grantor's own operations, accounted under ASC 505-50, Equity-Based Payments to Non-Employees. Under the amendments of ASU 2018-07, most of the guidance on compensation to non-employees would be aligned with the requirements for shared based payments granted to employees, Topic 718. The ASU is effective for fiscal years beginning after December 15, 2018. Our adoption of ASU No. 2018-07-12 effective January 1, 2019 did not have an impact on our consolidated financial condition and results of operations.

Pronouncements Not Yet Implemented

In June 2016, the FASB issued ASU No. 2016-13, "Financial Instruments-Credit Losses (Topic 326), Measurement of Credit Losses on Financial Instruments." The ASU requires, among other things, the use of a new current expected credit loss ("CECL") model in order to determine our allowances for doubtful accounts with respect to accounts receivable, contract assets, leased assets and guarantees. The CECL model requires that we estimate our lifetime expected credit loss with respect to our receivables and contract assets and record allowances that, when deducted from the balance of the receivables, represent the net amounts expected to be collected. During our evaluation of ASU No. 2016-13 and all related ASUs, we formed a project team to assess the requirements of the new guidance, which included a review of our financial assets measured at amortized cost basis and the associated methodology for development of reserves. To support the requirements of the new standard and all related ASUs, we modified our accounting policies and processes, and adopted the new standard on a prospective basis as of January 1, 2020. The adoption of ASU No. 2016-13 is not expected to have a material impact on our consolidated financial condition and results of operations.

In January 2017, the FASB issued ASU No. 2017-04, "Intangibles - Goodwill and Other (Topic 350): Simplifying the Test for Goodwill Impairment." The amendments in this ASU allow companies to apply a one-step quantitative test and record the amount of goodwill impairment as the excess of a reporting unit's carrying amount over its fair value, not to exceed the total amount of goodwill allocated to the reporting unit. The amendments of the ASU are effective for annual or interim goodwill impairment tests in fiscal years beginning after December 15, 2019. Early adoption is permitted for interim or annual goodwill impairment tests performed on testing dates after January 1, 2017. The adoption of ASU No. 2017-04 is not expected to have a material impact on our consolidated financial condition and results of operations.

In August 2018, the FASB issued ASU No. 2018-13, "Fair Value Measurement (Topic 820): Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement." The amendments of the ASU modify the disclosure requirements for fair value measurements by removing, modifying, or adding certain disclosure information requirements for assets and liabilities measured at fair value in the statement of financial position or disclosed in the notes to financial statements. The ASU is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2019, with early adoption permitted for the removed disclosures and delayed adoption until fiscal year 2020 permitted for the new disclosures. The removed and modified disclosures will be adopted on a retrospective basis and the new disclosures will be adopted on a prospective basis. The adoption of ASU No. 2018-13 is not expected to have a material impact on our consolidated financial condition and results of operations.

In August 2018, the FASB issued ASU No. 2018-14, "Compensation-Retirement Benefits-Defined Benefit Plans-General (Subtopic 715-20): Disclosure Framework-Changes to the Disclosure Requirements for Defined Benefit Plans." The ASU amends the disclosure requirements by adding, clarifying, or removing certain disclosures for sponsor defined benefit pension or other postretirement plans. The amendments are effective for fiscal years ending after December 15, 2020 and the amendments should be applied retrospectively to all periods presented. The adoption of ASU No. 2018-14 is not expected to have a material impact on our consolidated financial condition and results of operations.

In August 2018, the FASB issued ASU No. 2018-15, "Intangibles-Goodwill and Other-Internal-Use Software (Subtopic 350-40): Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract." The ASU addresses how entities should account for costs associated with implementing a cloud computing arrangement that is considered a service contract. Per the amendments of the ASU, implementation costs incurred in a cloud computing arrangement that is a service contract should be accounted for in the same manner as implementation costs incurred to develop or obtain software for internal use as prescribed by guidance in ASC350-40. The ASU requires that implementation costs incurred in a cloud computing arrangement be capitalized rather than expensed. Further, the ASU specifies the method for the amortization of costs incurred during implementation, and the manner in which the unamortized portion of these capitalized implementation costs should be evaluated for impairment. The ASU also provides guidance on how to present such implementation costs in the financial statements and also creates additional disclosure requirements. The amendments are effective for fiscal years beginning after December 15, 2019, including interim periods. The amendments in this ASU should be applied either retrospectively or prospectively to all implementation costs incurred after the date of adoption. The adoption of ASU No. 2018-15 is not expected to have a material impact on our consolidated financial condition and results of operations.

In October 2018, the FASB issued ASU No. 2018-17, "Consolidation (Topic 810): Targeted Improvements to Related Party Guidance for Variable Interest Entities (*"VIEs"*)." The standard reduces the cost and complexity of financial reporting associated with VIEs. The new standard amends the guidance for determining whether a decision-making fee is a VIE. The amendments require organizations to consider indirect interests held through related parties under common control on a proportional basis rather than as the equivalent of a direct interest in its entirety as currently required in GAAP. The amendments of this ASU are effective for fiscal years beginning after December 15, 2019, and interim periods within those fiscal years. The adoption of ASU No. 2018-17 is not expected to have a material impact on our consolidated financial condition and results of operations.

In November 2018, the FASB issued ASU No. 2018-18, "Collaborative Arrangements (Topic 808): Clarifying the Interaction Between Topic 808 and Topic 606" ("New Revenue Standard"). The ASU clarifies the interaction between the guidance for certain collaborative arrangements and the New Revenue Standard. The amendments of the ASU provide guidance on how to assess whether certain transactions between collaborative arrangement participants should be accounted for within the New Revenue Standard. The ASU also provides more comparability in the presentation of revenue for certain transactions between collaborative arrangement participants. Parts of the collaborative arrangement that are not in the purview of the revenue recognition standard should be presented separately. The amendments are effective for fiscal years beginning after December 15, 2019, and interim periods within those fiscal years. Early adoption is permitted. The adoption of ASU No. 2018-18 is not expected to have a material impact on our consolidated financial condition and results of operations.

In December 2019, the FASB issued ASU No. 2019-12, "Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes," (Topic 740). The ASU intends to simplify various aspects related to accounting for income taxes and removes certain exceptions to the general principles in the standard. Additionally, the ASU clarifies and amends existing guidance to improve consistent application of its requirements. The amendments of the ASU are effective for fiscal years beginning after December 15, 2020, and interim periods within those fiscal years. Early adoption is permitted. The adoption of ASU No. 2019-12 is not expected to have a material impact on our consolidated financial condition and results of operations.

2. REVENUE RECOGNITION

We enter into contracts with customers often having multiple commitments of goods and services including any combination of designing, developing, manufacturing, modifying, installing and commissioning of flow management equipment and providing services and parts related to the performance of such products. We evaluate the commitments in our contracts with customers to determine if the commitments are both capable of being distinct and distinct in the context of the contract in order to identify performance obligations.

We recognize revenue when (or as) we satisfy a performance obligation by transferring control of the performance obligation to a customer. Control of a performance obligation may transfer to the customer either over time or at a point in time depending on an evaluation of the specific facts and circumstances for each contract, including the terms and conditions of the contract as agreed with the customer, as well as the nature of the products or services to be provided. Our larger contracts are typically completed within a one to three-year period, while many other contracts, such as “short cycle” contracts, have a shorter timeframe for revenue recognition.

Control transfers over time when the customer is able to direct the use of and obtain substantially all of the benefits of our work as we perform. This typically occurs when products have no alternative use and we have a right to payment for performance completed to date, including a reasonable profit margin. Our contracts often include cancellation provisions that require the customer to reimburse us for costs incurred up to the date of cancellation, and some contracts also provide for reimbursement of profit upon cancellation in addition to costs incurred to date.

Our primary method for recognizing revenue over time is the POC method. We measure progress towards completion by applying an input measure based on costs incurred to date relative to total estimated costs at completion (i.e., the cost-to-cost method). This method provides a reasonable depiction of the transfer of control of products and services to customers as it ensures our efforts towards satisfying a performance obligation, as reflected by costs incurred, are included in the measure of progress used for recognition of revenue. Costs generally include direct labor, direct material and manufacturing overhead. Costs that do not contribute towards control transfer are generally immaterial, but are excluded from the measure of progress in the event they are significant.

Prior to the adoption of the New Revenue Standard effective January 1, 2018, revenue recognized under the POC method had been 4% to 10% of our consolidated sales. Under the New Revenue Standard, we have experienced an increase in the amount of revenue recognized over time. This increase is primarily due to the application of the new “transfer of control” model for revenue recognition. Under this model, revenue for performance obligations subject to contractual transfer of control during the manufacturing process are recognized over time. This includes contracts with cancellation provisions that require reimbursement for costs incurred plus a reasonable margin and for which the performance obligation has no alternative use. Revenue from products and services transferred to customers over time accounted for approximately 19%, 22% and 4% of total revenue for the years ended December 31, 2019, 2018 and 2017, respectively.

If control does not transfer over time, then control transfers at a point in time. We recognize revenue at a point in time at the level of each performance obligation based on the evaluation of certain indicators of control transfer, such as title transfer, risk of loss transfer, customer acceptance and physical possession. Revenue from products and services transferred to customers at a point in time accounted for approximately 81%, 78% and 96% of total revenue for the years ended December 31, 2019, 2018 and 2017, respectively.

A contract modification, or “change order,” occurs when the existing enforceable rights and obligations of a contract change, such as a change in the scope, price or terms and conditions. We account for a change order as a new accounting contract when the change order is limited to adding new, distinct products and services that are priced in an amount consistent with standalone selling price. Other change orders are accounted for as a modification of the existing accounting contract. When a change order occurs for a contract having in-process over time performance obligations, the effect of the change order on the transaction price and the measure of progress for the performance obligations to which it relates is recognized as an adjustment to revenue (either as an increase in or a reduction of revenue) on a cumulative catch-up basis.

Freight charges billed to customers are included in sales and the related shipping costs are included in cost of sales ("COS") in our consolidated statements of income. If shipping activities are performed after a customer obtains control of a product, we apply a policy election to account for shipping as an activity to fulfill the promise to transfer the product to the customer.

We apply a policy election to exclude transaction taxes collected from customers from sales when the tax is both imposed on and concurrent with a specific revenue-producing transaction.

In certain instances, we provide guaranteed completion dates under the terms of our contracts. Failure to meet contractual delivery dates can result in late delivery penalties or liquidated damages. In the event that the transaction price of such a contract is probable of experiencing a significant reversal due to a penalty, we constrain a portion of the transaction price.

This reduction to the transaction price could potentially cause estimated total contract costs to exceed the transaction price, in which case we record a provision for the estimated loss in the period the loss is first projected. In circumstances where the transaction price still exceeds total projected costs, the estimated penalty generally reduces profitability of the contract at the time of subsequent revenue recognition.

Our incremental costs to obtain a contract are limited to sales commissions. We apply the practical expedient to expense commissions as incurred for contracts having a duration of one year or less. Sales commissions related to contracts with a duration of greater than one year are immaterial to our financial statements and are also expensed as incurred.

Performance Obligations

A performance obligation is a promise in a contract to transfer a distinct good or service to the customer, and is the unit of account for recognition of revenue. Many of our contracts have multiple performance obligations as the promise to transfer the individual goods or services, or certain groups of goods and services, is separately identifiable from other promises in the contract.

We allocate the transaction price of each contract to the performance obligations on the basis of standalone selling price and recognize revenue when, or as, control of each performance obligation transfers to the customer. For standard products, we identify the standalone selling price based on directly observable information. For customized or unique products and services, we apply the cost plus margin approach to estimate the standalone selling price. Under this method, we forecast our expected costs of satisfying a performance obligation and then add an appropriate standalone market margin for that distinct good or service.

We have elected to use the practical expedient to not adjust the transaction price of a contract for the effects of a significant financing component if, at the inception of the contract, we expect that the period between when we transfer a promised good or service to a customer and when the customer pays for that good or service will be one year or less.

On December 31, 2019, the aggregate transaction price allocated to unsatisfied (or partially unsatisfied) performance obligations related to contracts having an original expected duration in excess of one year was approximately $709 million. We estimate recognition of approximately $593 million of this amount as revenue in 2020 and an additional $116 million in 2021 and thereafter.

Disaggregated Revenue

We conduct our operations through two business segments based on the type of product and how we manage the business:

- Flowserve Pump Division ("FPD") for custom, highly-engineered pumps, pre-configured industrial pumps, pump systems, mechanical seals, auxiliary systems and replacement parts and related services; and

- Flow Control Division ("FCD") for engineered and industrial valves, control valves, actuators and controls and related services.

Our revenue sources are derived from our original equipment manufacturing and our aftermarket sales and services. Our original equipment revenues are generally related to originally designed, manufactured, distributed and installed equipment that can range from pre-configured, short-cycle products to more customized, highly-engineered equipment ("Original Equipment"). Our aftermarket sales and services are derived from sales of replacement equipment, as well as maintenance, advanced diagnostic, repair and retrofitting services ("Aftermarket"). Each of our two business segments generate Original Equipment and Aftermarket revenues.

The following table presents our customer revenues disaggregated by revenue source:

	December 31, 2019		
(Amounts in thousands)	FPD	FCD	Total
Original Equipment	$ 994,719	$ 972,424	$ 1,967,143
Aftermarket	1,709,726	267,981	1,977,707
	$ 2,704,445	$ 1,240,405	$ 3,944,850

	December 31, 2018		
(Amounts in thousands)	FPD	FCD	Total
Original Equipment	$ 992,162	$ 943,893	$ 1,936,055
Aftermarket	1,628,326	268,285	1,896,611
	$ 2,620,488	$ 1,212,178	$ 3,832,666

	December 31, 2017 (1)		
(Amounts in thousands)	FPD	FCD	Total
Original Equipment	$ 968,856	$ 906,890	$ 1,875,746
Aftermarket	1,508,882	276,203	1,785,085
	$ 2,477,738	$ 1,183,093	$ 3,660,831

(1) Presented in accordance with Topic 605.

Our customer sales are diversified geographically. The following table presents our revenues disaggregated by geography, based on the shipping addresses of our customers:

	December 31, 2019		
(Amounts in thousands)	FPD	FCD	Total
North America(1)	$ 1,085,627	$ 543,986	$ 1,629,613
Latin America(1)	202,247	28,899	231,146
Middle East and Africa	355,937	98,959	454,896
Asia Pacific	499,932	319,235	819,167
Europe	560,702	249,326	810,028
	$ 2,704,445	$ 1,240,405	$ 3,944,850

	December 31, 2018		
(Amounts in thousands)	FPD	FCD	Total
North America(1)	$ 1,037,637	$ 540,316	$ 1,577,953
Latin America(1)	219,376	22,405	241,781
Middle East and Africa	329,484	138,240	467,724
Asia Pacific	502,559	279,109	781,668
Europe	531,432	232,108	763,540
	$ 2,620,488	$ 1,212,178	$ 3,832,666

	December 31, 2017 (2)		
(Amounts in thousands)	FPD	FCD	Total
North America(1)	$ 969,417	$ 477,275	$ 1,446,692
Latin America(1)	168,971	33,207	202,178
Middle East and Africa	327,366	155,447	482,813
Asia Pacific	445,001	239,197	684,198
Europe	566,983	277,967	844,950
	$ 2,477,738	$ 1,183,093	$ 3,660,831

(1) North America represents United States and Canada; Latin America includes Mexico.
(2) Presented in accordance with Topic 605.

Contract Balances

We receive payment from customers based on a contractual billing schedule and specific performance requirements as established in our contracts. We record billings as accounts receivable when an unconditional right to consideration exists. A contract asset represents revenue recognized in advance of our right to bill the customer under the terms of a contract. A contract liability represents our contractual billings in advance of revenue recognized for a contract.

The following table presents opening and closing balances of contract assets and contract liabilities, current and long-term, for the years ended December 31, 2019 and 2018:

(Amounts in thousands)	Contract Assets, net (Current)	Long-term Contract Assets, net(1)	Contract Liabilities (Current)	Long-term Contract Liabilities(2)
Balance — January 1, 2018	$ 219,361	$ 3,990	$ 178,515	$ 3,925
Revenue recognized that was included in contract liabilities at the beginning of the period	—	—	(123,458)	(1,360)
Increase due to revenue recognized in the period in excess of billings	846,922	6,668	—	—
Increase due to billings arising during the period in excess of revenue recognized	—	—	152,664	(481)
Amounts transferred from contract assets to receivables	(815,213)	(2,503)	—	—
Currency effects and other, net	(22,491)	2,812	(5,263)	(714)
Balance — December 31, 2018	$ 228,579	$ 10,967	$ 202,458	$ 1,370
Revenue recognized that was included in contract liabilities at the beginning of the period	—	—	(125,274)	—
Increase due to revenue recognized in the period in excess of billings	835,147	—	—	—
Increase due to billings arising during the period in excess of revenue recognized	—	—	135,695	290
Amounts transferred from contract assets to receivables	(785,279)	(1,747)	—	—
Currency effects and other, net	(5,533)	60	3,662	(8)
Balance — December 31, 2019	$ 272,914	$ 9,280	$ 216,541	$ 1,652

(1) Included in other assets, net.
(2) Included in retirement obligations and other liabilities.

3. DISPOSITIONS

FPD Business Divestiture

On June 29, 2018, pursuant to a plan of sale approved by management, we executed an agreement to divest two FPD locations and associated product lines, including the related assets and liabilities. This transaction did not meet the criteria for classification of assets held for sale as of June 30, 2018 due to a contingency that could have potentially impacted the final terms and/or timing of the divestiture. The sale transaction was completed on August 9, 2018. During the twelve months ended December 31, 2018, we recorded a pre-tax charge of $25.1 million, including a pre-tax charge of $17.4 million in the second quarter of 2018 and a loss on sale of the business of $7.7 million in the third quarter of 2018. The second quarter of 2018 pre-tax charge related to write-downs of inventory and long-lived assets to their estimated fair value, of which $7.7 million was recorded in COS and $9.7 million was recorded in SG&A. The third quarter of 2018 pre-tax charge primarily related to working capital changes since the second quarter of 2018 and net cash transferred at the closing date of $3.7 million. The sale included a manufacturing facility in Germany and a related assembly facility in France. In 2017, net sales related to the business totaled approximately $42 million, although the business produced an operating loss in 2016 and 2015.

Vogt

Effective July 6, 2017, we sold our FCD's Vogt product line and related assets and liabilities to a privately held company for $28.0 million of cash received at closing. The sale resulted in a pre-tax gain of $11.1 million recorded in gain on sale of business in the consolidated statements of income. In 2016, net sales related to the Vogt business totaled approximately $17 million, with earnings before interest and taxes of approximately $4 million.

Gestra AG

Effective May 2, 2017, we sold our FCD's Gestra AG ("Gestra") business to a leading provider of steam system solutions for $203.6 million (€178.3 million) of cash received in 2017. The sale resulted in a pre-tax gain of $130.2 million ($79.4 million after-tax) recorded in gain on sale of business in the consolidated statements of income. The sale included Gestra's manufacturing facility in Germany as well as related operations in the U.S., the United Kingdom ("U.K."), Spain, Poland, Italy, Singapore and Portugal. In 2016, Gestra recorded revenues of approximately $101 million (€92 million) with earnings before interest and taxes of approximately $17 million (€15 million).

4. LEASES

We adopted the New Lease Standard effective January 1, 2019 utilizing the modified retrospective approach and have elected an initial application date of January 1, 2019. Adoption of the New Lease Standard resulted in an increase to total assets and liabilities due to the recording of lease ROU assets and lease liabilities of approximately $225 million as of January 1, 2019. Our adoption of the New Lease Standard included modification of certain accounting policies and practices, business processes, systems and controls in order to support compliance with the requirements.

We elected the package of three practical expedients for transition, which include the carry forward of our leases without reassessing whether any contracts are leases or contain leases, lease classification and initial direct costs. We elected the transition practical expedient to apply hindsight when determining the lease term and when assessing impairment of ROU assets at the adoption date, which allows us to update our assessments according to new information and changes in facts and circumstances that have occurred since lease inception. We have certain land easements that have historically been accounted for as finite-lived intangible assets. We elected the practical expedient related to land easements, allowing us to carry forward our accounting treatment for land easements on existing agreements as intangible assets. Any new or modified land easements will be accounted for as leases under the New Lease Standard.

Presentation of Leases

We have operating and finance leases for certain manufacturing facilities, offices, service and quick response centers, machinery, equipment and automobiles. Our leases have remaining lease terms of up to 34 years. The terms and conditions of our leases may include options to extend or terminate the lease which are considered and included in the lease term when these options are reasonably certain of exercise.

We determine if a contract is (or contains) a lease at inception by evaluating whether the contract conveys the right to control the use of an identified asset. For all classes of leased assets, we have elected the practical expedient to account for any non-lease components in the contract together with the related lease component in the same unit of account. For lease contracts containing more than one lease component, we allocate the contract consideration to each of the lease components on the basis of relative standalone prices in order to identify the lease payments for each lease component.

ROU assets and lease liabilities are recognized in our consolidated balance sheets at the commencement date based on the present value of remaining lease payments over the lease term. Additionally, ROU assets include any lease payments made at or before the commencement date, as well as any initial direct costs incurred, and are reduced by any lease incentives received. As most of our operating leases do not provide an implicit rate, we apply our incremental country-specific borrowing rate to determine the present value of remaining lease payments. Our incremental borrowing country-specific rate is determined based on information available at the commencement date of the lease.

