

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

FORM 10-K

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

For the fiscal year ended December 31, 2018

OR

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

Commission File Number 001-03970

HARSCO CORPORATION

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of incorporation or organization)

350 Poplar Church Road, Camp Hill, Pennsylvania

(Address of principal executive offices)

23-1483991

(I.R.S. employer identification number)

17011

(Zip Code)

Registrant's telephone number, including area code **717-763-7064**

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

Title of each class	Name of each exchange on which registered
Common stock, par value \$1.25 per share	New York Stock Exchange

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

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

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

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

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See 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 ☒

Non-accelerated filer ☐

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 Company's voting stock held by non-affiliates of the Company as of June 30, 2018 was \$1,786,698,000

Indicate the number of shares outstanding of each of the registrant's classes of common stock, as of the latest practicable date:

Class	Outstanding at January 31, 2019
Common stock, par value \$1.25 per share	79,545,023

DOCUMENTS INCORPORATED BY REFERENCE

Selected portions of the 2019 Proxy Statement are incorporated by reference into Part III of this Report.

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PART I

Item 1. Business.

General

Harsco Corporation (the "Company") is a diversified, multinational provider of industrial environmental services and engineered products serving global industries that are fundamental to worldwide economic growth and infrastructure development. The Company's operations consist of three reportable segments: Harsco Metals & Minerals, Harsco Industrial and Harsco Rail. The Company has locations in approximately 30 countries, including the U.S. The Company was incorporated in 1956. At December 31, 2018, the Company had approximately 9,900 employees.

The Company's executive offices are located at 350 Poplar Church Road, Camp Hill, Pennsylvania 17011 and the Company's main telephone number is (717) 763-7064. The Company's Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K and any amendments to such reports filed with or furnished to the Securities and Exchange Commission (the "SEC") under Sections 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, are available on the Company's website at www.harsco.com as soon as reasonably practicable after such reports are electronically filed with the SEC. The information posted on the Company's website is not incorporated into the Company's SEC filings. Additionally, the SEC maintains a website that contains reports, proxy and other information regarding issuers that electronically file with the SEC at www.sec.gov.

The Company believes each of its segments are among the global market leaders in their respective sectors. However, the Company competes with a range of global, regional and local businesses of varying size and scope, and its competitive environment is complex given the diversity of services and products provided and the global breadth of markets served.

The Company's Harsco Metals & Minerals Segment provides services which are usually subject to volume changes at certain points of the year and the Company furnishes products within the Harsco Industrial Segment that are seasonal in nature. As a result, the Company's revenues and results of operations for the first quarter ending March 31 and the fourth quarter ending December 31 may be lower than the second quarter ending June 30 and the third quarter ending September 30. Additionally, the majority of the Company's cash flows provided by operations has historically been generated in the second half of the year. This is a result of normally higher income and working capital management during the second half of the year.

The raw materials used by the Company for its product manufacturing principally include steel and, to a lesser extent, aluminum, which are readily available the majority of the time. The profitability of the Company's manufactured products may be affected by changing purchase prices of steel, other materials and commodities; as well as electronics and components.

The practices of the Company relating to working capital are similar to those of other industrial service providers or manufacturers servicing both domestic and international industrial customers and commercial markets. These practices include the following:

- Standard accounts receivable payment terms of 30 to 60 days, with progress or advance payments required for certain long-lead-time or large orders. Payment terms are slightly longer in certain international markets.
- Standard accounts payable payment terms of 30 to 90 days.
- Inventories are maintained in sufficient quantities to meet forecasted demand. Due to the time required to manufacture certain railway track maintenance equipment to customer specifications, inventory levels of this business tend to increase for an extended period of time during the production phase and decline when the equipment is delivered.

The Company has become subject to, as have others, stringent air and water quality control legislation. In general, the Company has not experienced substantial difficulty complying with these environmental regulations and does not anticipate making any material capital expenditures for environmental control facilities. While the Company expects that environmental regulations may expand, and that expenditures for air and water quality control will continue, the Company cannot predict the effect on its business of such expanded regulations. For additional information regarding environmental matters see Note 12, Commitments and Contingencies, in Part II, Item 8, "Financial Statements and Supplementary Data."

Segment Information

The Company reports segment information using the "management approach," based on the way management organizes and reports the segments within the enterprise for making operating decisions and assessing performance. The Company's reportable segments are identified based upon differences in products, services and markets served. These segments and the types of products and services offered are more fully described below. Financial information concerning segments and international and domestic operations is included in Note 16, Information by Segment and Geographic Area, in Part II, Item 8, "Financial Statements and Supplementary Data," which information is incorporated herein by reference.

Harsco Metals & Minerals Segment-62%, 63% and 67% of consolidated revenues for 2018, 2017 and 2016, respectively

The Harsco Metals & Minerals Segment is one of the world's largest providers of on-site services for product quality improvement; resource recovery from steel and metals manufacturing; and material logistics in approximately 30 countries, with the largest operations focused in the U.S., France, the U.K, Brazil and China. The majority of operating costs are denominated in local currencies, therefore providing a natural hedge against revenues generated in non-U.S. dollar markets. This Segment's operations are linked to customer operations and the performance of services enables the customer to focus on their core business.

This Segment also provides value added environmental solutions for industrial byproducts. For example, this Segment also produces industrial abrasives and roofing granules from power-plant utility coal slag at several locations throughout the U.S. The Company's BLACK BEAUTY® abrasives are used for industrial surface preparation, such as rust removal and cleaning of bridges, ship hulls and various structures. Roofing granules are sold to residential roofing shingle manufacturers in the U.S., primarily for the replacement roofing market. This business is one of the largest U.S. producers of slag abrasives, residential roofing granules. Additionally, this Segment extracts high-value metallic content from stainless steel by-products and specializes in the development of minerals technologies for commercial applications, including agriculture fertilizers. The Segment also sells road base materials and manufactures high performance asphalt products, branded under SteelPhalt, for the UK road-making market.

In May 2018, the Company acquired Altek Europe Holdings Limited and its affiliated entities, a U.K.-based manufacturer of market leading products that enable aluminum producers and recyclers to manage and efficiently extract value from critical byproduct streams, reduce byproduct generation and improve operating productivity.

As part of the Harsco Metals & Minerals Segment's initiatives to develop new products and services, in particular environmental solutions for industrial co-products and byproduct streams, the Segment is involved with several initiatives focused on developing greater environmental sustainability through the recovery of resources from byproducts and related streams. The principal business drivers of this Segment are global metals production and capacity utilization; outsourcing of services by metals producers; demand for high-value specialty steel and ferro alloys; demand for environmental solutions for metals and minerals byproduct streams; demand for industrial and infrastructure surface preparation and restoration; demand for residential roofing shingles; and demand for road making materials.

This Segment's key competitive factors are innovative resource recovery solutions, significant industry experience, technology, safety performance, and service quality. This Segment competes principally with a number of privately-held businesses for services outsourced by customers. Additionally, due to the nature of this Segment's services, it encounters a certain degree of competition from customers' desire to perform similar services themselves instead of using an external solution.

The Harsco Metals & Minerals Segment risk exposures are diverse and may vary across locations, customers and underlying end-markets. In 2018, 2017 and 2016, the Harsco Metals & Minerals Segment had one customer that provided in excess of 10% of this Segment's revenues under multiple long-term contracts at several mill sites. The loss of any one of the contracts would not have a material adverse effect upon the Company's financial position or cash flows; however, it could have a significant effect on quarterly or annual results of operations. Additionally, a decline in economic conditions may impact the ability of the Company's customers to meet their obligations to the Company on a timely basis and could result in bankruptcy or receivership filings by any of such customers. If customers are unable to meet their obligations on a timely basis, or if the Company is unable to collect amounts due from customers for any reason, it could adversely impact the realizability of receivables and inventories, and the recoverability of long-lived assets across the Company's businesses. As part of its credit risk management practices, the Company closely monitors the credit standing and accounts receivable positions of its customer base.

The Harsco Metals & Minerals Segment operates generally under long-term contracts with high renewal rates, and in many cases the Harsco Metals & Minerals Segment has operated at a customer location for several decades. At December 31, 2018, the Company's metals services contracts had estimated future revenues of \$3.1 billion at current production levels, compared with \$2.8 billion at December 31, 2017. This provides the Company with a substantial base of anticipated long-term revenues. The increase is primarily due to new and renewed contracts and the timing of contract expirations, partially offset by the impact of foreign currency translation. Approximately 23% of these revenues are expected to be recognized by December 31, 2019; approximately 42% of these revenues are expected to be recognized between January 1, 2020 and December 31, 2022; approximately 15% of these revenues are expected to be recognized between January 1, 2023 and December 31, 2025; and the remaining revenues are expected to be recognized thereafter. There are no significant metals services contracts included in the estimated future revenues for which the estimated costs to complete the contract currently exceed the estimated revenue to be realized. The estimated future revenues are exclusive of anticipated contract renewals, projected volume increases and ad-hoc services. The estimated future revenues are also exclusive of aluminum dross and scrap processing systems; roofing granules; industrial abrasives products; and minerals and metal recovery technologies services.

Harsco Industrial Segment-22%, 19% and 17% of consolidated revenues for 2018, 2017 and 2016, respectively

The Harsco Industrial Segment includes the Harsco Industrial Air-X-Changers, Harsco Industrial IKG and Harsco Industrial Patterson-Kelley businesses which are manufacturing businesses located principally in the U.S. Primary competitors are U.S.-based manufacturers of similar products and key competitive factors include product quality and durability, technology and energy-efficiency.

Harsco Industrial Air-X-Changers is a leading supplier of custom-engineered and manufactured air-cooled heat exchangers for the natural gas compression and processing industry as well as the refining and petrochemical industry in the U.S. Harsco Industrial Air-X-Changers' heat exchangers are the primary apparatus used to condition natural gas during recovery, compression and transportation from underground reserves through major pipeline distribution channels. Principal business drivers include investment in natural gas production capabilities and distribution, and demand for natural gas and downstream refined and derivative products. This business contributed 12%, 9% and 6% of the Company's consolidated revenues for 2018, 2017 and 2016.

Harsco Industrial IKG manufactures a varied line of industrial grating and fencing products at several plants in the U.S. and an international plant located in Mexico. These products include a full range of metal bar grating configurations, which are used mainly in industrial flooring, as well as safety and security applications in various industries. Principal business drivers include industrial plant and warehouse construction and expansions; off-shore drilling and new rig construction, and security fencing requirements to protect facilities and infrastructure.

Harsco Industrial Patterson-Kelley is a leading manufacturer of energy-efficient heat transfer products such as boilers and water heaters for commercial and institutional applications. The principal business driver is demand for commercial and institutional boilers and water heaters.

The Harsco Industrial Segment had no customers in 2018, one customer in 2017 and no customers in 2016 that provided in excess of 10% of the Segment's revenues. The loss of any individual customer would not have a material adverse impact on the Company's financial positions or cash flows; however, it could have a material effect on quarterly or annual results of operations.

At December 31, 2018, the Harsco Industrial Segment had an estimated order backlog of \$209.1 million compared with \$85.3 million at December 31, 2017. This increase is primarily due to fundamental market improvements for the Segment's air-cooled heat exchangers businesses for customers primarily in the natural gas compression, processing and distribution markets as well as downstream markets, ultimately driving higher capital spending. There was also moderate growth in the Segment's industrial and commercial boilers and hot water heater group. At December 31, 2018, all of the Harsco Industrial Segment's backlog is expected to be filled in 2019.

Harsco Rail Segment-16%, 18% and 16% of consolidated revenues for 2018, 2017 and 2016, respectively

The Harsco Rail Segment is a global provider of equipment, after-market parts and services for the maintenance, repair and construction of railway track. This Segment manufactures and sells highly-engineered railway track maintenance equipment, collision avoidance and warning systems to support passenger, rail worker and pedestrian safety, and measurement and diagnostic technologies that support railway maintenance programs. These products are produced primarily in the U.S. for customers throughout the world. Additionally, this Segment provides railway track maintenance services principally in the U.S. and the U.K. The principal business drivers of this business are global railway track maintenance-of-way capital spending; outsourcing of track maintenance and new track construction by railroads; increased market attention on safety, including collision avoidance and warning systems; and measurement and inspection technologies to monitor track conditions and plan maintenance practices. This Segment's key competitive factors are product quality, technology and customer service. Primary competitors for both products and services are privately-held global businesses as well as certain regional competitors.

The Harsco Rail Segment had one customer in 2018, 2017 and 2016 that provided in excess of 10% of the Segment's revenues. The loss of any individual customer would not have a material adverse impact on the Company's financial positions or cash flows; however, it could have a material effect on quarterly or annual results of operations.

At December 31, 2018, the Harsco Rail Segment had an estimated order backlog of \$297.2 million compared with \$260.5 million at December 31, 2017. This increase is primarily attributable to higher bookings of equipment and aftermarket parts projects. At December 31, 2018, \$144.3 million or 49% of the Harsco Rail Segment's manufactured products order backlog is not expected to be filled in 2019. The remainder of this backlog is expected to be filled through 2021.

Item 1A. Risk Factors.

Set forth below are risks and uncertainties that could materially and adversely affect the Company's results of operations, financial condition, liquidity and cash flows. The risks set forth below are not the only risks faced by the Company. The Company's business operations could also be affected by other factors not presently known to the Company or factors that the Company currently does not consider to be material.

Negative economic conditions may adversely impact demand for the Company's products and services, as well as the ability of the Company's customers to meet their obligations to the Company on a timely basis.

Negative economic conditions, including the tightening of credit in financial markets, can lead businesses to postpone spending, which may impact the Company's customers, causing them to cancel, decrease or delay their existing and future orders with the Company. In addition, economic conditions may impact the ability of the Company's customers by either causing them to close locations serviced by the Harsco Metals & Minerals Segment or cause their financial condition to deteriorate to a point where they are unable to meet their obligations to the Company on a timely basis. One or more of these events could adversely impact the Company's operating results and ability to collect its receivables.

Cyclical industry and economic conditions may adversely affect the Company's businesses.

The Company's businesses are subject to general economic slowdowns and cyclical conditions in each of the industries served. Examples are:

- The Harsco Metals & Minerals Segment may be adversely impacted by prolonged slowdowns in steel mill production, excess production capacity, bankruptcy or receivership of steel producers and changes in outsourcing practices;
- The resource recovery technologies business of the Harsco Metals & Minerals Segment can also be adversely impacted by prolonged slowdowns in customer production or a reduction in the selling prices of its materials, which are in some cases market-based and vary based upon the current fair value of the components being sold. Therefore, the revenue generated from the sale of such recycled materials varies based upon the fair value of the commodity components being sold;
- The industrial abrasives and roofing granules business of the Harsco Metals & Minerals Segment may be adversely impacted by economic conditions that slow the rate of residential roof replacement, or by slowdowns in the industrial and infrastructure refurbishment industries;
- Decreasing oil prices may adversely impact purchasing by energy sector customers in the Harsco Industrial Segment;
- The industrial grating products business of the Harsco Industrial Segment may be adversely impacted by slowdowns in non-residential construction and industrial production;
- The Harsco Rail Segment may be adversely impacted by developments in the railroad industry that lead to lower capital spending or reduced track maintenance spending; and
- Capital constraints and increased borrowing costs may also adversely impact the financial position and operations of the Company's customers across all business segments.

Furthermore, utilization of deferred tax assets is ultimately dependent on generating sufficient income in future periods to ensure recovery of those assets. The cyclicity of the Company's end markets and adverse economic conditions may negatively impact the future income levels that are necessary for the utilization of deferred tax assets.

The seasonality of the Company's business may cause quarterly results to fluctuate.

The majority of the Company's cash flows provided by operations has historically been generated in the second half of the year. This is a result of normally higher income during the second half of the year, as the Company's business tends to follow seasonal patterns. If the Company is unable to successfully manage the cash flow and other effects of seasonality on the business, its results of operations may suffer.

Customer concentration and related credit and commercial risks may adversely impact the Company's results of operations, financial condition and cash flows.

For the year ended December 31, 2018, the Company's top five customers in the Harsco Metals & Minerals Segment accounted for approximately 30% of revenues in that Segment and 19% of the Company's consolidated revenues. The Company routinely enters into multiple contracts with its top customers, and many vary in contract length and scope. Disagreements between the parties can arise as a result of the scope, nature and varying degree of relationship between the Company and these customers.

The Harsco Metals & Minerals Segment has several large customers and if a large customer were to experience financial difficulty or file for bankruptcy or receivership protection, it could adversely impact the Company's results of operations, cash flows and asset valuations.

Disputes with customers with long-term contracts could adversely affect the Company's financial condition.

The Company routinely enters into multiple contracts with customers, many of which can be long-term contracts. Under long-term contracts, the Company may incur capital expenditures or other costs at the beginning of the contract that it expects to recoup through the life of the contract. Some of these contracts provide for advance payments to assist the Company in covering these costs and expenses. A dispute with a customer during the life of a long-term contract could impact the ability of the Company to receive payments or otherwise recoup incurred costs and expenses.

The Company's global presence subjects it to a variety of risks arising from doing business internationally.

The Company operates in approximately 30 countries, generating 53% of its revenues outside of the U.S. (based on location of the facility generating the revenue) for the year ended December 31, 2018. In addition, as of December 31, 2018, approximately 71% of the Company's property, plant and equipment are located outside of the U.S. The Company's global footprint exposes it to a variety of risks that may adversely affect the Company's results of operations, financial condition, liquidity and cash flows. These include, but may not be limited to, the following:

- periodic economic downturns in the countries in which the Company does business;
- imposition of or increases in currency exchange controls and hard currency shortages;
- customs matters and changes in trade policy or tariff regulations;
- changes in regulatory requirements in the countries in which the Company does business;
- changes in tax regulations, higher tax rates in certain jurisdictions and potentially adverse tax consequences including restrictions on repatriating earnings, adverse tax withholding requirements and "double taxation;"
- longer payment cycles and difficulty in collecting accounts receivable;
- complexities in complying with a variety of U.S. and foreign government laws, controls and regulations;
- political, economic and social instability, civil and political unrest, terrorist actions and armed hostilities in the regions or countries in which, or adjacent to which, the Company does business;
- increasingly complex laws and regulations concerning privacy and data security, including the European Union's ("EU") General Data Protection Regulation ("GDPR");
- inflation rates in the countries in which the Company does business;
- complying with complex labor laws in foreign jurisdictions;
- laws in various international jurisdictions that limit the right and ability of subsidiaries to pay dividends and remit earnings to affiliated companies unless specified conditions are met;
- sovereign risk related to international governments, including, but not limited to, governments stopping interest payments or repudiating their debt, nationalizing private businesses or altering foreign exchange regulations; and
- uncertainties arising from local business practices, cultural considerations and international political and trade tensions.

If the Company is unable to successfully manage the risks associated with its global business, the Company's results of operations, financial condition, liquidity and cash flows may be negatively impacted.

Due to the international nature of the Company's business, the Company could be adversely affected by violations of certain laws.

The U.S. Foreign Corrupt Practices Act ("FCPA") and similar anti-bribery laws in non-U.S. jurisdictions generally prohibit companies and their intermediaries from making improper payments to officials for the purpose of obtaining or retaining business. The FCPA also imposes accounting standards and requirements on publicly traded U.S. corporations and their foreign affiliates, which, among other things, are intended to prevent the diversion of corporate funds to the payment of bribes and other improper payments, and to prevent the establishment of "off the books" slush funds from which improper payments can be made. The Company may be unsuccessful in its efforts to prevent reckless or criminal acts by employees or agents and may be exposed to liability due to pre-acquisition conduct of employees or agents of businesses or operations the Company may acquire. Violations of these laws, or allegations of such violations, could disrupt the Company's operations, require significant management involvement and have a material adverse effect on the Company's results of operations, financial condition and cash flows. If the Company is found to be liable for violations of these laws (either due to its own acts, out of inadvertence or due to the acts or inadvertence of others), the Company could also be subject to severe criminal or civil penalties or other sanctions; disgorgement; further changes or enhancements to its procedures, policies and controls; personnel changes and other remedial actions.

Furthermore, the Company is subject to the export controls and economic embargo rules and regulations of the U.S., including the Export Administration Regulations and trade sanctions against embargoed countries, which are administered by the Office of Foreign Asset Control within the Department of Treasury, as well as other laws and regulations administered by the Department of Commerce. These regulations limit the Company's ability to market, sell, distribute or otherwise transfer its products to prohibited countries or persons. Failure to comply with these rules and regulations may result in substantial civil and criminal penalties, including fines and disgorgement of profits, the imposition of a court-appointed monitor, the denial of export privileges and debarment from participation in U.S. Government contracts.

Exchange rate fluctuations may adversely impact the Company's business.

Fluctuations in foreign exchange rates between the U.S. dollar and the approximately 25 other currencies in which the Company currently conducts business may adversely impact the Company's results of operations in any given fiscal period. The Company's principal foreign currency exposures are in the EU, the U.K. and Brazil. Given the structure of the Company's operations, an increase in the value of the U.S. dollar relative to the foreign currencies in which the Company earns its revenues generally has a negative impact on the translated amounts of the assets and liabilities, results of operations and cash flows. The Company's foreign currency exposures increase the risk of volatility in its financial position, results of operations and cash flows. If currencies in the below regions change materially in relation to the U.S. dollar, the Company's financial position, results of operations, or cash flows may be materially affected.

Compared with the corresponding full-year period in 2017, the average value of major currencies changed as follows in relation to the U.S. dollar during the full-year 2018, impacting the Company's revenues and income:

- British pound sterling strengthened by 3%;
- euro strengthened by 4%; and
- Brazilian real weakened by 12%

Compared with exchange rates at December 31, 2017, the value of major currencies at December 31, 2018 changed as follows:

- British pound sterling weakened by 6%;
- euro weakened by 4%; and
- Brazilian real weakened by 15%

To illustrate the effect of foreign exchange rate changes in certain key markets of the Company, in 2018 revenues would have been less than 1% or \$3 million higher and operating income would have been approximately less than 1% or less than \$1 million higher if the average exchange rates for 2017 were utilized. In a similar comparison for 2017 revenues would have been less than 1% or \$8 million lower and operating income would have been approximately less than 1% or less than \$1 million higher if the average exchange rates for 2016 were utilized.

Currency changes also result in assets and liabilities denominated in local currencies being translated into U.S. dollars at different amounts than at the prior period end. Generally, if the U.S. dollar weakens in relation to currencies in countries in which the Company does business, the translated amounts of the related assets, liabilities, and therefore stockholders' equity, would increase. Conversely, if the U.S. dollar strengthens in relation to currencies in countries in which the Company does business, the translated amounts of the related assets, liabilities, and therefore stockholders' equity, would decrease.

Although the Company engages in foreign currency exchange forward contracts and other hedging strategies to mitigate foreign exchange transactional risks, hedging strategies may not be successful or may fail to completely offset these risks. In addition, competitive conditions in the Company's manufacturing businesses may limit the Company's ability to increase product prices in the face of adverse currency movement. Sales of products manufactured in the U.S. for the domestic and export markets may be affected by the value of the U.S. dollar relative to other currencies. Any long-term strengthening of the U.S. dollar could depress demand for these products and reduce sales. Conversely, any long-term weakening of the U.S. dollar could improve demand for these products and increase sales.

Economic conditions and regulatory changes following the U.K.'s referendum on withdrawal from the EU could impact the Company's business and results of operations.

In June 2016, a majority of voters in the U.K. approved a withdrawal from the EU in a national referendum (often referred to as Brexit). In March 2017 the U.K. invoked Article 50 of the Lisbon Treaty, initiating the withdrawal process, and the U.K. is scheduled to depart from the EU on March 29, 2019. The U.K. and the EU are continuing to negotiate their future relationship, including whether there will be a transition period. The scheduled withdrawal of the U.K. from the EU, as well as the manner of withdrawal, has created significant uncertainty about the future relationship between the U.K. and the EU, including with respect to the laws and regulations that will apply as the U.K. determines which EU laws to replace or replicate in the event of a withdrawal.

The Company's business, particularly the Harsco Metals & Minerals Segment, whose headquarters is in the U.K., could be impacted by the likely exit of the U.K. from the EU. Adverse consequences such as deterioration in economic conditions and volatility in currency exchange rates could have a negative impact on the Company's operations, financial condition and results of operations. In addition, incremental regulatory controls and regulations governing trade between the U.K. and the rest of the EU could have adverse consequences on the steel industry in the U.K. and/or the EU and could negatively impact the Company's operations and financial condition.

The Company may lose customers or be required to reduce prices as a result of competition.

The industries in which the Company operates are highly competitive:

- The Harsco Metals & Minerals Segment is sustained mainly through contract renewals and new contract signings. The Company may be unable to renew contracts at historical price levels or to obtain additional contracts at historical rates as a result of competition. If the Company is unable to renew its contracts at the historical rates or renewals are made at reduced prices, or if its customers terminate their contracts, revenue and results of operations may decline.
- The Harsco Industrial and Harsco Rail Segments compete with companies that manufacture similar products both internationally and domestically. Certain international competitors export their products into the U.S. and sell them at lower prices, which can be the result of lower labor costs and government subsidies for exports. In addition, certain competitors may from time to time sell their products below their cost of production in an attempt to increase their market share. Such practices may limit the prices the Company can charge for its products and services. Unfavorable foreign exchange rates can also adversely impact the Company's ability to match the prices charged by international competitors. If the Company is unable to match the prices charged by competitors, it may lose customers.

Restrictions imposed by the Company's Senior Secured Credit Facility and other financing arrangements may limit the Company's operating and financial flexibility.

The agreements governing the Company's outstanding financing arrangements impose a number of restrictions. Under the Company's Senior Secured Credit Facility, the Company must comply with certain financial covenants on a quarterly basis. The covenants also place limitations on dividends, acquisitions, investments in joint ventures, unrestricted subsidiaries, indebtedness and the imposition of liens on the Company's assets. In the event of a default, the Company's lenders and the counterparties to the Company's other financing arrangements could terminate their commitments to the Company and declare all amounts borrowed, together with accrued interests and fees, immediately due and payable. If this were to occur, the Company might not be able to pay these amounts, or the Company might be forced to seek an amendment to the Company's financing arrangements which could make the terms of these arrangements more onerous for the Company. In addition, this could also trigger an event of default under the cross-default provisions of the Company's other obligations. As a result, a default under one or more of the existing or future financing arrangements could have significant consequences for the Company.

The Company is exposed to counterparty risk in its derivative financial arrangements.

The Company uses derivative financial instruments, such as interest rate swaps and foreign currency exchange forward contracts, for a variety of purposes. The Company uses interest rate swaps in conjunction with certain debt issuances in order to secure either a fixed or floating interest rate. The Company uses foreign currency exchange forward contracts as part of a worldwide program to minimize foreign currency operating income and balance sheet exposure. In particular, the Company uses foreign currency exchange forward contracts to hedge commitments, such as foreign currency debt, firm purchase commitments and foreign currency cash flows for certain export sales transactions. The unsecured contracts for foreign currency exchange forward contracts outstanding at December 31, 2018 mature at various times through 2021 and are with major financial institutions. The Company may also enter into derivative contracts to hedge commodity exposures. The failure of one or more counterparties to the Company's derivative financial instruments to fulfill their obligations could adversely affect the Company's results of operations, financial condition, liquidity and cash flows.