Operating leases are included in operating lease right-of-use assets, net and operating lease liabilities in our consolidated balance sheets. Finance leases are included in property plant and equipment, debt due within one year and long-term debt due after one year in our consolidated balance sheets.

For all classes of leased assets, we have applied an accounting policy election to exclude short-term leases from recognition in our consolidated balance sheets. A short-term lease has a lease term of 12 months or less at the commencement date and does not include a purchase option that is reasonably certain of exercise. We recognize short-term lease expense in our consolidated income statements on a straight-line basis over the lease term. Our short-term lease expense and short-term lease commitments as of December 31, 2019 are immaterial.

We have certain lease contracts with terms and conditions that provide for variability in the payment amount based on changes in facts or circumstances occurring after the commencement date. These variable lease payments are recognized in our consolidated income statements as the obligation is incurred.

We have certain lease contracts where we provide a guarantee to the lessor that the value of an underlying asset will be at least a specified amount at the end of the lease. Estimated amounts expected to be paid for residual value guarantees are included in lease liabilities and ROU assets.

As of December 31, 2019, we had $34.7 million of legally binding minimum lease payments for operating leases signed but not yet commenced. We did not have material subleases, leases that imposed significant restrictions or covenants, material related party leases or sale-leaseback arrangements.

Other information related to our leases is as follows:

(Amounts in thousands)		December 31, 2019
Operating Leases:		
ROU assets recorded under operating leases	$	220,865
Accumulated amortization associated with operating leases		(34,647)
Total operating leases ROU assets, net	$	186,218
Liabilities recorded under operating leases (current)	$	36,108
Liabilities recorded under operating leases (non-current)		151,523
Total operating leases liabilities	$	187,631
Finance Leases:		
ROU assets recorded under finance leases	$	19,606
Accumulated depreciation associated with finance leases		(7,551)
Total finance leases ROU assets, net(1)	$	12,055
Total finance leases liabilities(2)	$	11,788

The costs components of operating and finance leases are as follows:

(Amounts in thousands)		December 31, 2019
Operating Lease Costs:		
Fixed lease expense(3)	$	57,450
Variable lease expense(3)		6,492
Total operating lease expense	$	63,942
Finance Lease Costs:		
Depreciation of finance lease ROU assets(3)	$	4,729
Interest on lease liabilities(4)		352
Total finance lease expense	$	5,081

(1) Included in property plant and equipment, net
(2) Included in debt due within one year and long-term debt due after one year, accordingly
(3) Included in cost of sales and selling, general and administrative expense, accordingly

(4) Included in interest expense

Supplemental cash flows information as of and for the year ended December 31, 2019**:**

(Amounts in thousands, except lease term and discount rate)		
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases(1)	$	64,725
Financing cash flows from finance leases(2)		4,465
ROU assets obtained in exchange for lease obligations:		
Operating leases	$	14,569
Finance leases		10,615
Weighted average remaining lease term (in years)		
Operating leases		9 years
Finance leases		3 years
Weighted average discount rate (percent)		
Operating leases		4.5%
Finance leases		3.6%

(1) Included in our consolidated statement of cash flows, operating activities, prepaid expenses and other assets, net and retirement obligations and other
(2) Included in our consolidated statement of cash flows, financing activities, payments under other financing arrangements

Future undiscounted lease payments under operating and finance leases as of December 31, 2019, were as follows (amounts in thousands):

Year ending December 31,		**Operating Leases**		**Finance Leases**
2020		42,164		4,897
2021		32,762		3,660
2022		27,378		2,417
2023		23,120		1,101
2024		18,160		277
Thereafter		84,742		96
Total future minimum lease payments	$	228,326	$	12,448
Less: Imputed interest		(40,695)		(660)
Total	$	187,631	$	11,788
Other current liabilities	$	36,108	$	—
Operating lease liabilities		151,523		—
Debt due within one year		—		4,622
Long-term debt due after one year		—		7,166
Total	$	187,631	$	11,788

The future minimum lease payments as of December 31, 2018 were as follows (amounts in thousands):

Year ending December 31,		
2019	$	68,443
2020		49,874
2021		38,446
2022		28,496
2023		21,473
Thereafter		66,518
Total future minimum lease payments	$	273,250

5. GOODWILL AND OTHER INTANGIBLE ASSETS

The changes in the carrying amount of goodwill for the years ended December 31, 2019 and 2018 are as follows:

	FPD	FCD	Total
		(Amounts in thousands)	
Balance as of December 31, 2017	$ 801,509	$ 416,679	$ 1,218,188
Currency translation and other	(11,370)	(9,178)	(20,548)
Balance as of December 31, 2018	$ 790,139	$ 407,501	$ 1,197,640
Currency translation and other	(3,509)	(1,121)	(4,630)
Balance as of December 31, 2019	$ 786,630	$ 406,380	$ 1,193,010

The following table provides information about our intangible assets for the years ended December 31, 2019 and 2018:

		December 31, 2019		December 31, 2018	
	Useful Life (Years)	Ending Gross Amount	Accumulated Amortization	Ending Gross Amount	Accumulated Amortization
		(Amounts in thousands, except years)			
Finite-lived intangible assets:					
Engineering drawings(1)	10-22	$ 89,490	$ (78,854)	$ 89,796	$ (75,239)
Existing customer relationships(2)	5-10	81,844	(53,468)	82,235	(47,016)
Patents	9-16	26,132	(26,132)	26,251	(26,136)
Other	4-40	92,920	(40,149)	88,138	(37,145)
		$ 290,386	$ (198,603)	$ 286,420	$ (185,536)
Indefinite-lived intangible assets(3)		$ 90,607	$ (1,585)	$ 91,251	$ (1,585)

(1) Engineering drawings represent the estimated fair value associated with specific acquired product and component schematics.

(2) Existing customer relationships acquired prior to 2011 had a useful life of five years.

(3) Accumulated amortization for indefinite-lived intangible assets relates to amounts recorded prior to the implementation date of guidance issued in ASC 350.

The following schedule outlines actual amortization expense recognized during 2019 and an estimate of future amortization based upon the finite-lived intangible assets owned at December 31, 2019:

	Amortization Expense
	(Amounts in thousands)
Actual for year ended December 31, 2019	$ 13,769
Estimated for year ended December 31, 2020	13,637
Estimated for year ended December 31, 2021	13,183
Estimated for year ended December 31, 2022	10,666
Estimated for year ended December 31, 2023	8,402
Estimated for year ended December 31, 2024	6,428
Thereafter	39,467

Amortization expense for finite-lived intangible assets was $14.1 million in 2018 and $15.3 million in 2017.

6. INVENTORIES

Inventories, net consisted of the following:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Raw materials	$ 328,080	$ 310,204
Work in process	192,993	191,660
Finished goods	218,408	205,814
Less: Excess and obsolete reserve	(78,644)	(73,807)
Inventories, net	$ 660,837	$ 633,871

During 2019, 2018 and 2017, we recognized expenses of $17.1 million, $16.2 million and $22.9 million, respectively, for excess and obsolete inventory. These expenses are included in COS in our consolidated statements of income.

7. STOCK-BASED COMPENSATION PLANS

During the year ended December 31, 2019, we maintained the Flowserve Corporation Equity and Incentive Compensation Plan (the "2010 Plan"), which is a shareholder-approved plan authorizing the issuance of up to 8,700,000 shares of our common stock in the form of restricted shares, restricted share units and performance-based units (collectively referred to as "Restricted Shares"), incentive stock options, non-statutory stock options, stock appreciation rights and bonus stock. Of the 8,700,000 shares of common stock authorized under the 2010 Plan, 1,611,332 were available for issuance as of December 31, 2019. In 2019, our shareholders approved the Flowserve Corporation 2020 Long-Term Incentive Plan (the “2020 Plan”), which became effective January 1, 2020 following the expiration of the 2010 Plan on December 31, 2019. This shareholder-approved plan authorizes the issuance of up to 12,500,000 shares of our common stock in the form of incentive stock options, non-statutory stock options, Restricted Shares, stock appreciation rights and bonus stock, in addition to any shares available for issuance or subject to forfeiture under the 2010 Plan as of its expiration on December 31, 2019. We plan to begin using the 2020 Plan in 2020 and it is intended to replace the 2010 Plan. The long-term incentive program allows Restricted Shares granted after January 1, 2016 to employees who retire and have achieved at least 55 years of age and ten years of service to continue to vest over the original vesting period ("55/10 Provision").

Stock Options — Options granted to officers, other employees and directors allow for the purchase of common shares at the market value of our stock on the date the options are granted. Options generally become exercisable after three years. Options generally expire ten years from the date of the grant or within a short period of time following the termination of employment or cessation of services by an option holder. As of December 31, 2019, 114,943 stock options were outstanding, with a grant date fair value of $2.0 million, recognized over three years, with remaining unearned compensation of $0.3 million. No stock options vested during years ended December 31, 2019, 2018 or 2017.

Information related to stock options issued to officers, other employees and directors under all plans is presented in the following table:

	2019		2018		2017	
	Shares	Weighted Average Exercise Price	Shares	Weighted Average Exercise Price	Shares	Weighted Average Exercise Price
Number of shares under option:						
Outstanding — beginning of year	114,943	$ 48.63	114,943	$ 48.63	—	$ —
Granted	—	—	—	—	114,943	48.63
Exercised	—	—	—	—	—	—
Canceled	—	—	—	—	—	—
Outstanding — end of year	114,943	$ 48.63	114,943	$ 48.63	114,943	$ 48.63
Exercisable — end of year	—	$ —	—	$ —	—	$ —

The weighted average remaining contractual life of options outstanding at December 31, 2019 and 2018 was 7.3 years and 8.3 years, respectively.

Restricted Shares — Generally, the restrictions on Restricted Shares do not expire for a minimum of one year and a maximum of three years, and shares are subject to forfeiture during the restriction period. Most typically, Restricted Share grants have staggered vesting periods over one to three years from grant date. The intrinsic value of the Restricted Shares, which is typically the product of share price at the date of grant and the number of Restricted Shares granted, is amortized on a straight-line basis to compensation expense over the periods in which the restrictions lapse.

Awards of Restricted Shares are valued at the closing market price of our common stock on the date of grant. The unearned compensation is amortized to compensation expense over the vesting period of the Restricted Shares, except for awards related to the 55/10 Provision which are expensed when granted. As of December 31, 2019 and 2018, we had $23.4 million and $24.3 million, respectively, of unearned compensation cost related to unvested Restricted Shares, which is expected to be recognized over a weighted-average period of approximately one year. The total fair value of Restricted Shares vested during the years ended December 31, 2019, 2018 and 2017 was $16.8 million, $14.3 million and $30.5 million, respectively.

We recorded stock-based compensation for Restricted Shares as follows:

	Year Ended December 31,		
	2019	2018	2017
	(Amounts in millions)		
Stock-based compensation expense	$ 23.9	$ 19.9	$ 22.8
Related income tax benefit	(5.4)	(4.5)	(5.2)
Net stock-based compensation expense	$ 18.5	$ 15.4	$ 17.6

The following table summarizes information regarding Restricted Shares:

	Year Ended December 31, 2019	
	Shares	Weighted Average Grant-Date Fair Value
Number of unvested Restricted Shares:		
Outstanding — beginning of year	1,530,214	$ 45.06
Granted	857,116	46.80
Vested	(392,152)	42.82
Canceled	(304,578)	43.66
Outstanding — ending of year	1,690,600	$ 46.71

Unvested Restricted Shares outstanding as of December 31, 2019, includes approximately 647,000 units with performance-based vesting provisions. Performance-based units are issuable in common stock and vest upon the achievement of pre-defined performance targets. Performance-based units have performance targets based on our average return on invested capital and our total shareholder return ("TSR") over a three-year period. Most unvested units were granted in three annual grants since January 1, 2017 and have a vesting percentage between 0% and 200% depending on the achievement of the specific performance targets. Except for shares granted under the 55/10 Provision, compensation expense is recognized ratably over a cliff-vesting period of 36 months, based on the fair value of our common stock on the date of grant, as adjusted for actual forfeitures. During the performance period, earned and unearned compensation expense is adjusted based on changes in the expected achievement of the performance targets for all performance-based units granted except for the TSR-based units. Vesting provisions range from 0 to approximately 1,294,000 shares based on performance targets. As of December 31, 2019, we estimate vesting of approximately 466,000 shares based on expected achievement of performance targets.

8. DERIVATIVES AND HEDGING ACTIVITIES

Our risk management and foreign currency derivatives and hedging policy specifies the conditions under which we may enter into derivative contracts. See Note 1 for additional information on our purpose for entering into derivatives and our overall risk management strategies. We enter into foreign exchange forward contracts to hedge our cash flow risks associated with transactions denominated in currencies other than the local currency of the operation engaging in the transaction.

Foreign exchange contracts had notional values of $398.5 million and $280.9 million at December 31, 2019 and 2018, respectively. At December 31, 2019, the length of foreign exchange contracts currently in place ranged from 17 days to 32 months.

We are exposed to risk from credit-related losses resulting from nonperformance by counterparties to our financial instruments. We perform credit evaluations of our counterparties under forward exchange contracts and expect all counterparties to meet their obligations. We have not experienced credit losses from our counterparties.

The fair values of foreign exchange contracts are summarized below:

	Year Ended December 31,	
	2019	2018
	(Amounts in thousands)	
Current derivative assets	$ 892	$ 535
Noncurrent derivative assets	15	5
Current derivative liabilities	3,418	3,285
Noncurrent derivative liabilities	8	2

Current and noncurrent derivative assets are reported in our consolidated balance sheets in prepaid expenses and other and other assets, net, respectively. Current and noncurrent derivative liabilities are reported in our consolidated balance sheets in accrued liabilities and retirement obligations and other liabilities, respectively.

The impact of net changes in the fair values of foreign exchange contracts are summarized below:

	Year Ended December 31,		
	2019	2018	2017
	(Amounts in thousands)		
Gain (loss) recognized in income	$ (6,495)	$ (3,154)	$ 2,122

Gains and losses recognized in our consolidated statements of income for foreign exchange contracts are classified as Other income (expense), net.

In March 2015, we designated €255.7 million of our €500.0 million 2022 EUR Senior Notes discussed in Note 12 as a net investment hedge of our investments in certain of our international subsidiaries that use the Euro as their functional currency. We use the spot method to measure the effectiveness of our net investment hedge. Under this method, for each reporting period, the change in the carrying value of the Euro senior notes due to remeasurement of the effective portion is reported in accumulated other comprehensive loss on our consolidated balance sheet and the remaining change in the carrying value of the ineffective portion, if any, is recognized in Other income (expense), net in our consolidated statement of income. We evaluate the effectiveness of our net investment hedge on a prospective basis at the beginning of each quarter. We did not record any ineffectiveness for the years ended December 31, 2019, 2018 or 2017.

9. FAIR VALUE OF FINANCIAL INSTRUMENTS

The fair value of our debt, excluding the Senior Notes (as described in Note 12), was estimated using interest rates on similar debt recently issued by companies with credit metrics similar to ours and is classified as Level II under the fair value hierarchy. The carrying value of our debt is included in Note 12 and, except for the Senior Notes, approximates fair value. The estimated fair value of the Senior Notes is based on Level I quoted market rates. The estimated fair value of our Senior Notes at December 31, 2019 was $1,381.2 million compared to the carrying value of $1,354.1 million. The carrying amounts of our other financial instruments (i.e., cash and cash equivalents, accounts receivable, net and accounts payable) approximated fair value due to their short-term nature at December 31, 2019 and December 31, 2018.

10. DETAILS OF CERTAIN CONSOLIDATED BALANCE SHEET CAPTIONS

The following tables present financial information of certain consolidated balance sheet captions.

Accounts Receivable, net — Accounts receivable, net were:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Accounts receivable	$ 848,950	$ 843,935
Less: allowance for doubtful accounts	(53,412)	(51,501)
Accounts receivable, net	$ 795,538	$ 792,434

Property, Plant and Equipment, net — Property, plant and equipment, net were:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Land	$ 64,778	$ 72,701
Buildings and improvements	419,454	441,006
Machinery, equipment and tooling	666,376	634,838
Software, furniture and fixtures and other	434,774	418,185
Gross property, plant and equipment	1,585,382	1,566,730
Less: accumulated depreciation	(1,013,207)	(956,634)
Property, plant and equipment, net	$ 572,175	$ 610,096

Accrued Liabilities — Accrued liabilities were:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Wages, compensation and other benefits	$ 192,354	$ 198,311
Commissions and royalties	23,027	19,673
Warranty costs and late delivery penalties	30,625	31,683
Sales and use tax	18,146	14,486
Income tax	20,018	9,865
Other	117,215	117,388
Accrued liabilities	$ 401,385	$ 391,406

"Other" accrued liabilities include professional fees, lease obligations, insurance, interest, freight, accrued cash dividends payable, legal and environmental matters, derivative liabilities, restructuring reserves and other items, none of which individually exceed 5% of current liabilities.

Retirement Obligations and Other Liabilities — Retirement obligations and other liabilities were:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Pension and postretirement benefits	$ 199,603	$ 183,012
Deferred taxes	163,084	159,404
Operating lease liabilities	151,523	—
Legal and environmental	28,593	21,949
Uncertain tax positions and other tax liabilities	42,086	57,553
Other	39,929	37,775
Retirement obligations and other liabilities	$ 624,818	$ 459,693

11. EQUITY METHOD INVESTMENTS

We occasionally enter into joint venture arrangements with local country partners as our preferred means of entry into countries where barriers to entry may exist. Similar to our consolidated subsidiaries, these unconsolidated joint ventures generally operate within our primary businesses of designing, manufacturing, assembling and distributing fluid motion and control products and services. We have agreements with certain of these joint ventures that restrict us from otherwise entering the respective market and certain joint ventures produce and/or sell our products as part of their broader product offering. Net earnings from investments in unconsolidated joint ventures is reported in net earnings from affiliates in our consolidated statements of income. Given the integrated role of the unconsolidated joint ventures in our business, net earnings from affiliates is presented as a component of operating income.

As of December 31, 2019, we had investments in six joint ventures, one located in each of Chile, China, India, Saudi Arabia, South Korea and the United Arab Emirates that were accounted for using the equity method and are immaterial for disclosure purposes.

12. DEBT AND FINANCE LEASE OBLIGATIONS

Debt, including finance lease obligations, consisted of:

	December 31,	
	2019	2018
	(Amounts in thousands)	
1.25% EUR Senior Notes due March 17, 2022, net of unamortized discount and debt issuance costs of $2,653 and $3,914 at December 31, 2019 and 2018, respectively	$ 557,847	$ 569,536
3.50% USD Senior Notes due September 15, 2022, net of unamortized discount and debt issuance costs of $1,924 and $2,589 at December 31, 2019 and 2018, respectively	498,076	497,411
4.00% USD Senior Notes due November 15, 2023, net of unamortized discount and debt issuance costs of $1,777 and $2,192 at December 31, 2019 and 2018, respectively	298,223	297,808
Term Loan Facility, interest rate of 4.30% at December 31, 2018, net of debt issuance costs of $249	—	104,751
Finance lease obligations and other borrowings	23,103	13,541
Debt and finance lease obligations	1,377,249	1,483,047
Less amounts due within one year	11,272	68,218
Total debt due after one year	$ 1,365,977	$ 1,414,829

Scheduled maturities of our Senior Notes and other debt, are (amounts in thousands):

2020	$ 11,272
2021	11,831
2022	1,055,923
2023	298,223
Total	$ 1,377,249

Senior Notes

On March 17, 2015, we completed a public offering of €500.0 million of Euro senior notes in aggregate principal amount due March 17, 2022 ("2022 EUR Senior Notes"). The 2022 EUR Senior Notes bear an interest rate of 1.25% per year, payable each year on March 17. The 2022 EUR Senior Notes were priced at 99.336% of par value, reflecting a discount to the aggregate principal amount.

On November 1, 2013 we completed the public offering of $300.0 million in aggregate principal amount of senior notes due November 15, 2023 ("2023 Senior Notes"). The 2023 Senior Notes bear an interest rate of 4.00% per year, payable on May 15 and November 15 of each year. The 2023 Senior Notes were priced at 99.532% of par value, reflecting a discount to the aggregate principal amount.

On September 11, 2012, we completed the public offering of $500.0 million in aggregate principal amount of senior notes due September 15, 2022 ("2022 Senior Notes"). The 2022 Senior Notes bear an interest rate of 3.50% per year, payable on March 15 and September 15 of each year. The 2022 Senior Notes were priced at 99.615% of par value, reflecting a discount to the aggregate principal amount.

We have the right to redeem the 2022 Senior Notes and 2023 Senior Notes at any time prior to June 15, 2022 and August 15, 2023, respectively, in whole or in part, at our option, at a redemption price equal to the greater of: (1) 100% of the principal amount of the senior notes being redeemed; or (2) the sum of the present values of the remaining scheduled payments of principal and interest in respect of the Senior Notes being redeemed discounted to the redemption date on a semi-annual basis, at the applicable Treasury Rate plus 30 basis points for the 2022 Senior Notes and plus 25 basis points for the 2023 Senior Notes. In addition, at any time on or after June 15, 2022 for the 2022 Senior Notes and August 15, 2023 for the 2023 Senior Notes, we may redeem the Senior Notes at a redemption price equal to 100% of the principal amount of the Senior Notes being redeemed. In each case, we will also pay the accrued and unpaid interest on the principal amount being redeemed to the redemption date. Similarly, we have the right to redeem the 2022 EUR Senior Notes at any time prior to December 17, 2021, in whole or in part, at our option, at a redemption price equal to the greater of: (1) 100% of the principal amount of the senior notes being redeemed; or (2) the sum of the present values of the remaining scheduled payments of principal and interest in respect of the Senior Notes being redeemed (exclusive of interest accrued to, but excluding, the date of redemption) discounted to the redemption date on an annual basis, at the Comparable German Government Bond Rate plus 25 basis points. At any time on or after December 17, 2021, we may redeem the 2022 EUR Senior Notes, in whole or in part from time to time, at our option, at a redemption price equal to 100% of the principal amount of the notes to be redeemed. In each case, we will also pay the accrued and unpaid interest on the principal amount being redeemed to the redemption date.

Senior Credit Facility

On July 16, 2019, we entered into a new credit agreement ("Credit Agreement") with Bank of America, N.A., as administrative agent, and the other lenders party thereto. The Credit Agreement provides for a $800.0 million unsecured senior credit facility with a maturity date of July 16, 2024 ("Senior Credit Facility"). The Senior Credit Facility includes a $750.0 million sublimit for the issuance of letters of credit and a $30.0 million sublimit for swing line loans. We have the right to increase the amount of the Senior Credit Facility by an aggregate amount not to exceed $400.0 million, subject to certain conditions, including each Lender's approval providing any increase. On July 16, 2019, approximately $75.0 million was borrowed under the Senior Credit Facility to repay all outstanding indebtedness under the previous senior credit facility. In connection with this repayment, our outstanding letters of credit under the previous senior credit facility were transferred to the Senior Credit Facility, and we terminated the previous senior credit facility. On September 16, 2019, the $75.0 million borrowed under the Senior Credit Facility was paid in full.

The interest rates per annum applicable to the Senior Credit Facility (other than with respect to swing line loans) are LIBOR plus between 1.000% to 1.750%, depending on our debt rating by either Moody's Investors Service, Inc. or Standard & Poor's Financial Services LLC ("S&P") Ratings, or, at our option, the Base Rate (as defined in the Senior Credit Agreement) plus between 0.000% to 0.750% depending on our debt rating by either Moody's Investors Service, Inc. or S&P Global Ratings. As of December 31, 2019, the interest rate on the Senior Credit Facility was LIBOR plus 1.375% in the case of LIBOR loans and the Base Rate plus 0.375% in the case of Base Rate loans. In addition, a commitment fee is payable quarterly in arrears on the daily unused portions of the Senior Credit Facility. The commitment fee will be between 0.090% and 0.300% of unused amounts under the Senior Credit Facility depending on our debt rating by either Moody's Investors Service, Inc. or S&P's Ratings. The commitment fee was 0.20% (per annum) during the period ended December 31, 2019.

As of December 31, 2019, and December 31, 2018, we had no revolving loans outstanding under the Senior Credit Facility. We had outstanding letters of credit of $88.5 million and $92.9 million at December 31, 2019, and December 31, 2018, respectively. The amount available for borrowings under our Senior Credit Facility was $711.5 million at December 31, 2019. As of December 31, 2018, due to a financial covenant in the previous senior credit facility, the amount available for borrowings under that facility was effectively limited to $513.7 million.

Repayment of Obligations — During the year ended December 31, 2019, we paid the $105.0 million outstanding principal balance on our previous senior credit facility, including $30.0 million of scheduled principal repayments. During both 2018 and 2017, we paid $60.0 million of scheduled principal repayments on the previous senior credit facility.

Financial Covenants — Our compliance with the financial covenants under the Senior Notes and Senior Credit Facility are tested quarterly. We were in compliance with all covenants as of December 31, 2019.

13. PENSION AND POSTRETIREMENT BENEFITS

We sponsor several noncontributory defined benefit pension plans, covering substantially all U.S. employees and certain non-U.S. employees, which provide benefits based on years of service, age, job grade levels and type of compensation. Retirement benefits for all other covered employees are provided through contributory pension plans, cash balance pension plans and government-sponsored retirement programs. All funded defined benefit pension plans receive funding based on independent actuarial valuations to provide for current service and an amount sufficient to amortize unfunded prior service over periods not to exceed 30 years, with funding falling within the legal limits prescribed by prevailing regulation. We also maintain unfunded defined benefit plans that, as permitted by local regulations, receive funding only when benefits become due.

Our defined benefit plan strategy is to ensure that current and future benefit obligations are adequately funded in a cost-effective manner. Additionally, our investing objective is to achieve the highest level of investment performance that is compatible with our risk tolerance and prudent investment practices. Because of the long-term nature of our defined benefit plan liabilities, our funding strategy is based on a long-term perspective for formulating and implementing investment policies and evaluating their investment performance.

The asset allocation of our defined benefit plans reflects our decision about the proportion of the investment in equity and fixed income securities, and, where appropriate, the various sub-asset classes of each. At least annually, we complete a comprehensive review of our asset allocation policy and the underlying assumptions, which includes our long-term capital markets rate of return assumptions and our risk tolerances relative to our defined benefit plan liabilities.

The expected rates of return on defined benefit plan assets are derived from review of the asset allocation strategy, expected long-term performance of asset classes, risks and other factors adjusted for our specific investment strategy. These rates are impacted by changes in general market conditions, but because they are long-term in nature, short-term market changes do not significantly impact the rates.

Our U.S. defined benefit plan assets consist of a balanced portfolio of equity and fixed income securities. Our non-U.S. defined benefit plan assets include a significant concentration of United Kingdom ("U.K.") fixed income securities. We monitor investment allocations and manage plan assets to maintain acceptable levels of risk.

For all periods presented, we used a measurement date of December 31 for each of our U.S. pension plans, non-U.S. pension plans and postretirement medical plans.

U.S. Defined Benefit Plans

We maintain qualified and non-qualified defined benefit pension plans in the U.S. The qualified plan provides coverage for substantially all full-time U.S. employees who receive benefits, up to an earnings threshold specified by the U.S. Department of Labor. The non-qualified plans primarily cover a small number of employees including current and former members of senior management, providing them with benefit levels equivalent to other participants, but that are otherwise limited by U.S. Department of Labor rules. The U.S. plans are designed to operate as "cash balance" arrangements, under which the employee has the option to take a lump sum payment at the end of their service. The difference between total accumulated benefit obligation and total projected benefit obligation ("Benefit Obligation") is immaterial.

The following are assumptions related to the U.S. defined benefit pension plans:

	Year Ended December 31,		
	2019	2018	2017
Weighted average assumptions used to determine Benefit Obligations:			
Discount rate	3.41%	4.34%	3.63%
Rate of increase in compensation levels	3.50	3.50	4.01
Weighted average assumptions used to determine net pension expense:			
Long-term rate of return on assets	6.00%	6.00%	6.00%
Discount rate	4.34	3.63	4.00
Rate of increase in compensation levels	3.50	4.01	4.01

At December 31, 2019 as compared with December 31, 2018, we decreased our discount rate from 4.34% to 3.41% based on an analysis of publicly-traded investment grade U.S. corporate bonds, which had a lower yield due to current market conditions. In determining 2019 expense, the expected rate of return on U.S. plan assets remained constant at 6.00%, primarily based on our target allocations and expected long-term asset returns. The long-term rate of return assumption is calculated using a quantitative approach that utilizes unadjusted historical returns and asset allocation as inputs for the calculation. For all U.S. plans, we adopted the Pri-2012 mortality tables and the MP-2019 improvement scale published in October 2019. We applied the Pri-2012 tables based on the constituency of our plan population for union and non-union participants. We adjusted the improvement scale to utilize 75% of the ultimate improvement rate, consistent with assumptions adopted by the Social Security Administration trustees, based on long-term historical experience. Currently, we believe this approach provides the best estimate of our future obligation. Most plan participants elect to receive plan benefits as a lump sum at the end of service, rather than an annuity. As such, the updated mortality tables had an immaterial effect on our pension obligation.

Net pension expense for the U.S. defined benefit pension plans (including both qualified and non-qualified plans) was:

	Year Ended December 31,		
	2019	2018	2017
	(Amounts in thousands)		
Service cost	$ 23,245	$ 22,195	$ 22,257
Interest cost	17,584	15,789	16,878
Expected return on plan assets	(25,645)	(25,704)	(24,505)
Settlement gain	—	(462)	(216)
Amortization of unrecognized prior service cost	164	164	112
Amortization of unrecognized net loss	3,675	5,514	6,021
U.S. net pension expense	$ 19,023	$ 17,496	$ 20,547

The estimated prior service cost and the estimated net loss for the U.S. defined benefit pension plans that will be amortized from accumulated other comprehensive loss into pension expense in 2020 is $0.2 million and $6.6 million, respectively. We amortize estimated prior service costs and estimated net losses over the remaining expected service period.

The following summarizes the net pension (liability) asset for U.S. plans:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Plan assets, at fair value	$ 482,553	$ 425,792
Benefit Obligation	(471,462)	(432,595)
Funded status	$ 11,091	$ (6,803)

The following summarizes amounts recognized in the balance sheet for U.S. plans:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Noncurrent assets	$ 16,396	$ —
Current liabilities	(348)	(232)
Noncurrent liabilities	(4,957)	(6,571)
Funded status	$ 11,091	$ (6,803)

The following is a summary of the changes in the U.S. defined benefit plans' pension obligations:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Balance — January 1	$ 432,595	$ 461,355
Service cost	23,245	22,195
Interest cost	17,584	15,789
Plan amendments and settlements	276	(3,016)
Actuarial loss (gain) (1)	31,214	(25,908)
Benefits paid	(33,452)	(37,820)
Balance — December 31	$ 471,462	$ 432,595
Accumulated benefit obligations at December 31	$ 470,643	$ 431,973

(1) The actuarial losses (gain) in 2019 and 2018 primarily reflect the impact of changes in the discount rate.

The following table summarizes the expected cash benefit payments for the U.S. defined benefit pension plans in the future (amounts in millions):

2020	$ 42.8
2021	44.0
2022	41.9
2023	42.9
2024	42.1
2025-2029	196.8

The following table shows the change in accumulated other comprehensive loss attributable to the components of the net cost and the change in Benefit Obligations for U.S. plans, net of tax:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Balance — January 1	$ (62,018)	$ (49,790)
Amortization of net loss	2,809	4,216
Amortization of prior service cost	125	125
Net gain (loss) arising during the year	9,785	(16,216)
Settlement gain	—	(353)
Prior service cost arising during the year	(211)	—
Balance — December 31	$ (49,510)	$ (62,018)

Amounts recorded in accumulated other comprehensive loss consist of:

	December 31, 2019	December 31, 2018
	(Amounts in thousands)	
Unrecognized net loss	$ (48,578)	$ (61,129)
Unrecognized prior service cost	(932)	(889)
Accumulated other comprehensive loss, net of tax	$ (49,510)	$ (62,018)

The following is a reconciliation of the U.S. defined benefit pension plans' assets:

	December 31, 2019	December 31, 2018
	(Amounts in thousands)	
Balance — January 1	$ 425,792	$ 464,779
Return on plan assets	69,663	(21,414)
Company contributions	20,552	23,263
Benefits paid	(33,454)	(37,820)
Settlements	—	(3,016)
Balance — December 31	$ 482,553	$ 425,792

We contributed $20.6 million and $23.3 million to the U.S. defined benefit pension plans during 2019 and 2018, respectively. These payments exceeded the minimum funding requirements mandated by the U.S. Department of Labor rules. Our estimated contribution in 2020 is expected to be approximately $20 million, excluding direct benefits paid.

All U.S. defined benefit plan assets are held by the qualified plan. The asset allocations for the qualified plan at the end of 2019 and 2018 by asset category, are as follows:

	Target Allocation at December 31,		Percentage of Actual Plan Assets at December 31,	
Asset category	2019	2018	2019	2018
Cash and cash equivalents	—%	—%	1%	1%
Cash and cash equivalents	—%	—%	1%	1%
Global Equity	31%	30%	28%	30%
Global Real Assets	12%	13%	12%	13%
Equity securities	43%	43%	40%	43%
Diversified Credit	12%	12%	12%	13%
Liability-Driven Investment	45%	45%	47%	43%
Fixed income	57%	57%	59%	56%

None of our common stock is directly held by our qualified plan. Our investment strategy is to earn a long-term rate of return consistent with an acceptable degree of risk and minimize our cash contributions over the life of the plan, while taking into account the liquidity needs of the plan. We preserve capital through diversified investments in high quality securities. Our current allocation target is to invest approximately 43% of plan assets in equity securities and 57% in fixed income securities. Within each investment category, assets are allocated to various investment strategies. Professional money management firms manage our assets, and we engage a consultant to assist in evaluating these activities. We periodically review the allocation target, generally in conjunction with an asset and liability study and in consideration of our future cash flow needs. We regularly rebalance the actual allocation to our target investment allocation.

Plan assets are invested in commingled funds. Our "Pension and Investment Committee" is responsible for setting the investment strategy and the target asset allocation for the plan's assets. As the qualified plan approached fully funded status, we implemented a Liability-Driven Investing ("LDI") strategy, which more closely aligns the duration of the plan's assets with the duration of its liabilities. The LDI strategy results in an asset portfolio that more closely matches the behavior of the liability, thereby reducing the volatility of the plan's funded status.

The plan's financial instruments, shown below, are presented at fair value. See Note 1 for further discussion on how the hierarchical levels of the fair values of the Plan's investments are determined. The fair values of our U.S. defined benefit plan assets were:

	At December 31, 2019				At December 31, 2018			
		Hierarchical Levels				Hierarchical Levels		
	Total	I	II	III	Total	I	II	III
	(Amounts in thousands)				(Amounts in thousands)			
Cash and cash equivalents	$ 4,994	$ 4,994	$ —	$ —	$ 4,778	$ 4,778	$ —	$ —
Commingled Funds:								
Equity securities								
Global Equity(a)	135,350	—	135,350	—	126,165	—	126,165	—
Global Real Assets(b)	60,523	—	60,523	—	55,046	—	55,046	—
Fixed income securities								
Diversified Credit(c)	56,375	—	56,375	—	55,039	—	55,039	—
Liability-Driven Investment(d)	225,311	—	225,311	—	184,764	—	184,764	—
	$ 482,553	$ 4,994	$ 477,559	$ —	$ 425,792	$ 4,778	$ 421,014	$ —

(a) Global Equity fund seeks to closely track the performance of the MSCI All Country World Index.

(b) Global Real Asset funds seek to provide exposure to the listed global real estate investment trusts (REITs) and infrastructure markets.

(c) Diversified Credit funds seek to provide exposure to the high yield, emerging markets, bank loans and securitized credit markets.

(d) Liability-Driven Investment ("LDI") funds seek to invest in high quality fixed income securities that collectively closely match those found in discount curves used to value the plan's liabilities.

Non-U.S. Defined Benefit Plans

We maintain defined benefit pension plans, which cover some or all of our employees in the following countries: Austria, Belgium, Canada, France, Germany, India, Italy, Japan, Mexico, The Netherlands, Sweden, Switzerland and the U.K. The assets of the plans in the U.K. (two plans), The Netherlands and Canada represent 94% of the total non-U.S. plan assets ("non-U.S. assets"). Details of other countries' plan assets have not been provided due to immateriality.

The following are assumptions related to the non-U.S. defined benefit pension plans:

	Year Ended December 31,		
	2019	2018	2017
Weighted average assumptions used to determine Benefit Obligations:			
Discount rate	1.61%	2.42%	2.25%
Rate of increase in compensation levels	3.12	3.28	3.25
Weighted average assumptions used to determine net pension expense:			
Long-term rate of return on assets	3.37%	3.62%	3.88%
Discount rate	2.42	2.25	2.34
Rate of increase in compensation levels	3.28	3.25	3.22

At December 31, 2019, as compared with December 31, 2018, we decreased our average discount rate for non-U.S. plans from 2.42% to 1.61% based on analysis of bonds and other publicly-traded instruments, by country, which had lower yields due to market conditions. To determine 2019 pension expense, we decreased our average expected rate of return on plan assets from 3.62% at December 31, 2018 to 3.37% at December 31, 2019, primarily based on our target allocations and expected long-term asset returns. As the expected rate of return on plan assets is long-term in nature, short-term market fluctuations do not significantly impact the rate.

Many of our non-U.S. defined benefit plans are unfunded, as permitted by local regulation. The expected long-term rate of return on assets for funded plans was determined by assessing the rates of return for each asset class and is calculated using a quantitative approach that utilizes unadjusted historical returns and asset allocation as inputs for the calculation. We work with our actuaries to determine the reasonableness of our long-term rate of return assumptions by looking at several factors including historical returns, expected future returns, asset allocation, risks by asset class and other items.

Net pension expense for non-U.S. defined benefit pension plans was:

	Year Ended December 31,		
	2019	2018	2017
	(Amounts in thousands)		
Service cost	$ 5,728	$ 7,208	$ 7,247
Interest cost	8,867	8,970	9,320
Expected return on plan assets	(7,535)	(8,747)	(8,834)
Amortization of unrecognized net loss	2,933	3,626	3,741
Amortization of unrecognized prior service cost (benefit)	265	33	(4)
Settlement loss (gain) and other	859	(521)	2,434
Non-U.S. net pension expense	$ 11,117	$ 10,569	$ 13,904

The estimated net loss and prior service cost for the non-U.S. defined benefit pension plans that will be amortized from accumulated other comprehensive loss into pension expense in 2020 is $4.3 million and $0.3 million, respectively. We amortize estimated net losses over the remaining expected service period or over the remaining expected lifetime of inactive participants for plans with only inactive participants.

The following summarizes the net pension liability for non-U.S. plans:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Plan assets, at fair value	$ 262,559	$ 232,175
Benefit Obligation	(425,617)	(376,649)
Funded status	$ (163,058)	$ (144,474)

The following summarizes amounts recognized in the balance sheet for non-U.S. plans:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Noncurrent assets	$ 16,379	$ 17,864
Current liabilities	(7,609)	(7,782)
Noncurrent liabilities	(171,828)	(154,556)
Funded status	$ (163,058)	$ (144,474)

The following is a reconciliation of the non-U.S. plans' defined benefit pension obligations:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Balance — January 1	$ 376,649	$ 413,960
Service cost	5,728	7,208
Interest cost	8,867	8,970
Employee contributions	78	238
Settlements and other	(3,713)	(7,896)
Actuarial loss (gain)(1)	48,888	(8,839)
Net benefits and expenses paid	(14,526)	(16,632)
Currency translation impact(2)	3,646	(20,360)
Balance — December 31	$ 425,617	$ 376,649
Accumulated benefit obligations at December 31	$ 404,035	$ 356,989

(1) The 2019 actuarial loss primarily reflects the decrease in the discount rates for all plans.

(2) In 2019, the currency translation loss reflects the weakening of the U.S. dollar against the British pound, partially offset by the strengthening of the U.S. dollar against the Euro, while in 2018 the currency translation gain reflected the strengthening of the U.S. dollar against our significant currencies, primarily the Euro and British pound.

The following table summarizes the expected cash benefit payments for the non-U.S. defined benefit plans in the future (amounts in millions):

2020	$ 16.5
2021	17.0
2022	17.8
2023	17.9
2024	18.7
2025-2029	97.3

The following table shows the change in accumulated other comprehensive loss attributable to the components of the net cost and the change in Benefit Obligations for non-U.S. plans, net of tax:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Balance — January 1	$ (62,088)	$ (67,872)
Amortization of net loss	2,946	3,260
Net (loss) gain arising during the year	(29,910)	2,458
Settlement loss (gain)	746	(386)
Prior service cost arising during the year	—	(3,080)
Currency translation impact and other	(1,031)	3,532
Balance — December 31	$ (89,337)	$ (62,088)

Amounts recorded in accumulated other comprehensive loss consist of:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Unrecognized net loss	$ (85,891)	$ (58,697)
Unrecognized prior service cost	(3,446)	(3,391)
Accumulated other comprehensive loss, net of tax	$ (89,337)	$ (62,088)

The following is a reconciliation of the non-U.S. plans' defined benefit pension assets:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Balance — January 1	$ 232,175	$ 248,733
Return (loss) on plan assets	23,793	(580)
Employee contributions	78	238
Company contributions	16,782	21,696
Settlements	(3,688)	(7,776)
Currency translation impact and other	7,945	(13,504)
Net benefits and expenses paid	(14,526)	(16,632)
Balance — December 31	$ 262,559	$ 232,175

Our contributions to non-U.S. defined benefit pension plans in 2020 are expected to be approximately $2 million, excluding direct benefits paid.