The Company's variable rate indebtedness subjects it to interest rate risk, which could cause the Company's debt service obligations to increase significantly.

The Company's total debt at December 31, 2018 was \$602.2 million. Of this amount, approximately 100% had variable rates of interest. The weighted average interest rate of total debt was approximately 4.9%. At debt levels as of December 31, 2018, a one percentage point increase/decrease in variable interest rates would increase/decrease interest expense by \$6.1 million per year. If the Company is unable to successfully manage its exposure to variable interest rates, including through interest rate swaps that the Company has put into place, its debt service obligations may increase even though the amount borrowed remains the same, and in turn, its results of operations and financial condition may be negatively impacted.

The Company is subject to taxes in numerous jurisdictions and could be subject to additional tax liabilities, which could materially adversely affect the Company's results of operations and cash flows and impact the Company's ability to compete abroad.

The Company is subject to U.S. federal, U.S. state and international income, payroll, property, sales and use, value-added, fuel and other types of taxes in numerous jurisdictions. Changes in tax rates, enactments of new tax laws, revisions of tax regulations, and claims or litigation with taxing authorities could result in substantially higher taxes, and therefore, could have a significant adverse effect on the Company's results of operations, financial condition and liquidity.

The Company's tax expense and liabilities may also be affected by other factors, such as changes in business operations, acquisitions, investments, entry into new geographies, intercompany transactions, the relative amount of foreign earnings, losses incurred in jurisdictions for which the related tax benefits may not be realized, and changes in deferred tax assets and their valuation. Significant judgment is required in evaluating and estimating the Company's tax expense and liabilities. The ultimate tax determination for many transactions and calculations is uncertain. For example, the legislation known as the U.S. Tax Cuts and Jobs Act of 2017 (the "Tax Act") requires complex computations to be performed that were not historically required, significant judgments to be made in interpretations of the provisions of the Tax Act, estimates in calculations, and the preparation and analysis of information not previously relevant or regularly produced. The U.S. Treasury Department, the IRS, and other standard-setting bodies will continue to interpret or issue guidance on how provisions of the Tax Act will be applied or administered. As future guidance is issued, the Company may need to make adjustments to amounts previously recorded, and those adjustments could materially impact the Company's consolidated financial statements in the period in which the adjustments are made.

The Company's defined benefit net periodic pension cost ("NPPC") is directly affected by equity and bond markets. A downward trend in those markets could adversely impact the Company's results of operations, financial condition and cash flows.

In addition to the economic issues that directly affect the Company's businesses, changes in the performance of equity and bond markets, particularly in the U.K. and the U.S., impact actuarial assumptions used in determining annual NPPC, pension liabilities and the valuation of the assets in the Company's defined benefit pension plans. Financial market deterioration would most likely have a negative impact on the Company's NPPC and the pension assets and liabilities. This could result in a decrease to stockholders' equity and an increase in the Company's statutory funding requirements.

In addition to the Company's defined benefit pension plans, the Company also participates in several multiemployer pension plans ("MEPPs") throughout the world. Within the U.S., the Pension Protection Act of 2006 may require additional funding for MEPPs that could cause the Company to be subject to higher cash contributions in the future. Additionally, market conditions and the number of participating employers remaining in each plan may affect the funded status of MEPPs and consequently, any Company withdrawal liability, if applicable.

A negative outcome on personal injury claims against the Company may adversely impact results of operations and financial condition.

The Company has been named as one of many defendants (approximately 90 or more in most cases) in legal actions alleging personal injury from exposure to airborne asbestos over the past several decades. In their suits, the plaintiffs have named as defendants, among others, many manufacturers, distributors and installers of numerous types of equipment or products that allegedly contained asbestos. The majority of the asbestos complaints pending against the Company have been filed in New York. Almost all of the New York complaints contain a standard claim for damages of \$20 million or \$25 million against the approximately 90 defendants, regardless of the individual plaintiff's alleged medical condition and without specifically identifying any of the Company's products as the source of plaintiff's asbestos exposure. If the Company is found to be liable in any of these actions and the liability exceeds the Company's insurance coverage, results of operations, cash flows and financial condition could be adversely affected.

The nature of the Company's products creates the possibility of significant product liability and warranty claims, which could harm its business.

The Company's customers use some of its products in potentially hazardous applications that can cause injury or loss of life and damage to property, equipment or the environment. In addition, the Company's products are integral to the production process for some end-users and any failure of the Company's products could result in a suspension of operations. Accidents may occur at a location where the Company's equipment and services have been or are being used. Investigations into such accidents, even if the Company and its products are ultimately found not to be the cause of such accidents, require the Company to expend significant time, effort and resources. The Company cannot be certain that its products will be completely free from defects. The Company may be named as a defendant in product liability or other lawsuits asserting potentially large claims. In addition, the Company cannot guarantee that insurance will be available or adequate to cover any or all liabilities incurred. The Company also may not be able to maintain insurance in the future at levels it believes are necessary and at rates it considers reasonable.

Higher than expected claims under insurance policies, under which the Company retains a portion of the risk, could adversely impact results of operations and cash flows.

The Company retains a significant portion of the risk for property, workers' compensation, U.K. employers' liability, automobile and general and product liability losses. Reserves have been recorded that reflect the undiscounted estimated liabilities for ultimate losses, including claims incurred but not reported. Inherent in these estimates are assumptions that are based on the Company's history of claims and losses, a detailed analysis of existing claims with respect to potential value, and current legal and legislative trends. If actual claims are higher than those projected by management, an increase to the Company's insurance reserves may be required and would be recorded as a charge to income in the period the need for the change was determined.

Increases or decreases in purchase prices (or selling prices) or availability of steel or other materials and commodities may affect the Company's profitability.

The profitability of the Company's manufactured products may be affected by changing purchase prices of raw material, including steel and other materials and commodities. If raw material costs associated with the Company's manufactured products increase and the costs cannot be transferred to the Company's customers, results of operations would be adversely affected. Additionally, decreased availability of steel or other materials could affect the Company's ability to produce manufactured products in a timely manner. If the Company cannot obtain the necessary raw materials for its manufactured products, then revenues, results of operations and cash flows could be adversely affected.

Certain services performed by the Harsco Metals & Minerals Segment result in the recovery, processing and sale of recovered metals and minerals and other high-value metal by-products to its customers. The selling price of the by-products material is market-based and varies based upon the current fair value of its components. Therefore, the revenue amounts generated from the sale of such by-products material vary based upon the fair value of the commodity components being sold.

The success of the Company's strategic ventures depends on the satisfactory performance by strategic venture partners of their strategic venture obligations.

The Company enters into various strategic ventures as part of its strategic growth initiatives as well as to comply with local laws. Differences in opinions or views between strategic venture partners can result in delayed decision-making or failure to agree on material issues which could adversely affect the business and operations of the venture. From time to time, in order to establish or preserve a relationship, or to better ensure venture success, the Company may accept risks or responsibilities for the strategic venture that are not necessarily proportionate with the reward it expects to receive. The success of these and other strategic ventures also depends, in large part, on the satisfactory performance by the Company's strategic venture partners of their strategic venture obligations, including their obligation to commit working capital, equity or credit support as required by the strategic venture and to support their indemnification and other contractual obligations.

If the Company's strategic venture partners fail to satisfactorily perform their strategic venture obligations as a result of financial or other difficulties, the strategic venture may be unable to adequately perform or deliver its contracted services. Under these circumstances, the Company may be required to make additional investments and provide additional services to ensure the adequate performance and delivery of the contracted services. These additional obligations could result in reduced profits or, in some cases, increased liabilities or significant losses for the Company with respect to the strategic venture. In addition, although the Company generally performs due diligence with regard to potential strategic partners or ventures, a failure by a strategic venture partner to comply with applicable laws, rules or regulations could negatively impact its business and, in the case of government contracts, could result in fines, penalties, suspension or even debarment. Unexpected strategic venture developments could have a material adverse effect on results of operations, financial condition and cash flows.

The Company is subject to various environmental laws, and the success of existing or future environmental claims against it could adversely impact the Company's results of operations and cash flows.

The Company's operations are subject to various federal, state, local and international laws, regulations and ordinances relating to the protection of health, safety and the environment, including those governing discharges to air and water, handling and disposal practices for solid and hazardous byproducts, the remediation of contaminated sites and the maintenance of a safe workplace. These laws impose penalties, fines and other sanctions for non-compliance and liability for response costs, property damages and personal injury resulting from past and current spills, disposals or other releases of, or exposure to, hazardous materials. The Company could incur substantial costs as a result of non-compliance with or liability for remediation or other costs or damages under these laws. The Company may be subject to more stringent environmental laws in the future, and compliance with more stringent environmental requirements may require the Company to make material expenditures or subject it to liabilities that the Company currently does not anticipate.

The Company is currently involved in a number of environmental remediation investigations and cleanups and, along with other companies, has been identified as a "potentially responsible party" for certain byproduct disposal sites under the federal "Superfund" law. At several sites, the Company is currently conducting environmental remediation, and it is probable that the Company will agree to make payments toward funding certain other of these remediation activities. It also is possible that some of these matters will be decided unfavorably to the Company and that other sites requiring remediation will be identified. Each of these matters is subject to various uncertainties, and financial exposure is dependent upon such factors as:

- the continuing evolution of environmental laws and regulatory requirements;
- the availability and application of technology;
- the allocation of cost among potentially responsible parties;
- the years of remedial activity required; and
- the remediation methods selected.

The Company's ongoing operations are subject to extensive laws, regulations, rules and ordinances relating to safety, health and environmental matters that impose significant costs and liabilities on the Company, and future laws and governmental standards could increase these costs and liabilities.

The Company is subject to a variety of international, federal, state and local laws and governmental regulations, rules and ordinances regulating the use of certain materials contained in its products and/or used in its manufacturing processes. Many of these laws and governmental standards provide for extensive obligations that require the Company to incur significant compliance costs and impose substantial monetary fines and/or criminal sanctions for violations.

Furthermore, such laws and standards are subject to change and may become more stringent. Although it is not possible to predict changes in laws or other governmental standards, the development, proposal or adoption of more stringent laws or governmental standards may require the Company to change its manufacturing processes, for example, by reducing or eliminating use of the regulated component or material in its manufacturing process. The Company may not be able to develop a new manufacturing process to comply with such legal and regulatory changes without investing significant time and resources, if at all. In addition, such legal and regulatory changes may also affect buying decisions by the users of the Company's products that contain regulated materials or that involve the use of such materials in the manufacturing process. If applicable laws and governmental standards become more stringent, the Company's results of operations, liquidity and financial condition could be materially adversely affected.

The Company maintains a workforce based upon current and anticipated workload. If the Company does not receive future contract awards or if these awards are delayed, significant cost may result that could have a material adverse effect on results of operations, financial condition, liquidity and cash flows.

The Company's estimates of future performance depend on, among other matters, whether and when the Company will receive certain new contract awards, including the extent to which the Company utilizes its workforce. The rate at which the Company utilizes its workforce is impacted by a variety of factors, including:

- the ability to manage attrition;
- the ability to forecast the need for services, which allows the Company to maintain an appropriately sized workforce;
- the ability to transition employees from completed projects to new projects or between segments; and
- the need to devote resources to non-revenue generating activities such as training or business development.

While the Company's estimates are based upon good faith judgment, these estimates can be unreliable and may frequently change based on newly available information. In the case of large-scale domestic and international projects where timing is often uncertain, it is particularly difficult to predict whether and when the Company will receive a contract award. The uncertainty of contract award timing can present difficulties in matching the Company's workforce size with contract needs. If an expected contract award is delayed or not received, the Company could incur cost resulting from reductions in staff or redundancy of facilities or equipment that could have a material adverse effect on results of operations, financial condition, liquidity and cash flows.

Increased information technology security threats and more sophisticated computer crime pose a risk to the Company's systems, networks, products and services.

The Company relies upon information technology systems and networks in connection with a variety of business activities, some of which are managed by third parties. Additionally, the Company collects and stores data that is of a sensitive nature. The secure operation of these information technology systems and networks, and the processing and maintenance of this data is critical to the Company's business operations and strategy. Information technology security threats - from user error to attacks designed to gain unauthorized access to the Company's systems, networks and data - are increasing in frequency and sophistication. These threats pose a risk to the security of the Company's systems and networks and the confidentiality, availability and integrity of the Company's data. Should an attack on the Company's information technology systems and networks succeed, it could expose the Company and the Company's employees, customers, dealers and suppliers to misuse of information or systems, the compromising of confidential information, manipulation and destruction of data, production

downtimes and operations disruptions. The occurrence of any of these events could adversely affect the Company's reputation, competitive position, business, results of operations and cash flows. In addition, various privacy and security laws govern the protection of this information and breaches in security could result in litigation, regulatory action, potential liability and the costs and operational consequences of implementing further data protection measures. For example, the EU's GDPR extends the scope of the EU data protection laws to all companies processing data of EU residents, regardless of the company's location.

The Company's intellectual property portfolio may not prevent competitors from independently developing similar or duplicative products and services.
The Company's patents and other intellectual property may not prevent competitors from independently developing or selling similar or duplicative products and services, and there can be no assurance that the resources invested by the Company to protect the Company's intellectual property will be sufficient or that the Company's intellectual property portfolio will adequately deter misappropriation or improper use of the Company's technology. The Company could also face competition in some countries where the Company has not protected its intellectual property portfolio. The Company may also face attempts to gain unauthorized access to the Company's information technology systems or products for the purpose of improperly acquiring trade secrets or confidential business information. The theft or unauthorized use or publication of the Company's trade secrets and other confidential business information as a result of such an incident could adversely affect the Company's competitive position and the value of the Company's investment in research and development. The Company may be unable to secure or retain ownership or rights to use data in certain software analytics or services offerings. In addition, the Company may be the target of aggressive and opportunistic enforcement of patents by third parties, including non-practicing entities. Regardless of the merit of such claims, responding to infringement claims can be expensive and time-consuming. If the Company is found to infringe any third-party rights, the Company could be required to pay substantial damages or could be enjoined from offering some of the Company's products and services. Also, there can be no assurances that the Company will be able to obtain or renew from third parties the licenses needed in the future, and there is no assurance that such licenses can be obtained on reasonable terms.

Union disputes or other labor matters could adversely affect the Company's operations and financial results.
A significant portion of the Company's employees are represented by labor unions in a number of countries under various collective bargaining agreements with varying durations and expiration dates. There can be no assurance that any current or future issues with the Company's employees will be resolved or that the Company will not encounter future strikes, work stoppages or other types of conflicts with labor unions or the Company's employees. The Company may not be able to satisfactorily renegotiate collective bargaining agreements in the U.S. and other countries when they expire. If the Company fails to renegotiate existing collective bargaining agreements, the Company could encounter strikes or work stoppages or other types of conflicts with labor unions. In addition, existing collective bargaining agreements may not prevent a strike or work stoppage at the Company's facilities in the future. The Company may also be subject to general country strikes or work stoppages unrelated to the Company's business or collective bargaining agreements. A work stoppage or other limitations on production at the Company's facilities for any reason could have an adverse effect on the Company's business, results of operations, financial condition and cash flows. In addition, many of the Company's customers and suppliers have unionized work forces. Strikes or work stoppages experienced by the Company's customers or suppliers could have an adverse effect on the Company's business, results of operations and financial condition.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

Operations of the Company and its subsidiaries are conducted at both owned and leased properties in domestic and international locations. The Company's executive offices are located at 350 Poplar Church Road, Camp Hill, Pennsylvania 17011 and are owned. The following table describes the location and principal use of the Company's more significant properties.

Location	Principal Products	Interest
Harsco Metals & Minerals Segment		
Taiyuan City, China	Minerals and Resource Recovery Technologies	Leased
Tangshan, China	Minerals and Resource Recovery Technologies	Leased
Rotherham, U.K.	Minerals and Resource Recovery Technologies	Owned
Drakesboro, Kentucky, U.S.	Roofing Granules/Abrasives	Owned
Sarver, Pennsylvania, U.S.	Minerals and Resource Recovery Technologies	Owned
Chesterfield, U.K.	Aluminum Dross and Scrap Processing Systems	Owned
Harsco Rail Segment		
Columbia, South Carolina, U.S.	Rail Maintenance Equipment	Owned
Harsco Industrial Segment		
Broken Arrow, Oklahoma, U.S.	Heat Exchangers	Leased
East Stroudsburg, Pennsylvania, U.S.	Heat Transfer Products	Owned
Channelview, Texas, U.S.	Industrial Grating Products	Owned
Garrett, Indiana, U.S.	Industrial Grating Products	Leased
Leeds, Alabama, U.S.	Industrial Grating Products	Owned
Queretaro, Mexico	Industrial Grating Products	Leased

The Harsco Metals business, which is part of the Harsco Metals & Minerals Segment, principally operates on customer-owned sites and has administrative offices throughout the world, including Camp Hill, Pennsylvania and Leatherhead, U.K. The above table includes the principal properties owned or leased by the Company. The Company also operates from a number of other smaller plants, warehouses and offices in addition to the above. The Company considers all of its properties at which operations are currently performed to be in satisfactory condition and suitable for their intended use.

Item 3. Legal Proceedings.

Information regarding legal proceedings is included in Note 12, Commitments and Contingencies, in Part II, Item 8, "Financial Statements and Supplementary Data."

Item 4. Mine Safety Disclosures.

Not applicable.

Supplementary Item. Executive Officers of the Registrant.

Set forth below, at February 21, 2019, are the executive officers of the Company and certain information with respect to each of them. There are no family relationships among any of the executive officers.

Name	Age	Position with the Company
Executive Officers:		
F. Nicholas Grasberger, III	55	Chairman, President and Chief Executive Officer
Peter F. Minan	57	Senior Vice President and Chief Financial Officer
Samuel C. Fenice	44	Vice President and Corporate Controller
Scott H. Gerson	48	Senior Vice President and Group President - Harsco Industrial
Jeswant Gill	56	Senior Vice President and Group President - Harsco Rail
Russell C. Hochman	54	Senior Vice President and General Counsel, Chief Compliance Officer & Corporate Secretary
Tracey L. McKenzie	51	Senior Vice President and Chief Human Resources Officer

F. Nicholas Grasberger, III - Chairman, President and Chief Executive Officer since October 22, 2018. President and Chief Executive Officer from August 1, 2014 to October 22, 2018. Mr. Grasberger served as Senior Vice President and Chief Financial Officer from April 2013 to November 2014, and as President and Chief Operating Officer from April 2014 to August 2014. Prior to joining Harsco in 2013, Mr. Grasberger served as the Managing Director of the multinational Precision Polymers division of Fenner Plc from March 2011 to April 2013. From April 2009 to November 2009 he served as Executive Vice President and Chief Executive Officer of Armstrong Building Products. From January 2005 to March 2009 he served as Senior Vice President and Chief Financial Officer of Armstrong World Industries, Inc. Prior to his employment with Armstrong, Mr. Grasberger served as Vice President and Chief Financial Officer of Kennametal Inc. and before that as Corporate Treasurer and Director of the corporate planning process at H.J. Heinz Company. He started his career with USX Corporation.

Peter F. Minan - Senior Vice President and Chief Financial Officer since November 11, 2014. Mr. Minan has an extensive background in global financial management acquired through a nearly 30-year career with KPMG from 1983 to 2012. He became a partner at KPMG in 1993 and served as global lead partner for several multi-national Fortune 500 industrial and consumer audits. His roles included National Managing Partner, U.S. Audit practice, and Partner in Charge, Washington/Baltimore Audit practice. His most recent role was with Computer Sciences Corporation, where he served as Vice President of Enterprise Risk Management and Internal Audit from 2012 to 2013.

Samuel C. Fenice - Vice President and Corporate Controller since August 16, 2016. Mr. Fenice oversees the administration of all corporate accounting policies and procedures, including internal and external corporate reporting. Mr. Fenice joined Harsco's Internal Audit team in 2002 and has since held progressively responsible roles in Finance, including two terms as Interim Corporate Controller. Mr. Fenice is a graduate of Penn State University and a Certified Public Accountant.

Scott H. Gerson - Senior Vice President and Group President-Harsco Industrial since April 29, 2015. Served as Vice President and Group President-Harsco Industrial from July 2010 to April 2015. Served as Chief Information Officer from April 2005 to January 2011. Prior to joining the Company in April 2005, Mr. Gerson was with Kulicke & Soffa Industries, Inc., where he served as IT director of their worldwide application services. He has also served in IT management capacities with Compaq Computers and TRW Inc.

Jeswant Gill - Senior Vice President and Group President - Harsco Rail since November 2016. Prior to joining the Company, Mr. Gill served as Senior Executive/Managing Director, Global Solutions of The Arcadia Group International, LLC from October 2015 to November 2016. From June 2014 to September 2015 Mr. Gill served as Vice President and Executive Vice President, Industrial Segment of Kennametal, Inc. From January 2008 to May 2014 Mr. Gill worked for Ingersoll Rand Company Limited, acting as Vice President of Global Services, Industrial Technologies from January 2011 to May 2014, and as President of Security Technologies, Asia Pacific from January 2008 until December 2010. Prior to his employment with Ingersoll Rand Company Limited, Mr. Gill worked for Invensys, Johnson Controls Inc. and Schlumberger. Mr. Gill holds a B.S. in engineering physics and an MBA, both from Queen's University in Ontario, Canada.

Russell C. Hochman - Senior Vice President and General Counsel, Chief Compliance Officer and Corporate Secretary since May 2015. Served as Vice President, Interim General Counsel, Chief Compliance Officer and Corporate Secretary from March 2015 to May 2015. Served as Deputy General Counsel from July 2013 to March 2015. Prior to joining Harsco in 2013, Mr. Hochman served in senior legal roles with Pitney Bowes Inc. and leading law firms based in New York. Mr. Hochman holds a J.D. from Albany Law School of Union University and a B.A. from Cornell University.

Tracey L. McKenzie - Senior Vice President and Chief Human Resources Officer since September 2014. Prior to joining the Company, Ms. McKenzie served as Global HR Vice President for JLG Industries, a leader in the manufacturing sector for advanced aerial lift systems. Ms. McKenzie previously held executive level HR positions in her native Australia and worked at Pacific Scientific Aerospace (a division of Danaher). She moved to the U.S. in 2003 and holds an MBA from the University of New England and a bachelor's in business administration from Royal Melbourne Institute of Technology (RMIT).

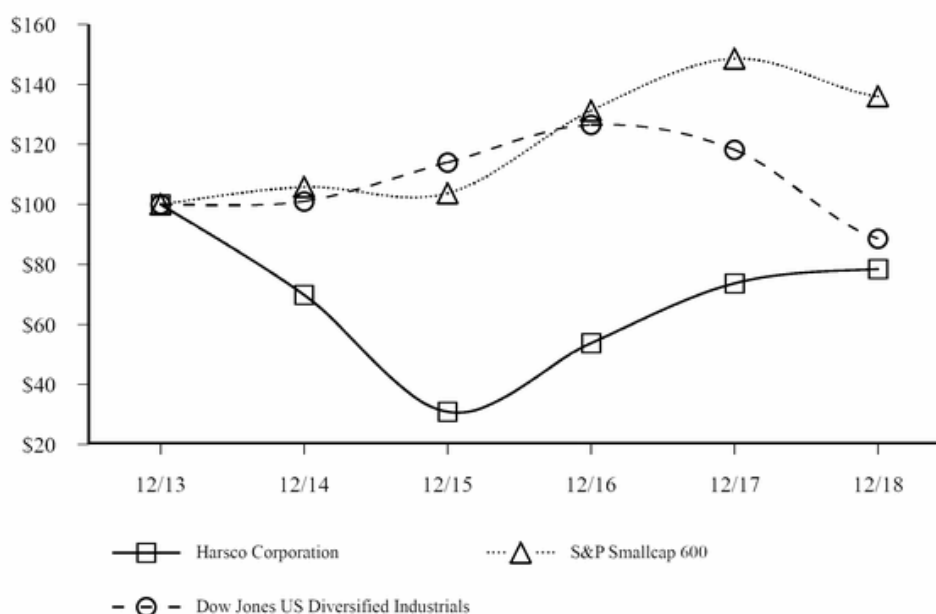
PART II

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

Harsco Corporation common stock is listed on the New York Stock Exchange under the trading symbol HSC. At December 31, 2018, there were 79,545,023 shares outstanding. In 2018, the Company's common stock traded in a range of \$15.55 to \$30.05 and closed at \$19.86 at year-end. At December 31, 2018, there were approximately 18,655 stockholders. For additional information regarding the Company's equity compensation plans see Note 14, Stock-Based Compensation, in Part II, Item 8, "Financial Statements and Supplementary Data," and Part III, Item 11, "Executive Compensation."

Stock Performance Graph

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN*
Among Harsco Corporation, the S&P Smallcap 600 Index and the Dow Jones US Diversified Industrials Index



*\$100 invested on December 31, 2013 in stock or index, including reinvestment of dividends. Fiscal year ending December 31.

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	December 2013	December 2014	December 2015	December 2016	December 2017	December 2018
Harsco Corporation	100.00	69.81	30.88	53.73	73.67	78.45
S&P Smallcap 600	100.00	105.76	103.67	131.20	148.56	135.96
Dow Jones US Diversified Industrials	100.00	101.05	114.02	126.52	118.18	88.53

Issuer Purchases of Equity Securities

On May 2, 2018, the Company announced that the Board of Directors (the "Board") adopted a share repurchase program authorizing the Company to repurchase up to \$75,000,000 of outstanding shares of the Company's common stock through April 24, 2021. Below is a table showing the share repurchase activity during the fourth quarter of 2018:

Period	Total Number of Shares Purchased	Average Price Paid per Share	Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	Maximum Number (or Approximate Dollar Value) of Shares that May Yet Be Purchased Under the Plans or Programs
October 1, 2018 - October 31, 2018	550,508	\$ 23.95	550,508	\$ 61,813,516
November 1, 2018 - November 30, 2018	238,591	25.15	238,591	55,812,773
December 1, 2018 - December 31, 2018	531,973	20.35	531,973	44,989,369
Total	1,321,072	\$ 22.72	1,321,072	

**Item 6. Selected Financial Data.
Five-Year Statistical Summary**

(In thousands, except per share, employee information and percentages)

	2018 (b)	2017	2016	2015	2014
Statement of operations information					
Revenues from continuing operations (a)	\$ 1,722,380	\$ 1,607,062	\$ 1,451,223	\$ 1,723,092	\$ 2,066,288
Amounts attributable to Harsco Corporation common stockholders (a)					
Income (loss) from continuing operations	\$ 136,783	\$ 7,626	\$ (86,336)	\$ 7,168	\$ (22,281)
Income (loss) from discontinued operations	274	196	669	(980)	110
Net income (loss)	137,057	7,822	(85,667)	6,188	(22,171)
Financial position and cash flow information					
Working capital (c)	\$ 188,038	\$ 117,964	\$ 122,602	\$ 120,267	\$ 80,036
Total assets (d)	1,632,867	1,578,685	1,581,338	2,051,887	2,263,664
Long-term debt (d)	585,662	566,794	629,239	845,621	827,428
Total debt (d)	602,229	586,623	659,072	900,934	869,364
Depreciation and amortization	132,785	129,937	141,486	156,475	176,326
Capital expenditures	(132,168)	(98,314)	(69,340)	(123,552)	(208,859)
Cash provided by operating activities (e)	192,022	176,892	159,876	121,772	227,442
Cash provided (used) by investing activities	(161,143)	(103,325)	122,887	(130,373)	(229,561)
Cash provided (used) by financing activities (e)	(25,538)	(83,715)	(292,364)	22,189	(22,509)
Ratios					
Return on average equity (f)	50.7%	4.1%	(29.5)%	2.3%	(4.0)%
Current ratio (c) (g)	1.5:1	1.2:1	1.3:1	1.2:1	1.1:1
Per share information attributable to Harsco Corporation common stockholders					
Basic—Income (loss) from continuing operations	\$ 1.69	\$ 0.09	\$ (1.07)	\$ 0.09	\$ (0.28)
Income (loss) from discontinued operations	—	—	0.01	(0.01)	—
Net income (loss)	\$ 1.70 ^(h)	\$ 0.10 ^(h)	\$ (1.07) ^(h)	\$ 0.08	\$ (0.27) ^(h)
Diluted—Income (loss) from continuing operations	\$ 1.64	\$ 0.09	\$ (1.07)	\$ 0.09	\$ (0.28)
Income (loss) from discontinued operations	—	—	0.01	(0.01)	—
Net income (loss)	\$ 1.64	\$ 0.09	\$ (1.07) ^(h)	\$ 0.08	\$ (0.27) ^(h)
Other information					
Book value per share (i)	\$ 3.94	\$ 2.67	\$ 1.72	\$ 3.88	\$ 4.36
Cash dividends declared per share	—	—	—	0.666	0.820
Diluted weighted-average number of shares outstanding	83,595	82,840	80,333	80,365	80,884
Number of employees	9,900	9,400	9,400	10,800	12,200

- (a) The Company has adopted the new revenue recognition standard utilizing the modified retrospective transition method, including the use of practical expedients. Comparative information has not been restated and continues to be reported under accounting principles generally accepted in the U.S. in effect for those periods. See Note 2, Recently Adopted and Recently Issued Accounting Standards, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.
- (b) Includes the effects of the acquisition of Altek Europe Holdings Limited and its affiliated entities. See Note 3, Acquisition, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.
- (c) On January 1, 2017, the Company adopted changes issued by the Financial Accounting Standards Board ("FASB") related to the reclassification of current deferred tax assets and liabilities to non-current. As a result of these changes, the Company reclassified its net current deferred tax assets and liabilities to non-current, which reduced Net working capital by \$27.1 million, \$38.1 million and \$37.9 million at December 31, 2016, 2015 and 2014, respectively.
- (d) On January 1, 2016, the Company adopted changes issued by the FASB related to simplifying the presentation of debt issuance costs. The changes required that debt issuance costs related to a recognized debt liability be presented in the balance sheet as a direct reduction from the carrying amount of that debt liability. The Company reclassified debt issuance costs in the amount of \$10.1 million and \$2.3 million at December 31, 2015 and 2014, respectively.
- (e) On January 1, 2017, the Company adopted changes issued by the FASB to the accounting for stock-based compensation. The Company reclassified employee taxes paid on stock compensation in the amount of \$0.1 million, \$0.3 million and \$0.7 million for the year ended December 31, 2016, 2015 and 2014, respectively, from Cash provided by operating activities to Cash provided (used by) financing activities on its Consolidated Statement of Cash Flows.
- (f) Return on average equity is calculated by dividing income (loss) from continuing operations by average Harsco Corporation stockholders' equity throughout the year.
- (g) Current ratio is calculated by dividing total current assets by total current liabilities.
- (h) Does not total due to rounding.
- (i) Book value per share is calculated by dividing total equity by shares outstanding.

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

The following discussion should be read in conjunction with the Consolidated Financial Statements of Harsco Corporation (the "Company") provided under Part II, Item 8, "Financial Statements and Supplementary Data," of this Annual Report on Form 10-K.

Amounts included in this Item 7 of this Annual Report on Form 10-K are rounded in millions and all percentages are calculated based on actual amounts. As a result, minor differences may exist due to rounding.

Forward-Looking Statements

The nature of the Company's business, together with the number of countries in which it operates, subject it to changing economic, competitive, regulatory and technological conditions, risks and uncertainties. In accordance with the "safe harbor" provisions of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, the Company provides the following cautionary remarks regarding important factors that, among others, could cause future results to differ materially from the results contemplated by forward-looking statements, including the expectations and assumptions expressed or implied herein. Forward-looking statements contained herein could include, among other things, statements about management's confidence in and strategies for performance; expectations for new and existing products, technologies and opportunities; and expectations regarding growth, sales, cash flows, and earnings. Forward-looking statements can be identified by the use of such terms as "may," "could," "expect," "anticipate," "intend," "believe," "likely," "estimate," "outlook," "plan" or other comparable terms.

Factors that could cause actual results to differ, perhaps materially, from those implied by forward-looking statements include, but are not limited to: (1) changes in the worldwide business environment in which the Company operates, including general economic conditions; (2) changes in currency exchange rates, interest rates, commodity and fuel costs and capital costs; (3) changes in the performance of equity and bond markets that could affect, among other things, the valuation of the assets in the Company's pension plans and the accounting for pension assets, liabilities and expenses; (4) changes in governmental laws and regulations, including environmental, occupational health and safety, tax and import tariff standards; (5) market and competitive changes, including pricing pressures, market demand and acceptance for new products, services and technologies; (6) the Company's inability or failure to protect its intellectual property rights from infringement in one or more of the many countries in which the Company operates; (7) failure to effectively prevent, detect or recover from breaches in the Company's cybersecurity infrastructure; (8) unforeseen business disruptions in one or more of the many countries in which the Company operates due to political instability, civil disobedience, armed hostilities, public health issues or other calamities; (9) disruptions associated with labor disputes and increased operating costs associated with union organization; (10) the seasonal nature of the Company's business; (11) the Company's ability to successfully enter into new contracts and complete new acquisitions or strategic ventures in the time-frame contemplated, or at all; (12) the integration of the Company's strategic acquisitions; (13) the amount and timing of repurchases of the Company's common stock, if any; (14) the outcome of any disputes with customers, contractors and subcontractors; (15) the financial condition of the Company's customers, including the ability of customers (especially those that may be highly leveraged and those with inadequate liquidity) to maintain their credit availability; (16) implementation of environmental remediation matters; (17) risk and uncertainty associated with intangible assets; and (18) other risk factors listed from time to time in the Company's SEC reports. A further discussion of these, along with other potential risk factors, can be found in Part I, Item 1A, "Risk Factors," of this Annual Report on Form 10-K. The Company cautions that these factors may not be exhaustive and that many of these factors are beyond the Company's ability to control or predict. Accordingly, forward-looking statements should not be relied upon as a prediction of actual results. The Company undertakes no duty to update forward-looking statements except as may be required by law.

Executive Overview

The Company is a diversified, multinational provider of industrial environmental services and engineered products serving global industries that are fundamental to worldwide economic growth and infrastructure development. The Company's operations consist of three reportable segments: Harsco Metals & Minerals, Harsco Industrial and Harsco Rail. In general, the Company believes each of the segments are among the global market leaders in their respective sectors. The Harsco Metals & Minerals Segment provides on-site services for product quality improvement; resource recovery from steel and metals manufacturing; and material logistics; value added environmental solutions for industrial co-products; as well as aluminum dross and scrap process systems. The Harsco Industrial Segment is a supplier of custom-engineered and manufactured air-cooled heat exchangers that support the processing and distribution of natural gas and downstream refined products; manufactures a full range of metal bar grating configurations, used mainly in industrial flooring, as well as safety and security applications; and also manufactures energy-efficient heat transfer products such as boilers and water heaters, for various commercial and industrial applications. The Harsco Rail Segment is a provider of highly engineered maintenance equipment, after-market parts and safety and diagnostic systems which support railroad and transit customers worldwide. The Company has locations in approximately 30 countries, including the U.S. The Company was incorporated in 1956.

Highlights for 2018 included (Refer to the discussion of segment and consolidated results included within Results of Operations below, as well as Liquidity and Capital Resources, for additional information pertaining to the key drivers impacting these highlights):

- Revenues for 2018 increased approximately 7% compared with 2017. The primary drivers for this increase were higher demand and volumes in the Harsco Metals & Minerals Segment and the Harsco Industrial Segment's air-cooled heat exchanger business, partially offset by decreased revenues in the Harsco Rail Segment related to the contract with the federal railway system of Switzerland ("SBB").
- Operating income from continuing operations for 2018 increased approximately 31% compared with 2017. The primary driver for this increase was improved operating results across all businesses, including a decrease in Corporate spending.
- Diluted earnings per common share from continuing operations attributable to Harsco Corporation for 2018 were \$1.64 compared to \$0.09 in 2017. The primary drivers for the increase were lower income tax expense, improved operating results and a decrease in interest expense. The decrease in income tax expense is due to the finalization of accounting for the Tax Cuts and Jobs Act (the "Tax Act") which included a provisional charge of \$48.7 million recorded in 2017 that did not repeat in 2018 and a favorable adjustment to this provision in 2018 of \$15.4 million, an \$8.3 million tax benefit arising from the adjustment to certain existing deferred tax asset valuation allowances as the result of the acquisition of Altek Europe Holdings Limited and its affiliated entities (collectively, "Altek"); and a lower effective income tax rate. The decrease in interest expense is due to the repricing of the Company's senior secured credit facility (the "Senior Secured Credit Facility") in both December 2017 and June 2018.
- Cash flows from operating activities for 2018 was \$192 million, an increase of approximately 9% compared with 2017. The primary driver for this increase was higher net cash income.
- In May 2018, the Company acquired Altek, a U.K.-based manufacturer of market leading products that enable aluminum producers and recyclers to manage and efficiently extract value from critical byproduct streams, reduce byproduct generation and improve operating productivity. See Note 3, Acquisition in Part II, Item 8, Financial Statements and Supplementary Data. The Company incurred acquisition related costs of approximately \$1 million related to Altek.
- On May 2, 2018 the Company announced that the Board of Directors (the "Board") authorized a share repurchase program pursuant to which the Company could repurchase shares in an amount up to \$75 million. During 2018, the Company purchased 1.3 million shares of common stock under this program at an average price of \$22.72 per share, or a total cost of approximately \$30 million.

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There has been gradual and steady improvement in the Company's end markets. These trends have benefited the Company although some volatility is expected to persist in the future. Given these expectations, the Company believes it is well positioned to execute actions through a disciplined focus on return-based capital allocations and business portfolio strategies. The Company believes these actions will enable it to generate returns above its cost of capital, with a balanced business portfolio, without jeopardizing its financial profile with unreasonable leverage. Looking forward, the Company maintains a positive outlook across all businesses.

- Markets served by the Harsco Metals & Minerals Segment maintained recent improvements in customer steel production and higher commodity volumes and prices. Additionally, increased short-cycle ad-hoc services provided to existing steel mill customers; new sites (or contracts); lower operating costs achieved through improvement initiatives; and increased contributions from the Company's industrial abrasives, metal additives and roofing granules business also positively impacted results in 2018. For 2019, (i) global growth in steel production and consumption are expected to increase demand for mill services; (ii) new sites (or contracts) are expected to outpace site exits; (iii) continued increased contributions from the industrial abrasives, metal additives and roofing granules business; and (iv) continued operational savings are expected to improve operating results compared to 2018. Additionally, revenues for 2019 will be positively impacted by strong demand for aluminum dross and scrap processing systems and the inclusion of a full year of results for Altek.
- The Harsco Industrial Segment's air-cooled heat exchangers business continues to be positively impacted by fundamental improvements within energy markets. Bookings for this business have increased significantly in recent quarters. Additionally, increased demand for metal grating and heat transfer products, new product innovations and manufacturing efficiencies have positively impacted this Segment during 2018. For 2019, (i) the air-cooled heat exchangers business starts with a robust backlog, (ii) improved demand is anticipated across this Segment's product offerings as the result of increased capital spending in end markets; and (iii) new product offerings are expected to positively impact operating results compared to 2018.
- The Harsco Rail Segment has experienced continued improvement in demand for maintenance equipment from North American railroads following a period of decreased demand in recent years along with continued growth, market penetration and investment within after-market parts and Protran Technology which have improved operating results during 2018. As a result, this Segment begins 2019 with strong backlogs. This fact along with increased demand for maintenance of way equipment, primarily in North America although also in other geographies, and for safety and measurement products are anticipated to improve operating results compared to 2018. Additionally, the Harsco Rail Segment has undertaken a number of strategic actions over the past two years to improve manufacturing processes. Recently, the Company decided to consolidate and centralize North American manufacturing and distribution into one facility, allowing for improved efficiency and better service to customers. The capital investment to complete this program and other expenditures began in the second-half of 2018 and will continue through 2019. The annualized savings anticipated from this latest action are approximately \$7 million, with a portion of these benefits expected to materialize in the second-half of 2019. The net impact of such costs and savings will not have a significant impact on 2019 operating results.
- The Company anticipates higher selling, general and administrative costs across all Segments as well as increased research and development spending in the Harsco Rail Segment, necessary to support anticipated volume increases and the Company's strategic growth initiatives.
- The Company anticipates net periodic pension cost ("NPPC") will increase by approximately \$9 million during 2019, which will primarily be reflected in the caption Defined benefit pension (income) expense on the consolidated statement of operations. The increase is primarily the result of lower plan assets at December 31, 2018.
- The Company anticipates that corporate spending will increase in 2019 in order to support the Company's strategic growth initiatives.

Results of Operations

Revenues by Segment

(Dollars in millions)	2018	2017	Change	%
Harsco Metals & Minerals	\$ 1,068.3	\$ 1,011.3	\$ 57.0	5.6 %
Harsco Industrial	374.7	299.6	75.1	25.1
Harsco Rail	279.3	296.0	(16.7)	(5.6)
Corporate	0.1	0.1	(0.1)	(48.3)
Total Revenues	<u>\$ 1,722.4</u>	<u>\$ 1,607.1</u>	<u>\$ 115.3</u>	<u>7.2 %</u>

Revenues by Region

(Dollars in millions)	2018	2017	Change	%
North America	\$ 862.1	\$ 745.0	\$ 117.1	15.7 %
Western Europe	438.9	448.5	(9.6)	(2.1)
Latin America (a)	176.0	183.3	(7.3)	(4.0)
Asia-Pacific	167.9	160.7	7.2	4.5
Middle East and Africa	50.0	42.7	7.3	17.1
Eastern Europe	27.6	26.9	0.6	2.3
Total Revenues	<u>\$ 1,722.4</u>	<u>\$ 1,607.1</u>	<u>\$ 115.3</u>	<u>7.2 %</u>

(a) Includes Mexico.

Operating Income (Loss) and Operating Margins by Segment

(Dollars in millions)	2018	2017	Change	%
Harsco Metals & Minerals	\$ 121.2	\$ 102.4	\$ 18.8	18.4%
Harsco Industrial	54.7	35.5	19.1	53.8
Harsco Rail	37.3	33.0	4.4	13.3
Corporate	(22.3)	(25.5)	3.2	12.5
Total Operating Income	<u>\$ 190.9</u>	<u>\$ 145.4</u>	<u>\$ 45.5</u>	<u>31.3%</u>

	2018	2017
Harsco Metals & Minerals	11.3%	10.1%
Harsco Industrial	14.6	11.9
Harsco Rail	13.4	11.1
Consolidated Operating Margin	<u>11.1%</u>	<u>9.0%</u>

Harsco Metals & Minerals Segment:

Significant Effects on Revenues (In millions)

Revenues—2017	\$ 1,011.3
Net effects of price/volume changes, primarily attributable to volume changes.	48.6
Effect of Altek acquisition.	11.8
Net impact of new contracts and lost contracts.	(2.3)
Foreign currency translation.	(1.8)
Other.	0.7
Revenues—2018	<u>\$ 1,068.3</u>

Factors Positively Affecting Operating Income:

- Overall steel production by customers under services contracts for 2018 increased modestly. Also, operating income was positively affected by increased short-cycle ad-hoc services provided to steel mill customers under existing contracts.
- The net effect of new and lost contracts increased operating income by approximately \$2 million during 2018 compared with prior year.
- Operating results for 2018 were positively affected by improved profitability in the Company's nickel-related sites due partially to increased nickel prices; and the industrial abrasives and metal additives businesses. Nickel prices increased 28% for 2018 compared with prior year.
- Operating results for 2018 were positively affected by a \$3.2 million reduction to previously accrued amounts related to the disposal of certain slag material in Latin America due to obtaining the necessary permits.

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- Operating results for 2018 were positively affected by a net positive contingent consideration adjustment related to the Altek acquisition of \$2.9 million.
- Operating results for 2018 were positively affected by \$4.6 million in bad debt expense, related to an Australian customer in voluntary administration, which occurred in the prior year and did not repeat during 2018.

Factors Negatively Impacting Operating Income:

- Increased raw material costs for the industrial abrasives business.
- Higher selling, general and administrative costs due to compensation expense and higher professional fees to support and execute the Company's growth strategies.
- Incremental amortization expenses associated with intangible assets acquired as part of the Altek acquisition.
- Costs associated with the Altek acquisition of approximately \$1 million for 2018.

Harsco Industrial Segment:

Significant Effects on Revenues (In millions)

Revenues—2017	\$	299.6
Net effects of price/volume changes, primarily attributable to volume changes.		75.3
Foreign currency translation.		(0.2)
Revenues—2018	\$	<u>374.7</u>

Factors Positively Affecting Operating Income:

- Higher overall volumes in the air-cooled heat exchanger business and a favorable product mix, resulting in increased operating income during 2018 compared with prior year.
- A favorable sales mix and higher prices led to increased operating income in the industrial grating businesses during 2018 compared with prior year.

Factors Negatively Impacting Operating Income:

- Moderately higher selling, general and administrative costs for 2018 resulting primarily from increased commissions due to increased volumes in the air-cooled heat exchanger business.
- Operating income was negatively impacted by a gain on sale of property of approximately \$4 million in 2017 which did not repeat during 2018.

Harsco Rail Segment:

Significant Impacts on Revenues (In millions)

Revenues—2017	\$	296.0
Revenues under the contracts with SBB.		(18.3)
Foreign currency translation.		(1.1)
Net effects of price/volume changes (exclusive of revenues under the SBB contracts), primarily attributable to volume changes.		2.6
Other.		0.1
Revenues—2018	\$	<u>279.3</u>

Factors Positively Affecting Operating Income:

- A favorable mix and increased demand for after-market part sales increased operating income during 2018 compared with prior year.
- Lower selling, general and administrative expenses for 2018 primarily related to lower professional fees.

Factors Negatively Impacting Operating Income:

- A less favorable mix of machine sales decreased operating income during 2018.
- Lost service contracts and lower contract service volumes decreased operating income in 2018 compared with prior year.
- Operating income was negatively impacted by \$0.6 million of costs associated with initiatives to improve manufacturing efficiency, including the recently announced consolidation of U.S. manufacturing and distribution into a single facility, during 2018.

Consolidated Results

(In millions, except per share information and percentages)	2018	2017	2016
Total revenues	\$ 1,722.4	\$ 1,607.1	\$ 1,451.2
Cost of services and products sold	1,288.7	1,223.0	1,172.6
Selling, general and administrative expenses	238.7	229.8	196.9
Research and development expenses	5.5	4.2	4.3
Other (income) expenses, net	(1.5)	4.6	12.6
Operating income from continuing operations	190.9	145.4	64.9
Interest income	2.2	2.5	2.5
Interest expense	(38.1)	(47.6)	(51.6)
Defined benefit pension income (expense)	3.4	(2.6)	(1.4)
Loss on early extinguishment of debt	(1.1)	(2.3)	(35.3)
Change in fair value to the unit adjustment liability and loss on dilution and sale of equity method investment	—	—	(58.5)
Income tax expense from continuing operations	(12.9)	(83.8)	(6.6)
Equity in income of unconsolidated entities, net	0.4	—	5.7
Income (loss) from continuing operations	144.7	11.6	(80.4)
Income from discontinued operations	0.3	0.2	0.7
Net income (loss)	145.0	11.8	(79.8)
Total other comprehensive income (loss)	(21.5)	63.2	(93.6)
Total comprehensive income (loss)	123.5	75.0	(173.4)
Diluted income (loss) per common share from continuing operations attributable to Harsco Corporation common stockholders	1.64	0.09	(1.07)
Effective income tax rate for continuing operations	8.2%	87.8%	(8.4)%

Comparative Analysis of Consolidated Results

Total Revenues

Revenues for 2018 increased \$115.3 million or 7% from 2017. Revenues for 2017 increased \$155.8 million or 11% from 2016. These increases were attributable to the following significant items:

Changes in Revenues (In millions)	2018 vs. 2017	2017 vs. 2016
Net effect of price/volume changes in the Harsco Industrial Segment, primarily attributable to volume changes.	\$ 75.3	\$ 52.0
Net effect of price/volume changes in the Harsco Metals & Minerals Segment, primarily attributable to volume changes.	48.6	55.9
Effect of Altek acquisition in the Harsco Metals & Minerals Segment.	11.8	—
Net effect of price/volume changes (exclusive of revenues under the SBB contracts for 2018), primarily attributable to volume changes in the Harsco Rail Segment.	2.6	16.4
Timing of revenues under the contracts with SBB in the Harsco Rail Segment.	(18.3)	42.5
Foreign currency translation.	(3.1)	8.0
Net impact of new contracts and lost contracts (including exited underperforming contracts) in the Harsco Metals & Minerals Segment.	(2.3)	(18.4)
Other.	0.7	(0.6)
Total change in revenues	\$ 115.3	\$ 155.8

Cost of Services and Products Sold

Cost of services and products sold for 2018 increased \$65.7 million or 5% from 2017. Cost of services and products sold for 2017 increased \$50.4 million or 4% from 2016. These increases were attributable to the following significant items:

Change in Cost of Services and Products Sold (In millions)	2018 vs. 2017	2017 vs. 2016
Increased costs due to changes in revenues; and product and service mix (exclusive of foreign currency translation and fluctuations in commodity costs included in selling prices).	\$ 65.2	\$ 96.4
Foreign currency translation.	(1.5)	7.5
Decreased costs due to estimated forward loss provision in the Harsco Rail Segment during the prior year (a).	—	(45.1)
Other.	2.0	(8.4)
Total change in cost of services and products sold	\$ 65.7	\$ 50.4

(a) See Note 4, Accounts Receivable and Inventories, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.

Selling, General and Administrative Expenses

Selling, general and administrative expenses for 2018 increased \$8.9 million or 4% from 2017. This increase was primarily related to the Altek acquisition and increased compensation expense; partially offset by a decrease in bad debt expense in the Harsco Metals & Minerals Segment.

Selling, general and administrative expenses for 2017 increased \$32.9 million or 17% from 2016. This increase was primarily related to higher compensation expense related to the timing of stock-based compensation issuances and higher incentive compensation earned; higher bad debt expense in the Metals & Minerals Segment; increased agent commissions in the Harsco Industrial Segment; and increased professional fees.

Other (Income) Expenses, Net

The major components of this Statement of operations caption are detailed below. See Note 18, Other (Income) Expenses, Net, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.

(In thousands)	Other Expenses		
	2018	2017	2016
Net gains	\$ (3,868)	\$ (5,136)	\$ (1,764)
Employee termination benefits costs	4,983	7,350	10,777
Other costs to exit activities	428	1,633	440
Impaired asset write-downs	113	1,025	399
Contingent consideration adjustments	(2,939)	—	—
Harsco Metals & Minerals Segment separation costs	—	—	3,235
Other income	(239)	(231)	(467)
Total other (income) expenses, net	<u>\$ (1,522)</u>	<u>\$ 4,641</u>	<u>\$ 12,620</u>

Interest Expense

Interest expense in 2018 was \$38.1 million, a decrease of \$9.4 million or 20% compared with 2017. The decrease primarily relates to reduced interest rates for the Senior Secured Credit Facility, which was amended in December 2017 and June 2018.

Interest expense in 2017 was \$47.6 million, a decrease of \$4.0 million or 8% compared with 2016. The decrease primarily relates to the Company's overall reduction in debt levels, partially offset by an increase in interest rates associated with the Company's debt.

See Note 8, Debt and Credit Agreements, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.

Loss on Early Extinguishment of Debt

In June 2018, the Company amended the Senior Secured Credit Facility in order to, among other things, reduce the interest rate applicable to the Company's term loan facility (the "Term Loan Facility") and to increase the limit of the Company's revolving credit facility (the "Revolving Credit Facility"). As a result, charges of \$1.1 million were recorded during 2018 consisting principally of fees associated with the transaction and the write-off of unamortized deferred financing costs.

In December 2017, the Company amended the Senior Secured Credit Facility in order to, among other things, reduce the interest rate applicable to the Term Loan Facility, improve certain covenants and extend the maturity date by a year until December 2024. As a result, a charge of \$2.3 million was recorded during the fourth quarter of 2017 consisting principally of fees associated with the transaction and the write-off of unamortized deferred financing costs.

See Note 8, Debt and Credit Agreements, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.

Income Tax Expense from Continuing Operations

Income tax expense from continuing operations in 2018 was \$12.9 million, a decrease of \$70.9 million compared with 2017. The effective income tax rate relating to continued operations for 2018 was 8.2% versus 87.8% for 2017. The decrease in income tax expense and the effective income tax rate related to continuing operations was primarily due to the impact of the Tax Act. The Company recognized a provisional \$48.7 million income tax charge as a result of revaluing the U.S. ending net deferred tax assets and liabilities for the year ended December 31, 2017 and made a favorable adjustment of a \$15.4 million to the provisional amount during the fourth quarter 2018. Additionally, as a result of the Altek acquisition, an \$8.3 million income tax benefit arising from the adjustment to certain existing deferred tax asset valuation allowances was realized.

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Income tax expense from continuing operations in 2017 was \$83.8 million, an increase of \$77.2 million compared with 2016. The effective income tax rate relating to continued operations for 2017 was 87.8% versus (8.4)% for 2016. The increase in income tax expense and the change in the effective income tax rate related to continuing operations was primarily due to the impact of the Tax Act as well as an increase in income. The Company recognized a provisional income tax charge of

\$48.7 million as a result of revaluing the U.S. ending net deferred tax asset from 35% to the newly enacted U.S. corporate income tax rate of 21% and establishing a valuation allowance on the full amount of foreign tax credit carryforwards of \$27.3 million.

See Note 11, Income Taxes, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.

Total Other Comprehensive Income (Loss)

Total other comprehensive loss was \$21.5 million in 2018, compared with total other comprehensive income of \$63.2 million in 2017. The primary driver for this decrease was the net unfavorable impact of foreign currency translation due to the strengthening of the U.S. dollar against multiple currencies during 2018, partially offset by higher discount rates for the U.S. and U.K. pension plans.