The asset allocations for the non-U.S. defined benefit pension plans at the end of 2019 and 2018 are as follows:

	Target Allocation at December 31,		Percentage of Actual Plan Assets at December 31,	
Asset category	**2019**	**2018**	**2019**	**2018**
Cash and cash equivalents	2%	7%	2%	7%
Cash and cash equivalents	2%	7%	2%	7%
North American Companies	1%	3%	1%	3%
Global Equity	1%	2%	1%	2%
Equity securities	2%	5%	2%	5%
U.K. Government Gilt Index	43%	43%	43%	43%
Global Fixed Income Bond	—%	2%	—%	2%
Liability-Driven Investment	7%	9%	7%	9%
Fixed income	50%	54%	50%	54%
Multi-asset	19%	19%	19%	19%
Buy-in Contracts	21%	10%	21%	10%
Other	6%	5%	6%	5%
Other types	46%	34%	46%	34%

None of our common stock is held directly by these plans. In all cases, our investment strategy for these plans is to earn a long-term rate of return consistent with an acceptable degree of risk and minimize our cash contributions over the life of the plan, while taking into account the liquidity needs of the plan and the legal requirements of the particular country. We preserve capital through diversified investments in high quality securities.

Asset allocation differs by plan based upon the plan’s benefit obligation to participants, as well as the results of asset and liability studies that are conducted for each plan and in consideration of our future cash flow needs. Professional money management firms manage plan assets and we engage a consultant in the U.K. to assist in evaluation of these activities. The assets of the U.K. plans are overseen by a group of Trustees who review the investment strategy, asset allocation and fund selection. These assets are passively managed as they are invested in index funds that attempt to match the performance of the specified benchmark index.

The fair values of the non-U.S. assets were:

	At December 31, 2019				At December 31, 2018			
		Hierarchical Levels				Hierarchical Levels		
	Total	I	II	III	Total	I	II	III
	(Amounts in thousands)				(Amounts in thousands)			
Cash	$ 5,026	$ 5,026	$ —	—	$ 15,105	$ 15,105	$ —	$ —
Commingled Funds:								
Equity securities								
North American Companies(a)	2,501	—	2,501	—	6,603	—	6,603	—
Global Equity(b)	2,411	—	2,411	—	4,648	—	4,648	—
Fixed income securities								
U.K. Government Gilt Index(c)	113,855	—	113,855	—	99,482	—	99,482	—
U.K. Corporate Bond Index	—	—	—	—	1,192	—	1,192	—
Global Fixed Income Bond	—	—	—	—	4,110	—	4,110	—
Liability-Driven Investment(d)	20,011	—	20,011	—	20,004	—	20,004	—
Other Types of Investments:								
Multi-asset(e)	48,964	—	48,964	—	44,147	—	44,147	—
Buy-in Contracts(f)	54,544	—	—	54,544	23,616	—	—	23,616
Other(g)	15,247	—	—	15,247	13,268	—	—	13,268
	$ 262,559	$ 5,026	$ 187,742	$ 69,791	$ 232,175	$ 15,105	$ 180,186	$ 36,884

(a) North American Companies represents U.S. and Canadian large cap equity funds, which are managed to track their respective benchmarks (FTSE All-World USA Index and FTSE All-World Canada Index).

(b) Global Equity represents actively managed global equity funds, taking a top-down strategic view on the different regions by analyzing companies based on fundamentals, market-driven, thematic and quantitative factors to generate alpha.

(c) U.K. Government Gilt Index represents U.K. government issued fixed income investments which are passively managed to track their respective benchmarks.

(d) LDI seeks to invest in fixed income securities that collectively closely match those found in discount curves used to value the plan's liabilities.

(e) Multi-asset seeks an attractive risk-adjusted return by investing in a diversified portfolio of strategies, including equities and fixed income.

(f) The Buy-in Contracts ("Contract" or "Contracts") represent assets held by plans, whereby the cost of providing benefits to plan participants is funded by the Contract. The Contracts are held by the plans for the benefit of plan participants in the Netherlands and U.K. The fair value of these assets are based on the current present value of accrued benefits and will fluctuate based on changes in the obligations associated with covered plan members as well as the assumptions used in the present value calculation. The fair value of asset held in the Netherlands Contract as of January 1, 2019 was $23.6 million, with contributions and currency adjustments resulting in a fair value of $25.9 million at December 31, 2019. On August 29, 2019, we established a Contract for our U.K. plan participants with initial investment of $27.4 million, with contributions and currency adjustments resulting in a fair value of $28.6 million at December 31, 2019.

(g) Includes assets held by plans outside the United Kingdom, the Netherlands and Canada. Details have not been provided due to immateriality.

Defined Benefit Pension Plans with Accumulated Benefit Obligations in Excess of Plan Assets

The following summarizes key pension plan information regarding U.S. and non-U.S. plans whose accumulated benefit obligations exceed the fair value of their respective plan assets.

	December 31,	
	2019	2018
	(Amounts in thousands)	
Benefit Obligation	$ 229,793	$ 613,441
Accumulated benefit obligation	212,906	596,584
Fair value of plan assets	46,718	444,929

Postretirement Medical Plans

We sponsor several defined benefit postretirement medical plans covering certain current retirees and a limited number of future retirees in the U.S. These plans provide for medical and dental benefits and are administered through insurance companies and health maintenance organizations. The plans include participant contributions, deductibles, co-insurance provisions and other limitations and are integrated with Medicare and other group plans. We fund the plans as benefits and health maintenance organization premiums are paid, such that the plans hold no assets in any period presented. Accordingly, we have no investment strategy or targeted allocations for plan assets. Benefits under our postretirement medical plans are not available to new employees or most existing employees.

The following are assumptions related to postretirement benefits:

	Year Ended December 31,		
	2019	2018	2017
Weighted average assumptions used to determine Benefit Obligation:			
Discount rate	3.27%	4.20%	3.48%
Weighted average assumptions used to determine net expense:			
Discount rate	4.20%	3.48%	3.75%

The assumed ranges for the annual rates of increase in medical costs used to determine net expense were 7.5% for 2019, 7.0% for 2018 and 7% for 2017, with a gradual decrease to 5.0% for 2029 and future years. At December 31, 2019, a one-percentage point change in assumed medical cost trend rates would not have a material effect on reported amounts.

Net postretirement benefit cost for postretirement medical plans was:

	Year Ended December 31,		
	2019	2018	2017
	(Amounts in thousands)		
Interest cost	$ 754	$ 779	$ 919
Amortization of unrecognized prior service cost	122	122	122
Amortization of unrecognized net gain	(215)	(764)	(275)
Net postretirement benefit expense	$ 661	$ 137	$ 766

The estimated actuarial net gain and the estimated prior service cost for the defined benefit postretirement medical plans that are expected to be amortized from accumulated other comprehensive loss into net pension expense in 2020 are immaterial.

The following summarizes the accrued postretirement benefits liability for the postretirement medical plans:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Postretirement Benefit Obligation	$ 18,862	$ 18,810
Funded status	$ (18,862)	$ (18,810)

The following summarizes amounts recognized in the balance sheet for postretirement Benefit Obligation:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Current liabilities	$ (2,370)	$ (2,500)
Noncurrent liabilities	(16,492)	(16,310)
Funded status	$ (18,862)	$ (18,810)

The following is a reconciliation of the postretirement Benefit Obligation:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Balance — January 1	$ 18,810	$ 23,882
Interest cost	754	779
Employee contributions	964	883
Medicare subsidies receivable	14	127
Actuarial loss (gain)	2,222	(2,662)
Net benefits and expenses paid	(3,902)	(4,199)
Balance — December 31	$ 18,862	$ 18,810

The following presents expected benefit payments for future periods (amounts in millions):

	Expected Payments
2020	$ 2.4
2021	2.3
2022	2.1
2023	1.9
2024	1.7
2025-2029	6.6

The following table shows the change in accumulated other comprehensive loss attributable to the components of the net cost and the change in Benefit Obligations for postretirement benefits, net of tax:

	2019	2018
	(Amounts in thousands)	
Balance — January 1	$ 2,425	$ 880
Amortization of net gain	(164)	(584)
Amortization of prior service cost	94	93
Net (loss) gain arising during the year	(1,699)	2,036
Balance — December 31	$ 656	$ 2,425

Amounts recorded in accumulated other comprehensive loss consist of:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Unrecognized net gain	$ 1,512	$ 3,365
Unrecognized prior service cost	(856)	(940)
Accumulated other comprehensive income, net of tax	$ 656	$ 2,425

We made contributions to the postretirement medical plans to pay benefits of $2.9 million in 2019, $3.2 million in 2018 and $2.5 million in 2017. Because the postretirement medical plans are unfunded, we make contributions as the covered individuals' claims are approved for payment. Accordingly, contributions during any period are directly correlated to the benefits paid.

Defined Contribution Plans

We sponsor several defined contribution plans covering substantially all U.S. and Canadian employees and certain other non-U.S. employees. Employees may contribute to these plans, and these contributions are matched in varying amounts by us, including opportunities for discretionary matching contributions by us. Defined contribution plan expense was $20.4 million in 2019, $18.7 million in 2018 and $17.7 million in 2017.

14. LEGAL MATTERS AND CONTINGENCIES

Asbestos-Related Claims

We are a defendant in a substantial number of lawsuits that seek to recover damages for personal injury allegedly caused by exposure to asbestos-containing products manufactured and/or distributed by our heritage companies in the past. While the overall number of asbestos-related claims has generally declined in recent years, there can be no assurance that this trend will continue, or that the average cost per claim will not further increase. Asbestos-containing materials incorporated into any such products were encapsulated and used as internal components of process equipment, and we do not believe that any significant emission of asbestos fibers occurred during the use of this equipment.

Our practice is to vigorously contest and resolve these claims, and we have been successful in resolving a majority of claims with little or no payment. Historically, a high percentage of resolved claims have been covered by applicable insurance or indemnities from other companies, and we believe that a substantial majority of existing claims should continue to be covered by insurance or indemnities, in whole or in part. Accordingly, we have recorded a liability for our estimate of the most likely settlement of asserted claims and a related receivable from insurers or other companies for our estimated recovery, to the extent we believe that the amounts of recovery are probable. While unfavorable rulings, judgments or settlement terms regarding these claims could have a material adverse impact on our business, financial condition, results of operations and cash flows, we currently believe the likelihood is remote.

Additionally, we have claims pending against certain insurers that, if resolved more favorably than reflected in the recorded receivables, would result in discrete gains in the applicable quarter. We are currently unable to estimate the impact, if any, of unasserted asbestos-related claims, although we expect that future claims would also be subject to then existing indemnities and insurance coverage.

Other

We are currently involved as a potentially responsible party at five former public waste disposal sites in various stages of evaluation or remediation. The projected cost of remediation at these sites, as well as our alleged "fair share" allocation, will remain uncertain until all studies have been completed and the parties have either negotiated an amicable resolution or the matter has been judicially resolved. At each site, there are many other parties who have similarly been identified. Many of the other parties identified are financially strong and solvent companies that appear able to pay their share of the remediation costs. Based on our information about the waste disposal practices at these sites and the environmental regulatory process in general, we believe that it is likely that ultimate remediation liability costs for each site will be apportioned among all liable parties, including site owners and waste transporters, according to the volumes and/or toxicity of the wastes shown to have been disposed of at the sites. We believe that our financial exposure for existing disposal sites will not be materially in excess of accrued reserves.

We are also a defendant in a number of other lawsuits, including product liability claims, that are insured, subject to the applicable deductibles, arising in the ordinary course of business, and we are also involved in other uninsured routine litigation incidental to our business. We currently believe none of such litigation, either individually or in the aggregate, is material to our business, operations or overall financial condition. However, litigation is inherently unpredictable, and resolutions or dispositions of claims or lawsuits by settlement or otherwise could have an adverse impact on our financial position, results of operations or cash flows for the reporting period in which any such resolution or disposition occurs.

Although none of the aforementioned potential liabilities can be quantified with absolute certainty except as otherwise indicated above, we have established or adjusted reserves covering exposures relating to contingencies, to the extent believed to be reasonably estimable and probable based on past experience and available facts. While additional exposures beyond these reserves could exist, they currently cannot be estimated. We will continue to evaluate and update the reserves as necessary and appropriate.

15. WARRANTY RESERVE

We have recorded reserves for product warranty claims that are included in current liabilities. The following is a summary of the activity in the warranty reserve:

	2019	2018	2017
	(Amounts in thousands)		
Balance — January 1	$ 32,033	$ 33,601	$ 30,459
Accruals for warranty expense, net of adjustments	26,215	28,454	35,001
Settlements made	(27,394)	(30,022)	(31,859)
Balance — December 31	$ 30,854	$ 32,033	$ 33,601

16. SHAREHOLDERS' EQUITY

Dividends – Generally, our dividend date-of-record is in the last month of the quarter and the dividend is paid the following month. Dividends per share were $0.76 for the years ending December 31, 2019, 2018 and 2017.

Share Repurchase Program – On November 13, 2014, our Board of Directors approved a $500.0 million share repurchase authorization. Our share repurchase program does not have an expiration date, and we reserve the right to limit or terminate the repurchase program at any time without notice.

We repurchased 324,889 shares of our outstanding common stock for $15.0 million during the year ended December 31, 2019. We had no repurchases of shares of our outstanding common stock for the years ended December 31, 2018 and 2017. As of December 31, 2019, we have $145.7 million of remaining capacity under our current share repurchase program.

17. INCOME TAXES

On December 22, 2017, the U.S. enacted the Tax Cuts and Jobs Act of 2017 (the "Tax Reform Act"), which significantly changed U.S. tax law. The Tax Reform Act, among other things, lowered our U.S. statutory federal income tax rate from 35% to 21% effective January 1, 2018, while imposing a deemed repatriation tax on deferred foreign income and implementing a modified territorial tax system. The Tax Reform Act also provides for a one-time transition tax ("Transition Tax") on certain foreign earnings as well as prospective changes which began in 2018, including repeal of the domestic manufacturing deduction, capitalization of research and development expenditures, additional limitations on executive compensation and limitations on the deductibility of interest.

We recognized provisional income tax effects of the Tax Reform Act in our previously issued financial statements in accordance with Staff Accounting Bulletin ("SAB") No. 118, which provides SEC staff guidance for the application of ASC Topic 740, Income Taxes with respect to recording certain tax impacts of the Tax Reform Act. We finalized our accounting for the income tax effects of the Tax Reform Act in the fourth quarter of 2018 with no material adjustments to previously recorded provisional amounts. The impacts of these changes are reflected in the 2018 tax benefit of $5.7 million and the 2017 provisional tax expense of $115.3 million.

The provision for income taxes consists of the following:

	Year Ended December 31,		
	2019	2018	2017
	(Amounts in thousands)		
Current:			
U.S. federal	$ 22,001	$ 5,150	$ 59,292
Foreign	61,976	36,897	22,442
State and local	4,506	2,647	5,537
Total current	88,483	44,694	87,271
Deferred:			
U.S. federal	2,933	11,242	135,294
Foreign	(12,243)	(4,585)	34,626
State and local	897	(127)	1,488
Total deferred	(8,413)	6,530	171,408
Total provision	$ 80,070	$ 51,224	$ 258,679

The provision for income taxes differs from the statutory corporate rate due to the following:

	Year Ended December 31,		
	2019	2018	2017
	(Amounts in millions)		
Statutory federal income tax at 21% (21% for 2018 and 35% for 2017)	$ 71.8	$ 37.0	$ 92.1
Foreign impact, net	4.5	(5.9)	(36.4)
Impact of U.S. Tax Reform Act	—	(5.7)	115.3
Change in valuation allowances	0.3	15.7	73.6
State and local income taxes, net	5.4	3.7	4.9
Other, net	(1.9)	6.4	9.2
Total	$ 80.1	$ 51.2	$ 258.7
Effective tax rate	23.4%	29.1%	98.4%

The 2017 tax rate differed from the federal statutory rate of 35% primarily due to the impacts pursuant to enactment of the Tax Reform Act, the net impact of foreign operations, the establishment of a valuation allowance against our deferred tax assets in various foreign jurisdictions, primarily Germany and Mexico, and taxes related to the sale of the Gestra and Vogt businesses.

For the year ended December 31, 2017, we did not assert permanent reinvestment on any of our foreign subsidiaries and as a result recorded deferred tax liabilities of approximately $75.4 million on cumulative unrepatriated earnings in connection with the Tax Reform Act. These deferred tax liabilities primarily relate to foreign withholding taxes that would be due upon repatriation of the designated earnings to the U.S. For the years ended December 31, 2019 and December 31, 2018, we have asserted permanent reinvestment on certain earnings of our foreign subsidiaries. As of December 31, 2019, we have recorded $67.9 million of deferred tax liabilities associated with the pre-December 31, 2017 earnings deemed available for repatriation as referenced above.

Deferred income taxes reflect the net tax effects 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 consolidated deferred tax assets and liabilities were:

	December 31,	
	2019	2018
	(Amounts in thousands)	
Deferred tax assets related to:		
Retirement benefits	$ 25,214	$ 26,496
Net operating loss carryforwards	101,193	92,630
Compensation accruals	24,685	25,993
Inventories	33,773	25,553
Credit and capital loss carryforwards	131,744	16,056
Warranty and accrued liabilities	7,042	2,763
Bad debt reserve	30,884	28,194
Other	25,339	32,253
Total deferred tax assets	379,874	249,938
Valuation allowances	(266,414)	(133,929)
Net deferred tax assets	113,460	116,009
Deferred tax liabilities related to:		
Property, plant and equipment	(26,545)	(18,773)
Goodwill and intangibles	(114,567)	(123,692)
Foreign undistributed earnings taxes	(67,930)	(70,331)
Other	(12,623)	(17,935)
Total deferred tax liabilities	(221,665)	(230,731)
Deferred tax liabilities, net	$ (108,205)	$ (114,722)

We have $417.3 million of U.S. and foreign net operating loss carryforwards at December 31, 2019. Of this total, $38.0 million are state net operating losses. Net operating losses generated in the U.S., if unused, will expire in 2024 through 2026 tax years. The majority of our foreign net operating losses carry forward without expiration. Additionally, we have $29.1 million of foreign tax credit carryforwards at December 31, 2019. The foreign tax credit carryforwards, if unused, will expire in 2026, 2028 and 2029 tax years.

Our valuation allowances primarily relate to the deferred tax assets established for U.S. foreign tax credit carryforwards of $29.1 million, a foreign capital loss carryforward of $102.6 million, and other foreign deferred tax assets of $134.7 million. The foreign capital loss carryforward was the result of a reorganization of certain foreign subsidiaries in the current year. Due to its capital nature, it is uncertain if the loss will be utilized within its ten year carryforward period and, therefore, has a full valuation allowance.

Earnings before income taxes comprised:

	Year Ended December 31,		
	2019	2018	2017
	(Amounts in thousands)		
U.S.	$ 129,917	$ 88,674	$ 102,372
Foreign	211,933	87,600	160,635
Total	$ 341,850	$ 176,274	$ 263,007

A tabular reconciliation of the total gross amount of unrecognized tax benefits, excluding interest and penalties, is as follows (in millions):

	2019	2018	2017
Balance — January 1	$ 41.2	$ 51.5	$ 59.3
Gross amount of increase (decrease) in unrecognized tax benefits resulting from tax positions taken:			
During a prior year	8.8	(6.6)	(3.5)
During the current period	6.3	4.0	5.5
Decreases in unrecognized tax benefits relating to:			
Settlements with taxing authorities	(11.4)	(2.7)	(10.8)
Lapse of the applicable statute of limitations	(3.2)	(3.7)	(3.1)
(Decrease) increase in unrecognized tax benefits relating to foreign currency translation adjustments	(1.1)	(1.3)	4.1
Balance — December 31	$ 40.6	$ 41.2	$ 51.5

The amount of gross unrecognized tax benefits at December 31, 2019, was $54.2 million, which includes $13.6 million of accrued interest and penalties. Of this amount $53.6 million, if recognized, would favorably impact our effective tax rate.

With limited exception, we are no longer subject to U.S. federal income tax audits for years through 2016, state and local income tax audits for years through 2013 or foreign income tax audits for years through 2012. We are currently under examination for various years in Austria, Canada, China, France, Germany, India, Indonesia, Italy, Mexico, the Netherlands, Philippines, Saudi Arabia, Singapore, the U.S., Venezuela and Vietnam.

It is reasonably possible that within the next 12 months the effective tax rate will be impacted by the resolution of some or all of the matters audited by various taxing authorities. It is also reasonably possible that we will have the statute of limitations close in various taxing jurisdictions within the next 12 months. As such, we estimate we could record a reduction in our tax expense up to approximately $5 million within the next 12 months.

18. BUSINESS SEGMENT INFORMATION

In connection with the Flowserve 2.0 Transformation program, which is discussed and defined in Note 20, we have determined that there are meaningful operational synergies and benefits to combining our previously reported EPD and IPD segments into one reportable segment, FPD. During the first quarter of 2019 we implemented a reorganization of our operating segments. The reorganization of the segments reflects how our chief operating decision maker (Chief Executive Officer) regularly reviews financial information to allocate resources and assess performance. Prior periods' financial information were retrospectively adjusted to conform to the new reportable segment composition.

Our business segments share a focus on industrial flow control technology and have a high number of common customers. These segments also have complementary product offerings and technologies that are often combined in applications that provide us a net competitive advantage. Our segments also benefit from our global footprint and our economies of scale in reducing administrative and overhead costs to serve customers more cost effectively.

We conduct our operations through two business segments based on type of product and how we manage the business:

- FPD for custom, highly-engineered pumps, pre-configured industrial pumps, pump systems, mechanical seals, auxiliary systems and replacement parts and related services; and
- FCD for engineered and industrial valves, control valves, actuators and controls and related services.

Our corporate headquarters does not constitute a separate division or business segment. Amounts classified as "Eliminations and All Other" include corporate headquarters costs and other minor entities that do not constitute separate segments. Intersegment sales and transfers are recorded at cost plus a profit margin, with the sales and related margin on such sales eliminated in consolidation.

The following is a summary of the financial information of our reportable segments as of and for the years ended December 31, 2019, 2018 and 2017 reconciled to the amounts reported in the consolidated financial statements.

	FPD	FCD	Subtotal—Reportable Segments	Eliminations and All Other	Consolidated Total
			(Amounts in thousands)		
Year Ended December 31, 2019:					
Sales to external customers	$2,704,445	$ 1,240,405	$ 3,944,850	$ —	$ 3,944,850
Intersegment sales	1,833	3,631	5,464	(5,464)	—
Segment operating income (loss)	343,514	197,972	541,486	(135,446)	406,040
Depreciation and amortization	50,845	23,577	74,422	30,059	104,481
Identifiable assets	2,974,161	1,333,926	4,308,087	611,555	4,919,642
Capital expenditures	26,450	14,449	40,899	25,271	66,170

	FPD	FCD	Subtotal—Reportable Segments	Eliminations and All Other	Consolidated Total
			(Amounts in thousands)		
Year Ended December 31, 2018:					
Sales to external customers	$2,620,488	$ 1,212,178	$ 3,832,666	$ —	$ 3,832,666
Intersegment sales	2,816	3,637	6,453	(6,453)	—
Segment operating income (loss)	200,981	201,216	402,197	(154,659)	247,538
Depreciation and amortization	68,148	26,585	94,733	17,740	112,473
Identifiable assets	2,768,879	1,268,717	4,037,596	578,681	4,616,277
Capital expenditures	40,648	14,458	55,106	28,887	83,993

	FPD	FCD	Subtotal—Reportable Segments	Eliminations and All Other	Consolidated Total
			(Amounts in thousands)		
Year Ended December 31, 2017:					
Sales to external customers	$ 2,477,738	$ 1,183,093	$ 3,660,831	$ —	$ 3,660,831
Intersegment sales	970	5,018	5,988	(5,988)	—
Segment operating income (loss)	112,287	323,682	435,969	(94,834)	341,135
Depreciation and amortization	77,524	27,278	104,802	13,652	118,454
Identifiable assets	2,981,822	1,317,944	4,299,766	610,708	4,910,474
Capital expenditures	28,158	16,626	44,784	16,818	61,602

Geographic Information — We attribute sales to different geographic areas based on our facilities' locations. Long-lived assets are classified based on the geographic area in which the assets are located and exclude deferred taxes, goodwill and intangible assets. Prior period information has been updated to conform to current year presentation. Sales and long-lived assets by geographic area are as follows:

	Year Ended December 31, 2019			
	Sales	Percentage	Long-Lived Assets(a)	Percentage
	(Amounts in thousands, except percentages)			
United States	$ 1,637,736	41.5%	$ 464,216	47.1%
EMA(1)	1,397,308	35.4%	312,668	31.7%
Asia(2)	551,759	14.0%	143,848	14.6%
Other(3)	358,047	9.1%	64,846	6.6%
Consolidated total	$ 3,944,850	100.0%	$ 985,578	100.0%

(a) Includes ROU assets recorded under operating and finance leases based on our adoption of the New Lease Standard discussed in Note 4.

	Year Ended December 31, 2018			
	Sales	Percentage	Long-Lived Assets	Percentage
	(Amounts in thousands, except percentages)			
United States	$ 1,525,930	39.8%	$ 323,883	40.5%
EMA(1)	1,424,498	37.2%	280,549	35.1%
Asia(2)	539,898	14.1%	132,667	16.6%
Other(3)	342,340	8.9%	63,161	7.8%
Consolidated total	$ 3,832,666	100.0%	$ 800,260	100.0%

	Year Ended December 31, 2017			
	Sales	Percentage	Long-Lived Assets	Percentage
	(Amounts in thousands, except percentages)			
United States	$ 1,460,899	40.0%	$ 333,126	38.2%
EMA(1)	1,434,506	39.2%	321,256	36.9%
Asia(2)	471,054	12.9%	148,757	17.1%
Other(3)	294,372	7.9%	68,379	7.8%
Consolidated total	$ 3,660,831	100.0%	$ 871,518	100.0%

(1) "EMA" includes Europe, the Middle East and Africa. In 2019, 2018 and 2017, Germany accounted for approximately 6%, 7% and 10%, respectively, of consolidated long-lived assets. No other individual country within this group represents 10% or more of consolidated totals for any period presented.

(2) "Asia" includes Asia and Australia. No individual country within this group represents 10% or more of consolidated totals for any period presented.

(3) "Other" includes Canada and Latin America. No individual country within this group represents 10% or more of consolidated totals for any period presented.

Net sales to international customers, including export sales from the U.S., represented approximately 63% of total sales in both 2019 and 2018, and 64% in 2017.

Major Customer Information — We have a large number of customers across a large number of manufacturing and service facilities and do not have sales to any individual customer that represent 10% or more of consolidated sales for any of the years presented.

19. ACCUMULATED OTHER COMPREHENSIVE LOSS

The following presents the components of accumulated other comprehensive loss (AOCL), net of related tax effects:

	2019				2018			
(Amounts in thousands)	Foreign currency translation items(1)	Pension and other post-retirement effects	Cash flow hedging activity	Total(1)	Foreign currency translation items(1)	Pension and other post-retirement effects	Cash flow hedging activity	Total(1)
Balance - January 1	$ (447,925)	$ (120,647)	$ (858)	$ (569,430)	$ (384,779)	$ (115,755)	$ (1,090)	$ (501,624)
Other comprehensive income (loss) before reclassifications	6,561	(22,523)	187	(15,775)	(63,146)	(12,022)	232	(74,936)
Amounts reclassified from AOCL	—	6,009	—	6,009	—	7,130	—	7,130
Net current-period other comprehensive income (loss)	6,561	(16,514)	187	(9,766)	(63,146)	(4,892)	232	(67,806)
Balance - December 31	$ (441,364)	$ (137,161)	$ (671)	$ (579,196)	$ (447,925)	$ (120,647)	$ (858)	$ (569,430)

(1) Includes foreign currency translation adjustments attributable to noncontrolling interests of $5.1 million, $4.5 million and $3.8 million for December 31, 2019, 2018 and 2017, respectively. For the year ended December 31, 2019, foreign currency translation impacts primarily represented the weakening of the Euro, British pound, Chinese yuan and Indian rupee exchange rates versus the U.S. dollar for the period. For the year ended December 31, 2018, foreign currency translation impacts primarily represented the weakening of the Euro, Argentine peso, Indian rupee and British pound exchange rates versus the U.S. dollar for the period. Includes net investment hedge cumulative losses of $12.1 million and $17.2 million, net of deferred taxes, at December 31, 2019 and 2018, respectively. Amounts in parentheses indicate debits.

The following table presents the reclassifications out of AOCL:

(Amounts in thousands)	Affected line item in the statement of income	2019(1)	2018(1)
Pension and other postretirement effects			
Amortization of actuarial losses(2)	Other income (expense), net	$ (6,608)	$ (9,140)
Prior service costs(2)	Other income (expense), net	(429)	(197)
Settlements and other(2)	Other income (expense), net	(859)	983
	Tax benefit	1,887	1,224
	Net of tax	$ (6,009)	$ (7,130)

(1) Amounts in parentheses indicate decreases to income. None of the reclassification amounts have a noncontrolling interest component.
(2) These accumulated other comprehensive loss components are included in the computation of net periodic pension cost. See Note 13 for additional details.

20. REALIGNMENT AND TRANSFORMATION PROGRAMS

In the second quarter of 2018, we launched and committed resources to our Flowserve 2.0 Transformation ("Flowserve 2.0 Transformation"), a program designed to transform our business model to drive operational excellence, reduce complexity, accelerate growth, improve organizational health and better leverage our existing global platform. For the years ended December 31, 2019 and 2018, we incurred Flowserve 2.0 Transformation related expenses of $28.0 million and 41.2 million, respectively. The Flowserve 2.0 Transformation expenses incurred primarily consist of professional services, project management and related travel costs recorded in SG&A.

In 2015, we initiated realignment programs to better align costs and improve long-term efficiency, including manufacturing optimization through the consolidation of facilities, reduction in our workforce and divestiture of certain non-strategic assets (the “Realignment Programs”). The Realignment Programs consist of both restructuring and non-restructuring charges. Restructuring charges represent costs associated with the relocation or reorganization of certain business activities and facility closures and include related severance costs. Non-restructuring charges are primarily employee severance associated with workforce reductions to reduce redundancies. Expenses are primarily reported in COS or SG&A, as applicable, in our consolidated statements of income. These Realignment Programs have been substantially completed as of December 31, 2019 and we have incurred charges of $351.7 million to date.

Generally, the aforementioned charges will be paid in cash, except for asset write-downs, which are non-cash charges. The following is a summary of total charges, net of adjustments, related to the Realignment and Flowserve 2.0 Transformation program charges:

	December 31, 2019				
(Amounts in thousands)	FPD	FCD	Subtotal–Reportable Segments	Eliminations and All Other	Consolidated Total
Restructuring Charges					
COS	$ 1,149	$ 2,653	$ 3,802	$ —	$ 3,802
SG&A(1)	(16,610)	556	(16,054)	—	(16,054)
Income tax expense(2)	(4,000)	—	(4,000)	—	(4,000)
	$ (19,461)	$ 3,209	$ (16,252)	$ —	$ (16,252)
Non-Restructuring Charges					
COS	$ 11,438	$ 1,742	$ 13,180	$ 255	$ 13,435
SG&A	2,104	218	2,322	4,428	6,750
	$ 13,542	$ 1,960	$ 15,502	$ 4,683	$ 20,185
Transformation Charges					
SG&A	$ —	$ —	$ —	$ 28,039	$ 28,039
	$ —	$ —	$ —	$ 28,039	$ 28,039
Total Realignment and Transformation Charges					
COS	$ 12,587	$ 4,395	$ 16,982	$ 255	$ 17,237
SG&A	(14,506)	774	(13,732)	32,467	18,735
Income tax expense(2)	(4,000)	—	(4,000)	—	(4,000)
Total	$ (5,919)	$ 5,169	$ (750)	$ 32,722	$ 31,972

(1) Includes gains from the sales of non-strategic manufacturing facilities that are included in our Realignment Programs.
(2) Income tax expense (benefit) includes exit taxes.

(Amounts in thousands)	December 31, 2018				
	FPD	FCD	Subtotal–Reportable Segments	Eliminations and All Other	Consolidated Total
Restructuring Charges					
COS	$ 18,405	$ 4,370	$ 22,775	$ —	$ 22,775
SG&A	1,853	358	2,211	38	2,249
Income tax expense(1)	(1,000)	—	(1,000)	—	(1,000)
	$ 19,258	$ 4,728	$ 23,986	$ 38	$ 24,024
Non-Restructuring Charges					
COS	21,072	$ (1,149)	$ 19,923	$ —	$ 19,923
SG&A	4,057	(652)	3,405	5,580	8,985
	$ 25,129	$ (1,801)	$ 23,328	$ 5,580	$ 28,908
Transformation Charges					
SG&A	$ —	$ —	$ —	$ 41,168	$ 41,168
	$ —	$ —	$ —	$ 41,168	$ 41,168
Total Realignment and Transformation Charges					
COS	$ 39,477	$ 3,221	$ 42,698	$ —	$ 42,698
SG&A	5,910	(294)	5,616	46,786	52,402
Income tax expense(1)	(1,000)	—	(1,000)	—	(1,000)
Total	$ 44,387	$ 2,927	$ 47,314	$ 46,786	$ 94,100

(1) Income tax expense (benefit) includes exit taxes as well as non-deductible costs.

The following is a summary of total inception to date charges, net of adjustments, related to the Realignment Programs:

	Inception to Date				
(Amounts in thousands)	FPD	FCD	Subtotal–Reportable Segments	Eliminations and All Other	Consolidated Total
Restructuring Charges					
COS	$ 110,191	$ 29,678	$ 139,869	$ —	$ 139,869
SG&A	20,300	10,011	30,311	317	30,628
Income tax expense(1)	14,700	1,800	16,500	—	16,500
	$ 145,191	$ 41,489	$ 186,680	$ 317	$ 186,997
Non-Restructuring Charges					
COS	$ 79,922	$ 15,460	$ 95,382	$ 263	$ 95,645
SG&A	41,408	7,730	49,138	19,930	69,068
	$ 121,330	$ 23,190	$ 144,520	$ 20,193	$ 164,713
Total Realignment Charges					
COS	$ 190,113	$ 45,138	$ 235,251	$ 263	$ 235,514
SG&A	61,708	17,741	79,449	20,247	99,696
Income tax expense(1)	14,700	1,800	16,500	—	16,500
Total	$ 266,521	$ 64,679	$ 331,200	$ 20,510	$ 351,710

(1) Income tax expense (benefit) includes exit taxes as well as non-deductible costs.

Restructuring charges represent costs associated with the relocation or reorganization of certain business activities and facility closures and include costs related to employee severance at closed facilities, contract termination costs, asset write-downs and other costs. Severance costs primarily include costs associated with involuntary termination benefits. Contract termination costs include costs related to termination of operating leases or other contract termination costs. Asset write-downs include accelerated depreciation of fixed assets, accelerated amortization of intangible assets, divestiture of certain non-strategic assets and inventory write-downs. Other costs generally include costs related to employee relocation, asset relocation, vacant facility costs (i.e., taxes and insurance) and other charges.

The following is a summary of restructuring charges, net of adjustments, for the Realignment Programs:

	December 31, 2019				
(Amounts in thousands)	Severance	Contract Termination	Asset Write-Downs/(Gains)	Other	Total
COS	$ 2,183	$ 58	$ (1,782)	$ 3,343	$ 3,802
SG&A(1)	2,211	—	(18,429)	164	(16,054)
Income tax expense(2)	—	—	—	(4,000)	(4,000)
Total	$ 4,394	$ 58	$ (20,211)	$ (493)	$ (16,252)

(1) Primarily consists of gains from the sales of non-strategic manufacturing facilities that are included in our Realignment Programs.
(2) Income tax expense (benefit) includes exit taxes.

(Amounts in thousands)	December 31, 2018 Severance	Contract Termination	Asset Write-Downs	Other	Total
COS	$ 2,975	$ 5	$ 9,018	$ 10,777	$ 22,775
SG&A	1,875	—	12	362	2,249
Income tax expense(1)	—	—	—	(1,000)	(1,000)
Total	$ 4,850	$ 5	$ 9,030	$ 10,139	$ 24,024

(1) Income tax expense (benefit) includes exit taxes as well as non-deductible costs.

The following is a summary of total inception to date restructuring charges, net of adjustments, related to the Realignment Programs:

(Amounts in thousands)	Inception to Date Severance	Contract Termination	Asset Write-Downs	Other	Total (1)
COS	$ 87,343	$ 965	$ 22,553	$ 29,008	$ 139,869
SG&A	33,956	43	(16,740)	13,369	30,628
Income tax expense(1)	—	—	—	16,500	16,500
Total	$ 121,299	$ 1,008	$ 5,813	$ 58,877	$ 186,997

(1) Income tax expense (benefit) includes exit taxes as well as non-deductible costs.

The following represents the activity, primarily severance, related to the restructuring reserve for the Realignment Programs for the years ended December 31, 2019 and 2018:

(Amounts in thousands)	2019	2018
Balance at January 1,	$ 11,927	$ 39,230
Charges	7,958	15,996
Cash expenditures	(12,865)	(28,267)
Other non-cash adjustments, including currency(1)	(317)	(15,032)
Balance at December 31,	$ 6,703	$ 11,927

(1) Includes a reduction of severance accruals associated with the divestiture of two FPD locations and associated product lines in 2018. Refer to Note 3 of this Annual Report for further discussion.

21. QUARTERLY FINANCIAL DATA (UNAUDITED)

The following presents a summary of the unaudited quarterly data for 2019 and 2018 (amounts in millions, except per share data):

	2019			
Quarter	4th	3rd	2nd	1st
Sales	$ 1,068.2	$ 996.5	$ 990.1	$ 890.1
Gross profit	349.6	333.7	318.0	294.1
Earnings before income taxes	86.7	96.2	82.9	76.1
Net earnings attributable to Flowserve Corporation	69.8	68.4	58.2	57.3
Earnings per share(1):				
Basic	$ 0.53	$ 0.52	$ 0.44	$ 0.44
Diluted	0.53	0.52	0.44	0.44

	2018			
Quarter	4th	3rd	2nd	1st
Sales	$ 986.9	$ 952.7	$ 973.1	$ 920.0
Gross profit	321.8	308.5	286.1	271.4
Earnings before income taxes	78.6	44.4	28.3	25.0
Net earnings attributable to Flowserve Corporation	63.1	28.2	13.2	15.1
Earnings per share(1):				
Basic	$ 0.48	$ 0.22	$ 0.10	$ 0.12
Diluted	0.48	0.21	0.10	0.12

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(1) Earnings per share is computed independently for each of the quarters presented. The sum of the quarters may not equal the total year amount due to the impact of changes in weighted average quarterly shares outstanding.

ITEM 9. *CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE*

None.

ITEM 9A. *CONTROLS AND PROCEDURES*

Disclosure Controls and Procedures

Our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended (the "Exchange Act") are designed to provide reasonable assurance that the information, which we are required to disclose in the reports that we file or submit under the Exchange Act, is recorded, processed, summarized and reported within the time periods specified in the U.S. SEC rules and forms, and that such information is accumulated and communicated to our management, including our Principal Executive Officer and Principal Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

In connection with the preparation of this Annual Report on Form 10-K for the year ended December 31, 2019, our management, under the supervision and with the participation of our Principal Executive Officer and our Principal Financial Officer, carried out an evaluation of the effectiveness of the design and operation of our disclosure controls and procedures as of December 31, 2019. Based on this evaluation, our Principal Executive Officer and Principal Financial Officer concluded that our disclosure controls and procedures were effective at the reasonable assurance level as of December 31, 2019.

Management's Report on Internal Control Over Financial Reporting

Our management, under the supervision and with the participation of our Principal Executive Officer and Principal Financial Officer, is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act. 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 in the United States ("U.S. GAAP"). Internal control over financial reporting includes policies and procedures that: (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of our assets; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. GAAP, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the financial statements.

Under the supervision and with the participation of our Principal Executive Officer and Principal Financial Officer, our management conducted an assessment of our internal control over financial reporting as of December 31, 2019, based on the criteria established in Internal Control - Integrated Framework (2013), issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this evaluation, our management concluded our internal control over financial reporting was effective as of December 31, 2019, based on criteria in *Internal Control - Integrated Framework* (2013) issued by the COSO.

The effectiveness of our internal control over financial reporting as of December 31, 2019, has been audited by PricewaterhouseCoopers LLP, our independent registered public accounting firm, as stated in their report, which is included herein.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act) during the quarter ended December 31, 2019 that have materially affected, or are reasonably likely to materially affect our internal control over financial reporting.

Other

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 existing policies or procedures may deteriorate.

ITEM 9B. *OTHER INFORMATION*

None.

PART III

ITEM 10. *DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE*

The information required in this Item 10 is incorporated by reference to all information under the captions “Security Ownership of Directors and Certain Executive Officers,” “Security Ownership of Certain Beneficial Owners,” “Proposal One: Election of Directors,” “Executive Officers,” “Shareholder Proposals and Nominations,” “Delinquent Section 16(a) Reports,” to the extent applicable, and “Certain Relationships and Related Transactions" in our definitive Proxy Statement relating to our 2020 annual meeting of shareholders to be held on May 21, 2020. The Proxy Statement will be filed with the SEC no later than April 10, 2020.

We have adopted a Code of Conduct that applies to all of our directors, officers and employees, including our Principal Executive, Principal Financial and Principal Accounting Officers, or persons performing similar functions. Our Code of Conduct is available on the Company’s website at www.flowserve.com under the “Investors - Corporate Governance” caption. We intend to disclose future amendments to certain provisions of the Code of Conduct, and waivers of the Code of Conduct granted to executive officers and directors, on the website within four business days following the date of the amendment or waiver.

ITEM 11. ***EXECUTIVE COMPENSATION***

The information required in this Item 11 is incorporated by reference to all information under the captions “Executive Compensation,” “Proposal Two: Advisory Vote on Executive Compensation,” “Delinquent Section 16(a) Reports,” to the extent applicable, “Security Ownership of Directors and Certain Executive Officers,” “Compensation Committee Interlocks and Insider Participation” and “Certain Relationships and Related Transactions” in our definitive Proxy Statement relating to our 2020 annual meeting of shareholders to be held on May 21, 2020. The Proxy Statement will be filed with the SEC no later than April 10, 2020.

ITEM 12. ***SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS***

The information required in this Item 12 is incorporated by reference to all information under the captions “Security Ownership of Directors and Certain Executive Officers,” “Security Ownership of Certain Beneficial Owners,” “Equity Compensation Plan Information” and “Executive Compensation” in our definitive Proxy Statement relating to our 2020 annual meeting of shareholders to be held on May 21, 2020. The Proxy Statement will be filed with the SEC no later than April 10, 2020.