Total other comprehensive income was \$63.2 million in 2017, compared with total other comprehensive loss of \$93.6 million in 2016. The major drivers for this change were pension liability adjustments and foreign currency translation adjustments. The pension liability adjustments were favorably impacted by actual returns on plan assets that were significantly higher than expected returns, partially offset by lower discount rates for the U.S. and U.K. defined benefit plans. The foreign currency translation adjustments were positively impacted by the weakening of the U.S. dollar, particularly against the Euro and British Pound Sterling.

Liquidity and Capital Resources

Cash Flow Summary

The Company has sufficient financial liquidity and borrowing capacity to support the strategies within each of its businesses. The Company currently expects operational and business needs to be met by cash provided by operations supplemented with borrowings from time to time due to historical patterns of seasonal cash flow and for the funding of various projects. The Company regularly assesses capital needs in the context of operational trends and strategic initiatives.

The Company's cash flows from operating, investing and financing activities, as reflected on the Consolidated Statements of Cash Flows, are summarized in the following table:

(In millions)	2018	2017	2016
Net cash provided (used) by:			
Operating activities	\$ 192.0	\$ 176.9	\$ 159.9
Investing activities	(161.1)	(103.3)	122.9
Financing activities	(25.5)	(83.7)	(292.4)
Impact of exchange rate changes on cash	(4.4)	4.5	1.7
Net change in cash and cash equivalents	\$ 0.9	\$ (5.7)	\$ (7.9)

Cash provided by operating activities — Net cash provided by operating activities in 2018 was \$192.0 million, an increase of \$15.1 million from 2017. The increase is primarily attributable to increased cash net income, partially offset by increased net working capital and the timing of payment of income taxes and other accruals. Net cash provided by operating activities in 2017 was \$176.9 million, an increase of \$17.0 million from 2016. The increase is primarily attributable to the timing of accounts payable, lower inventories and an increase in cash net income. This increase was partially offset by timing of sales and collections of accounts receivable and a net decrease in advances on contracts and other customer advances received and utilized. Also included in the Cash flows from operating activities section of the Consolidated Statements of Cash Flows is the caption, Other assets and liabilities. A summary of the major components of this caption for the periods presented is as follows:

(In millions)	2018	2017	2016
Net cash provided (used) by:			
Change in income taxes	\$ (15.3)	\$ 0.9	\$ 0.8
Change in prepaid expenses	2.1	(3.7)	6.7
Change in non-current insurance accruals	(2.7)	(3.0)	(5.0)
Other (a)	(17.6)	9.2	(15.8)
Total change in other assets and liabilities	\$ (33.5)	\$ 3.4	\$ (13.3)

(a) Other relates primarily to other accruals that are individually not significant.

Cash provided (used) by investing activities — Net cash used by investing activities in 2018 was \$161.1 million, an increase of \$57.8 million from 2017. The increase was primarily due to the Altek acquisition and an increase in capital expenditures, primarily in the Company's Harsco Metals & Minerals Segment in 2018, compared with 2017; partially offset by net foreign currency hedge settlement receipts. Net cash used by investing activities in 2017 was \$103.3 million compared to a net cash provided by investing activities of \$122.9 million in 2016. The change was primarily due to the gross proceeds received from the sale of the Company's investment in Brand which occurred in September 2016 and an increase in capital expenditures, primarily in the Company's Harsco Metals & Minerals Segment, in 2017, compared with 2016 and higher net foreign currency hedge settlement payments.

Cash used by financing activities — Net cash used by financing activities in 2018 was \$25.5 million, a decrease of \$58.2 million from 2017. The change was primarily due to net cash borrowings of \$13.8 million in 2018 compared with net cash borrowing repayments of \$75.2 million in 2017, partially offset by common stock repurchases of \$30 million. The increased borrowings were used to fund the Altek acquisition and the increased capital expenditures in the Harsco Metals & Minerals Segment. In 2017, net cash used by financing activities was \$83.7 million, a decrease of \$208.6 million from 2016. The change was primarily due to lower repayments of the Company's borrowings in 2017; a deferred pension underfunding payment related to the Company's equity interest in Brand and payment of deferred financing costs which occurred in 2016 and did not repeat in 2017. This increase was partially offset by proceeds from the termination of cross-currency interest rate swaps which occurred in 2016 but did not repeat in 2017.

Cash Requirements

The following summarizes the Company's expected future payments related to contractual obligations and commercial commitments at December 31, 2018:

Contractual Obligations and Commercial Commitments at December 31, 2018 (b)

(In millions)	Total	Payments Due by Period			
		Less than 1 year	1-3 years	3-5 years	After 5 years
Short-term borrowings	\$ 10.1	\$ 10.1	\$ —	\$ —	\$ —
Long-term debt (including current maturities and capital leases)	605.4	6.5	73.5	10.9	514.5
Projected interest payments on long-term debt (c)	161.2	27.7	57.1	51.6	24.8
Purchase obligations (d)	184.4	138.1	28.3	18.0	—
Operating leases (non-cancellable)	78.0	14.0	21.7	13.9	28.4
Pension obligations (e)	29.5	29.5	—	—	—
Contingent consideration (f)	8.4	—	8.4	—	—
Total contractual obligations (g) (h)	\$ 1,077.0	\$ 225.9	\$ 189.0	\$ 94.4	\$ 567.7

(b) See Note 3, Acquisition; Note 8, Debt and Credit Agreements; Note 9, Operating Leases; Note 10, Employee Benefit Plans; Note 11, Income Taxes; and Note 15, Financial Instruments, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information on short-term borrowings and long-term debt (including capital leases); operating leases; employee benefit plans; income taxes; interest rate swaps and foreign currency exchange forward contracts, respectively.

(c) The total projected interest payments on long-term debt are based upon borrowings, interest rates and foreign currency exchange rates at December 31, 2018, including interest rate swaps currently in effect. The interest rates on variable-rate debt and the foreign currency exchange rates are subject to changes beyond the Company's control and may result in actual interest expense and payments differing from the amounts projected above.

(d) Purchase obligations represent legally binding obligations to purchase property, plant and equipment, inventory and other commitments made in the normal course of business to meet operations requirements.

(e) Amounts represent expected employer contributions to defined benefit pension plans for the next year.

(f) The Company acquired Altek, on a debt and cash free basis, for a purchase price of £45 million (approximately \$60 million) in cash, with the potential for up to £25 million (approximately \$33 million) in additional contingent consideration through 2021 subject to the future financial performance of Altek. This amount represents the Company's estimate of contingent consideration payable at December 31, 2018.

(g) At December 31, 2018, in addition to the above contractual obligations, the Company had \$3.4 million of potential long-term tax liabilities, including interest and penalties, related to uncertain tax positions. Because of the high degree of uncertainty regarding the future cash flows associated with these potential long-term tax liabilities, the Company is unable to estimate the years in which settlement will occur with the respective taxing authorities.

(h) Total does not include the fair value of foreign currency exchange contracts outstanding at December 31, 2018. Due to the nature of these contracts, based on fair values at December 31, 2017 there will be a net cash receivable of \$0.6 million comprised of cash receipts of \$424.5 million and cash payments of \$423.9 million. The foreign currency exchange contracts are recorded on the Consolidated Balance sheets at fair value.

Off-Balance Sheet Arrangements

The following table summarizes the Company's contingent commercial commitments at December 31, 2018. These amounts are not included on the Consolidated Balance Sheets since there are no current circumstances known to management indicating that the Company will be required to make payments on these contingent commercial commitments.

Commercial Commitments at December 31, 2018

(In millions)	Total	Amount of Commercial Commitment Expiration Per Period				
		Less than 1 Year	1-3 Years	3-5 Years	Over 5 Years	Indefinite Expiration
Performance bonds	\$ 151.4	\$ 123.4	\$ 26.3	\$ —	\$ —	\$ 1.7
Standby letters of credit	73.4	62.4	9.1	1.9	—	—
Guarantees	66.5	5.9	2.9	4.3	—	53.4
Other commercial commitments	11.2	0.1	—	—	—	11.1
Total commercial commitments	\$ 302.5	\$ 191.8	\$ 38.3	\$ 6.2	\$ —	\$ 66.2

Certain commercial commitments that are of a continuous nature do not have an expiration date and are therefore considered to be indefinite in nature. See Note 15, Financial Instruments, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Sources and Uses of Cash

The Company's principal sources of liquidity are cash provided by operations and borrowings under the Senior Secured Credit Facility, augmented by cash proceeds from asset sales. In addition, the Company has other bank credit facilities available throughout the world. The Company expects to continue to utilize all of these sources to meet future cash requirements for operations and growth initiatives.

In June 2018, the Company amended the Senior Secured Credit Facility in order to, among other things, reduce the interest rate applicable to the Term Loan Facility and to increase the limit of the Revolving Credit Facility to \$500 million. A charge of \$1.1 million was recorded during 2018 consisting principally of fees associated with the transaction and the write-off of unamortized deferred financing costs. See Note 8, Debt and Credit Agreements, in Part II, Item 8, "Financial Statements and Supplementary Data" for additional information.

Borrowings under the \$500 million Revolving Credit Facility bear interest at a rate per annum ranging from 87.5 to 200 basis points over the base rate or 187.5 to 300 basis points over the adjusted London Interbank Offered Rate ("LIBOR") as defined in the credit agreement governing the Senior Secured Credit Facility (the "Credit Agreement"). Any principal amount outstanding under the Revolving Credit Facility is due and payable on the maturity of the Revolving Credit Facility. The Revolving Credit Facility matures on November 2, 2021.

As a result of the amendments, borrowings under the Term Loan Facility now bear interest at a rate per annum of 225 basis points over the adjusted LIBOR rate. The Term Loan Facility requires scheduled quarterly payments, each equal to 0.25% of the original principal amount of the loans under the Term Loan Facility. These payments are reduced by the application of any prepayments and any remaining balance is due and payable on the maturity of the Term Loan Facility. The Term Loan Facility matures on December 8, 2024.

The Senior Secured Credit Facility imposes certain restrictions including, but not limited to, restrictions as to types and amounts of debt and liens that may be incurred by the Company; limitations on increases in dividend payments; limitations on repurchases of the Company's stock and limitations on certain acquisitions by the Company.

The obligations of the Company are guaranteed by substantially all of the Company's current and future wholly-owned domestic subsidiaries ("Guarantors"). All obligations under the Senior Credit Facility, and the guarantees of those obligations, are secured, subject to certain exceptions, by substantially all of the Company's assets and the assets of the Guarantors.

In January 2017 and February 2018, the Company entered into a series of interest rate swaps that cover the period from 2018 through 2022 and had the effect of converting \$300.0 million of the Term Loan Facility from floating-rate to fixed-rate beginning in 2018. The fixed rates provided by the swaps replace the adjusted LIBOR rate in the interest calculation, ranging from 1.65% for 2018 to 3.12% for 2022. The total notional of the Company's interest rate swaps was \$300.0 million as of December 31, 2018.

Summary of Senior Secured Credit Facility Borrowings: (In millions)	December 31 2018	December 31 2017
By type:		
Revolving Credit Facility	\$ 62.0	\$ 41.0
Term Loan Facility	541.8	545.9
Total	\$ 603.8	\$ 586.9
By classification:		
Current	\$ 5.4	\$ 5.5
Long-term	598.3	581.4
Total	\$ 603.8	\$ 586.9

The following table illustrates available credit at December 31, 2018:

(In millions)	Facility Limit	Outstanding Balance	Outstanding Letters of Credit	Available Credit
Multi-year revolving credit facility	\$ 500.0	\$ 62.0	\$ 30.4	\$ 407.6

On May 2, 2018 the Company announced that the Board authorized a share repurchase program pursuant to which the Company could repurchase shares in an amount up to \$75 million. The extent to which the Company repurchases shares, and the timing of such repurchases, will depend upon a variety of factors including market conditions and other corporate considerations as determined by the Company's management. The repurchase program may be suspended or discontinued at any time. During 2018, the Company purchased 1.3 million shares of common stock under this program at an average price of \$22.72 per share or a total of approximately \$30 million.

Certainty of Cash Flows

The majority of the Company's cash flows provided by operations has historically been generated in the second half of the year. The certainty of the Company's future cash flows is underpinned by the long-term nature of the Company's metals services contracts, the order backlog for the Company's railway track maintenance services and equipment and overall discretionary cash flows (operating cash flows plus cash from asset sales in excess of the amounts necessary for capital expenditures to maintain current revenue levels) generated by the Company. Historically, the Company has utilized these discretionary cash flows for growth-related capital expenditures, strategic acquisitions, debt repayment and dividend payments.

The types of products and services that the Company provides are not subject to rapid technological change, which increases the stability of related cash flows. Additionally, the Company believes each business in its portfolio is a leader in the industries and major markets the Company serves. Due to these factors, the Company is confident in the Company's future ability to generate positive cash flows from operations.

Debt Covenants

The Credit Agreement contains a consolidated net debt to consolidated adjusted earnings before interest, tax, depreciation and amortization ("EBITDA") ratio covenant, which is not to exceed 3.75 to 1.0 and a minimum consolidated adjusted EBITDA to consolidated interest charges ratio covenant, which is not to be less than 3.0 to 1.0. The consolidated net debt to consolidated adjusted EBITDA ratio covenant is reduced to 3.5 to 1.0 after December 31, 2018. At December 31, 2018, the Company was in compliance with these covenants as the net leverage ratio was 1.7 to 1.0 and interest coverage ratio was 8.6 to 1.0. Based on balances and covenants in effect at December 31, 2018, the Company could increase net debt by \$681.1 million and still be in compliance with these debt covenants. Alternatively, keeping all other factors constant, the Company's adjusted EBITDA could decrease by \$181.6 million and the Company would still be within these debt covenants. The Company expects to continue to be in compliance with these debt covenants for at least the next twelve months.

Cash Management

The Company has various cash management systems throughout the world that centralize cash in various bank accounts where it is economically justifiable and legally permissible to do so. These centralized cash balances are then redeployed to other operations to reduce short-term borrowings and to finance working capital needs or capital expenditures. Due to the transitory nature of cash balances, they are normally invested in bank deposits that can be withdrawn at will or in very liquid short-term bank time deposits and government obligations. The Company's policy is to use the largest banks in the various countries in which the Company operates. The Company monitors the creditworthiness of banks and, when appropriate, will adjust banking operations to reduce or eliminate exposure to less creditworthy banks. The Company plans to continue the strategy of targeted, prudent investing for strategic purposes for the foreseeable future and to make more efficient use of existing investments.

At December 31, 2018, the Company's consolidated cash and cash equivalents included \$61.5 million held by non-U.S. subsidiaries. At December 31, 2018, less than 5% of the Company's consolidated cash and cash equivalents had regulatory restrictions that would preclude the transfer of funds with and among subsidiaries. Non-U.S. subsidiaries also held \$19.1 million of cash and cash equivalents in consolidated strategic ventures. The strategic venture agreements may require strategic venture partner approval to transfer funds with and among subsidiaries. While the Company's remaining non-U.S. cash and cash equivalents can be transferred with and among subsidiaries, the majority of these non-U.S. cash balances will be used to support the ongoing working capital needs and continued growth of the Company's non-U.S. operations.

Application of Critical Accounting Policies

The Company's discussion and analysis of its financial condition and results of operations are based upon the consolidated financial statements, which have been prepared in accordance with generally accepted accounting principles in the U.S. ("U.S. GAAP"). The preparation of these consolidated financial statements requires the Company to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses. On an ongoing basis, the Company evaluates the estimates, including those related to defined benefit pension benefits, notes and accounts receivable, goodwill, long-lived asset impairment, inventories, revenue recognition - cost-to-cost method, insurance reserves and income taxes. The impact of changes in these estimates, as necessary, is reflected in the respective segment's results of operations in the period of the change. The Company bases estimates on historical experience and various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different outcomes, assumptions or conditions.

The Company believes the following critical accounting policies are affected by the Company's more significant judgments and estimates used in the preparation of the consolidated financial statements. Management has discussed the development and selection of the critical accounting estimates described below with the Audit Committee of the Board and they have reviewed the Company's disclosures relating to these estimates in this Management's Discussion and Analysis of Financial Condition. These items should be read in conjunction with Note 1, Summary of Significant Accounting Policies, in Part II, Item 8, "Financial Statements and Supplementary Data."

Defined Benefit Pension Benefits

The Company has defined benefit pension plans in several countries. The largest of these plans are in the U.K. and the U.S. The Company's funding policy for these plans is to contribute amounts sufficient to meet the minimum funding pursuant to U.K. and U.S. statutory requirements, plus any additional amounts that the Company may determine to be appropriate.

Changes in the discount rate assumption and the actual performance of plan assets compared with the expected long-term rate of return on plan assets are the primary drivers in the change in funded status of the Company's defined benefit pension plans. These factors are components of actuarial loss (gain) and impact the amount recognized in Other comprehensive income (loss), as such actuarial changes are not reflected directly on the Consolidated Statements of Operations but amortized over time in accordance with U.S. GAAP.

Critical Estimate—Defined Benefit Pension Benefits

Accounting for defined benefit pension plans requires the use of actuarial assumptions. The principal assumptions used include the discount rate and the expected long-term rate of return on plan assets. Each assumption is reviewed annually and represents management's best estimate at that time. The assumptions are selected to represent the average expected experience over time and may differ, in any one year, from actual experience due to changes in capital markets and the overall economy. These differences will impact the amount of unfunded benefit obligation and the expense recognized.

The discount rates used in calculating the Company's projected benefit obligations at the December 31, 2018 measurement date for the U.K. and U.S. defined benefit pension plans were 2.9% and 4.2%, respectively, and the global weighted-average discount rate was 3.2%. The discount rates selected represent level-equivalent rates using the yield curve spot rates on a year-by-year expected cash flow basis, using yield curves of high-quality corporate bonds. Annual NPPC is determined using the discount rates at the beginning of the year. The discount rates for 2018 expense were 2.5% for the U.K. plan, 3.5% for the U.S. plans and 2.8% for the global weighted-average of plans.

The expected long-term rate of return on plan assets is determined by evaluating the asset return expectations with the Company's advisors as well as actual, long-term, historical results of asset returns for the pension plans. Generally, the NPPC increases as the expected long-term rate of return on assets decreases. For 2019 and 2018, the global weighted-average expected long-term rate of return on asset assumption is 5.9% and 6.0%, respectively. This rate was determined based on a model of expected asset returns for an actively managed portfolio.

Changes in NPPC may occur in the future due to changes in actuarial assumptions and due to changes in returns on plan assets resulting from financial market conditions. Holding all other assumptions constant, using December 31, 2018 plan data, a one-quarter percent increase or decrease in the discount rate and the expected long-term rate of return on plan assets would increase or decrease annual 2018 pre-tax defined benefit NPPC as follows:

Approximate Changes in Pre-tax Defined Benefit Net Periodic Pension Cost

	U.S. Plans	U.K. Plan
Discount rate		
One-quarter percent increase	Increase of \$0.1 million	Decrease of \$0.2 million
One-quarter percent decrease	Decrease of \$0.1 million	Increase of \$0.2 million
Expected long-term rate of return on plan assets		
One-quarter percent increase	Decrease of \$0.5 million	Decrease of \$1.7 million
One-quarter percent decrease	Increase of \$0.5 million	Increase of \$1.7 million

Increases or decreases to the net pension obligations may be required should circumstances that affect these estimates change. Additionally, certain events could result in the pension obligation changing at a time other than the annual measurement date. This would occur when a benefit plan is amended or when plan curtailments or settlements occur.

See Note 10, Employee Benefit Plans, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Notes and Accounts Receivable

Notes and accounts receivable are stated at net realizable value through the use of an allowance for doubtful accounts. The allowance for doubtful accounts is maintained for estimated losses resulting from the inability or unwillingness of customers to make required payments. The Company has policies and procedures in place requiring customers to be evaluated for creditworthiness prior to the execution of new service contracts or shipments of products. These reviews are structured to minimize the Company's risk related to realizability of receivables. Despite these policies and procedures, the Company may at times still experience collection problems and potential bad debts due to economic conditions within certain industries (e.g., steel industry), countries or regions in which the Company operates. At December 31, 2018 and 2017, trade accounts receivable of \$291.2 million and \$288.0 million, respectively, were net of reserves of \$4.6 million and \$4.7 million, respectively.

Critical Estimate—Notes and Accounts Receivable

A considerable amount of judgment is required to assess the realizability of receivables, including the current creditworthiness of each customer, related aging of past due balances and the facts and circumstances surrounding any non-payment. The Company's provisions for bad debts during 2018 and 2017 were \$0.4 million and \$5.3 million, respectively. The Company did not make any significant provisions for bad debts during 2016.

On a monthly basis, customer accounts are analyzed for collectability. Reserves are established based upon a specific-identification method as well as historical collection experience, as appropriate. The Company also evaluates specific accounts when it becomes aware of a situation in which a customer may not be able to meet its financial obligations due to a deterioration in financial condition, credit ratings, bankruptcy or receivership. The reserves are based on the facts available to the Company and are re-evaluated and adjusted as additional information becomes available. Reserves are also determined by using percentages (based upon experience) applied to certain aged receivable categories. Specific issues are discussed with corporate management and any significant changes in reserve amounts or the write-off of balances must be approved by specifically designated corporate personnel. All approved items are monitored to ensure they are recorded in the proper period. Additionally, any significant changes in reserve balances are reviewed to ensure the proper corporate approval has occurred.

If the financial condition of the Company's customers were to deteriorate, resulting in their inability to make payments, additional allowances may be required. Conversely, an improvement in a customer's ability to make payments could result in a decrease of the allowance for doubtful accounts. Changes in the allowance for doubtful accounts related to both of these situations would be recorded through Operating income from continuing operations in the period the change was determined. As previously disclosed, one of the Company's customers for the Harsco Metals & Minerals Segment in Australia had entered into the process of voluntary administration under Australian law, the purpose of which was to focus on long-term solvency. The result of this administration process was that the customer's operations were sold to a new owner in August 2017. In September 2017, the administrators informed the Company that most of the pre-administration accounts receivable balance would not be paid, and as a result the Company recorded a bad debt expense of \$4.6 million during the third quarter of 2017. The Company continues to provide services for the new owner pending a formalization of a new contract.

The Company has not materially changed the methodology for calculating allowances for doubtful accounts for the years presented. See Note 4, Accounts Receivable and Inventories, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Goodwill

The Company's goodwill balances were \$411.6 million and \$401.8 million at December 31, 2018 and 2017, respectively. The Company performs the annual goodwill impairment test as of October 1. The Company has five reporting units (only three of which have goodwill associated with them as of December 31, 2018). The Company's reporting units with goodwill are the Harsco Metals & Minerals Segment, the Harsco Rail Segment and the air-cooled heat exchanger business of the Harsco Industrial Segment. Almost all of the Company's goodwill is allocated to the Harsco Metals & Minerals Segment.

Critical Estimate—Goodwill

In accordance with U.S. GAAP, goodwill is not amortized and is tested for impairment at least annually or more frequently if indicators of impairment exist or if a decision is made to dispose of a business. Goodwill is allocated among and evaluated for impairment at the reporting unit level, which is defined as an operating segment or one level below an operating segment for which discrete financial information is available. A significant amount of judgment is involved in determining if an indicator of impairment has occurred. Such indicators may include declining cash flows or operating losses at the reporting unit level, a significant adverse change in legal factors or in the business climate, an adverse action or assessment by a regulator, unanticipated competition, a loss of key personnel or a more likely than not expectation that a reporting unit or a significant portion of a reporting unit will be sold or otherwise disposed of, among others.

The evaluation of potential goodwill impairment involves comparing the current fair value of each reporting unit to the net book value, including goodwill. The Company uses a discounted cash flow model ("DCF model") to estimate the current fair value of reporting units, as management believes forecasted operating cash flows are the best indicator of current fair value. A number of significant assumptions and estimates are involved in the preparation of DCF models, including future revenues and operating margin growth, the weighted-average cost of capital ("WACC"), tax rates, capital spending, pension funding, the impact of strategic business initiatives and working capital projections. These assumptions and estimates may vary significantly among reporting units. DCF models are based on approved long-range plans for the early years and historical relationships and projections for later years. WACC rates are derived from internal and external factors including, but not limited to, the average market price of the Company's stock, shares outstanding, book value of the Company's debt, the long-term risk-free interest rate, and both market and size-specific risk premiums. Due to the many variables noted above and the relative size of the Company's goodwill, differences in assumptions may have a material impact on the results of the Company's annual goodwill impairment testing. If the net book value of a reporting unit were to exceed the current fair value, the second step of the goodwill impairment test would currently be required to determine if an impairment existed and the amount of goodwill impairment to record, if any. The second step of the goodwill impairment test compares the net book value of a reporting unit's goodwill with the implied fair value of that goodwill. The implied fair value of goodwill represents the excess of fair value of the reporting unit over the fair value amounts assigned to all of the assets and liabilities of the reporting unit if it were to be acquired in a hypothetical business combination and the current fair value of the reporting unit represented the purchase price. The second step of the goodwill impairment test may require the utilization of valuation experts.

The performance of the Company's 2018 annual impairment tests did not result in any impairment of the Company's goodwill.

For the Company's 2018 annual goodwill impairment test, the average annual revenue growth rates over the duration of the DCF models ranged from (0.5)% to 2.0%. The WACCs used in the 2018 annual goodwill impairment test ranged from 8.50% to 10.75%.

See Note 1, Summary of Significant Accounting Policies and Note 7, Goodwill and Other Intangible Assets, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Long-lived Asset Impairment (Other than Goodwill)

Long-lived assets (or asset groups) are reviewed for impairment when events and circumstances indicate that the book value of an asset (or asset group) may be impaired. The amounts charged against pre-tax income from continuing operations related to impaired long-lived assets (or asset groups) included in Other (income) expenses, net on the Consolidated Statements of Operations were \$0.1 million, \$1.0 million and \$0.4 million in 2018, 2017 and 2016, respectively.

Critical Estimate—Asset Impairment

The determination of a long-lived asset (or asset group) impairment involves significant judgments based upon short-term and long-term projections of future asset (or asset group) performance. If the undiscounted cash flows associated with an asset (or asset group) do not exceed the asset's book value, impairment loss estimates would be based upon the difference between the book value and fair value of the asset (or asset group). The fair value is generally based upon the Company's estimate of the amount that the assets (or asset group) could be bought or sold for in a transaction between willing parties. If quoted market prices for the asset (or asset group) or similar assets are unavailable, the fair value estimate is generally calculated using a DCF model. Should circumstances change that affect these estimates, additional impairment charges may be required and would be recorded through income in the period the change was determined.

The Company has not materially changed the methodology for calculating long-lived asset impairments for the years presented. U.S. GAAP requires consideration of all valuation techniques for which market participant inputs can be obtained without undue cost and effort. The use of a DCF model continues to be an appropriate method for determining fair value; however, methodologies such as quoted market prices must also be evaluated. See Note 18, Other (Income) Expenses, Net in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Inventories

Inventories are stated at the lower of cost or net realizable value. Inventory balances are adjusted for estimated obsolete or unmarketable inventory equal to the difference between the cost of inventory and its net realizable value or estimated market value, as applicable. At December 31, 2018 and 2017, inventories of \$133.1 million and \$178.3 million, respectively, are net of reserves of \$10.0 million and \$14.1 million, respectively.