ITEM 13. ***CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE***

The information required in this Item 13 is incorporated by reference to all information under the captions “Role of the Board; Corporate Governance Matters,” “Committees of the Board” and “Certain Relationships and Related Transactions” in our definitive Proxy Statement relating to our 2020 annual meeting of shareholders to be held on May 21, 2020. The Proxy Statement will be filed with the SEC no later than April 10, 2020.

ITEM 14. ***PRINCIPAL ACCOUNTING FEES AND SERVICES***

The information required in this Item 14 is incorporated by reference to all information under the caption “Other Audit Information” in our definitive Proxy Statement relating to our 2020 annual meeting of shareholders to be held on May 21, 2020. The Proxy Statement will be filed with the SEC no later than April 10, 2020.

PART IV

ITEM 15. ***EXHIBITS, FINANCIAL STATEMENT SCHEDULES***

(a) Documents filed as a part of this Annual Report:

1. *Consolidated Financial Statements*

The following consolidated financial statements and notes thereto are filed as part of this Annual Report:

Report of Independent Registered Public Accounting Firm

Flowserve Corporation Consolidated Financial Statements:

Consolidated Balance Sheets at December 31, 2019 and 2018:

For each of the three years in the period ended December 31, 2019:

Consolidated Statements of Income

Consolidated Statements of Comprehensive Income

Consolidated Statements of Shareholders’ Equity

Consolidated Statements of Cash Flows

Notes to Consolidated Financial Statements

2. *Consolidated Financial Statement Schedules*

The following consolidated financial statement schedule is filed as part of this Annual Report:

Financial statement schedules not included in this Annual Report have been omitted because they are not applicable or the required information is shown in the consolidated financial statements or notes thereto.

3. *Exhibits*

Exhibit No.	Description
3.1	Restated Certificate of Incorporation of Flowserve Corporation (incorporated by reference to Exhibit 3.1 to the Registrant's Quarterly Report on Form 10-Q (File No. 001-13179) for the quarter ended June 30, 2013).
3.2	Flowserve Corporation By-Laws, as amended and restated effective December 12, 2019 (incorporated by reference to Exhibit 3.1 to the Registrant's Current Report on Form 8-K (File No. 001-13179) dated December 12, 2019).
4.1	Senior Indenture, dated September 11, 2012, by and between Flowserve Corporation and U.S. Bank National Association, as trustee (incorporated by reference to Exhibit 4.1 to the Registrant's Current Report on Form 8-K (File No. 001-13179) dated September 11, 2012).
4.2	First Supplemental Indenture, dated September 11, 2012, by and among Flowserve Corporation, certain of its subsidiaries and U.S. Bank National Association, as trustee (incorporated by reference to Exhibit 4.2 to the Registrant's Current Report on Form 8-K (File No. 001-13179) dated September 11, 2012).
4.3	Second Supplemental Indenture, dated November 1, 2013, by and among Flowserve Corporation, certain of its subsidiaries and U.S. Bank National Association, as trustee (incorporated by reference to Exhibit 4.2 to the Registrant's Current Report on Form 8-K (File No. 001-13179) dated November 1, 2013).
4.4	Third Supplemental Indenture, dated March 17, 2015, by and among Flowserve Corporation, certain of its subsidiaries and U.S. Bank National Association, as trustee (incorporated by reference to Exhibit 4.2 to the Registrant's Current Report on Form 8-K (File No. 001-13179) dated March 17, 2015).
4.5+	Description of Registrant's Securities.
10.1	Credit Agreement, dated July 16, 2019, among Flowserve Corporation, Bank of America, N.A., as swingline lender, letter of credit issuer and administrative agent and the other lenders referred to therein (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 001-13179) dated July 16, 2019).
10.2	Amended and Restated Flowserve Corporation Director Cash Deferral Plan, effective January 1, 2009 (incorporated by reference to Exhibit 10.7 to the Registrant's Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2008).*
10.3	Amended and Restated Flowserve Corporation Director Stock Deferral Plan, dated effective January 1, 2009 (incorporated by reference to Exhibit 10.8 to the Registrant's Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2008).*
10.4	Trust for Non-Qualified Deferred Compensation Benefit Plans, dated February 11, 2011 (incorporated by reference to Exhibit 10.8 to the Registrant's Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2010).*
10.5	Flowserve Corporation Deferred Compensation Plan (incorporated by reference to Exhibit 10.23 to the Registrant's Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2000).*
10.6	Amendment No. 1 to the Flowserve Corporation Deferred Compensation Plan, as amended and restated, effective June 1, 2000 (incorporated by reference to Exhibit 10.50 to the Registrant's Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2002).*
10.7	Amendment to the Flowserve Corporation Deferred Compensation Plan, dated December 14, 2005 (incorporated by reference to Exhibit 10.70 to the Registrant's Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2004).*
10.8	Amendment No. 3 to the Flowserve Corporation Deferred Compensation Plan, as amended and restated effective June 1, 2000 (incorporated by reference to Exhibit 10.22 to the Registrant's Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2007).*
10.9	Flowserve Corporation Senior Management Retirement Plan, amended and restated effective November 2, 2018 (incorporated by reference to Exhibit 10.13 to the Registrant's Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2018).*

Exhibit No.	Description
10.10	Flowserve Corporation Supplemental Executive Retirement Plan, amended and restated effective November 2, 2018 (incorporated by reference to Exhibit 10.14 to the Registrant's Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2018).*
10.11	Flowserve Corporation Equity and Incentive Compensation Plan (incorporated by reference to Appendix A to the Registrant's Proxy Statement on Schedule 14A (File No. 001-13179) dated April 3, 2009).*
10.12	Flowserve Corporation 2020 Long-Term Incentive Plan (incorporated by reference to Appendix A to the Registrant's Proxy Statement on Schedule 14A (File No. 001-13179) dated April 11, 2019).*
10.13	Form of Restrictive Covenants Agreement for Officers (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K (File No. 001-13179) dated as of March 9, 2006).*
10.14	Form of Indemnification Agreement for all Directors and Officers (incorporated by reference to Exhibit 10.47 to the Registrant’s Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2015).
10.15	Offer Letter, dated as of February 6, 2017, by and between Flowserve Corporation and R. Scott Rowe (incorporated by reference to Exhibit 10.1 to the Registrant’s Current Report on Form 8-K (File No. 001-13179) dated as of February 8, 2017).*
10.16	Flowserve Corporation Change In Control Severance Plan, amended and restated effective November 2, 2018 (incorporated by reference to Exhibit 10.1 to the Registrant’s Quarterly Report on Form 10-Q (File No. 001-13179) for the quarter ended September 30, 2018).*
10.17	Flowserve Corporation Executive Officer Severance Plan, as amended and restated effective November 2, 2018 (incorporated by reference to Exhibit 10.20 to the Registrant's Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2018).*
10.18	Flowserve Corporation Annual Incentive Plan, as amended and restated effective February 14, 2017 (incorporated by reference to Exhibit 10.44 to the Registrant’s Annual Report on Form 10-K (File No. 001-13179) for the year ended December 31, 2016).*
14.1	Flowserve Corporation Employee Code of Conduct (incorporated by reference to Exhibit 14.1 to the Registrant’s Current Report on Form 8-K (File No. 001-13179) dated as of August 15, 2019).
21.1+	Subsidiaries of the Registrant.
23.1+	Consent of PricewaterhouseCoopers LLP.
31.1+	Certification of Principal Executive Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2+	Certification of Principal Financial Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1++	Certification of Principal Executive Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2++	Certification of Principal Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101.INS	XBRL Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.
101.SCH	XBRL Taxonomy Extension Schema Document
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	XBRL Taxonomy Extension Label Linkbase Document
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document
104	The cover page from the Company’s Annual Report on Form 10-K for the year ended December 31, 2019, formatted in Inline XBRL (included as Exhibit 101).

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* Management contracts and compensatory plans and arrangements required to be filed as exhibits to this Annual Report on Form 10-K.

\+ Filed herewith.

++ Furnished herewith.

ITEM 16. FORM 10-K SUMMARY

None

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.

FLOWSERVE CORPORATION

By: /s/ R. Scott Rowe

R. Scott Rowe
President and Chief Executive Officer

Date: February 17, 2020

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 date indicated.

Signature	Title	Date
/s/ Roger L. Fix Roger L. Fix	Non-Executive Chairman of the Board	February 17, 2020
/s/ R. Scott Rowe R. Scott Rowe	President, Chief Executive Officer and Director (Principal Executive Officer)	February 17, 2020
/s/ John E. Roueche, III John E. Roueche, III	Vice President and Interim Chief Financial Officer (Principal Financial and Accounting Officer)	February 17, 2020
/s/ Sujeet Chand Sujeet Chand	Director	February 17, 2020
/s/ Ruby R. Chandy Ruby R. Chandy	Director	February 17, 2020
/s/ Gayla J. Delly Gayla J. Delly	Director	February 17, 2020
/s/ John R. Friedery John R. Friedery	Director	February 17, 2020
/s/ John L. Garrison John L. Garrison	Director	February 17, 2020
/s/ Joseph E. Harlan Joseph E. Harlan	Director	February 17, 2020
/s/ Michael C. McMurray Michael C. McMurray	Director	February 17, 2020
/s/ Rick J. Mills Rick J. Mills	Director	February 17, 2020
/s/ David E. Roberts David E. Roberts	Director	February 17, 2020

FLOWSERVE CORPORATION

Schedule II — Valuation and Qualifying Accounts

For the Years Ended December 31, 2019, 2018 and 2017

Description	Balance at Beginning of Year	Additions Charged to Cost and Expenses	Additions Charged to Other Accounts— Acquisitions and Related Adjustments	Deductions From Reserve	Balance at End of Year
			(Amounts in thousands)		
Year Ended December 31, 2019					
Allowance for doubtful accounts(a):	$ 51,501	9,906	—	(7,995)	$ 53,412
Deferred tax asset valuation allowance(b):	133,929	145,010	1,832	(14,357)	266,414
Year Ended December 31, 2018					
Allowance for doubtful accounts(a):	59,113	8,050	—	(15,662)	51,501
Deferred tax asset valuation allowance(b):	119,309	32,157	(7,551)	(9,986)	133,929
Year Ended December 31, 2017					
Allowance for doubtful accounts(a):	51,920	14,508	—	(7,315)	59,113
Deferred tax asset valuation allowance(b):	36,191	86,694	2,595	(6,171)	119,309

(a) Deductions from reserve represent accounts written off and recoveries.

(b) Deductions from reserve result from the expiration or utilization of net operating losses and foreign tax credits previously reserved. Additions in 2019 includes capital loss carryforward. Refer to Note 17 to our consolidated financial statements included in Item 8 of this Annual Report.

DESCRIPTION OF THE REGISTRANT'S SECURITIES REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

Flowserve Corporation ("Flowserve", "Company," "we", "us", and "our") has two classes of securities registered under Section 12 of the Securities Exchange Act of 1934, as amended: (i) our common stock, par value $1.25 per share (our "common stock") and (ii) our €500,000,000 1.250% Senior Notes due 2022 (the "notes").

DESCRIPTION OF COMMON STOCK

The following summary description sets forth some of the general terms and provisions of our common stock. Because this is a summary description, it does not contain all of the information that may be important to you and is subject to, and qualified in its entirety by reference to, our restated certificate of incorporation (our "certificate of incorporation") and our amended and restated by-laws (our "by-laws"), each of which has been incorporated by reference or filed as an exhibit to the Annual Report on Form 10-K to which this description is an exhibit, and the applicable provisions of New York law.

General

Under our certificate of incorporation, Flowserve is authorized to issue up to 305,000,000 shares of our common stock and up to 1,000,000 shares of preferred stock, par value $1.00 per share (our "preferred stock"). All issued and outstanding shares of our common stock are fully paid and non-assessable. No shares of preferred stock are currently outstanding. Our board of directors is not classified. Our board of directors has the authority to adopt, amend and repeal by-laws.

No Preemptive, Redemption or Conversion Rights

Our common stock is not redeemable, is not subject to sinking fund provisions, and does not have any conversion rights. Holders of shares of common stock do not have preemptive rights to acquire newly issued shares.

Voting Rights

Subject to any special voting rights of any preferred stock, holders of our common stock have one vote per share in all elections of directors and on all other matters submitted to a vote of stockholders of Flowserve. Holders of our common stock do not have cumulative voting rights. Except as otherwise provided by law, at elections of directors at an annual or special meeting of shareholders at which a quorum is present, a director shall, except in a contested election, be elected by a majority of the votes cast in favor of or against such nominee by the holders of shares entitled to vote in the election. In a contested election, a director shall be elected by a plurality of the votes cast in favor of or against such nominee by the holders of shares entitled to vote in the election. Except as otherwise provided by law or our certificate of incorporation, any other action at an annual or special meeting of shareholders at which a quorum is present shall be authorized by a majority of the votes cast in favor of or against such action by the holders of shares entitled to vote thereon.

Dividend Rights

Holders of common stock will be entitled to dividends in the amounts and at the times declared by our board of directors, after payment of any dividends on any outstanding preferred stock and subject to limitations for dividends contained in certain of Flowserve's outstanding debt instruments,

Liquidation, Dissolution or Similar Rights

Holders of our common stock will share equally in our assets on liquidation after payment or provision for all liabilities and any preferential liquidation rights of any preferred stock then outstanding.

Preferred Stock

Under our certificate of incorporation, without further stockholder action, our board of directors is authorized to provide for the issuance of shares of preferred stock in one or more series, to establish from time to time the number of shares to be included in each such series, and to establish or change the rights of the holders of such series, including voting rights, liquidation preferences, dividend rights, redemption rights, conversion or exchange rights, and sinking fund provisions. The issuance of such preferred stock could, among other things, (i) adversely affect the voting, dividend and liquidation rights with respect to our common stock, (ii) discourage an unsolicited proposal to acquire us, or (iii) facilitate a particular business combination involving us. Any of these actions, plus others described herein, could discourage a transaction that some or a majority of our shareholders might believe to be in their best interests or in which our shareholders might receive a premium for their stock over its then market price.

Forum Selection Clause

Under our by-laws, unless Flowserve consents in writing to the selection of an alternative forum, the sole and exclusive forum for making certain types of claims shall be the Supreme Court in the City of New York or the District Court in Dallas, Texas (or, if the Supreme Court or District Court do not have jurisdiction, the federal district court for the Southern District of New York or the Northern District of Texas). This provision applies to (i) any derivative action or proceeding brought on behalf of Flowserve, (ii) any action asserting a claim of breach of a fiduciary duty owed by any director, officer or other employee of Flowserve to Flowserve or Flowserve's stockholders, (iii) any action asserting a claim arising pursuant to any provision of the New York Business Corporation Law (the "NYBCL") or our certificate of incorporation or by-laws, or (iv) any action asserting a claim governed by the internal affairs doctrine.

Certain Anti-Takeover Effects of Provisions of Our Certificate of Incorporation, By-laws, and New York Law

Our by-laws provide that directors may be removed from office only for cause and only with the affirmative vote of the shareholders or the board of directors, and advance notice of shareholder nominations for the election of directors must be given in the manner provided by our by-laws.

In addition, our certificate of incorporation requires a two-thirds vote of the outstanding stock of Flowserve entitled to vote thereon to approve certain transactions with a Related Corporation (as defined in our certificate of incorporation).

Under the NYBCL, a "merger moratorium" statute would prohibit any business combination with an "interested shareholder" (as defined in the statute) for a five year period, unless the combination is approved by our board of directors. In addition, amendments which make changes relating to the capital stock by increasing or decreasing the par value or the aggregate number of authorized shares of a class, or otherwise adversely affecting the rights of such class, must be approved by the majority vote of each class or series of stock affected, even if such stock would not otherwise have such voting rights.

The noted merger moratorium statute and the noted required supermajority shareholder vote and the other matters described above may make it more difficult to change the composition of our board of directors and may discourage or make difficult any attempt by a person or group to obtain control of Flowserve.

DESCRIPTION OF DEBT SECURITIES

The following description is only a summary of certain provisions of our €500,000,000 1.250% Senior Notes due 2022 (the "notes") and the indenture (as defined below). As of February 12, 2020, €500,000,000 principal amount of the notes remain outstanding. The following summary does not purport to be complete and is subject to, and is qualified in its entirety by reference to, the Trust Indenture Act of 1939, as amended (the "TIA"), and to all of the provisions of the indenture and those terms made a part of the indenture by reference to the TIA.

General

The notes were issued in March 2015 under the indenture dated as of September 11, 2012 (the "base indenture") between us and U.S. Bank National Association, as trustee, as supplemented by a third supplemental indenture dated as of March 17, 2015 between us, the guarantors and the trustee (the "third supplemental indenture," and together with the base indenture, the "indenture"). The notes constitute a separate series of our debt securities.

The notes are initially limited to €500,000,000 in aggregate principal amount. The indenture does not limit the amount of debt securities that we may issue under the indenture and provides that debt securities may be issued from time to time in one or more series. We may from time to time, without giving notice to or seeking the consent of the holders of the notes, issue additional debt securities having the same interest rate, maturity and other terms (except for the issue date, the public offering price and the first interest payment date) as, and ranking equally and ratably with, the notes. The indenture and the terms of the notes do not contain any covenants (other than those described herein) designed to afford holders of the notes protection in a highly leveraged or other transaction involving us that may adversely affect holders of the notes.

The notes will mature on March 17, 2022 and bear interest at an annual rate of 1.250% per year.

Interest on the notes accrues from March 17, 2015. Interest payments on the notes is paid annually on March 17 of each year, beginning on March 17, 2016, to holders of record at the close of business on the business day immediately preceding the interest payment date (whether or not that date is a business day) and on the maturity date. Interest on the notes will be computed on the basis of the actual number of days in the period for which interest is being calculated and the actual number of days from and including the last date on which interest was paid on the notes, to but excluding the next scheduled interest payment date. This payment convention is referred to as ACTUAL/ACTUAL (ICMA) as defined in the rulebook of the International Capital Market Association.

If any interest payment date would otherwise be a day that is not a business day, that interest payment date will be postponed to the next date that is a business day. If the maturity date of the notes falls on a day that is not a business day, the related payment of principal and interest will be made on the next business day as if it were made on the date such payment was due, and no interest will accrue on the amounts so payable for the period from and after such date to the next business day. For purposes of the notes, "business day" shall mean a day on which commercial banks and foreign exchange markets are open for business in New York, London and in the place where any note is presented for payment (if presentation is applicable), and which is a day on which the Trans-European Automated Real-Time Gross Settlement Express Transfer System (TARGET2), or any successor thereto, is operating.

The notes will not be entitled to the benefit of any sinking fund.

The notes will be issued only in fully registered form without coupons and in minimum denominations of €100,000 and integral multiples of €1,000 in excess thereof. The notes will be represented by one or more global securities. Each global security will be deposited with, or on behalf of, a common depositary, and registered in the name of the nominee of the common depositary for the accounts of Clearstream Banking, *société anonyme* or its successor ("Clearstream") and Euroclear Bank, S.A./N.V. or its successor ("Euroclear"). Except as described under "Global notes, book-entry form," the notes will not be issuable in certificated form.

Issuance in euro

All payments of interest and principal, including payments made upon any redemption of the notes, will be made in euros; provided that if the euro is unavailable to us due to the imposition of exchange controls or other circumstances beyond our control or if the euro is no longer being used by the then member states of the European Monetary Union that have adopted the euro as their currency or for the settlement of transactions by public institutions of or within the international banking community, then all payments in respect of the notes will be made in U.S. dollars until the euro is again available to us or so used. If the euro is unavailable to us, the amount payable on any date in euro will be converted into U.S. dollars at the rate mandated by the U.S. Federal Reserve Board as of the close of business on the second business day prior to the relevant payment date or, if the U.S. Federal Reserve Board has not mandated a rate of conversion, the rate will be determined in our sole discretion on the basis of the most recently available market exchange rate for the euro. Any payment in respect of the notes so made in U.S. dollars will not constitute an event of default under the notes or the indenture. Neither the trustee nor the paying agent shall have any responsibility for any calculation or conversion in connection with the forgoing.

Guarantees

Subject to the limitations described in the base indenture, each of our subsidiaries that from time to time is a guarantor under our primary bank credit facility (the "guarantors") jointly and severally, fully, unconditionally and irrevocably guarantee (the "guarantees") the full and punctual payment when due, whether at maturity, by acceleration, by redemption or otherwise, of the principal of and interest on the notes and our obligations under the indenture.

The guarantee of a guarantor will be automatically and unconditionally released and discharged, without the consent of the holders of the notes, and no further action by us, any guarantor or the trustee shall be required for such release (unless we shall notify the trustee that no release and discharge shall occur as a result thereof) upon:

— the sale or other disposition (including by way of consolidation or merger) of such guarantor to a person or entity other than us or any of our subsidiaries in a transaction or series of transactions not prohibited by the indenture;

— the sale or other disposition of all or substantially all the assets of such guarantor to a person or entity other than us or any of our subsidiaries in a transaction or series of transactions not prohibited by the indenture;

— our exercise of our legal or covenant defeasance option under the indenture or the discharge of our obligations under the indenture in accordance with the terms of the indenture; or

— the delivery of an officer's certificate to the trustee that such guarantor does not guarantee our obligations under our primary bank credit facility.