Critical Estimate—Inventories

In assessing the realization of inventory balances, the Company is required to make judgments as to future demand and compare these with current or committed inventory levels. If actual market conditions are determined to be less favorable than those projected by management, additional inventory write-downs may be required and would be recorded through Operating income from continuing operations in the period the determination is made. Additionally, the Company records reserves to adjust a substantial portion of its U.S. inventory balances to the LIFO method of inventory valuation. In adjusting these reserves throughout the year, the Company estimates its year-end inventory costs and quantities. At December 31 of each year, the reserves are adjusted to reflect actual year-end inventory costs and quantities. During periods of inflation, LIFO expense usually increases and during periods of deflation it decreases. These year-end adjustments resulted in pre-tax expense of \$1.0 million in 2018 and pre-tax income of \$2.0 million and \$1.2 million in 2017 and 2016, respectively.

The Company has not materially changed the methodology for calculating inventory reserves for the years presented. See Note 4, Accounts Receivable and Inventories, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Revenue Recognition - Cost-to-cost Method

For certain contracts with customers, which meet specific criteria established in U.S. GAAP, the Company recognizes revenue on an over time basis utilizing an input method based on costs incurred ("cost-to-cost method") to measure progress, which requires the Company to make estimates regarding the revenues and costs associated with design, manufacturing and delivery of products.

Critical Estimate—Revenue Recognition - Cost-to-cost Method

Accounting for contracts with customers using the cost-to-cost method requires significant judgment relative to assessing risks, estimating contract revenues (including estimates of variable consideration, if applicable), estimating contract costs (including estimating any liquidating damages or penalties related to performance); making assumptions for schedule and technical items; and evaluating whether a significant financing component is present. Due to the number of years it may take to complete certain contracts and the scope and nature of the work required to be performed on those contracts, primarily in the Harsco Rail Segment, estimating total revenues and costs at completion is inherently complicated and subject to many variables. Accordingly, estimates are subject to change as experience is gained and as more information is obtained, even though the scope of the work under the contract may not have changed. When adjustments in estimated total contract sales or estimated total costs are required, any changes from prior estimates are recognized in current period earnings for the inception-to-date effect of such changes. When estimates of total costs to be incurred on a contract using the cost-to-cost method exceed estimates of total sales to be earned, a provision for the entire loss on the contract is recorded in current period earnings when the loss is determined.

The Company recognized an initial estimated forward loss provision related to the contracts with the federal railway system of Switzerland ("SBB") of \$45.1 million for the year ended December 31, 2016. The Company recorded an additional forward loss provision of \$1.8 million for the year ended December 31, 2018. At December 31, 2018, the entire remaining estimated forward loss provision of \$9.6 million is included in the caption Other current liabilities on the Consolidated Balance Sheets. The estimated forward loss provision represents the Company's best estimate based on currently available information. It is possible that the Company's overall estimate of costs to complete these contracts may increase, which would result in an additional estimated forward loss provision at such time.

As of December 31, 2018, the Company has substantially completed the first SBB contract and the second SBB contract is approximately 26% complete. Based on all information currently available, the Company is unable to estimate any further possible loss or range of loss at this time. There are a number of key events expected to occur in 2019, including the finalization of the manufacturing designs for certain of the vehicles, and which could affect the cost estimates. Any adjustment to the cost estimates would be recorded when new information becomes available and could have a material impact on the Company's results of operations in that period.

On January 1, 2018, the Company adopted changes, with subsequent amendments, issued by the FASB related to the recognition of revenue from contracts with customers. See Note 1, Summary of Significant Accounting Policies; Note 2, Recently Issued and Recently Adopted Accounting Standards; and Note 17, Revenue Recognition, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Insurance Reserves

The Company retains a significant portion of the risk for U.S. workers' compensation, U.K. employers' liability, automobile, general and product liability losses. At December 31, 2018 and 2017, the Company recorded liabilities of \$60.3 million and \$33.6 million, respectively, related to both asserted and unasserted insurance claims. At December 31, 2018 and 2017, \$34.2 million and \$4.1 million, respectively, was included in insurance liabilities related to claims covered by insurance carriers for which a corresponding receivable has been recorded.

Critical Estimate—Insurance Reserves

Insurance reserves have been recorded based upon actuarial calculations that reflect the undiscounted estimated liabilities for ultimate losses, including claims incurred but not reported. Inherent in these estimates are assumptions that are based on the Company's history of claims and losses, a detailed analysis of existing claims with respect to potential value, and current legal and legislative trends. If actual claims differ from those projected by management, changes (either increases or decreases) to insurance reserves may be required and would be recorded through Operating income from continuing operations in the period the change was determined. During 2018, 2017 and 2016, the Company recorded a retrospective insurance reserve adjustment that decreased pre-tax insurance expense from continuing operations for self-insured programs by \$2.7 million, \$2.6 million and \$5.4 million, respectively. The Company has programs in place to improve claims experience, such as disciplined claim and insurance litigation management and a focused approach to workplace safety.

The Company has not materially changed the methodology for calculating insurance reserves for the years presented. There are currently no known trends, demands, commitments, events or uncertainties that are reasonably likely to occur that would materially affect the methodology or assumptions described above. See Note 1, Summary of Significant Accounting Policies, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Income Taxes

The Company's income tax expense, deferred tax assets and liabilities and reserves for uncertain tax positions reflect management's best estimate of taxes to be paid. The Company is subject to various international, federal, state and local income taxes in jurisdictions where the Company operates. In determining income tax expense, the Company makes its best estimate of the annual effective income tax rate at the end of each quarter and applies that rate to year-to-date income (loss) before income taxes to arrive at the year-to-date income tax provision (exclusive of loss jurisdictions for which no tax benefit is realizable with any discrete tax items recorded separately). At December 31, 2018, 2017 and 2016, the Company's annual effective income tax rate on income from continuing operations was 8.2%, 87.8% and (8.4)%, respectively.

Critical Estimate—Income Taxes

Annual effective income tax rates are estimated by giving recognition to currently enacted tax rates, tax holidays, tax credits, capital losses and tax deductions as well as certain exempt income and non-deductible expenses for all jurisdictions where the Company operates. Quarterly income tax provisions incorporate any change in the year-to-date provision from the previous quarterly periods.

The Company records deferred tax assets to the extent the Company believes these assets will more likely than not be realized. In making such determinations, the Company considers all available evidence, including future reversals of existing deferred tax liabilities, projected future taxable income, feasible and prudent tax planning strategies and recent financial operating results. In the event the Company was to determine that it would be able to realize deferred tax assets in the future in excess of their net recorded amount, an adjustment to the valuation allowance would be made that would reduce the provision for income taxes.

Valuation allowances of \$138.9 million and \$174.2 million at December 31, 2018 and 2017, respectively, related principally to deferred tax assets for pension liabilities, NOLs, foreign tax credit carryforwards, capital loss carryforwards and foreign currency translation that are uncertain as to realizability. In 2018, the Company finalized the impact of the Tax Act and reduced the provisional valuation allowance by \$15.2 million because of the expected realization of foreign tax credit and state net operating loss carryforward. In addition, the U.K. valuation allowance was reduced by \$13.6 million as a result of the Altek acquisition and change in estimates of interest deductions. The Company recorded a valuation allowance reduction of \$8.7 million from the effects of foreign currency translation adjustments, partially offset by the net increase related to losses in certain jurisdictions where the Company determined that it is more likely than not that these assets will not be realized. In 2017, the Company recorded a valuation allowance of \$27.3 million related to foreign tax credit carryforwards due to the impact of the Tax Act, an increase from foreign currency translation in the amount of \$10.1 million and a net increase of \$6.9 million related to losses in certain jurisdictions where the Company determined that it is more likely than not that these assets will not be realized. This was partially offset by a reduction related to current year pension adjustments recorded through Accumulated other comprehensive loss and a decrease related to U.S., Argentina and Belgium tax rate changes.

An income tax benefit from an uncertain tax position may be recognized when it is more likely than not that the position will be sustained upon examination, including resolutions of any related appeals or litigation processes, based on its technical merits. The unrecognized tax benefits at December 31, 2018 and 2017 were \$2.4 million and \$3.6 million, respectively, excluding accrued interest and penalties. The unrecognized income tax benefit may decrease as a result of the lapse of statute of limitations or as a result of final settlement and resolution of outstanding tax matters in various state and international jurisdictions.

On December 22, 2017, the Tax Act was signed into law. The Tax Act significantly changed U.S. tax law by, among other things, lowering corporate income tax rates, implementing a territorial tax system and imposing a repatriation tax on deemed repatriated earnings of foreign subsidiaries. The Tax Act permanently reduced the U.S. Corporate income tax rate from a maximum of 35% to a 21% rate, effective January 1, 2018. The SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of U.S. GAAP in situations when a registrant did not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Tax Act. The Company recognized provisional tax impacts related to the deemed repatriated earnings and the revaluation of deferred tax assets and liabilities in its consolidated financial statements for the year ended December 31, 2017. Based on an analysis of the earnings and profits ("E&P") for the Company's foreign subsidiaries, no toll charge was recorded in 2017 related to the Tax Act. The Company finalized its E&P analysis in 2018 and confirmed there is no toll charge related to the Tax Act. Adjustments made to the provisional amounts allowed under SAB 118 were identified and recorded as discrete adjustments during the year ended December 31, 2018. The accounting was completed in the fourth quarter of 2018.

The Company has not materially changed the methodology for calculating income tax expense, deferred tax assets and liabilities and reserves for uncertain tax positions for the years presented or for quarterly periods. See Note 11, Income Taxes, in Part II, Item 8, "Financial Statements and Supplementary Data," for additional information.

Research and Development

Internal funding for research and development was as follows:

(In millions)	Research and Development Expenses		
	2018	2017	2016
Harsco Metals & Minerals	\$ 1.6	\$ 1.3	\$ 0.9
Harsco Industrial	1.6	1.5	1.5
Harsco Rail	2.3	1.4	1.9
Total research and development expenses	<u>\$ 5.5</u>	<u>\$ 4.2</u>	<u>\$ 4.3</u>

The amounts shown exclude technology development and engineering costs classified in cost of services sold; cost of products sold; or selling, general and administrative expenses.

Recently Adopted and Recently Issued Accounting Standards

Information on recently adopted and recently issued accounting standards is included in Note 2, Recently Adopted and Recently Issued Accounting Standards, in Part II, Item 8, "Financial Statements and Supplementary Data."

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

See Part I, Item 1A, "Risk Factors," for quantitative and qualitative disclosures about market risk.

Item 8. Financial Statements and Supplementary Data.

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Management's Report on Internal Control Over Financial Reporting

Management of Harsco Corporation, together with its consolidated subsidiaries (the "Company"), is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Securities Exchange Act Rule 13a-15(f) or 15d-15(e). The Company's internal control over financial reporting is a process designed under the supervision of the Company's principal executive and principal financial officers to provide reasonable assurance regarding the reliability of financial reporting and the preparation of the Company's consolidated financial statements for external reporting purposes in accordance with accounting principles generally accepted in the United States of America.

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

- Pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect transactions and dispositions of assets of the Company;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of consolidated financial statements in accordance with accounting principles generally accepted in the United States of America, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and the directors of the Company; and
- Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Company's assets that could have a material effect on the Company's consolidated financial statements.

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

Management has assessed the effectiveness of its internal control over financial reporting at December 31, 2018 based on the framework established in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Based on this assessment, management has determined that the Company's internal control over financial reporting was effective at December 31, 2018.

The effectiveness of the Company's internal control over financial reporting at December 31, 2018 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report appearing in this Annual Report on Form 10-K, which expresses an unqualified opinion on the effectiveness of the Company's internal control over financial reporting at December 31, 2018.

/s/ F. NICHOLAS GRASBERGER III

F. Nicholas Grasberger III
Chairman, President and Chief Executive Officer
February 21, 2019

/s/ PETER F. MINAN

Peter F. Minan
Senior Vice President and Chief Financial Officer
February 21, 2019

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors of Harsco Corporation

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Harsco Corporation and its subsidiaries (the “Company”) as of December 31, 2018 and 2017 and the related consolidated statements of operations, comprehensive income (loss), changes in equity, and cash flows for each of the three years in the period ended December 31, 2018, including the related notes and financial statement schedule 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, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2018 and 2017, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2018 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2018, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the COSO.

Change in Accounting Principles

As discussed in Note 2 to the consolidated financial statements, the Company changed the manner in which it accounts for revenue from contracts with customers in 2018.

Basis for Opinions

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

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

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

Definition and Limitations of Internal Control over Financial Reporting

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

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

/s/ PricewaterhouseCoopers LLP

Philadelphia, Pennsylvania

February 21, 2019

We have served as the Company's auditor since at least 1933. We have not determined the specific year we began serving as the auditor of the Company.

**HARSCO CORPORATION
CONSOLIDATED BALANCE SHEETS**

(In thousands, except share amounts)	December 31 2018	December 31 2017
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 64,260	\$ 62,098
Restricted cash	2,886	4,111
Trade accounts receivable, net	291,213	288,034
Other receivables	54,182	20,224
Inventories	133,111	178,293
Current portion of contract assets	24,254	—
Other current assets	35,128	39,332
Total current assets	605,034	592,092
Property, plant and equipment, net	469,900	479,747
Goodwill	411,552	401,758
Intangible assets, net	79,825	38,251
Deferred income tax assets	49,114	51,574
Other assets	17,442	15,263
Total assets	\$ 1,632,867	\$ 1,578,685
LIABILITIES		
Current liabilities:		
Short-term borrowings	\$ 10,078	\$ 8,621
Current maturities of long-term debt	6,489	11,208
Accounts payable	149,410	126,249
Accrued compensation	57,586	60,451
Income taxes payable	2,634	5,106
Insurance liabilities	40,774	11,167
Current portion of advances on contracts	31,317	117,958
Other current liabilities	118,708	133,368
Total current liabilities	416,996	474,128
Long-term debt	585,662	566,794
Insurance liabilities	19,575	22,385
Retirement plan liabilities	213,578	259,367
Advances on contracts	37,675	—
Other liabilities	46,005	40,846
Total liabilities	1,319,491	1,363,520
COMMITMENTS AND CONTINGENCIES		
HARSCO CORPORATION STOCKHOLDERS' EQUITY		
Preferred stock, Series A junior participating cumulative preferred stock	—	—
Common stock, par value \$1.25 (issued 113,473,951 and 112,888,126 shares at December 31, 2018 and 2017, respectively)	141,842	141,110
Additional paid-in capital	190,597	180,201
Accumulated other comprehensive loss	(567,107)	(546,582)
Retained earnings	1,298,752	1,157,801
Treasury stock, at cost (33,928,928 and 32,434,274 shares at December 31, 2018 and 2017, respectively)	(795,821)	(762,079)
Total Harsco Corporation stockholders' equity	268,263	170,451
Noncontrolling interests	45,113	44,714
Total equity	313,376	215,165
Total liabilities and equity	\$ 1,632,867	\$ 1,578,685

See accompanying notes to consolidated financial statements.

HARSCO CORPORATION
CONSOLIDATED STATEMENTS OF OPERATIONS

(In thousands, except per share amounts)	Years ended December 31		
	2018	2017	2016
Revenues from continuing operations:			
Service revenues	\$ 1,007,239	\$ 981,672	\$ 939,129
Product revenues	715,141	625,390	512,094
Total revenues	1,722,380	1,607,062	1,451,223
Costs and expenses from continuing operations:			
Cost of services sold	780,930	770,268	762,431
Cost of products sold	507,807	452,740	410,138
Selling, general and administrative expenses	238,690	229,792	196,871
Research and development expenses	5,548	4,227	4,280
Other (income) expenses, net	(1,522)	4,641	12,620
Total costs and expenses	1,531,453	1,461,668	1,386,340
Operating income from continuing operations	190,927	145,394	64,883
Interest income	2,155	2,469	2,475
Interest expense	(38,148)	(47,552)	(51,584)
Defined benefit pension income (expense)	3,447	(2,595)	(1,414)
Loss on early extinguishment of debt	(1,127)	(2,265)	(35,337)
Change in fair value to the unit adjustment liability and loss on dilution and sale of equity method investment	—	—	(58,494)
Income (loss) from continuing operations before income taxes and equity income	157,254	95,451	(79,471)
Income tax expense	(12,899)	(83,803)	(6,637)
Equity in income of unconsolidated entities, net	384	—	5,686
Income (loss) from continuing operations	144,739	11,648	(80,422)
Discontinued operations:			
Income on disposal of discontinued business	358	306	1,061
Income tax expense related to discontinued business	(84)	(110)	(392)
Income from discontinued operations	274	196	669
Net income (loss)	145,013	11,844	(79,753)
Less: Net income attributable to noncontrolling interests	(7,956)	(4,022)	(5,914)
Net income (loss) attributable to Harsco Corporation	\$ 137,057	\$ 7,822	\$ (85,667)
Amounts attributable to Harsco Corporation common stockholders:			
Income (loss) from continuing operations, net of tax	\$ 136,783	\$ 7,626	\$ (86,336)
Income from discontinued operations, net of tax	274	196	669
Net income (loss) attributable to Harsco Corporation common stockholders	\$ 137,057	\$ 7,822	\$ (85,667)
Weighted average shares of common stock outstanding	80,716	80,553	80,333
Basic earnings (loss) per share attributable to Harsco Corporation common stockholders:			
Continuing operations	\$ 1.69	\$ 0.09	\$ (1.07)
Discontinued operations	—	—	0.01
Basic earnings (loss) per share attributable to Harsco Corporation common stockholders	\$ 1.70 (a)	\$ 0.10 (a)	\$ (1.07) (a)
Diluted weighted average shares of common stock outstanding	83,595	82,840	80,333
Diluted earnings (loss) per share attributable to Harsco Corporation common stockholders:			
Continuing operations	\$ 1.64	\$ 0.09	\$ (1.07)
Discontinued operations	—	—	0.01
Diluted earnings (loss) per share attributable to Harsco Corporation common stockholders	\$ 1.64	\$ 0.09	\$ (1.07) (a)

(a) Does not total due to rounding.

See accompanying notes to consolidated financial statements.

HARSCO CORPORATION
CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME (LOSS)

(In thousands)	Years ended December 31		
	2018	2017	2016
Net income (loss)	\$ 145,013	\$ 11,844	\$ (79,753)
Other comprehensive income (loss):			
Foreign currency translation adjustments, net of deferred income taxes of \$(2,167), \$3,471 and \$(13,670) in 2018, 2017 and 2016, respectively	(50,743)	36,011	(21,560)
Net gain (loss) on cash flow hedging instruments, net of deferred income taxes of \$(1,130), \$(759) and \$(544) in 2018, 2017 and 2016, respectively	2,101	1,897	(682)
Pension liability adjustments, net of deferred income taxes of \$854, \$(4,084) and \$34 in 2018, 2017 and 2016, respectively	27,185	25,254	(71,398)
Unrealized gain (loss) on marketable securities, net of deferred income taxes of \$16, \$(12) and \$(16) in 2018, 2017 and 2016, respectively	(48)	22	26
Total other comprehensive income (loss)	(21,505)	63,184	(93,614)
Total comprehensive income (loss)	123,508	75,028	(173,367)
Less: Comprehensive income attributable to noncontrolling interests	(5,454)	(7,068)	(3,334)
Comprehensive income (loss) attributable to Harsco Corporation	\$ 118,054	\$ 67,960	\$ (176,701)

See accompanying notes to consolidated financial statements.

HARSCO CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS

(In thousands)	Years ended December 31		
	2018	2017	2016
Cash flows from operating activities:			
Net income (loss)	\$ 145,013	\$ 11,844	\$ (79,753)
Adjustments to reconcile net income (loss) to net cash provided by operating activities:			
Depreciation	122,135	121,839	129,083
Amortization	10,650	8,098	12,403
Change in fair value to the unit adjustment liability and loss on dilution and sale of equity method investment	—	—	58,494
Contract estimated forward loss provision for Harsco Rail Segment	—	—	45,050
Loss on early extinguishment of debt	—	—	35,337
Deferred income tax expense (benefit)	(6,522)	57,349	(7,654)
Equity income of unconsolidated entities, net	(384)	—	(5,686)
Dividends from unconsolidated entities	88	93	16
Other, net	2,666	749	2,633
Changes in assets and liabilities, net of acquisitions and dispositions of businesses:			
Accounts receivable	(16,881)	(32,012)	16,041
Inventories	(14,706)	19,557	(12,313)
Contract assets	(3,312)	—	—
Accounts payable	18,347	12,554	(20,194)
Accrued interest payable	(154)	438	(3,197)
Accrued compensation	(1,127)	11,126	8,865
Advances on contracts and other customer advances	3,057	(16,811)	14,485
Retirement plan liabilities, net	(33,321)	(21,300)	(20,420)
Other assets and liabilities	(33,527)	3,368	(13,314)
Net cash provided by operating activities	192,022	176,892	159,876
Cash flows from investing activities:			
Purchases of property, plant and equipment	(132,168)	(98,314)	(69,340)
Purchase of businesses, net of cash acquired*	(56,389)	—	(26)
Proceeds from sales of assets	11,887	13,418	9,305
Proceeds from sale of equity investment	—	—	165,640
Net proceeds (payments) from settlement of foreign currency forward exchange contracts	15,527	(18,429)	17,238
Other investing activities, net	—	—	70
Net cash provided (used) by investing activities	(161,143)	(103,325)	122,887
Cash flows from financing activities:			
Short-term borrowings, net	1,932	5,061	(2,350)
Current maturities and long-term debt:			
Additions	128,858	27,985	720,727
Reductions	(116,988)	(108,280)	(979,567)
Cash dividends paid on common stock	—	—	(4,105)
Dividends paid to noncontrolling interests	(5,480)	(2,445)	(1,702)
Sale (purchase) of noncontrolling interests	477	(3,412)	(4,731)
Stock-based compensation - Employee taxes paid	(3,730)	(1,688)	(91)
Common stock acquired for treasury	(30,011)	—	—
Proceeds from cross-currency interest rate swap termination	—	—	16,625
Deferred pension underfunding payment to unconsolidated affiliate	—	—	(20,640)
Deferred financing costs	(596)	(42)	(16,530)
Other investing activities, net	—	(894)	—
Net cash used by financing activities	(25,538)	(83,715)	(292,364)
Effect of exchange rate changes on cash, including restricted cash	(4,404)	4,478	1,724
Net increase (decrease) in cash and cash equivalents, including restricted cash	937	(5,670)	(7,877)
Cash and cash equivalents, including restricted cash, at beginning of period	66,209	71,879	79,756
Cash and cash equivalents, including restricted cash, at end of period	\$ 67,146	\$ 66,209	\$ 71,879

HARSCO CORPORATION
CONSOLIDATED STATEMENTS OF CASH FLOWS (Continued)

(In thousands)	Years ended December 31		
	2018	2017	2016
*Purchase of businesses, net of cash acquired			
Working capital	\$ 1,295	\$ —	\$ —
Property, plant and equipment	(3,327)	—	—
Goodwill	(22,518)	—	—
Long-term debt acquired	335	—	—
Other noncurrent assets and liabilities, net	(32,174)	—	(26)
Net cash used to acquire businesses	\$ (56,389)	\$ —	\$ (26)

See accompanying notes to consolidated financial statements.

HARSCO CORPORATION
CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

(In thousands, except share and per share amounts)	Common Stock		Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Noncontrolling Interests	Total
	Issued	Treasury					
Balances, January 1, 2016	\$ 140,503	\$ (760,299)	\$ 170,699	\$ 1,236,355	\$ (515,688)	\$ 39,233	\$ 310,803
Net income (loss)				(85,667)		5,914	(79,753)
Cash dividends declared:							
Noncontrolling interests						(1,702)	(1,702)
Total other comprehensive loss, net of deferred income taxes of \$(14,196)					(91,034)	(2,580)	(93,614)
Purchase of subsidiary shares from noncontrolling interest			(5,128)			397	(4,731)
Vesting of restricted stock units and other stock grants, net 80,598 shares	122	(92)	(1,194)				(1,164)
Amortization of unearned stock-based, compensation, net of forfeitures			7,724				7,724
Balances, December 31, 2016	140,625	(760,391)	172,101	1,150,688	(606,722)	41,262	137,563
Adoption of new accounting standard (See Note 2)			1,106	(709)			397
Net income				7,822		4,022	11,844
Cash dividends declared:							
Noncontrolling interests						(2,445)	(2,445)
Total other comprehensive income, net of deferred income taxes of \$(1,384)					60,140	3,044	63,184
Purchase of subsidiary shares from noncontrolling interest			(2,242)			(1,194)	(3,436)
Sale of investment in consolidated subsidiary						25	25
Stock appreciation rights exercise, net 8,965 shares	16	(63)	(16)				(63)
Vesting of restricted stock units and other stock grants, net 269,924 shares	469	(1,625)	(469)				(1,625)
Amortization of unearned stock-based compensation, net of forfeitures			9,721				9,721
Balances, December 31, 2017	141,110	(762,079)	180,201	1,157,801	(546,582)	44,714	215,165
Adoption of new accounting standard (See Note 2)				3,894	(1,520)		2,374
Net income				137,057		7,956	145,013
Cash dividends declared:							
Noncontrolling interests						(5,534)	(5,534)
Total other comprehensive loss, net of deferred income taxes of \$(2,427)					(19,005)	(2,500)	(21,505)
Purchase of subsidiary shares from noncontrolling interest						477	477
Stock appreciation rights exercised, net 28,109 shares	50	(282)	(50)				(282)
Vesting of restricted stock units and other stock grants, net 384,134 shares	682	(3,449)	(682)				(3,449)
Treasury shares repurchased, 1,321,072 shares		(30,011)					(30,011)
Amortization of unearned stock-based compensation, net of forfeitures			11,128				11,128
Balances, December 31, 2018	<u>\$ 141,842</u>	<u>\$ (795,821)</u>	<u>\$ 190,597</u>	<u>\$ 1,298,752</u>	<u>\$ (567,107)</u>	<u>\$ 45,113</u>	<u>\$ 313,376</u>

See accompanying notes to consolidated financial statements.

HARSCO CORPORATION

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. Summary of Significant Accounting Policies

Consolidation

The consolidated financial statements include all accounts of Harsco Corporation (the "Company"), all entities in which the Company has a controlling voting interest and variable interest entities required to be consolidated in accordance with generally accepted accounting principles in the U.S. ("U.S. GAAP"). Intercompany accounts and transactions have been eliminated among consolidated entities. The Company's management has evaluated all activity of the Company and concluded that subsequent events are properly reflected in the Company's consolidated financial statements and notes as required by U.S. GAAP.

Reclassifications

Certain reclassifications have been made to prior year amounts to conform with current year classifications.

Cash and Cash Equivalents

Cash and cash equivalents include cash on hand, demand deposits and short-term investments that are highly liquid in nature and have an original maturity of three months or less.

Restricted Cash

The Company had restricted cash of \$2.9 million and \$4.1 million at December 31, 2018 and December 31, 2017, respectively, and the restrictions are primarily related to collateral provided for certain guarantees of the Company's performance.

Inventories

Inventories in the U.S. are principally accounted for using the last-in, first-out ("LIFO") method and are stated at the lower of cost or net realizable value. The Company's remaining inventories are accounted for using the first-in, first-out ("FIFO") or average cost methods and are stated at the lower of cost or net realizable value. See Note 4, Accounts Receivable and Inventories, for additional information.

Depreciation

Property, plant and equipment is recorded at cost and depreciated over the estimated useful lives of the assets using, principally, the straight-line method. When property, plant and equipment is retired from service, the cost of the retirement is charged to the allowance for depreciation to the extent of the accumulated depreciation and the balance is charged to income. Long-lived assets to be disposed of by sale are not depreciated while they are classified as held-for-sale.

Leases

The Company leases certain property and equipment under noncancelable lease agreements. All lease agreements are evaluated and classified as either an operating or capital lease in accordance with U.S. GAAP. A lease is classified as a capital lease if any of the following criteria are met: transfer of ownership to the Company by the end of the lease term; the lease contains a bargain purchase option; the lease term is equal to or greater than 75% of the asset's economic life; or the present value of future minimum lease payments is equal to or greater than 90% of the asset's fair market value. Operating lease expense is recognized ratably over the lease term, including rent abatement periods and rent holidays. See Note 2, Recently Adopted and Recently Issued Accounting Standards; Note 6, Property, Plant and Equipment; Note 8, Debt and Credit Agreements; and Note 9, Operating Leases, for additional information on leases.

Goodwill and Other Intangible Assets

In accordance with U.S. GAAP, goodwill is not amortized and is tested for impairment annually, or more frequently, if indicators of impairment exist, or if a decision is made to dispose of a business. Goodwill is allocated among and evaluated for impairment at the reporting unit level, which is defined as an operating segment or one level below for which discrete financial information is available. A significant amount of judgment is involved in determining if an indicator of impairment has occurred. Such indicators may include declining cash flows or operating losses at the reporting unit level, a significant adverse change in legal factors or business climate, an adverse action or assessment by a regulator, unanticipated competition, a loss of key personnel, or a more likely than not expectation that a reporting unit or a significant portion of a reporting unit will be sold or otherwise disposed of, among others.

The Company performs the annual goodwill impairment test as of October 1. The Company has five reporting units, only three of which have goodwill associated with them as of December 31, 2018. Almost all of the Company's goodwill is included in the Harsco Metals & Minerals Segment.

The evaluation of potential goodwill impairment involves comparing the current fair value of each reporting unit to the net book value, including goodwill. The Company uses a discounted cash flow model ("DCF model") to estimate the current fair value of reporting units, as management believes forecasted operating cash flows are the best indicator of current fair value. A number of significant assumptions and estimates are involved in the preparation of DCF models including future revenues and operating margin growth, the weighted-average cost of capital ("WACC"), tax rates, capital spending, pension funding, the impact of business initiatives and working capital projections. These assumptions and estimates may vary significantly among reporting units. DCF models are based on approved long-range plans for the early years and historical relationships and projections for later years. WACC rates are derived from internal and external factors including, but not limited to, the average market price of the Company's stock, shares outstanding, book value of the Company's debt, the long-term risk-free interest rate, and both market and size-specific risk premiums. Due to the many variables noted above and the relative size of the Company's goodwill, differences in assumptions may have a material impact on the results of the Company's annual goodwill impairment testing. If the net book value of a reporting unit were to exceed the current fair value, the second step of the goodwill impairment test would currently be required to determine if an impairment existed and the amount of goodwill impairment to record, if any. The second step of the goodwill impairment test compares the net book value of a reporting unit's goodwill with the implied fair value of that goodwill. The implied fair value of goodwill represents the excess of fair value of the reporting unit over the fair value amounts assigned to all of the assets and liabilities of the reporting unit if it were to be acquired in a hypothetical business combination and the current fair value of the reporting unit represented the purchase price. As necessary, the Company may use valuation experts to assist with the second step of the goodwill impairment test. See Note 7, Goodwill and Other Intangible Assets, for additional information.

Long-Lived Assets Impairments (Other than Goodwill)

Long-lived assets (or asset groups) are reviewed for impairment when events and circumstances indicate that the carrying amount of an asset (or asset group) may not be recoverable. Long-lived assets (or asset groups) are reviewed for impairment when events and circumstances indicate the book value of an asset (or asset group) may be impaired. The Company's policy is to determine if an impairment loss exists when it is determined that the carrying amount of the asset (or asset group) exceeds the sum of the expected undiscounted future cash flows resulting from use of the asset (or asset group) and its eventual disposition. Impairment losses are measured as the amount by which the carrying amount of the asset (or asset group) exceeds its fair value, normally as determined in either open market transactions or through the use of a DCF model. Long-lived assets (or asset groups) to be disposed of are reported at the lower of the carrying amount or fair value less cost to sell. See Note 18, Other (Income) Expenses, Net for additional information.

Deferred Financing Costs

The Company has incurred debt issuance costs which are recognized as a reduction of Long-term debt on the Consolidated Balance Sheets. Debt issuance costs are amortized and recognized as interest expense over the contractual term of the related indebtedness or shorter period if appropriate based upon contractual terms. Whenever indebtedness is modified from its original terms, an evaluation is made whether an accounting modification or extinguishment has occurred in order to determine the accounting treatment for debt issuance costs related to the debt modification.

Revenue Recognition

The Company recognizes revenues to depict the transfer of promised services and products to customers in an amount that reflects the consideration the Company expects to receive in exchange for those services or products. Service revenues include the service components of the Harsco Metals & Minerals and Harsco Rail Segments. Product revenues include the Harsco Industrial Segment and the product revenues of the Harsco Metals & Minerals and Harsco Rail Segments.

Harsco Metals & Minerals - This Segment provides on-site services, under long-term contracts, for material logistics; product quality improvement and resource recovery from iron, steel and metals manufacturing; manufactures and sells industrial abrasives and roofing granule products; and manufactures aluminum dross and scrap processing systems.

- Service revenues are recognized over time as the customer simultaneously receives the benefits provided by the Company's performance. The Company utilizes an output method based on work performed (liquid steel tons processed, weight of material handled, etc.) to measure progress, which is deemed to best depict the transfer of value to the customer and revenue earned by the Company. Transaction prices are based on contractual terms, which may include both fixed and variable portions. The fixed portion is recognized as earned (normally monthly) over the contractual period. The variable portion is recognized as services are performed and differs based on the volume of

services performed. Given the long-term nature of these arrangements, most contracts permit periodic adjustment of either the variable or both the fixed and variable portions based on the changes in macroeconomic indicators, including changes in commodity prices. Transaction prices, when the standalone selling price is not directly observable, are allocated to performance obligations utilizing an expected cost plus a margin approach. Amounts are typically billed and payable on a monthly basis as services are performed.

- Product revenues in the applied products business are recognized at the point when control transfers to the customer. Control generally transfers at the point of shipment for domestic orders and in accordance with the international commercial terms included in contracts for export sales. Transaction prices are based on contractual terms, which are generally fixed and when the standalone selling price is not directly observable, allocated to performance obligations utilizing an adjusted market assessment approach. Amounts are billed and payable upon completion of each transaction.
- Product revenues in the aluminum dross and scrap process systems business are generally recognized over time as control is transferred to the customer. Control transfers over time because aluminum dross and scrap systems are customized, have no alternate use and the Company has an enforceable right to payment. The Company utilizes an input method based on costs incurred ("cost-to-cost method") to measure progress, which is deemed to best depict the transfer of value to the customer and revenue earned by the Company. Transaction prices are based on contractual terms, which are generally fixed, and when the standalone selling price is not directly observable, allocated to performance obligations utilizing an adjusted market assessment approach. The Company may receive periodic payments associated with key milestones with any remaining consideration billed and payable upon completion of the transaction.

Harsco Industrial - This Segment sells air-cooled heat exchangers, metal bar grating configurations and energy-efficient heat transfer products.

- For air-cooled heat exchangers, revenue is recognized over time as control is transferred to the customer. Control transfers over time because the air-cooled heat exchangers are customized, have no alternate use and the Company has an enforceable right to payment. The Company utilizes a cost-to-cost method to measure progress, which is deemed to best depict the transfer of value to the customer and revenue earned by the Company. Transaction prices are based on contractual terms, which are generally fixed, and when the standalone selling price is not directly observable, allocated to performance obligations utilizing an adjusted market assessment approach. The Company may receive periodic payments associated with key milestones with any remaining consideration billed and payable upon completion of the transaction.
- For metal bar grating configurations and energy-efficient heat transfer products, revenue is recognized at the point when control transfers to the customer. Control generally transfers at the point of shipment for domestic orders and in accordance with the international commercial terms included in contracts for export sales. Transaction prices are based on contractual terms, which are generally fixed, and when the standalone selling price is not directly observable, allocated to performance obligations utilizing an adjusted market assessment approach. Amounts are billed and payable upon completion of each transaction though advance payments are required in limited circumstances.

Harsco Rail - This Segment sells railway track maintenance equipment, after-market parts and provides railway track maintenance services.

- For the majority of railway track maintenance equipment sales, revenue is recognized at the point when control transfers to the customer. Control generally transfers at the point of shipment for domestic orders and in accordance with the international commercial terms included in contracts for export sales. In certain railway track maintenance equipment sales, revenue is recognized over time because such equipment is highly customized, has no alternate use and the Company has an enforceable right to payment. In such instances, the Company utilizes a cost-to-cost method to measure progress, which is deemed to best depict the transfer of value to the customer and revenue earned by the Company. Transaction prices are based on contracted terms, which are generally fixed, and when the standalone selling price is not directly observable, allocated to performance obligations utilizing either the adjusted market assessment or expected cost plus a margin approach. For certain transactions, the Company receives periodic payments associated with key milestones. In limited instances, those payments are intended to provide financing with such transactions being treated as including a significant financing component. Any remaining consideration is billed and payable upon completion of the transaction.
- For after-market parts sales, revenue is recognized at the point when control transfers to the customer. Control generally transfer to the customer at the point of shipment for domestic orders and in accordance with the international commercial terms included in contracts for export sales. Transaction prices are based on contracted terms, which are

generally fixed, and when the standalone selling price is not directly observable, allocated to performance obligations utilizing an adjusted market assessment approach. Amounts are billed and payable upon completion of each contract.

- For railway track maintenance services, revenue is recognized over time as the customer simultaneously receives the benefits provided by the Company's performance. The Company utilizes an appropriate output method based on work performed (feet, miles, shifts worked, etc.) to measure progress, which is deemed to best depict the transfer of value to the customer and revenue earned by the Company. Transaction prices are based on contracted terms, which are generally variable. The variable portion is recognized as services are performed and differs based on the value of services. Given the long-term nature of these arrangements, most contracts permit periodic adjustment based on the changes in macroeconomic indicators. Transaction prices, when the standalone selling price is not directly observable, are allocated to performance obligations utilizing an expected cost plus a margin approach. Amounts are typically billed and payable on a monthly basis as services are performed.

Income Taxes

The Company accounts for income taxes under the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of the events that have been included in the consolidated financial statements. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial statements and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income in the period that includes the enactment date.

The Company records deferred tax assets to the extent that the Company believes that these assets will more likely than not be realized. In making such determinations, the Company considers all available positive and negative evidence, including future reversals of existing deferred tax liabilities, projected future taxable income, tax planning strategies and recent financial results. In the event the Company was to determine that it would be able to realize deferred income tax assets in the future in excess of their net recorded amount, an adjustment to the valuation allowance would be made that would reduce the provision for income taxes.

The Company prepares and files tax returns based on interpretation of tax laws and regulations and records its provision for income taxes based on these interpretations. Uncertainties may exist in estimating the Company's tax provisions and in filing tax returns in the many jurisdictions in which the Company operates, and as a result these interpretations may give rise to an uncertain tax position. The tax benefit from an uncertain tax position is recognized when it is more likely than not that the position will be sustained upon examination, including resolutions of any related appeals or litigation processes, based on its technical merits. Each subsequent period the Company determines if existing or new uncertain tax positions meet a more likely than not recognition threshold and adjust accordingly.

The Company recognizes interest and penalties related to unrecognized tax benefits within Income tax expense in the accompanying Consolidated Statements of Operations. Accrued interest and penalties are included in Other liabilities on the Consolidated Balance Sheets.

The significant assumptions and estimates described in the preceding paragraphs are important contributors to the effective tax rate each year.

See Note 11, Income Taxes, for additional information.

Accrued Insurance and Loss Reserves

The Company retains a significant portion of the risk for U.S. workers' compensation, U.K. employers' liability, automobile, general and product liability losses. During 2018, 2017 and 2016, the Company recorded insurance expense from continuing operations related to these lines of coverage of \$14.3 million, \$16.4 million and \$15.0 million, respectively. Reserves have been recorded that reflect the undiscounted estimated liabilities including claims incurred but not reported. When a recognized liability is covered by third-party insurance, the Company records an insurance claim receivable to reflect the covered liability. Changes in the estimates of the reserves are included in net income (loss) in the period determined. During 2018, 2017 and 2016, the Company recorded retrospective insurance reserve adjustments that decreased pre-tax insurance expense from continuing operations for self-insured programs by \$2.7 million, \$2.6 million and \$5.4 million, respectively. At

December 31, 2018 and 2017, the Company has recorded liabilities of \$60.3 million and \$33.6 million, respectively, related to both asserted as well as unasserted insurance claims. Included in the balances at December 31, 2018 and 2017 were \$34.2 million and \$4.1 million, respectively, of recognized liabilities covered by insurance carriers. Amounts estimated to be paid within one year have been included in current caption, Insurance liabilities, with the remainder included in non-current caption, Insurance liabilities, on the Consolidated Balance Sheets.

Warranties

The Company has recorded product warranty reserves of \$5.7 million, \$6.0 million and \$6.3 million at December 31, 2018, 2017 and 2016, respectively. The Company provides for warranties of certain products as they are sold. The following table summarizes the warranty activity for 2018, 2017 and 2016:

(In thousands)	2018	2017	2016
Warranty reserves, beginning of the year	\$ 5,956	\$ 6,281	\$ 7,844
Accruals for warranties issued during the year	4,596	5,528	6,439
Reductions related to pre-existing warranties	(3,730)	(3,792)	(5,611)
Acquisitions (See Note 3)	249	—	—
Warranties paid	(1,293)	(2,078)	(2,372)
Other (principally foreign currency translation)	(67)	17	(19)
Warranty reserves, end of the year	<u>\$ 5,711</u>	<u>\$ 5,956</u>	<u>\$ 6,281</u>

Warranty expense and payments are incurred principally in the Harsco Industrial and Harsco Rail Segments. Warranty activity may vary from year to year depending upon the mix of revenues and contractual terms related to product warranties.

Foreign Currency Translation

The financial statements of the Company's subsidiaries outside the U.S., except for those subsidiaries located in highly inflationary economies and those entities for which the U.S. dollar is the currency of the primary economic environment in which the entity operates, are measured using the local currency as the functional currency. Assets and liabilities of these subsidiaries are translated at the exchange rates at the balance sheet date. Resulting translation adjustments are recorded in the cumulative translation adjustment account, a separate component of Accumulated other comprehensive loss on the Consolidated Balance Sheets. Income and expense items are translated at average monthly exchange rates. Gains and losses from foreign currency transactions are included in Operating income from continuing operations. For subsidiaries operating in highly inflationary economies, and those entities for which the U.S. dollar is the currency of the primary economic environment in which the entity operates, gains and losses on foreign currency transactions and balance sheet translation adjustments are included in Operating income from continuing operations.

Financial Instruments and Hedging

The Company has operations throughout the world that are exposed to fluctuations in related foreign currencies in the normal course of business. The Company seeks to reduce exposure to foreign currency fluctuations through the use of forward exchange contracts. The Company does not hold or issue financial instruments for trading purposes and it is the Company's policy to prohibit the use of derivatives for speculative purposes. The Company has a Foreign Currency Risk Management Committee that meets periodically to monitor foreign currency risks.

The Company executes foreign currency exchange forward contracts to hedge transactions for firm purchase commitments, to hedge variable cash flows of forecasted transactions and for export sales denominated in foreign currencies. These contracts are generally for 90 days or less; however, where appropriate, longer-term contracts may be utilized. For those contracts that are designated as qualified cash flow hedges, gains or losses are recorded in Accumulated other comprehensive loss on the Consolidated Balance Sheets.

The Company uses interest rate swaps in conjunction with certain debt issuances in order to secure a fixed interest rate. The interest rate swaps are recorded on the Consolidated Balance Sheets at fair value, with changes in value attributed to the effect of the swaps' interest spread and changes in the credit worthiness of the counter-parties recorded in Accumulated other comprehensive loss.

Amounts recorded in Accumulated other comprehensive loss on the Consolidated Balance Sheets are reclassified into operations in the same period or periods during which the hedged forecasted transaction affects income. The cash flows from these contracts are classified consistent with the cash flows from the transaction being hedged (e.g., the cash flows related to contracts to hedge the purchase of fixed assets are included in cash flows from investing activities, etc.). The Company also enters into certain forward exchange contracts that are not designated as hedges. Gains and losses on these contracts are recognized in operations based on changes in fair market value. For fair value hedges of a firm commitment, the gain or loss on the derivative and the offsetting gain or loss on the hedged firm commitment are recognized currently in operations.

See Note 15, Financial Instruments, for additional information.

Earnings Per Share

Basic earnings per share are calculated using the weighted-average shares of common stock outstanding, while diluted earnings per share reflect the dilutive effects of stock-based compensation. Dilutive securities are not included in the computation of loss per share when the Company reports a net loss from continuing operations as the impact would be anti-dilutive. All share and per share amounts are restated for any stock splits and stock dividends that occur prior to the issuance of the financial statements.

See Note 13, Capital Stock, for additional information.

Use of Estimates in the Preparation of Financial Statements

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses. Actual results could differ from those estimates.

2. Recently Adopted and Recently Issued Accounting Standards

The following accounting standards have been adopted in 2018:

On January 1, 2018, the Company adopted changes, with subsequent amendments, issued by the Financial Accounting Standards Board ("FASB") related to the recognition of revenue from contracts with customers. The changes clarify the principles for recognizing revenue and develop a common revenue standard. The core principle of the changes is that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The adoption of these changes resulted in the following modifications to the Company's revenue recognition process:

- *Harsco Industrial Segment* - The timing of revenue recognition for air-cooled heat exchanger sales, which the Company historically recognized upon the completion of the efforts associated with these arrangements, is now recognized over time with the impact of increasing revenue in earlier periods. This change also impacted the Company's Consolidated Balance Sheets by decreasing both Inventories and Advances on contracts; and creating a new caption and establishing a balance related to Contract assets.
- *Harsco Rail Segment* - The timing of revenue recognition for certain railway track maintenance equipment sales, which the Company historically recognized upon the completion of the efforts associated with these arrangements, is now recognized over time with the impact of increasing revenue in earlier periods. This change also impacted the Company's Consolidated Balance Sheets by decreasing both Inventories and Advances on contracts; and creating a new caption and establishing a balance related to Contract assets. In addition, certain advance payments received from customers, which provide a significant benefit of financing and are expected to be outstanding longer than twelve months, are treated as significant financing components to the related transactions and the Company will increase the overall transaction price with a corresponding increase in interest expense.

Additionally, the Company's disclosure related to revenue recognition has been expanded in accordance with the FASB changes. See Note 17, Revenue Recognition for additional information.

The Company chose to implement the impact of the FASB changes utilizing the modified retrospective transition method, using the following practical expedients:

- The Company has elected to apply the changes only to revenue arrangements that were not completed as of January 1, 2018; and
- The Company has elected to reflect the aggregate effect of all contract modifications that occurred prior to the beginning of the earliest reported period when (i) identifying the satisfied and unsatisfied performance obligations; (ii) determining the transaction price; and (iii) allocating the transaction price to the satisfied and unsatisfied performance obligations.

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Comparative information has not been restated and continues to be reported under U.S. GAAP in effect for those periods. The cumulative effect of the changes made to the Consolidated Balance Sheet at January 1, 2018 was as follows:

(In thousands)	Balance at December 31, 2017	Impact of Adoption	Balance at January 1, 2018
ASSETS			
Current assets:			
Trade accounts receivable, net	\$ 288,034	\$ 532	\$ 288,566
Inventories	178,293	(59,793)	118,500
Current portion of contract assets	—	18,248	18,248
Other current assets	39,332	179	39,511
Total current assets	592,092	(40,834)	551,258
Contract assets	—	3,566	3,566
Other assets	15,263	1,337	16,600
Total assets	1,578,685	(35,931)	1,542,754
LIABILITIES			
Current liabilities:			
Current portion of advances on contracts	117,958	(78,507)	39,451
Other current liabilities	133,368	13,995	147,363
Total current liabilities	474,128	(64,512)	409,616
Advances on contracts	—	24,564	24,564
Other liabilities	40,846	1,580	42,426
Total liabilities	1,363,520	(38,368)	1,325,152
HARSCO CORPORATION STOCKHOLDERS' EQUITY			
Accumulated other comprehensive loss	(546,582)	(1,520)	(548,102)
Retained earnings	1,157,801	3,957	1,161,758
Total Harsco Corporation stockholders' equity	170,451	2,437	172,888
Total equity	215,165	2,437	217,602
Total liabilities and equity	1,578,685	(35,931)	1,542,754

The impact of modifying the Company's Consolidated Balance Sheet at December 31, 2018 is as follows:

(In thousands)	December 31, 2018		
	As Reported	Impact of Adoption	As Reported - Less Impact of Adoption
ASSETS			
Current assets:			
Trade accounts receivable, net	\$ 291,213	\$ 12,767	\$ 303,980
Inventories	133,111	44,510	177,621
Current portion of contract assets	24,254	(24,254)	—
Other current assets	35,128	(620)	34,508
Total current assets	605,034	32,403	637,437
Deferred income tax assets	49,114	2,401	51,515
Other assets	17,442	(1,681)	15,761
Total assets	1,632,867	33,123	1,665,990

(In thousands)	December 31, 2018		
	As Reported	Impact of Adoption	As Reported - Less Impact of Adoption
LIABILITIES			
Current liabilities:			
Current portion of advances on contracts	31,317	86,011	117,328
Other current liabilities	118,708	(9,449)	109,259
Total current liabilities	416,996	76,562	493,558
Advances on contracts	37,675	(37,675)	—
Other liabilities	46,005	(253)	45,752
Total liabilities	1,319,491	38,634	1,358,125
HARSCO CORPORATION STOCKHOLDERS' EQUITY			
Accumulated other comprehensive loss	(567,107)	1,104	(566,003)
Retained earnings	1,298,752	(6,636)	1,292,116
Total Harsco Corporation stockholders' equity	268,263	(5,532)	262,731
Noncontrolling interests	45,113	21	45,134
Total equity	313,376	(5,511)	307,865
Total liabilities and equity	1,632,867	33,123	1,665,990

The impact of modifying the Company's Consolidated Statements of Operation for the twelve months ended December 31, 2018 is as follows:

(In thousands, except per share amounts)	Twelve Months Ended December 31, 2018		
	As Reported	Impact of Adoption	As Reported - Less Impact of Adoption
Revenues from continuing operations:			
Services revenues	\$ 1,007,239	\$ 4,921	\$ 1,012,160
Product revenues	715,141	6,084	721,225
Total revenues	1,722,380	11,005	1,733,385
Costs and expenses from continuing operations:			
Costs of services sold	780,930	5,300	786,230
Costs of products sold	507,807	11,642	519,449
Selling, general and administrative costs	238,690	117	238,807
Total costs and expenses	1,531,453	17,059	1,548,512
Operating income from continuing operations	190,927	(6,054)	184,873
Interest expense	(38,148)	1,929	(36,219)
Income from continuing operations before income taxes	157,254	(4,125)	153,129
Income tax expense	(12,899)	1,446	(11,453)
Income from continuing operations	144,739	(2,679)	142,060
Net income	145,013	(2,679)	142,334
Less: Net income attributable to noncontrolling interests	(7,956)	(21)	(7,977)
Net income attributable to Harsco Corporation	137,057	(2,700)	134,357
Amounts attributable to Harsco Corporation common stockholders:			
Income from continuing operations, net of tax	136,783	(2,700)	134,083
Net income attributable to Harsco Corporation common stockholders	137,057	(2,700)	134,357
Basic earnings per share attributable to Harsco Corporation common stockholders (a):			
Continuing operations	1.69	(0.03)	\$ 1.66
Basic earnings per share attributable to Harsco Corporation common stockholders	1.70	(0.03)	\$ 1.66
Diluted earnings per share attributable to Harsco Corporation common stockholders (a):			
Continuing operations	1.64	(0.03)	\$ 1.60
Diluted earnings per share attributable to Harsco Corporation common stockholders	1.64	(0.03)	\$ 1.61

(a) The total of As Reported and Impact of Adoption may not equal As Reported - Less Impact of Adoption due to rounding.

The impact of modifying the Company's Consolidated Statements of Cash Flows for the twelve months ended December 31, 2018 is as follows:

(In thousands)	Twelve Months Ended December 31, 2018		
	As Reported	Impact of Adoption	As Reported - Less Impact of Adoption
Cash flows from operating activities:			
Net income	\$ 145,013	\$ (2,679)	\$ 142,334
Adjustments to reconcile net income to net cash used by operating activities:			
Deferred income tax benefit	(6,522)	(1,446)	(7,968)
Changes in assets and liabilities:			
Accounts receivable	(16,881)	(13,143)	(30,024)
Inventories	(14,706)	10,330	(4,376)
Contract assets	(3,312)	3,312	—
Advances on contracts	3,057	(1,378)	1,679
Other assets and liabilities	(33,527)	5,004	(28,523)
Net cash used by operating activities	192,022	—	192,022

On January 1, 2018, the Company adopted changes issued by the FASB related to how employers that sponsor defined benefit pension plans and other postretirement plans present the net periodic pension cost ("NPPC") in the statement of operations. Employers are required to report the service cost component in the same line item or items as other compensation costs arising from services rendered by the pertinent employees during the period. Other components of NPPC are required to be presented in the statement of operations separately from the service cost component and outside of the subtotal of income from operations. The changes also allow only the service cost component to be eligible for capitalization. The adoption of these changes resulted in the Company reclassifying \$2.6 million and \$1.4 million of NPPC expense for the year ended December 31, 2017 and December 31, 2016, respectively, from the captions Cost of services sold; Cost of products sold; and Selling, general and administrative expenses to the new caption, Defined benefit pension income (expense) in the Company's Consolidated Statements of Operations.

On January 1, 2018, the Company adopted changes issued by the FASB clarifying when revisions to the terms or conditions of a share-based payment award require an entity to apply modification accounting. The changes require modification accounting only in circumstances when the terms or conditions result in changes to the fair value, vesting conditions or classification of the award as an equity instrument or a liability. The adoption of these changes did not have an impact on the Company's consolidated financial statements.

On January 1, 2018, the Company adopted changes issued by FASB which eliminate the requirement to defer the recognition of current and deferred income taxes for an intra-entity asset transfer until the asset has been sold to an outside party. Under the new guidance, an entity should recognize the income tax consequences of an intra-entity transfer of an asset other than inventory when the transfer occurs. The changes resulted in an adjustment to opening retained earnings of less than \$0.1 million.