At any time after the issuance of the notes, including following any release of a guarantor from its guarantee, we will cause any of our subsidiaries that is a guarantor under our primary bank credit facility to execute and deliver to the trustee a supplemental indenture pursuant to which such subsidiary will guarantee payment of the notes on the same terms and conditions as those set forth in the indenture. Thereafter, such subsidiary shall be a guarantor for all purposes of the notes unless and until such guarantee is released in accordance with the provisions of the indenture.

Ranking

The notes and the guarantees are our and the guarantors' respective senior unsecured obligations and rank equally in right of payment with all our and the guarantors' respective existing and future senior unsecured indebtedness.

The notes and the guarantees rank senior in right of payment to all of our and the guarantors' existing and future subordinated indebtedness.

The notes and the guarantees effectively rank junior to any future secured indebtedness incurred by us or any of the guarantors, to the extent of the value of the assets securing such indebtedness.

In addition, the notes and the guarantees effectively rank junior to all liabilities of our subsidiaries that are not guaranteeing the notes (excluding any amounts owed by such subsidiaries to us or any guarantor). We derive a portion of our operating income and cash flow from our investments in our subsidiaries that will not become guarantors. Claims of creditors of our subsidiaries that are not guaranteeing the notes generally will have priority with respect to the assets and earnings of such subsidiaries over the claims of our and the guarantors' respective creditors, including holders of the notes. Accordingly, the notes and the guarantees will be structurally subordinated to creditors, including trade creditors and preferred stockholders, if any, other than us or any guarantor, of our subsidiaries that are not guaranteeing the notes.

Further issues

We may from time to time, without giving notice to or seeking the consent of the holders of the notes, issue additional debt securities having the same interest rate, maturity and other terms (except for the issue date, the public offering price and the first interest payment date) as, and ranking equally and ratably with, the notes. Any additional debt securities having such similar terms, together with the notes, will constitute a single series of securities under the indenture, including for purposes of voting and redemptions, and any additional debt securities issued as part of the same series as the notes will be fungible with the notes for United States federal income tax purposes. No such additional debt securities may be issued if an event of default has occurred and is continuing with respect to the notes.

Optional redemption

At any time prior to December 17, 2021 (the date that is three months prior to the maturity date of the notes), we will have the right to redeem the notes, in whole or in part from time to time, at our option, on at least 30 days' but no more than 60 days' prior written notice. We will not be responsible for giving notice to anyone other than the registered holder of the notes to be redeemed. Upon redemption of the notes, we will pay a redemption price equal to the greater of:

— 100% of the principal amount of the notes to be redeemed; and

— the sum of the present values of the Remaining Scheduled Payments (as defined below) of the notes to be redeemed, discounted to the date of redemption on an annual basis (ACTUAL/ACTUAL ICMA) at the Comparable Government Bond Rate (as defined below) plus 25 basis points.

At any time on or after December 17, 2021 (the date that is three months prior to the maturity date of the notes), we may redeem the notes, in whole or in part from time to time, at our option, at a redemption price equal to 100% of the principal amount of the notes to be redeemed.

In each case, we will also pay the accrued and unpaid interest on the principal amount being redeemed to, but excluding, the redemption date.

"*Comparable Government Bond*" means, in relation to any Comparable Government Bond Rate calculation, at the discretion of an independent investment bank selected by us, a German government bond whose maturity is closest to the maturity of the notes to be redeemed, or if such independent investment bank in its discretion determines that such similar bond is not in issue, such other German government bond as such independent investment bank may, with the advice of three brokers of, and/or market makers in, German government bonds selected by us, determine to be appropriate for determining the Comparable Government Bond Rate.

"*Comparable Government Bond Rate*" means the price, expressed as a percentage (rounded to three decimal places, with 0.0005 being rounded upwards), at which the gross redemption yield on the notes to be redeemed, if they were to be purchased at such price on the third business day prior to the date fixed for redemption, would be equal to the gross redemption yield on such business day of the Comparable Government Bond (as defined below) on the basis of the middle market price of the Comparable Government Bond prevailing at 11:00 a.m. (London time) on such business day as determined by an independent investment bank.

"*Remaining Scheduled Payments*" means, with respect to each note to be redeemed, the remaining scheduled payments of the principal thereof and interest thereon that would be due after the related redemption date for such redemption; provided, however, that, if such redemption date is not an interest payment date with respect to such note, the amount of the next succeeding scheduled interest payment thereon will be reduced by the amount of interest accrued thereon to such redemption date.

If less than all of the notes are to be redeemed, and the notes are global notes, the notes to be redeemed will be selected by Euroclear or Clearsteam in accordance with their standard procedures. If the notes to be redeemed are not global notes then held by Euroclear or Clearstream, the trustee will select notes to be redeemed on a *pro rata* basis, by lot, or by any other method the trustee deems fair and appropriate. If the notes are listed on any national securities exchange, Euroclear or Clearstream or the trustee, as applicable, will select notes in compliance with the requirements of the principal national securities exchange on which the notes are listed. Unless we default in payment of the redemption price, on and after the redemption date, interest will cease to accrue on the notes or portions thereof called for redemption.

We or our affiliates may purchase notes from investors who are willing to sell from time to time, either in the open market at prevailing prices or in private transactions at negotiated prices. Notes that we or they purchase may, at our discretion, be held, resold or canceled.

The notes are also subject to redemption prior to maturity if certain events occur involving U.S. taxation. If any of these special tax events do occur, the notes will be redeemed at a redemption price of 100% of their principal amount plus accrued and unpaid interest to, but excluding, the redemption date. See "Redemption for tax reasons." Before the redemption date, we will deposit with the paying agent money sufficient to pay the redemption price of and (unless the redemption date shall be an interest payment date) accrued and unpaid interest to the redemption date on the notes to be redeemed on such date.

Payment of additional amounts

All payments of principal and interest on the notes by us will be made free and clear of and without withholding or deduction for or on account of any present or future tax, assessment or other governmental charge imposed by the United States (or any political subdivision or taxing authority thereof or therein having power to tax), unless the withholding or deduction of such taxes, assessment or other government charge is required by law or the official interpretation or administration thereof. We will, subject to the exceptions and limitations set forth below, pay as additional interest on the notes such additional amounts as are necessary in order that the net payment by us of the principal of and interest on the notes to a holder who is not a United States person (as defined below), after withholding or deduction for any present or future tax, assessment or other governmental charge imposed by the United States (or any political subdivision or taxing authority thereof or therein having power to tax), will not be less than the amount provided in the notes to be then due and payable; provided, however, that the foregoing obligation to pay additional amounts shall not apply:

(1) to the extent any tax, assessment or other governmental charge is imposed by reason of the holder (or the beneficial owner for whose benefit such holder holds such note), or a fiduciary, settlor, beneficiary, member or shareholder of the holder if the holder is an estate, trust, partnership or corporation, or a person holding a power over an estate or trust administered by a fiduciary holder, being considered as:

(a) being or having been engaged in a trade or business in the United States or having or having had a permanent establishment in the United States;

(b) having a current or former connection with the United States (other than a connection arising solely as a result of the ownership of the notes, the receipt of any payment or the enforcement of any rights hereunder), including being or having been a citizen or resident of the United States;

(c) being or having been a personal holding company, a passive foreign investment company or a controlled foreign corporation for United States income tax purposes, a private foundation or other tax-exempt organization or a corporation that has accumulated earnings to avoid U.S. federal income tax; or

(d) being or having been a "10-percent shareholder" of the Company as defined in section 871(h)(3) of the United States Internal Revenue Code of 1986, as amended (the "Code") or any successor provision;

(2) to any holder that is not the sole beneficial owner of the notes, or a portion of the notes, or that is a fiduciary, partnership or limited liability company, but only to the extent that a beneficial owner with respect to the holder, a beneficiary or settlor with respect to the fiduciary, or a beneficial owner or member of the partnership or limited liability company

would not have been entitled to the payment of an additional amount had the beneficiary, settlor, beneficial owner or member received directly its beneficial or distributive share of the payment;

(3) to the extent any tax, assessment or other governmental charge that would not have been imposed but for the failure of the holder or any other person to comply with certification, identification or information reporting requirements concerning the nationality, residence, identity or connection with the United States of the holder or beneficial owner of the notes, if compliance is required by statute, by regulation of the United States or any taxing authority therein or by an applicable income tax treaty to which the United States is a party as a precondition to exemption from such tax, assessment or other governmental charge;

(4) to any tax, assessment or other governmental charge that is imposed otherwise than by withholding by us or a paying agent from the payment;

(5) to any estate, inheritance, gift, sales, transfer, wealth, capital gains or personal property tax or similar tax, assessment or other governmental charge, or excise tax imposed on the transfer of notes;

(6) to any withholding or deduction that is imposed on a payment to an individual and that is required to be made pursuant to European Council Directive 2003/48/EC or any other directive implementing the conclusions of the ECOFIN Council meeting of November 26 and 27, 2000 on the taxation of savings income, or any law implementing or complying with or introduced in order to conform to, such directive;

(7) to any tax, assessment or other governmental charge required to be withheld by any paying agent from any payment of principal of or interest on any note as a result of the presentation of any note for payment (where presentation is required) by or on behalf of a holder of notes, if such payment could have been made without such withholding by presenting the relevant note to at least one other paying agent in a member state of the European Union;

(8) to the extent any tax, assessment or other governmental charge would not have been imposed but for the presentation by the holder of any note, where presentation is required, for payment on a date more than 30 days after the date on which payment became due and payable or the date on which payment thereof is duly provided for, whichever occurs later;

(9) to any tax, assessment or other governmental charge imposed under Sections 1471 through 1474 of the Code (or any amended or successor provisions), any current or future regulations or official interpretations thereof, any agreement entered into pursuant to Section 1471(b) of the Code or any fiscal or regulatory legislation, rules or practices adopted pursuant to any intergovernmental agreement entered into in connection with the implementation of such sections of the Code; or

(10) in the case of any combination of items (1), (2), (3), (4), (5), (6), (7), (8), and (9).

The notes are subject in all cases to any tax, fiscal or other law or regulation or administrative or judicial interpretation applicable to the notes. Except as specifically provided under this heading “Payment of additional amounts,” we will not be required to make any payment for any tax, assessment or other governmental charge imposed by any government or a political subdivision or taxing authority of or in any government or political subdivision.

As used under this heading “Payment of additional amounts” and under the heading “Redemption for tax reasons”, the term “United States” means the United States of America, the states of the United States, and the District of Columbia, and the term “United States person” means any individual who is a citizen or resident of the United States for U.S. federal income tax purposes, a corporation, partnership or other entity created or organized in or under the laws of the United States, any state of the United States or the District of Columbia, or any estate or trust the income of which is subject to U.S. federal income taxation regardless of its source.

Redemption for tax reasons

If, as a result of any change in, or amendment to, the laws (or any regulations or rulings promulgated under the laws) of the United States (or any taxing authority in the United States), or any change in, or amendments to, an official position regarding the application or interpretation of such laws, regulations or rulings, which change or amendment is announced or becomes effective on or after the date of the issuance of the notes, we become or, based upon a written opinion of independent counsel selected by us, will become obligated to pay additional amounts as described herein under the heading “Payment of additional amounts” with respect to the notes, then we may at any time at our option redeem, in whole, but not in part, the notes on not less than 30 nor more than 60 days prior notice, at a redemption price equal to 100% of their principal amount, together with accrued and unpaid interest on those notes to, but excluding, the redemption date.

Certain covenants

Limitation on liens

We will not, and will not permit any Material Subsidiary to, create, assume or permit to exist, any Lien, other than Permitted Liens, on any Principal Property, now owned or hereafter acquired by us or any Subsidiary, to secure Debt, without effectively providing concurrently that the notes are secured equally and ratably with such Debt, for so long as such Debt shall be so secured.

"Permitted Liens" means:

(1) Liens existing on the date of the Indenture, or any Lien in favor of the trustee for the benefit of holders of the notes;

(2) Liens in favor of us or any guarantor;

(3) Liens on any property existing at the time we or a Material Subsidiary acquired or leased such property, including property acquired by us or a Material Subsidiary through a merger or similar transaction;

(4) Liens on any Principal Property to secure all or part of the cost of acquisition, construction, development or improvement of such Principal Property, or to secure Debt incurred to provide funds for any such purposes, provided, that the commitment of the creditor to extend the credit secured by any such Lien shall have been obtained not later than 12 months after the later of (A) the completion of the acquisition, construction, development or improvement of such Principal Property and (B) the placing in operation of such Principal Property or of such Principal Property as so constructed, developed or improved;

(5) Liens on property of any Person existing at the time such Person becomes a Material Subsidiary;

(6) Liens imposed by law for taxes, assessments or charges of any governmental authority for claims which are not overdue for a period of more than 60 days, or to the extent that such Lien is being contested in good faith by appropriate actions and adequate reserves in accordance with GAAP are being maintained therefor;

(7) statutory Liens of landlords and Liens of carriers, warehousemen, mechanics, materialmen and other Liens imposed by law or created in the ordinary course of business which are not delinquent or remain payable without penalty or which are being contested in good faith by appropriate actions;

(8) Liens securing (i) the non-delinquent performance of bids, trade contracts (other than for borrowed money), leases or statutory obligations, (ii) surety bonds (excluding appeal bonds and other bonds posted in connection with court proceedings or judgments) and (iii) other non-delinquent obligations of a like nature (including those to secure health, safety and environmental obligations) in each case incurred in the ordinary course of business;

(9) Liens created by or resulting from any litigation or other proceeding that is being contested in good faith by appropriate proceedings, including Liens arising out of judgments or awards against the Company or our Subsidiaries with respect to which we or our Subsidiaries are in good faith prosecuting an appeal or proceedings for review or for which the time to make an appeal has not yet expired, and Liens relating to final unappealable judgment liens which are satisfied within 60 days of the date of judgment or Liens incurred by the Company or any of our Subsidiaries for the purpose of obtaining a stay or discharge in the course of any litigation or proceeding to which we or any of our Subsidiaries is a party;

(10) easements, rights-of-way, zoning or any other restrictions, encroachments, protrusions and other similar encumbrances on real property which in the aggregate do not materially detract from the value of such property or materially interfere with the ordinary conduct of our businesses or the businesses of our Subsidiaries, taken as a whole;

(11) Liens securing obligations in respect of Capital Leases on assets subject to such leases, provided that such leases are not otherwise prohibited;

(12) any Lien renewing, extending or replacing any Lien referred to above, to the extent that (a) the principal amount of the indebtedness secured by such Lien is not increased and (b) no assets encumbered by any such Lien other than the assets permitted to be encumbered immediately prior to such renewal, extension, refinance or refund are encumbered thereby; or

(13) any other Lien on any of our or our subsidiaries' assets or properties that secure indebtedness, liabilities and obligations of us or our subsidiaries in an aggregate amount at the time of the creation of such Lien that, together with the amount of such indebtedness, liabilities and obligations secured by other Liens pursuant to this clause at such time, does not exceed an amount equal to 15% of our Consolidated Tangible Assets (determined as of the most recently ended fiscal quarter for which financial statements are available).

Limitation on sale and leaseback transactions

The indenture provides that we will not, and will not permit any Material Subsidiary to, enter into any Sale and Leaseback Transaction covering any Principal Property owned by us or such Material Subsidiary. However, a Sale and Leaseback Transaction will not be prohibited if:

(1) the transaction is permitted pursuant to the exception described in the last clause under "Limitation on liens;"

(2) the proceeds of the Sale and Leaseback Transaction are at least equal to the fair value (as determined by our Board of Directors in good faith) of the Principal Property leased pursuant to such transaction and an amount equal to the greater of (i) the net proceeds of the sale or transfer and (ii) the Attributable Debt of the Principal Property sold (as determined by us) is applied within 180 days of the Sale and Leaseback Transaction to either (x) the purchase or acquisition of, or, in the case of real property, the commencement of construction on or improvement of, property or assets, or (y) the voluntary retirement or repayment (other than at maturity or pursuant to a mandatory sinking fund or mandatory redemption provision) of Funded Debt of ours (other than indebtedness subordinated to the notes) or a Material Subsidiary, for money borrowed, maturing more than 12 months after the voluntary retirement;

(3) the lease is for a period not exceeding three years and by the end of which it is intended that the use of such Principal Property by the lessee will be discontinued; or

(4) the lease is with us or another Material Subsidiary.

Certain definitions

The following are the meanings of terms that are important in understanding the covenants previously described:

"*Attributable Debt*" with regard to a Sale and Leaseback Transaction with respect to any Principal Property means, at the time of determination, the present value of the total net amount of rent required to be paid under the lease during the remaining term thereof (including any period for which the lease has been extended), discounted at the rate of interest set forth or implicit in the terms of the lease (or, if not practicable to determine the rate, the weighted average interest rate per annum borne by the notes then outstanding under the indenture) compounded semi-annually. In the case of any lease that is terminable by the lessee upon the payment of a penalty, the net amount of rent will be the lesser of (x) the net amount determined assuming termination upon the first date the lease may be terminated (in which case the net amount will also include the amount of the penalty, but will not include any rent that would be required to be paid under the lease subsequent to the first date upon which it may be so terminated) or (y) the net amount determined assuming no such termination.

"*Capital Lease*" means a lease with respect to which the lessee is required concurrently to recognize the acquisition of an asset and the incurrence of a liability in accordance with generally accepted accounting principles in effect in the United States as of the date of the indenture.

"*Consolidated Tangible Assets*" means, as of any date, total assets (excluding treasury stock, unamortized debt discount and expense, goodwill, trademarks, trade names, patents, deferred charges and other intangible assets) of the Company and its Subsidiaries on a consolidated basis, as determined in accordance with GAAP.

"*Debt*" means with respect to a Person all obligations of such Person for borrowed money and all such obligations of any other Person for borrowed money guaranteed by such Person.

"*Funded Debt*" means, on the date of determination, any Debt maturing by its terms more than 12 months from such date (notwithstanding that any portion of such Debt is included in current liabilities), including any Debt renewable to extendible at the option of the borrower to a date later than 12 months from such date of determination.

"*GAAP*" means generally accepted accounting principles as in effect from time to time in the United States.

"*Liens*" means, with respect to any Person, any mortgage, lien, pledge, charge, security interest or other similar encumbrance, or any interest or title of any vendor, lessor, lender or other secured party to or of such Person under any conditional sale or other title retention agreement or Capital Lease, upon or with respect to any property or asset of such Person.

"*Material Subsidiary*" means each guarantor and any other Subsidiary of ours which owns a Principal Property.

"*Person*" means an individual, limited liability company, partnership, corporation, trust, unincorporated organization, association, joint venture or other entity or a government or agency or political subdivision thereof.

"*Principal Property*" means any manufacturing plant, warehouse, office building or parcel of real property, including fixtures but excluding leases and other contract rights which might otherwise be deemed real property, owned by us or any of our Subsidiaries, whether owned on the date of the indenture or thereafter acquired, that has a gross book value (determined in accordance with GAAP) in excess of 1.0% of the Consolidated Tangible Assets of us and our consolidated subsidiaries. Any plant, warehouse, office building or parcel of real property or portion thereof will not be a Principal Property if our board of directors in good faith determines it is not of material importance to the business conducted by us and our Subsidiaries taken as a whole.

"*Sale and Leaseback Transaction*" means any arrangement with any Person relating to property now owned or hereafter acquired whereby the Company or any Subsidiary transfers such property to another Person and the Company or the Subsidiary leases or rents it from such Person.

"*Subsidiary*" means any corporation, partnership or other legal entity (a) the accounts of which are consolidated with ours in accordance with GAAP and (b) of which, in the case of a corporation, more than 50% of the outstanding Voting Stock is owned, directly or indirectly, by us or by one or more other subsidiaries, or by us and one or more other subsidiaries or, in the case of any partnership or other legal entity, more than 50% of the ordinary equity capital interests is, at the time, directly or indirectly owned or controlled by us or by one or more of the subsidiaries or by us and one or more of the subsidiaries.

"*Voting Stock*" of any specified Person as of any date means the capital stock of such Person that is at the time entitled to vote generally in the election of the board of directors of such Person.

Offer to repurchase upon a change of control triggering event

Upon the occurrence of a Change of Control Triggering Event (as defined below), unless we have given written notice with respect to a redemption of the notes as described under "Optional redemption" or "Redemption for tax reasons," each holder of notes will have the right to require us to purchase all or a portion of such holder's notes pursuant to the offer described below (the "Change of Control Offer"), at a purchase price equal to 101% of the principal amount thereof plus accrued and unpaid interest, if any, to , but excluding, the date of purchase (a "Change of Control Payment").

Within 30 days following the date upon which the Change of Control Triggering Event occurred, or at our option, prior to any Change of Control but after the public announcement of the transaction that constitutes or may constitute the Change of Control, we will send, by first class mail, a notice to each holder of notes, with a copy to the trustee, which notice will govern the terms of the Change of Control Offer. Such notice will state, among other things, the purchase date, which must be no earlier than 30 days nor later than 60 days from the date such notice is mailed, other than as may be required by law (the "Change of Control Payment Date"). The notice, if mailed prior to the date of consummation of the Change of Control, will state that the Change of Control Offer is conditioned on the Change of Control being consummated on or prior to the Change of Control Payment Date. Holders of notes electing to have notes purchased pursuant to a Change of Control Offer will be required to surrender their notes, with the form entitled "Option of Holder to Elect Purchase" on the reverse of the note completed, to the paying agent at the address specified in the notice, or transfer their notes to the paying agent by book-entry transfer pursuant to the applicable procedures of the paying agent, prior to the close of business on the third business day prior to the Change of Control Payment Date.