In October 2018, the Company adopted changes issued by FASB that require entities that are customers in cloud computing arrangements to defer implementation costs if they would be capitalized by the entity in software licensing arrangements under the internal-use software guidance. The adoption of these changes did not have an impact on the Company's consolidated financial statements.

The following accounting standards have been issued and become effective for the Company at a future date:

In February 2016, the FASB issued changes, with subsequent amendments, in accounting for leases, which become effective for the Company on January 1, 2019. The changes introduce a lessee model that brings most leases onto the balance sheet, which will result in an increase in lease-related assets and liabilities. The changes also align many of the underlying principles of the new lessor model with those in the FASB's new revenue recognition standard. Furthermore, the changes address other concerns related to the current lease model such as eliminating the requirement in current guidance for an entity to use bright-line tests in determining lease classification. The changes also require lessors to increase the transparency of their exposure to changes in value of their residual assets and how they manage that exposure. The changes allow for a modified retrospective transition approach, applying the new standard to all leases existing at the date of initial application. Entities may choose to use either (1) its effective date or (2) the beginning of the earliest comparative period presented in the financial statement as the date of initial application. The Company has elected to apply the transition requirements at the January 1, 2019 effective date.

rather than at the beginning of the earliest comparative period presented, which allows for a cumulative effect adjustment in the period of adoption. Prior periods will not be restated. In addition, the Company has also elected to utilize certain practical expedients upon adoption. The Company is in the process of finalizing changes to current business processes and internal controls to support the reporting and disclosure requirements of the new standard. The Company has completed an assessment of existing leasing agreements and is in the process of finalizing the quantification of the impact on the Company's consolidated financial statements.

In June 2016, the FASB issued changes which amends the impairment model by requiring entities to use a forward-looking approach based on expected losses rather than incurred losses to estimate credit losses on certain types of financial instruments, including trade receivables. This may result in the earlier recognition of allowances for losses. The changes become effective for the Company on January 1, 2020, with early adoption permitted. Management has not yet completed the assessment of the impact of the new standard on the Company's Consolidated Financial Statements.

In January 2017, the FASB issued changes that remove the second step of the annual goodwill impairment test, which requires a hypothetical purchase price allocation. The changes provide that the amount of goodwill impairment will be equal to the amount by which a reporting unit's carrying value exceeds its fair value, not to exceed the carrying amount of goodwill. All other goodwill impairment guidance remains largely unchanged. The same one-step impairment test will be applied to goodwill at all reporting units, even those with zero or negative carrying amounts. Entities will be required to disclose the amount of goodwill at reporting units with zero or negative carrying amounts. The changes become effective for the Company on January 1, 2020. Management has determined that these changes will not have a material impact on the Company's consolidated financial statements. However, should the Company be required to record a goodwill impairment charge in future periods, the amount recorded may differ compared to any amounts that might be recorded under current practice.

In August 2017, the FASB issued changes which expand and refine hedge accounting for both financial and non-financial risk components, aligns the recognition and presentation of the effects of hedging instruments and hedged items in the financial statements and includes certain targeted improvements to ease the application of current guidance related to the assessment of hedge effectiveness. The amendments in this update should be applied to hedging relationships existing on the date of adoption, which includes a cumulative-effect adjustment to eliminate any ineffectiveness recorded to accumulated other comprehensive income or loss with a corresponding adjustment to the opening balance of retained earnings as of the beginning of the fiscal year in which adoption occurred. Presentation and disclosure amendments are required to be applied prospectively. The changes become effective for the Company on January 1, 2019. Management has determined that these changes will not have a material impact on the Company's consolidated financial statements.

In February 2018, the FASB issued changes which allow entities to reclassify stranded income tax effects resulting from the Tax Cuts and Jobs Act (the "Tax Act") from accumulated other comprehensive income to retained earnings in their consolidated financial statements. Under the Tax Act, deferred taxes were adjusted to reflect the reduction of the historical corporate income tax rate to the newly enacted corporate income tax rate, which left the tax effects on items within accumulated other comprehensive income stranded at historical tax rates. The changes become effective for the Company on January 1, 2019. The Company had approximately \$21 million of stranded income tax effects in accumulated other comprehensive income at both December 31, 2017 and 2018 resulting from the Tax Act which the Company plans to reclassify upon initial adoption of these changes.

In August 2018, the FASB issued changes which modify the disclosure requirements for fair value measurements. The amendments in this update remove the requirement to disclose the amount of, and reasons for, transfers between Level 1 and Level 2 of the fair value hierarchy; the policy for timing of transfers between levels; and the valuation processes for Level 3 fair value measurements. The changes require disclosure of changes in unrealized gains and losses for the period included in other comprehensive income (loss) for recurring Level 3 fair value measurements held at the end of the reporting period and the range and weighted average of significant unobservable inputs used to develop Level 3 fair value measurements. The changes become effective for the Company on January 1, 2020. Management is currently evaluating the impact of these changes on its consolidated financial statements.

In August 2018, the FASB issued changes which modify the disclosure requirements for employers that sponsor defined benefit pension or other post-retirement plans. The changes remove the requirements to disclose: amounts in accumulated other comprehensive income (loss) expected to be recognized as components of net periodic benefit cost over the next fiscal year; the amount and timing of plan assets expected to be returned to the employer; and the effects of a one-percentage point change in assumed health care cost trend rates. The update also requires disclosure of an explanation of the reasons for significant gains and losses related to changes in the benefit obligation for the period. The changes become effective for the Company on January 1, 2021. Management does not believe these changes will have a material impact on its consolidated financial statements.

3. Acquisition

In May 2018, the Company acquired Altek Europe Holdings Limited and its affiliated entities (collectively, "Altek"), a U.K.-based manufacturer of market leading products that enable aluminum producers and recyclers to manage and efficiently extract value from critical byproduct streams, reduce byproduct generation and improve operating productivity. The Company acquired Altek, on a debt and cash free basis, for a purchase price of £45 million (approximately \$60 million) in cash, with the potential for up to £25 million (approximately \$33 million) in additional contingent consideration through 2021 subject to the future financial performance of Altek. The preliminary purchase price included an upfront payment of \$60.1 million, subject to working capital adjustments and net of cash acquired, as well as contingent consideration with an estimated preliminary fair value of \$12.1 million as of the acquisition date. Altek's revenues and operating results have been included in the results of the Harsco Metals & Minerals Segment and were not material to the Company's consolidated results for the year ended December 31, 2018. The Company incurred approximately \$1 million of costs associated with the Altek acquisition in the caption Selling, general and administrative expenses in the Consolidated Statements of Operations.

The fair value recorded for the assets acquired and liabilities assumed for Altek is as follows:

(In millions)	Preliminary Valuation		
	June 30 2018	Measurement Period Adjustments (a)	December 31 2018
Cash and cash equivalents	\$ 1.7	\$ —	\$ 1.7
Net working capital	(1.5)	0.2	(1.3)
Property, plant and equipment	3.3	—	3.3
Intangible assets	52.5	0.2	52.7
Goodwill	20.9	1.6	22.5
Net deferred tax liabilities	(8.5)	—	(8.5)
Other liabilities	(0.3)	—	(0.3)
Total identifiable net assets of Altek	\$ 68.1	\$ 2.0	\$ 70.1

(a) The measurement period adjustments did not have a material impact on the Company's previously reported operating results.

The goodwill is attributable to strategic benefits, including enhanced operational and financial scale and product and market diversification that the Company expects to realize. The Company expects less than \$1.0 million of goodwill to be deductible for income tax purposes.

The following table details the preliminary valuation of identifiable intangible assets and amortization periods for Altek:

(Dollars in millions)	Amortization Period	Preliminary Valuation		
		June 30 2018	Measurement Period Adjustments (a)	December 31 2018
Customer related	14.2 years	\$ 11.5	\$ 0.1	\$ 11.6
Technology related	10.3 years	36.5	0.1	36.6
Trade names	15.0 years	4.5	—	4.5
Total identifiable intangible assets of Altek		\$ 52.5	\$ 0.2	\$ 52.7

(a) The measurement period adjustments did not have a material impact on the Company's previously reported operating results.

The Company valued the customer related assets, technology related assets, and trade names using an income-based approach that utilized either the multi-period excess earnings method or the relief from royalty method.

The preliminary fair value of contingent consideration was estimated using a probability simulation model, which uses assumptions and estimates to forecast a range of outcomes for the contingent consideration. Key inputs to the model include projected earnings before interest, tax, depreciation and amortization; the discount rate; the projection risk neutralization rate; and volatility, which are Level 3 data. The Company will assess these assumptions and estimates on a quarterly basis as additional data impacting the assumptions is obtained. Any changes in the fair value of contingent consideration related to updated assumptions and estimates will be recognized in the Consolidated Statements of Operations during the period in which the change occurs.

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The following table reflects the changes in the fair value of contingent consideration:

(In thousands)	Contingent Consideration
Balance, June 30, 2018	\$ 10,097
Measurement period adjustment (b)	1,958
Fair value adjustment (c)	(2,939)
Foreign currency translation (c)	(696)
Balance, December 31, 2018	\$ 8,420

(b) Measurement period adjustment was recorded to goodwill on the Consolidated Balance Sheet.

(c) These amounts are recorded in the caption Other (income) expenses, net on the Consolidated Statements of Operations.

The purchase price allocation for this transaction is not final and the fair value of intangible assets, goodwill and contingent consideration may vary from those reflected in the consolidated financial statements at December 31, 2018. Inclusion of pro forma financial information for this transaction is not necessary as the acquisition is immaterial to the Company's results of operations.

4. Accounts Receivable and Inventories

Accounts receivable consist of the following:

(In thousands)	December 31 2018	December 31 2017
Trade accounts receivable	\$ 295,847	\$ 292,765
Less: Allowance for doubtful accounts	(4,634)	(4,731)
Trade accounts receivable, net	\$ 291,213	\$ 288,034
Other receivables (a) (b)	\$ 54,182	\$ 20,224

(a) Other receivables include insurance claim receivables, employee receivables, tax claim receivables and other miscellaneous receivables not included in Trade accounts receivable, net

(b) From time to time, based on developments including ongoing negotiations, the Company adjusts insured liabilities with offsetting insurance receivables, with no impact to the Consolidated Statements of Operations.

The provision (benefit) for doubtful accounts related to trade accounts receivable was as follows:

(In thousands)	Years Ended December 31		
	2018	2017	2016
Provision (benefit) for doubtful accounts related to trade accounts receivable	\$ 372	\$ 5,346	\$ (38)

The increase in the provision for doubtful accounts for the year ended 2017 is due principally to the write-off of certain pre-administration receivable balances for one of the Company's customers in Australia.

Inventories consist of the following:

(In thousands)	December 31 2018	December 31 2017
Finished goods	\$ 17,223	\$ 26,415
Work-in-process	21,787	24,367
Contracts-in-process (c)	—	45,599
Raw materials and purchased parts	72,194	58,943
Stores and supplies	21,907	22,969
Total inventories	\$ 133,111	\$ 178,293
Valued at lower of cost or market:		
LIFO basis	\$ 80,590	\$ 80,644
FIFO basis	8,611	52,832
Average cost basis	43,910	44,817
Total inventories	\$ 133,111	\$ 178,293

Inventories valued on the LIFO basis at December 31, 2018 and 2017 were approximately \$36 million and \$33 million, respectively, less than the amounts of such inventories valued at current costs. During 2018, 2017 and 2016 as a result of reducing certain inventory quantities valued on a LIFO basis, net income (loss) was favorably impacted compared to that which would have been recorded under the FIFO basis of valuation by \$0.6 million, \$0.4 million and \$1.3 million, respectively.

Contracts-in-process consist of the following:

(In thousands)	December 31 2017
Contract costs accumulated to date	\$ 73,740
Estimated forward loss provisions for contracts-in-process (d)	(28,141)
Contracts-in-process (c)(e)	\$ 45,599

(c) The Company has adopted the new revenue recognition standard utilizing the modified retrospective transition method, including use of practical expedients. Amounts previously reported as Contracts-in-progress have been recognized through the related cumulative catch-up adjustment. See Note 2, Recently Adopted and Recently Issued Accounting Standards for additional information.

(d) For periods prior to January 1, 2018, to the extent that the estimated forward loss provision exceeds accumulated contract costs it is included in the caption Other current liabilities on the Consolidated Balance Sheets and amounted to \$3.0 million at December 31, 2017.

(e) At December 31, 2017, the Company had \$97.9 million of net customer advances related to SBB contracts. These amounts are included in the caption Current portion of advances on contracts on the Consolidated Balance Sheets.

The Company recognized an initial estimated forward loss provision related to the contracts with the federal railway system of Switzerland ("SBB") of \$45.1 million for the year ended December 31, 2016. The Company recorded an additional forward loss provision of \$1.8 million for the year ended December 31, 2018. At December 31, 2018, the entire remaining estimated forward loss provision of \$9.6 million is included in the caption Other current liabilities on the Consolidated Balance Sheets. The estimated forward loss provision represents the Company's best estimate based on currently available information. It is possible that the Company's overall estimate of costs to complete these contracts may increase, which would result in an additional estimated forward loss provision at such time.

The Company recognized \$24.2 million of revenues for the contracts with SBB, on an over time basis, utilizing a cost-to-cost method for the year ended December 31, 2018. In addition, for the years ended December 31, 2017 and 2016, the Company recognized \$42.5 million and \$0.2 million, respectively, of revenue based on the percentage-of-completion (units-of-delivery) method of accounting, whereby revenues and estimated average costs of the units to be produced under the contracts are recognized as deliveries are made or accepted. For 2016, consolidated product revenue gross margins were not significantly impacted by the revenue recognized under the SBB contracts. For 2018 and 2017, product gross margins would have been 100 basis points and 200 basis points higher, respectively, excluding the revenue recognized under the SBB contract. The Company is approximately 99% complete on the first contract and 26% complete on the second contract with SBB as of December 31, 2018.

5. Equity Method Investments

In November 2013, the Company sold the Company's Harsco Infrastructure Segment into a strategic venture with Clayton, Dubilier & Rice ("CD&R") as part of a transaction that combined the Harsco Infrastructure Segment with Brand Energy & Infrastructure Services, Inc., which CD&R simultaneously acquired (the "Infrastructure Transaction"). As a result of the Infrastructure Transaction, the Company retained an equity interest in Brand Energy & Infrastructure Service, Inc. and Subsidiaries ("Brand" or the "Infrastructure strategic venture") which was accounted for as an equity method investment in accordance with U.S. GAAP.

As part of the Infrastructure Transaction, the Company was required to make a quarterly payment to the Company's partner in the Infrastructure strategic venture, either (at the Company's election) (i) in cash, with total payments to equal approximately \$22 million per year on a pre-tax basis (approximately \$15 million per year after-tax), or (ii) in kind, through the transfer of approximately 3% of the Company's ownership interest in the Infrastructure strategic venture on an annual basis (the "unit adjustment liability"). The Company recognized the change in fair value to the unit adjustment liability each period until the Company was no longer required to make these payments or chose not to make these payments. The change in fair value to the unit adjustment liability was a non-cash expense.

In March 2016, the Company elected not to make the quarterly cash payments to the Company's partner in the Infrastructure strategic venture for the remainder of 2016. Instead, the Company transferred approximately 3% of its ownership interest in satisfaction of the Company's 2016 obligation related to the unit adjustment liability. The resulting net loss of \$10.3 million was recognized in Change in fair value to the unit adjustment liability and loss on dilution and sale of equity method investment on the Consolidated Statement of Operations. This net loss was a non-cash expense.

In September 2016, the Company entered into an Omnibus Agreement with CDR Bullseye Holdings, L.P., Bullseye G.P., LLC, Bullseye Partnership, L.P., Bullseye Holdings, L.P. and Brand Energy & Infrastructure Holdings, Inc. (the "Brand Entities"), pursuant to which the Brand Entities repurchased the Company's remaining approximate 26% interest in Brand.

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In exchange for the Company's interest, (i) the Company received \$145 million in cash, net, and (ii) the requirement for the Company to fund certain obligations to Brand through 2018 were satisfied, the present value of which equaled \$20.6 million. In addition, the Company received \$1.4 million in accrued but unpaid fees, rent and expenses from the Brand Entities. As a result of the sale, the Company's obligation to make quarterly payments related to the unit adjustment liability under the terms of a limited partnership agreement that governed the operation of the strategic venture terminated. The Company recognized a loss on the sale of its equity interest in Brand in the amount of \$43.5 million which was reflected in Change in fair value to unit adjustment liability and loss on dilution and sale of equity method investment on the Consolidated Statement of Operations.

The Company's proportionate share of Brand's net income or loss is recorded one quarter in arrears. Brand's summarized statement of operations information for the period from October 1, 2015 through June 30, 2016 is summarized as follows:

(In thousands)	Period From October 1, 2015 Through June 30 2016 (a)
Summarized Statement of Operations Information of Brand:	
Net revenues	\$ 2,333,561
Gross profit	499,005
Net income attributable to Brand Energy & Infrastructure Services, Inc. and Subsidiaries	20,756
Harsco's equity in income of Brand	5,686

(a) The Company's equity method investment in Brand was sold in September 2016; accordingly, equity income was recorded for the period from October 1, 2015 through June 30, 2016.

There was no change in fair value to the unit adjustment liability for the years ended 2018 and 2017 due to the sale of the interest in Brand. For the year ended 2016, the Company recognized \$4.7 million of change in fair value to the unit adjustment liability, exclusive of the fair value adjustment resulting from the decision not to make the quarterly payments in 2016 and the loss related to the sale of the Company's interest, in Change in fair value to the unit adjustment liability and loss on dilution and sale of equity method investment on the Consolidated Statement of Operations.

6. Property, Plant and Equipment

Property, plant and equipment consist of the following:

(In thousands)	Estimated Useful Lives	December 31 2018	December 31 2017
Land	—	\$ 10,621	\$ 10,840
Land improvements	5-20 years	16,156	14,996
Buildings and improvements (a)	5-40 years	191,072	198,582
Machinery and equipment	3-20 years	1,538,166	1,599,713
Uncompleted construction	—	37,713	24,387
Gross property, plant and equipment		1,793,728	1,848,518
Less: Accumulated depreciation		(1,323,828)	(1,368,771)
Property, plant and equipment, net		<u>\$ 469,900</u>	<u>\$ 479,747</u>

(a) Buildings and improvements include leasehold improvements that are amortized over the shorter of their useful lives or the initial term of the lease.

Included in the amounts are \$1.7 million and \$5.5 million of property, plant and equipment under capital leases at December 31, 2018 and 2017, respectively.

7. Goodwill and Other Intangible Assets

Goodwill by Segment

The following table reflects the changes in carrying amounts of goodwill by segment for the years ended December 31, 2018 and 2017:

(In thousands)	Harsco Metals & Minerals Segment	Harsco Industrial Segment	Harsco Rail Segment	Consolidated Totals
Balance at December 31, 2016	\$ 362,386	\$ 6,839	\$ 13,026	\$ 382,251
Foreign currency translation	19,507	—	—	19,507
Balance at December 31, 2017	381,893	6,839	13,026	401,758
Changes to goodwill (a)	22,518	—	—	22,518
Foreign currency translation	(12,724)	—	—	(12,724)
Balance at December 31, 2018	<u>\$ 391,687</u>	<u>\$ 6,839</u>	<u>\$ 13,026</u>	<u>\$ 411,552</u>

(a) Changes to goodwill in the Harsco Metals & Minerals Segment relate to the acquisition of Altek. The purchase price allocation is not yet final for this acquisition. See Note 3, Acquisition.

The Company's methodology for determining reporting unit fair value is described in Note 1, Summary of Significant Accounting Policies. Performance of the Company's 2018 annual impairment test did not result in impairment of any of the Company's reporting units.

Intangible Assets

Intangible assets totaled \$79.8 million, net of accumulated amortization of \$110.0 million at December 31, 2018 and \$38.3 million, net of accumulated amortization of \$163.9 million at December 31, 2017. The following table reflects these intangible assets by major category:

(In thousands)	December 31, 2018		December 31, 2017	
	Gross Carrying Amount	Accumulated Amortization	Gross Carrying Amount	Accumulated Amortization
Customer related	\$ 136,307	\$ 99,383	\$ 153,014	\$ 121,385
Patents	2,598	2,503	5,825	5,700
Technology related	35,831	2,681	26,131	26,131
Trade names	9,212	1,897	8,317	4,845
Other	5,865	3,524	8,875	5,850
Total	<u>\$ 189,813</u>	<u>\$ 109,988</u>	<u>\$ 202,162</u>	<u>\$ 163,911</u>

Amortization expense for intangible assets was \$7.7 million, \$5.1 million and \$7.9 million for 2018, 2017 and 2016, respectively. The following table shows the estimated amortization expense for the next five fiscal years based on current intangible assets.

(In thousands)	2019	2020	2021	2022	2023
Estimated amortization expense (a)	\$ 9,000	\$ 8,750	\$ 8,500	\$ 8,250	\$ 8,250

(a) These estimated amortization expense amounts do not reflect the potential effect of future foreign currency exchange rate fluctuations.

8. Debt and Credit Agreements

In November 2016, the Company entered into a senior secured credit facility (the "Senior Secured Credit Facility"), consisting of a \$400 million revolving credit facility (the "Revolving Credit Facility") and a \$550 million term loan facility (the "Term Loan Facility"). Upon closing of the Senior Secured Credit Facility, the Company amended and extended the existing Revolving Credit Facility, repaid the existing term loan A facility and redeemed, satisfied and discharged its 5.75% notes (the "Notes") in accordance with the indenture governing the Notes. As a result, a charge of \$35.3 million was recorded during the fourth quarter of 2016 consisting principally of the cost of early extinguishment of the Notes and the write-off of unamortized deferred financing costs associated with the Company's then existing financing agreements and the Notes and is reflected in the financing activities section of the Consolidated Statements of Cash Flows as a reduction of long-term debt.

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In December 2017, the Company amended its Senior Secured Credit Facility in order to, among other things, reduce the interest rate applicable to the Term Loan Facility, improve certain covenants and extend the maturity date by a year until December 2024. As a result of this amendment, a charge of \$2.3 million was recorded during the fourth quarter of 2017 consisting principally of fees associated with the transaction and the write-off of unamortized deferred financing costs and is reflected in the operating activities section of the Consolidated Statements of Cash Flows as part of Net income.

In June 2018, the Company amended the Senior Secured Credit Facility in order to, among other things, reduce the interest rate applicable to the Term Loan Facility and to increase the limit of the Revolving Credit Facility. A charge of \$1.1 million was recorded during 2018 consisting principally of fees associated with the transaction and the write-off of unamortized deferred financing costs.

Borrowings under the \$500 million Revolving Credit Facility bear interest at a rate per annum ranging from 87.5 to 200 basis points over the base rate or 187.5 to 300 basis points over the adjusted London Interbank Offered Rate ("LIBOR") as defined in the credit agreement governing the Senior Secured Credit Facility (the "Credit Agreement"). Any principal amount outstanding under the Revolving Credit Facility is due and payable on the maturity of the Revolving Credit Facility. The Revolving Credit Facility matures on November 2, 2021.

Borrowings under the Term Loan Facility bear interest at a rate per annum of 225 basis points over the adjusted LIBOR rate, subject to a 1% floor, as defined in the Credit Agreement. The Term Loan Facility requires scheduled quarterly payments, each equal to 0.25% of the original principal amount of the loans under the Term Loan Facility. These payments are reduced by the application of any prepayments and any remaining balance is due and payable on the maturity of the Term Loan Facility. The Term Loan Facility matures on December 8, 2024.

The Credit Agreement requires certain mandatory prepayments of the Term Loan Facility, subject to certain exceptions, based on net cash proceeds of certain sales or distributions of assets, as well as certain casualty and condemnation events, in some cases subject to reinvestment rights and certain other exceptions; net cash proceeds of any issuance of debt, excluded permitted debt issuances; and a percentage of excess cash flow, as defined by the Credit Agreement, during a fiscal year.

The Senior Secured Credit Facility imposes certain restrictions including, but not limited to, restrictions as to types and amounts of debt of liens that may be incurred by the Company; limitations on increases in dividend payments; limitations on repurchases of the Company's stock and limitations on certain acquisitions by the Company.

With respect to the Senior Secured Credit Facility, the obligations of the Company are guaranteed by substantially all of the Company's current and future wholly-owned domestic subsidiaries ("Guarantors"). All obligations under the Senior Credit Facility, and the guarantees of those obligations, are secured, subject to certain exceptions, by substantially all of the Company's assets and the assets of the Guarantors.

Summary of Senior Secured Credit Facility Borrowings: (In thousands)	December 31 2018	December 31 2017
By type:		
Revolving Credit Facility	\$ 62,000	\$ 41,000
Term Loan Facility	541,788	545,875
Total	<u>\$ 603,788</u>	<u>\$ 586,875</u>
By classification:		
Current	\$ 5,445	\$ 5,459
Long-term	598,343	581,416
Total	<u>\$ 603,788</u>	<u>\$ 586,875</u>

The following table illustrates the amount outstanding under the Revolving Credit Facility and available credit at December 31, 2018.

(In thousands)	December 31, 2018			
	Facility Limit	Outstanding Balance	Outstanding Letters of Credit	Available Credit
Revolving Credit Facility (a U.S.-based program)	<u>\$ 500,000</u>	<u>\$ 62,000</u>	<u>\$ 30,352</u>	<u>\$ 407,648</u>

Short-term borrowings amounted to \$10.1 million and \$8.6 million at December 31, 2018 and 2017, respectively. At December 31, 2018 and 2017, Short-term borrowings consist primarily of bank overdrafts and other third-party debt. The weighted-average interest rate for short-term borrowings at December 31, 2018 and 2017 was 3.0% and 4.3%, respectively.

Long-term debt consists of the following:

(In thousands)	December 31 2018	December 31 2017
Senior Secured Credit Facilities:		
Term Loan Facility with an interest rate of 4.8% and 4.6% at December 31, 2018 and 2017, respectively	\$ 541,788	\$ 545,875
Revolving Credit Facility with an average interest rate of 4.6% and 4.2% at December 31, 2018 and 2017, respectively	62,000	41,000
Other financing payable (including capital leases) in varying amounts due principally through 2019 with a weighted-average interest rate of 3.9% and 5.0% at December 31, 2018 and 2017, respectively	1,606	6,784
Total debt obligations	605,394	593,659
Less: deferred financing costs	(13,243)	(15,657)
Total debt obligations, net of deferred financing costs	592,151	578,002
Less: current maturities of long-term debt	(6,489)	(11,208)
Long-term debt	\$ 585,662	\$ 566,794

The maturities of long-term debt for the four years following December 31, 2019 are as follows:

(In thousands)	
2020	\$ 5,953
2021	67,507
2022	5,445
2023	5,445

Cash payments for interest on debt were \$34.2 million, \$44.3 million and \$49.6 million in 2018, 2017 and 2016, respectively.

The Credit Agreement contains a consolidated net debt to consolidated adjusted earnings before interest, tax, depreciation and amortization ("EBITDA") ratio covenant, which is not to exceed 3.75 to 1.0 and a minimum consolidated adjusted EBITDA to consolidated interest charges ratio covenant, which is not to be less than 3.0 to 1.0. The consolidated net debt to consolidated adjusted EBITDA ratio covenant is reduced to 3.5 to 1.0 after December 31, 2018. At December 31, 2018, the Company was in compliance with these and all other covenants.