On each Change of Control Payment Date, we will, to the extent lawful:

— accept for payment all notes or portions of notes properly tendered pursuant to the applicable Change of Control Offer; and

— deposit with the paying agent an amount equal to the Change of Control Payment in respect of all notes or portions of notes properly tendered pursuant to the applicable Change of Control Offer; and deliver or cause to be delivered to the trustee the notes properly accepted together with an officers' certificate stating the aggregate principal amount of notes or portions of notes being repurchased.

We will not be required to make a Change of Control Offer upon the occurrence of a Change of Control Triggering Event if a third party makes such an offer in the manner, at the times and otherwise in compliance with the requirements for such an offer made by us and such third party purchases all notes properly tendered and not withdrawn under its offer.

The Change of Control Triggering Event feature of the notes may in certain circumstances make more difficult or discourage a sale or takeover of us and, thus, the removal of incumbent management. We have no present intention to engage in a transaction involving a Change of Control, although it is possible that the Company could decide to do so in the future. Subject to the limitations discussed above under "Certain covenants," the Company could, in the future, enter into certain transactions, including acquisitions, refinancings or other recapitalizations, that would not constitute a Change of Control under the indenture, but that could increase the amount of indebtedness outstanding at such time or otherwise affect the Company's capital structure or credit ratings.

We will comply with the requirements of Rule 14e-1 under the Exchange Act, and any other securities laws and regulations thereunder to the extent those laws and regulations are applicable in connection with the repurchase of the notes as a result of a Change of Control Triggering Event. To the extent that the provisions of any such securities laws or regulations conflict with the Change of Control Offer provisions of the notes, we will comply with the applicable securities laws and regulations and will not be deemed to have breached our obligations under the Change of Control Offer provisions of the notes by virtue of such conflicts.

"*Change of Control*" means the occurrence of any one of the following:

(1) the direct or indirect sale, lease, transfer, conveyance or other disposition (other than by way of merger or consolidation), in one or a series of related transactions, of all or substantially all of the assets of the Company and its Subsidiaries, taken as a whole, to any "person" or "group" (as those terms are used in Section 13(d)(3) of the Exchange Act) other than to the Company and/or one or more of its Subsidiaries;

(2) the consummation of any transaction (including without limitation, any merger or consolidation) the result of which is that any "person" or "group" (as those terms are used in Section 13(d)(3) of the Exchange Act) becomes the "beneficial owner" (as defined in Rules 13d-3 and 13d-5 under the Exchange Act), directly or indirectly, of more than 50% of the outstanding Voting Stock of the Company, measured by voting power rather than number of shares;

(3) the Company consolidates with, or merges with or into, any Person, or any Person consolidates with, or merges with or into, the Company, in any such event pursuant to a transaction in which any of the outstanding Voting Stock of the Company or the Voting Stock of such other Person is converted into or exchanged for cash, securities or other property, other than any such transaction where the shares of Voting Stock of the Company outstanding immediately prior to such transaction constitute, or are converted into or exchanged for, at least a majority of the Voting Stock of the surviving Person immediately after giving effect to such transaction;

(4) the first day on which the majority of the members of the board of directors of the Company cease to be Continuing Directors; or the approval by the holders of the Voting Stock of the Company of any plan for the liquidation or dissolution of the Company.

"*Change of Control Triggering Event*" means the notes cease to be rated Investment Grade by each of the three Rating Agencies on any date during the period (the "Trigger Period") commencing on the date of our first public announcement of any Change of Control (or pending Change of Control) and ending 60 days following consummation of such Change of Control or, if earlier, upon abandonment of the Change of Control (which Trigger Period will be extended following consummation of a Change of Control for so long as any of the Rating Agencies has publicly announced that it is considering a possible ratings downgrade). Unless at least two of the three Rating Agencies are providing a rating for the notes at the commencement of any Trigger Period, the notes will be deemed to have ceased to be rated Investment Grade by each of the three Rating Agencies during that Trigger Period. Notwithstanding the foregoing, no Change of Control Triggering Event will be deemed to have occurred in connection with any particular Change of Control unless and until such Change of Control has actually been consummated.

"*Continuing Director*" means, as of any date of determination, any member of the Company's board of directors who:

(1) was a member of such board of directors on the date of the issuance of the notes; or

(2) was nominated for election or elected or appointed to the Company's board of directors with the approval of a majority of the Continuing Directors who were members of the Company's board of directors at the time of such nomination,

election or appointment (either by a specific vote or by approval of our proxy statement in which such member was named as a nominee for election as a director, without objection to such nomination).

"*Fitch*" means Fitch Inc., and its successors.

"*Investment Grade*" means a rating of Baa3 or better by Moody's (or its equivalent under any successor rating category of Moody's); a rating of BBB- or better by S&P (or its equivalent under any successor rating category of S&P); and a rating of BBB- or better by Fitch (or its equivalent under any successor rating category of Fitch).

"*Moody's*" means Moody's Investors Service, Inc., a subsidiary of Moody's Corporation, and its successors.

"*Rating Agency*" means each of Moody's, S&P and Fitch; provided, that if any of Moody's, S&P and Fitch ceases to rate the notes or fails to make a rating of the notes publicly available for reasons outside of our control, a "nationally recognized statistical rating organization" within the meaning of Section 3(a)(62) of the Exchange Act, selected by us as a replacement agency for Moody's, S&P or Fitch, or all of them, as the case may be.

"*S&P*" means Standard & Poor's Ratings Services, a division of The McGraw-Hill Companies, Inc., and its successors.

Events of default

The notes are subject to the following events of default:

- default for 30 days in payment of any interest due and payable on the notes;

- default in payment of principal of the notes when due and payable, whether at maturity or upon acceleration, redemption, required repurchase or otherwise;

- our failure to comply with the covenant described under "Consolidation, Merger and Sale of Assets," in the base indenture, or our failure, for 180 days after written notice to us by the trustee or holders of at least 25% in aggregate principle amount of the outstanding securities in that series to comply with the reporting requirements under the indenture;

- default in our performance of any other covenants or agreements in respect of the indenture or the notes for 90 days after written notice is received by us from the trustee, or received by us and the trustee from the holders of at least 25% in aggregate principal amount of the notes then outstanding;

- our failure to deposit any sinking fund payment, if any, when due, in respect of the notes;

- the guarantee of any such guarantor is held to be unenforceable or invalid or ceases for any reason to be in full force and effect (other than in accordance with the terms of the indenture) or any guarantor of the notes or any person acting on behalf of any guarantor denies or disaffirms such guarantor's obligations under its guarantee (other than by reason of a release or termination of such guarantor from its guarantee in accordance with the terms of the indenture);

- certain events of bankruptcy, insolvency and reorganization of us or our Significant Subsidiaries (as defined in the base indenture);

- an event of default (i) under the terms of any indenture or instrument for borrowed money under which we or any of our subsidiaries has outstanding an aggregate principal amount of at least $60,000,000 or (ii) under the terms of our primary revolving bank facility, in each case, which event of default results in an acceleration of the payment of all or a portion of such indebtedness for money borrowed (which acceleration is not rescinded or annulled within 30 days after notice of such acceleration); and

- the entry against the Company, any Material Subsidiary or any Significant Subsidiary (as defined in the base indenture) of one or more final judgments or orders for the payment of money in an aggregate amount (as to all such judgments or orders) in excess of $60,000,000 (to the extent not covered by independent third-party insurance as to which the insurer has been notified of the claim and does not dispute coverage) and (A) enforcement proceedings are commenced by any creditor upon such judgment or order or (B) there is a period of 30 consecutive days during which a stay of enforcement of such judgment, by reason of a pending appeal or otherwise, is not in effect.

Discharge and defeasance

The discharge and defeasance provisions of the base indenture will apply to the notes. If we discharge or defease our obligations under the indenture, the Company and the Guarantors will be released from their obligations in the provisions described under the headings “Certain covenants—Limitation on liens,” “Certain covenants—Limitation on sale and leaseback transactions,” and “Offer to repurchase upon a change of control triggering event.”

Governing law

The indenture, the notes and the guarantees are governed by and construed in accordance with the laws of the State of New York without regard to conflicts of laws.

EXHIBIT 21.1

SUBSIDIARIES
FLOWSERVE CORPORATION

NAME OF SUBSIDIARY	JURISDICTION OF INCORPORATION	PERCENTAGE OWNERSHIP
ARABIAN SEALS COMPANY, LTD.	Saudi Arabia	40%
AUDCO ITALIANA S.R.L.	Italy	12.5%
AUDCO LIMITED	United Kingdom	100%
BW/IP NEW MEXICO, INC.	United States	100%
CALDER GMBH	Switzerland	100%
COOPERATIE FLOWSERVE W.A.	Netherlands	100%
FLOWCOM INSURANCE COMPANY, INC.	United States	100%
FLOWSERVE - AL MANSOORI SERVICES COMPANY LTD.	United Arab Emirates	49%
FLOWSERVE - AL RUSHAID COMPANY LTD	Saudi Arabia	51%
FLOWSERVE (AUSTRIA) GMBH	Austria	100%
FLOWSERVE (B) SDN. BND.	Brunei	100%
FLOWSERVE (BELGIUM) BVBA	Belgium	100%
FLOWSERVE (MAURITIUS) CORPORATION	Mauritius	100%
FLOWSERVE (PHILIPPINES), INC.	Philippines	100%
FLOWSERVE (SHANGHAI) LIMITED	China	100%
FLOWSERVE (THAILAND) LIMITED	Thailand	100%
FLOWSERVE / ABAHSAIN FLOW CONTROL CO. LTD.	Saudi Arabia	60%
FLOWSERVE / ABAHSAIN SEAL COMPANY LIMITED	Saudi Arabia	60%
FLOWSERVE AHAUS GMBH	Germany	100%
FLOWSERVE AUSTRALIA PTY. LTD.	Australia	100%
FLOWSERVE B.V.	Netherlands	100%
FLOWSERVE BELGIUM N.V.	Belgium	100%
FLOWSERVE BOLIVIA S.R.L.	Bolivia	100%
FLOWSERVE CANADA CORP.	Canada	100%
FLOWSERVE CANADA HOLDING CORP.	Canada	100%
FLOWSERVE CANADA LIMITED PARTNERSHIP	Canada	100%
FLOWSERVE CANADA LLC	United States	100%
FLOWSERVE CHILE S.P.A.	Chile	100%
FLOWSERVE COLOMBIA S.A.S.	Colombia	100%
FLOWSERVE CONTROL VALVES GMBH	Austria	100%
FLOWSERVE COOP HOLDINGS LLC	United States	100%

FLOWSERVE CORPORATION	United States	100%
FLOWSERVE CV HOLDINGS LLC	United States	100%
FLOWSERVE CZECH REPUBLIC, S.R.O.	Czech Republic	100%
FLOWSERVE DE VENEZUELA C.C.A.	Venezuela	100%
FLOWSERVE DE VENEZUELA LLC	United States	100%
FLOWSERVE DO BRASIL LTDA.	Brazil	100%
FLOWSERVE DORTMUND GMBH & CO. KG	Germany	100%
FLOWSERVE DORTMUND VERWALTUNGS GMBH	Germany	100%
FLOWSERVE DUTCH CANADA HOLDINGS LLC	United States	100%
FLOWSERVE DUTCH HOLDINGS LLC	United States	100%
FLOWSERVE ECUADOR CIA. LTDA.	Ecuador	100%
FLOWSERVE EMA HOLDINGS B.V.	Netherlands	100%
FLOWSERVE ESSEN GMBH	Germany	100%
FLOWSERVE FINLAND OY	Finland	100%
FLOWSERVE FLOW CONTROL GMBH	Germany	100%
FLOWSERVE FLUID MOTION AND CONTROL (SUZHOU) CO., LTD.	China	100%
FLOWSERVE FRANCE HOLDING S.A.S.	France	100%
FLOWSERVE FRANCE S.A.S.	France	100%
FLOWSERVE FSD S.A.S.	France	100%
FLOWSERVE GB LIMITED	United Kingdom	100%
FLOWSERVE GERMANY GMBH	Germany	100%
FLOWSERVE GERMANY HOLDINGS BV	Netherlands	100%
FLOWSERVE GLOBAL HOLDINGS HUNGARY KFT	Hungary	100%
FLOWSERVE GULF FZE	United Arab Emirates	100%
FLOWSERVE HOLDINGS COOPERATIEF W.A.	Netherlands	100%
FLOWSERVE HOLDINGS, INC.	United States	100%
FLOWSERVE HUNGARY CANHOLD KFT	Hungary	100%
FLOWSERVE HUNGARY HOLDINGS KFT	Hungary	100%
FLOWSERVE HUNGARY SERVICES KFT	Hungary	100%
FLOWSERVE INDIA CONTROLS PVT. LTD.	India	100%
FLOWSERVE INTERNATIONAL B.V.	Netherlands	100%

FLOWSERVE INTERNATIONAL HOLDINGS COOPERATIEF U.A.	Netherlands	100%
FLOWSERVE INTERNATIONAL LIMITED	United Kingdom	100%
FLOWSERVE INTERNATIONAL MIDDLE EAST VALVES LLC	United States	100%
FLOWSERVE INTERNATIONAL, INC.	United States	100%
FLOWSERVE JAPAN CO. LTD.	Japan	100%
FLOWSERVE KAZAKHSTAN LLP	Kazakhstan	100%
FLOWSERVE KOREA LTD.	South Korea	100%
FLOWSERVE KSM CO. LTD.	South Korea	40%
FLOWSERVE LA HOLDINGS S. DE R.L. DE C.V.	Mexico	100%
FLOWSERVE LUXEMBOURG HOLDINGS S.A.R.L.	Luxembourg	100%
FLOWSERVE MANAGEMENT COMPANY	United States	100%
FLOWSERVE MEXICO HOLDINGS LLC	United States	100%
FLOWSERVE MICROFINISH PUMPS PVT. LTD.	India	76%
FLOWSERVE MICROFINISH VALVES PVT. LTD.	India	76%
FLOWSERVE MOROCCO SARL AU	Morocco	100%
FLOWSERVE NETHERLANDS C.V.	Netherlands	100%
FLOWSERVE NETHERLANDS VIII C.V.	Netherlands	100%
FLOWSERVE NORWAY AS	Norway	100%
FLOWSERVE NOVA SCOTIA HOLDING CORP.	Canada	100%
FLOWSERVE PERU S.A.C.	Peru	100%
FLOWSERVE POMPES S.A.S.	France	100%
FLOWSERVE PTE. LTD.	Singapore	100%
FLOWSERVE S.A.	Spain	100%
FLOWSERVE S.A.S.	France	100%
FLOWSERVE S.R.L.	Argentina	100%
FLOWSERVE S.R.L.	Italy	100%
FLOWSERVE SALES INTERNATIONAL, S.A.S.	France	100%
FLOWSERVE SANMAR PRIVATE LIMITED	India	40%
FLOWSERVE SERVICES & TRADING LLC	Qatar	49%
FLOWSERVE SIHI (FRANCE) SAS	France	100%
FLOWSERVE SIHI (SCHWEIZ) GMBH	Switzerland	100%
FLOWSERVE SIHI (SPAIN) S.L.	Spain	100%

FLOWSERVE SIHI AUSTRIA GMBH	Austria	100%
FLOWSERVE SIHI BULGARIA EOOD	Bulgaria	100%
FLOWSERVE SIHI CZ S.R.O.	Czech Republic	100%
FLOWSERVE SIHI GERMANY GMBH	Germany	100%
FLOWSERVE SIHI HOLDING GmbH	Germany	100%
FLOWSERVE SIHI HUNGARY KFT	Hungary	100%
FLOWSERVE SIHI ROMANIA SRL	Romania	100%
FLOWSERVE SINGAPORE LLC	United States	100%
FLOWSERVE SIZDIRMAZLIK COZUMLERI TICARET LTD. STI.	Turkey	100%
FLOWSERVE SOLUTIONS (CHENGDU) CO. LTD.	China	100%
FLOWSERVE SOLUTIONS (MALAYSIA) SDN. BHD.	Malaysia	100%
FLOWSERVE SOUTH AFRICA (PROPRIETARY) LIMITED	South Africa	100%
FLOWSERVE SPAIN S.L.	Spain	100%
FLOWSERVE SWEDEN HOLDING AB	Sweden	100%
FLOWSERVE TREASURY B.V.	Netherlands	100%
FLOWSERVE US INC.	United States	100%
FLOWSERVE VIETNAM CO., LLC	Vietnam	100%
FLOWSERVE XD CHANGSHA PUMP CO., LTD.	China	50%
FLOWSERVE, S. DE R.L. DE C.V.	Mexico	100%
HALBERG MASCHINENBAU GMBH	Germany	100%
HOT TAPPING & PLUGGING C.A.	Venezuela	100%
INDUSTRIAS MEDINA S.A. DE C.V.	Mexico	36.6%
INGERSOLL-DRESSER PUMPS S.R.L.	Italy	100%
INMOBILIARIA INDUSTRIAL DE LEON S.A. DE C.V.	Mexico	36.6%
INVENSYS FLOW CONTROL AUSTRALASIA PTY. LTD.	Australia	100%
KSM CO. LTD	Republic of Korea	40%
LIMITORQUE INDIA LIMITED	India	24%
MAQUILADORA INDUSTRIAL DE LEON S.A. DE C.V.	Mexico	36.6%
NAF AB	Sweden	100%
OOO FLOWSERVE	Russian Federation	100%
PMV AUTOMATION AB	Sweden	100%
PT FLOWSERVE	Indonesia	100%
SIHI CHILE S.A.	Chile	50%

SIHI GROUP B.V.	Netherlands	100%
SIHI PUMPS & SERVICES (THAILAND) LTD.	Thailand	100%
SIHI PUMPS (MALAYSIA) SDN. BHD.	Malaysia	100%
SIHI PUMPS (TAIWAN) CO. LTD.	Taiwan	100%
SIHI PUMPS (THAILAND) LTD.	Thailand	100%
STERLING FLUID SYSTEMS (POLSKA) SP.ZO.O.	Poland	100%
STERLING INDUSTRY CONSULT GMBH	Germany	100%
STERLING SIHI (NETHERLANDS) B.V.	Netherlands	100%
THOMPSONS, KELLY & LEWIS PTY. LIMITED	Australia	100%
WORTHINGTON S.R.L.	Italy	100%
YKV CORPORATION	Japan	15%

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-3 (No. 333-230796) and Form S-8 (Nos. 333-234407, 333-137706, 333-163251, and 333-82081) of Flowserve Corporation of our report dated February 17, 2020 relating to the financial statements and financial statement schedule and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP
PricewaterhouseCoopers LLP
Dallas, Texas
February 17, 2020

EXHIBIT 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002

I, R. Scott Rowe, certify that:

1. I have reviewed this Annual Report on Form 10-K for the fiscal year ended December 31, 2019 of Flowserve Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the consolidated financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

/s/ R. Scott Rowe

R. Scott Rowe

President and Chief Executive Officer
(Principal Executive Officer)

Date: February 17, 2020

EXHIBIT 31.2

**CERTIFICATION OF PRINCIPAL FINANCIAL OFFICER
PURSUANT TO SECTION 302
OF THE SARBANES-OXLEY ACT OF 2002**

I, John E. Roueche, III, certify that:

1. I have reviewed this Annual Report on Form 10-K for the fiscal year ended December 31, 2019 of Flowserve Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the consolidated financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant’s other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant’s disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant’s internal control over financial reporting that occurred during the registrant’s most recent fiscal quarter (the registrant’s fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant’s internal control over financial reporting; and

5. The registrant’s other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant’s auditors and the audit committee of the registrant’s board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant’s ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant’s internal control over financial reporting.

/s/ John E. Roueche, III

John E. Roueche, III
Vice President and Interim Chief Financial Officer
(Principal Financial and Accounting Officer)

Date: February 17, 2020

EXHIBIT 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

I, R. Scott Rowe, President and Chief Executive Officer of Flowserve Corporation (the "Company"), certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

(1) the Annual Report on Form 10-K of the Company for the period ended December 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Annual Report"), fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) the information contained in the Annual Report fairly presents, in all material respects, the consolidated financial condition and results of operations of the Company.

/s/ R. Scott Rowe

R. Scott Rowe
President and Chief Executive Officer
(Principal Executive Officer)

Date: February 17, 2020

EXHIBIT 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

I, John E. Roueche, III, Vice President and Interim Chief Financial Officer of Flowserve Corporation (the "Company"), certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to my knowledge:

(1) the Annual Report on Form 10-K of the Company for the period ended December 31, 2019, as filed with the Securities and Exchange Commission on the date hereof (the "Annual Report"), fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) the information contained in the Annual Report fairly presents, in all material respects, the consolidated financial condition and results of operations of the Company.

/s/ John E. Roueche, III

John E. Roueche, III

Vice President and Interim Chief Financial Officer
(Principal Financial and Accounting Officer)

Date: February 17, 2020