9. Operating Leases

The Company leases certain property and equipment under operating leases. Rental expense under such operating leases was \$16.2 million, \$16.5 million and \$16.9 million in 2018, 2017 and 2016, respectively.

Future minimum payments under operating leases with noncancelable terms are as follows:

(In thousands)	
2019	\$ 13,985
2020	12,204
2021	9,448
2022	7,706
2023	6,201
After 2023	28,442

Total minimum rentals to be received in the future under noncancelable subleases at December 31, 2018 are \$0.5 million.

10. Employee Benefit Plans

Pension Benefits

The Company has defined benefit pension plans covering a substantial number of employees. The defined benefits for salaried employees generally are based on years of service and the employee's level of compensation during specified periods of employment. Defined benefit pension plans covering hourly employees generally provide benefits of stated amounts for each year of service. The multiemployer pension plans ("MEPPs"), in which the Company participates, provide benefits to certain unionized employees. The Company's funding policy for qualified plans is consistent with statutory regulations and customarily equals the amount deducted for income tax purposes. Periodic voluntary contributions are made, as recommended, by the Company's Pension Committee.

For most U.S. defined benefit pension plans and a majority of international defined benefit pension plans, accrued service is no longer granted. In place of these plans, the Company has established defined contribution plans providing for the Company to contribute a specified matching amount for participating employees' contributions to the plan. For U.S. employees, this match is made on employee contributions up to 4% of eligible compensation. Additionally, the Company may provide a discretionary contribution for eligible employees. There have been no discretionary contributions provided for the years 2018, 2017 and 2016. For non-U.S. employees, this match is up to 6% of eligible compensation with an additional 2% going towards insurance and administrative costs.

NPPC for U.S. and international plans for 2018, 2017 and 2016 is as follows:

(In thousands)	U.S. Plans			International Plans		
	2018	2017	2016	2018	2017	2016
Defined benefit pension plans:						
Service cost	\$ 42	\$ 43	\$ 102	\$ 1,669	\$ 1,724	\$ 1,585
Interest cost	9,562	9,878	10,165	21,589	21,459	26,822
Expected return on plan assets	(12,068)	(10,485)	(10,721)	(42,685)	(40,469)	(42,979)
Recognized prior service costs	1	33	63	(140)	186	189
Recognized losses	5,207	5,701	5,493	14,807	16,283	12,002
Settlement/curtailment loss (gain)	285	—	276	(36)	(20)	79
Defined benefit pension plan cost (income)	3,029	5,170	5,378	(4,796)	(837)	(2,302)
Multiemployer pension plans	686	650	636	1,313	1,306	1,368
Defined contribution plans	5,034	4,239	3,833	5,608	5,905	5,807
Net periodic pension cost	\$ 8,749	\$ 10,059	\$ 9,847	\$ 2,125	\$ 6,374	\$ 4,873

The change in the financial status of the defined benefit pension plans and amounts recognized on the Consolidated Balance Sheets at December 31, 2018 and 2017 are as follows:

(In thousands)	U.S. Plans		International Plans	
	2018	2017	2018	2017
Change in benefit obligation:				
Benefit obligation at beginning of year	\$ 314,861	\$ 305,652	\$ 1,015,586	\$ 952,360
Service cost	42	43	1,669	1,724
Interest cost	9,562	9,878	21,589	21,459
Plan participants' contributions	—	—	49	61
Amendments	—	—	11,238	(4,459)
Actuarial (gain) loss	(21,474)	14,459	(78,658)	(3,613)
Settlements/curtailments	—	—	(313)	(3,362)
Benefits paid	(16,964)	(15,171)	(37,721)	(40,379)
Effect of foreign currency	—	—	(58,760)	91,795
Benefit obligation at end of year	\$ 286,027	\$ 314,861	\$ 874,679	\$ 1,015,586

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(In thousands)	U.S. Plans		International Plans	
	2018	2017	2018	2017
Change in plan assets:				
Fair value of plan assets at beginning of year	\$ 229,941	\$ 205,271	\$ 842,717	\$ 732,743
Actual return on plan assets	(17,883)	33,942	(30,004)	67,136
Employer contributions	10,294	5,899	18,415	18,187
Plan participants' contributions	—	—	49	61
Settlements/curtailments	—	—	(313)	(3,241)
Benefits paid	(16,964)	(15,171)	(37,570)	(39,800)
Effect of foreign currency	—	—	(48,756)	67,631
Fair value of plan assets at end of year	\$ 205,388	\$ 229,941	\$ 744,538	\$ 842,717
Funded status at end of year	\$ (80,639)	\$ (84,920)	\$ (130,141)	\$ (172,869)

Amounts recognized on the Consolidated Balance Sheets for defined benefit pension plans consist of the following at December 31, 2018 and 2017:

(In thousands)	U.S. Plans December 31		International Plans December 31	
	2018	2017	2018	2017
Noncurrent assets	\$ 1,953	\$ 1,860	\$ 2,379	\$ 1,820
Current liabilities	1,954	2,237	643	625
Noncurrent liabilities	80,638	84,543	131,876	174,064
Accumulated other comprehensive loss before tax	149,326	146,341	391,849	427,127

Amounts recognized in Accumulated other comprehensive loss, before tax, for defined benefit pension plans consist of the following at December 31, 2018 and 2017:

(In thousands)	U.S. Plans		International Plans	
	2018	2017	2018	2017
Net actuarial loss	\$ 149,326	\$ 146,340	\$ 384,666	\$ 430,377
Prior service cost	—	1	7,183	(3,250)
Total	\$ 149,326	\$ 146,341	\$ 391,849	\$ 427,127

The estimated amounts that will be amortized from Accumulated other comprehensive loss into defined benefit pension plan NPPC in 2019 are as follows:

(In thousands)	U.S. Plans	International Plans
Net actuarial loss	\$ 5,621	\$ 14,480
Prior service cost	—	324
Total	\$ 5,621	\$ 14,804

The Company's estimate of expected contributions to be paid in 2019 for the U.S. and international defined benefit plans are \$9.1 million and \$20.4 million, respectively.

Future Benefit Payments

The expected benefit payments for defined benefit pension plans over the next ten years are as follows:

(In millions)	2019	2020	2021	2022	2023	2024-2028
U.S. Plans	\$ 20.0	\$ 19.5	\$ 19.3	\$ 19.4	\$ 19.3	\$ 94.1
International Plans	38.5	39.4	41.0	41.4	42.5	228.2

Net Periodic Pension Cost and Defined Benefit Pension Obligation Assumptions

The weighted-average actuarial assumptions used to determine the defined benefit pension plan NPPC for 2018, 2017 and 2016 were as follows:

	U.S. Plans December 31			International Plans December 31			Global Weighted-Average December 31		
	2018	2017	2016	2018	2017	2016	2018	2017	2016
Discount rates	3.5%	4.0%	4.2%	2.6%	2.8%	3.8%	2.8%	3.1%	3.9%

Expected long-term rates of return on plan assets	7.3%	7.3%	7.3%	5.6%	5.9%	6.5%	6.0%	6.2%	6.7%
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The expected long-term rates of return on defined benefit pension plan assets for the 2019 NPPC are 7.3% for the U.S. plans and 5.5% for the international plans. The expected global long-term rate of return on assets for 2019 is 5.9%.

The weighted-average actuarial assumptions used to determine the defined benefit pension plan obligations at December 31, 2018 and 2017 were as follows:

	U.S. Plans December 31		International Plans December 31		Global Weighted-Average December 31	
	2018	2017	2018	2017	2018	2017
Discount rates	4.2%	3.5%	2.9%	2.6%	3.2%	2.8%

Since accrued service is no longer granted to the U.S. defined benefit plans and the majority of the international defined benefit pension plans, the rate of compensation increase did not have a significant impact on the defined benefit pension obligation at December 31, 2018 and 2017 or the defined benefit pension plan NPPC for the years ended 2018, 2017 and 2016.

The U.S. discount rate was determined using a yield curve that was produced from a universe containing approximately 1,100 U.S. dollar-denominated, AA-graded corporate bonds, all of which were noncallable (or callable with make-whole provisions) and excluding the 10% of the bonds with the highest deviation from the expected yield and the 10% with the lowest deviation from the expected yield within each duration group. The discount rate was then developed as the level-equivalent rate that would produce the same present value as that using spot rates to discount the projected benefit payments. For international plans, the discount rate is aligned to corporate bond yields in the local markets, normally AA-rated corporations. The process and selection seek to approximate the cash inflows with the timing and amounts of the expected benefit payments.

Accumulated Benefit Obligation

The accumulated benefit obligation for all defined benefit pension plans at December 31, 2018 and 2017 was as follows:

(In millions)	U.S. Plans December 31		International Plans December 31	
	2018	2017	2018	2017
Accumulated benefit obligation	\$ 286.0	\$ 314.9	\$ 869.4	\$ 1,010.6

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

The projected benefit obligation, accumulated benefit obligation and fair value of plan assets for defined benefit pension plans with accumulated benefit obligations in excess of plan assets at December 31, 2018 and 2017 were as follows:

(In millions)	U.S. Plans December 31		International Plans December 31	
	2018	2017	2018	2017
Projected benefit obligation	\$ 279.2	\$ 306.0	\$ 831.7	\$ 986.6
Accumulated benefit obligation	279.2	306.0	828.9	981.9
Fair value of plan assets	196.6	219.2	701.4	812.0

The asset allocations attributable to the Company's U.S. defined benefit pension plans at December 31, 2018 and 2017, and the long-term target allocation of plan assets, by asset category, are as follows:

U.S. Plans Asset Category	Target Long-Term Allocation	Percentage of Plan Assets December 31	
		2018	2017
Domestic equity securities	27%-37%	30.6%	38.6%
International equity securities	20%-30%	22.0%	24.5%
Fixed income securities	35%-45%	42.9%	30.9%
Cash and cash equivalents	Less than 5%	0.7%	1.0%
Other (a)	0%-10%	3.8%	5.0%

(a) Investments within this caption include diversified global asset allocation funds.

Defined benefit pension plan assets are allocated among various categories of equities, fixed income securities and cash and cash equivalents with professional investment managers whose performance is actively monitored. The primary investment objective is long-term growth of assets in order to meet present and future benefit obligations. The Company periodically conducts an asset/liability modeling study and accordingly adjusts investments among and within asset categories to ensure the long-term investment strategy is aligned with the profile of benefit obligations.

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The Company reviews the long-term expected return on asset assumption on a periodic basis taking considering variety of factors including the historical investment returns achieved over a long-term period, the targeted allocation of plan assets and future expectations based on a model of asset returns for an actively managed portfolio. The model simulates 1,000 different capital market results over 20 years. For both 2019 and 2018, the expected return-on-asset assumption for U.S. defined benefit pension plans was 7.3%.

The U.S. defined benefit pension plans' assets include 450,000 shares of the Company's common stock at both December 31, 2018 and 2017, valued at \$8.9 million and \$8.4 million, respectively. These shares represented 4.4% and 3.7% of total U.S. plan assets at December 31, 2018 and 2017, respectively.

The asset allocations attributable to the Company's international defined benefit pension plans at December 31, 2018 and 2017 and the long-term target allocation of plan assets, by asset category, are as follows:

International Plans Asset Category	Target Long-Term Allocation	Percentage of Plan Assets December 31	
		2018	2017
Equity securities	29.0%	29.2%	31.5%
Fixed income securities	50.0%	50.7%	44.6%
Cash and cash equivalents	—	0.3%	0.3%
Other (b)	21.0%	19.8%	23.6%

(b) Investments within this caption include diversified growth funds and real estate funds.

International defined benefit pension plan assets at December 31, 2018 in the U.K. defined benefit pension plan amounted to approximately 94% of the international defined benefit pension plan assets. The U.K. plan assets are allocated among various categories of equities, fixed income securities and cash and cash equivalents with professional investment managers whose performance is actively monitored. The primary investment objective is long-term growth of assets in order to meet present and future benefit obligations. The Company periodically conducts asset/liability modeling studies and accordingly adjusts investment amounts within asset categories to ensure the long-term investment strategy is aligned with the profile of benefit obligations.

For the international long-term rate of return assumption, the Company considered the current level of expected returns in risk-free investments (primarily government bonds); the historical level of the risk premium associated with other asset classes in which the portfolio is invested; and the expectations for future returns of each asset class and plan expenses. The expected return for each asset class was then weighted based on the target asset allocation to develop the expected long-term rate of return on assets. For both 2019 and 2018, the expected return on asset assumption for the U.K. plan is 5.5%. The remaining international defined benefit pension plans, with plan assets representing approximately 6% of the international defined benefit pension plan assets, are under the guidance of professional investment managers and have similar investment objectives.

The fair values of the Company's U.S. defined benefit pension plans' assets at December 31, 2018 by asset class are as follows:

(In thousands)	Total	Level 1	Level 2
Domestic equities:			
Common stocks	\$ 8,937	\$ 8,937	\$ —
Mutual funds—equities	54,002	54,002	—
International equities:			
Mutual funds—equities	45,195	45,195	—
Fixed income investments:			
Mutual funds—bonds	88,107	88,107	—
Other—mutual funds	7,703	7,703	—
Cash and money market accounts	1,444	1,444	—
Total	<u>\$ 205,388</u>	<u>\$ 205,388</u>	<u>\$ —</u>

The fair values of the Company's U.S. defined benefit pension plans' assets at December 31, 2017 by asset class are as follows:

(In thousands)	Total	Level 1	Level 2
Domestic equities:			
Common stocks	\$ 28,200	\$ 28,200	\$ —
Mutual funds—equities	60,785	11,062	49,723
International equities:			
Common stocks	1,429	1,429	—
Mutual funds—equities	54,879	54,879	—
Fixed income investments:			
U.S. Treasuries and collateralized securities	18,407	—	18,407
Corporate bonds and notes	10,878	10,878	—
Mutual funds—bonds	41,745	12,184	29,561
Other—mutual funds	11,336	11,336	—
Cash and money market accounts	2,282	2,282	—
Total	\$ 229,941	\$ 132,250	\$ 97,691

The fair values of the Company's international defined benefit pension plans' assets at December 31, 2018 by asset class are as follows:

(In thousands)	Total	Level 1	Level 2
Equity securities:			
Mutual funds—equities	\$ 217,321	\$ —	\$ 217,321
Fixed income investments:			
Mutual funds—bonds	372,094	—	372,094
Insurance contracts	5,620	—	5,620
Other:			
Other mutual funds	147,313	—	147,313
Cash and money market accounts	2,190	2,190	—
Total	\$ 744,538	\$ 2,190	\$ 742,348

The fair values of the Company's international defined benefit pension plans' assets at December 31, 2017 by asset class are as follows:

(In thousands)	Total	Level 1	Level 2
Equity securities:			
Mutual funds—equities	\$ 265,989	\$ —	\$ 265,989
Fixed income investments:			
Mutual funds—bonds	369,291	—	369,291
Insurance contracts	6,189	—	6,189
Other:			
Other mutual funds	198,856	—	198,856
Cash and money market accounts	2,392	2,392	—
Total	\$ 842,717	\$ 2,392	\$ 840,325

Following is a description of the valuation methodologies used for the defined benefit pension plans' investments measured at fair value:

- Level 1 Fair Value Measurements—Investments in interest-bearing cash are stated at cost, which approximates fair value. The fair values of money market accounts and certain mutual funds are based on quoted net asset values of the shares held by the plan at year-end. The fair values of domestic and international stocks and corporate bonds, notes and convertible debentures are valued at the closing price reported in the active market on which the individual securities are traded.
- Level 2 Fair Value Measurements—The fair values of investments in mutual funds for which quoted net asset values in an active market are not available are valued by the investment advisor based on the current market values of the underlying assets of the mutual fund based on information reported by the investment consistent with audited financial statements of the mutual fund. Further information concerning these mutual funds may be obtained from their separate audited financial statements. Investments in U.S. Treasury notes and collateralized securities are valued based on yields currently available on comparable securities of issuers with similar credit ratings.

Multiemployer Pension Plans

The Company, through the Harsco Metals & Minerals Segment, contributes to several MEPPs under the terms of collective-bargaining agreements that cover union-represented employees, many of whom are temporary in nature. The Company's total contributions to MEPPs were \$2.0 million, \$2.0 million and \$2.0 million for the years ended December 31, 2018, 2017 and 2016, respectively.

11. Income Taxes

Current income tax expense represents the amounts expected to be reported on the Company's income tax returns, and deferred income tax expense or benefit represents the change in net deferred tax assets and liabilities. Deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets and liabilities as measured by the enacted income tax rates that will be in effect when these differences reverse. Valuation allowances are recorded as appropriate to reduce deferred tax assets to the amount considered likely to be realized.

On December 22, 2017, the Tax Act was signed into law. The Tax Act significantly changed U.S. tax law by, among other things, lowering corporate income tax rates, implementing a territorial tax system and imposing a repatriation tax on deemed repatriated earnings of foreign subsidiaries. The Tax Act permanently reduced the U.S. Corporate income tax rate from a maximum of 35% to a 21% rate, effective January 1, 2018.

The Tax Act provides for a one-time deemed mandatory repatriation of post-1986 undistributed foreign subsidiary Earnings and Profits ("E&P") through 2017. Based on the analysis of E&P, no income tax expense was recorded in the Company's Consolidated Statement of Operations for 2018 or 2017.

While the Tax Act provides for a territorial system, beginning in 2018, it includes the global intangible low-taxed income ("GILTI") provision. The Company elected to account for GILTI tax in the period in which it is incurred. The GILTI provisions require the Company to include in its U.S. income tax return foreign subsidiary earnings in excess of an allowable return on the foreign subsidiary's tangible assets. The GILTI tax expense is primarily caused by a U.S. foreign tax credit limitation which requires an allocation of expenses to the GILTI income, which limits the ability to benefit from foreign tax credits. As a result of the GILTI provisions, the Company's effective tax rate increased by 0.25% for 2018.

On December 22, 2017, the SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118") to address the application of U.S. GAAP in situations when a registrant did not have the necessary information available, prepared, or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the Tax Act. The Company recognized a provisional \$48.7 million income tax charge related to the revaluation of deferred tax assets and liabilities in its consolidated financial statements for the year ended December 31, 2017. Adjustments made to the provisional amounts allowed under SAB 118 were identified and recorded as discrete adjustments as described in the following paragraph.

During the fourth quarter of 2018, the Company recognized a \$15.4 million discrete income tax benefit for adjustments to the provisional income tax impacts of the Tax Act included in its consolidated financial statement for the year ended December 31, 2017. These adjustments resulted from changes in its revaluation of deferred tax assets and liabilities due to additional analysis, changes in interpretations and assumptions the Company made, and additional regulatory guidance that was issued. The accounting for the Tax Act was completed in the fourth quarter of 2018.

Income (loss) from continuing operations before income taxes and equity income as reported on the Consolidated Statements of Operations consists of the following:

(In thousands)	2018	2017	2016
U.S.	\$ 69,125	\$ 5,694	\$ (99,939)
International	88,129	89,757	20,468
Total income (loss) from continuing operations before income taxes and equity income	<u>\$ 157,254</u>	<u>\$ 95,451</u>	<u>\$ (79,471)</u>

Income tax expense as reported on the Consolidated Statements of Operations consists of the following:

(In thousands)	2018	2017	2016
Income tax expense (benefit):			
Currently payable:			
U.S. federal	\$ 281	\$ 4,107	\$ (4,088)
U.S. state	1,127	372	365
International	18,014	21,975	18,014
Total income taxes currently payable	19,422	26,454	14,291
Deferred U.S. federal	7,164	46,470	(8,195)
Deferred U.S. state	(11,045)	1,142	2,238
Deferred international	(2,642)	9,737	(1,697)
Total income tax expense	\$ 12,899	\$ 83,803	\$ 6,637

Cash payments for income taxes were \$26.8 million, \$24.9 million and \$14.6 million for 2018, 2017 and 2016, respectively.

A reconciliation of the normal expected statutory U.S. federal income tax expense (benefit) to the actual Income tax expense as reported on the Consolidated Statements of Operations is as follows:

(In thousands)	2018	2017	2016
U.S. federal income tax expense (benefit)	\$ 33,023	\$ 33,408	\$ (27,815)
U.S. state income taxes, net of federal income tax benefit	1,614	786	(355)
U.S. domestic deductions and credits	(6,145)	(1,210)	(661)
Capital loss on sale of equity interest in Brand with no realizable tax benefit	—	—	16,106
Difference in effective tax rates on international earnings and remittances	5,399	675	2,006
Uncertain tax position contingencies and settlements	(1,180)	(1,517)	(1,886)
Changes in realization on beginning of the year deferred tax assets	(6,937)	2,758	1,978
Forward Loss Provisions in SBB Contract with no realizable tax benefits	—	—	15,768
Global Intangible Low-Taxed Income	400	—	—
U.S. non-deductible expenses	2,277	664	724
Income related to the Infrastructure Transaction	—	—	(644)
Impact of U.S. tax reform	(15,409)	48,680	—
Cumulative effect of change in statutory tax rates/laws	—	(153)	(388)
Income from unconsolidated entities	—	—	2,098
Other, net	(143)	(288)	(294)
Total income tax expense	\$ 12,899	\$ 83,803	\$ 6,637

At December 31, 2018, 2017 and 2016, the Company's annual effective income tax rate on income from continuing operations was 8.2%, 87.8% and (8.4)%, respectively.

The Company's international income from continuing operations before income taxes and equity income (loss) was \$88.1 million and \$89.8 million for 2018 and 2017, respectively. In 2017, because of the reduction in the U.S. corporate income tax rate from 35% to 21% under the Tax Act, the Company revalued its ending net deferred tax asset related to the outside basis difference in its international branches and recognized a provisional \$6.5 million income tax expense in the Company's Consolidated Statement of Operations for 2017. The decreased international income from continuing operations, the \$8.3 million income tax benefit recorded in the second quarter of 2018 arising from the adjustment to certain existing deferred tax asset valuation allowances as the result of the Altek acquisition, and the provisional income tax expense because of the Tax Act not recurring in 2018 decreased the Company's total international income tax expense to \$15.4 million in 2018 from \$31.7 million in 2017.

The Company's differences in effective income tax rates for 2018 and 2017 on international earnings and remittances was \$5.4 million and \$0.7 million, respectively, which included U.S. income tax expense on international deemed remittances of \$3.1 million and \$6.4 million, respectively. This increase is primarily due to the reduction of U.S. Corporate income tax rate from a maximum 35% to a 21% rate.

The Company's income from continuing operations before income taxes and equity income attributable to the U.S. was \$69.1 million and \$5.7 million for 2018 and 2017, respectively. In 2017, due to the impact of the Tax Act, the Company recognized a \$14.9 million provisional income tax expense because of revaluing the U.S. ending net deferred tax assets from 35% to the newly enacted U.S. corporate income tax rate of 21% and established a provisional valuation allowance on the full

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amount of foreign tax credit carryforward of \$27.3 million due to the impact the Tax Act had on future foreign source income. In 2018, the Company finalized the impact of the Tax Act and recognized a \$15.4 million income tax benefit because of the change in expected realization of foreign tax credit and state net operating loss carryforwards. The Company's total U.S. income tax expense decreased from \$52.1 million in 2017 to a \$2.5 million income tax benefit in 2018 due primarily to the impact of the Tax Act, including the lower tax rate.

The income tax effects of the temporary differences giving rise to the Company's deferred tax assets and liabilities at December 31, 2018 and 2017 are as follows:

(In thousands)	2018		2017	
	Asset	Liability	Asset	Liability
Depreciation and amortization	\$ —	\$ 8,681	\$ 6,616	\$ —
Expense accruals	18,827	—	17,690	—
Inventories	3,071	—	4,390	—
Provision for receivables	690	—	649	—
Deferred revenue	—	3,122	—	979
Operating loss carryforwards	83,168	—	90,193	—
Foreign tax credit carryforwards	25,814	—	27,256	—
Capital loss carryforwards	9,759	—	11,011	—
Pensions	40,442	—	47,153	—
Currency adjustments	3,795	—	7,160	—
Deferred financing costs	—	2,227	—	2,135
Post-retirement benefits	471	—	403	—
Stock based compensation	5,832	—	4,761	—
Other	5,886	—	7,684	—
Subtotal	197,755	14,030	224,966	3,114
Valuation allowance	(138,862)	—	(174,227)	—
Total deferred income taxes	\$ 58,893	\$ 14,030	\$ 50,739	\$ 3,114

The deferred tax asset and liability balances recognized on the Consolidated Balance Sheets at December 31, 2018 and 2017 are as follows:

(In thousands)	2018	2017
Deferred income tax assets	\$ 49,114	\$ 51,574
Other liabilities	4,251	3,949

At December 31, 2018, the tax-effected amount of net operating loss carryforwards ("NOLs") totaled \$83.2 million. Tax-effected NOLs from international operations are \$68.1 million. Of that amount, \$56.6 million can be carried forward indefinitely and \$11.5 million will expire at various times between 2019 and 2039. Tax-effected U.S. state NOLs are \$15.1 million. Of that amount, \$4.3 million expire at various times between 2019 and 2023, \$2.9 million expire at various times between 2024 and 2028, \$3.4 million expire at various times between 2029 and 2033 and \$4.5 million expire at various times between 2034 and 2038. At December 31, 2018, the tax-effected amount of capital loss carryforwards totaled \$9.8 million which expire in 2021.

Valuation allowances of \$138.9 million and \$174.2 million at December 31, 2018 and 2017, respectively, related principally to deferred tax assets for pension liabilities, NOLs, foreign tax credit carryforwards, capital loss carryforwards and foreign currency translation that are uncertain as to realizability. In 2018, the Company finalized the impact of the Tax Act and reduced the provisional valuation allowance by \$15.2 million because of the expected realization of foreign tax credit and state net operating loss carryforward. In addition, the U.K. valuation allowance was reduced by \$13.6 million as a result of the Altek acquisition and a change in estimate of interest deductions. The Company recorded a valuation allowance reduction of \$8.7 million from the effects of foreign currency translation adjustments, partially offset by the net increase related to losses in certain jurisdictions where the Company determined that it is more likely than not that these assets will not be realized. In 2017, the Company recorded a valuation allowance of \$27.3 million related to foreign tax credit carryforwards due to the impact of the Tax Act, an increase from foreign currency translation in the amount of \$10.1 million and a net increase of \$6.9 million related to losses in certain jurisdictions where the Company determined that it is more likely than not that these assets will not be realized. This was partially offset by a reduction related to current year pension adjustments recorded through Accumulated other comprehensive loss and a decrease related to U.S., Argentina and Belgium tax rate changes.

The Tax Act introduced a transition tax and a territorial tax system, which was effective beginning in 2018. The territorial tax system impacts the Company's overall global capital and legal entity structure, working capital, and repatriation plan on a go-forward basis. Based on the Company's analysis of the territorial tax system and other new international tax provisions, the Company continues to support the assertion to indefinitely reinvest \$677 million of accumulated foreign earnings and profits in non-U.S. jurisdictions. Included in this amount is \$628 million of deferred foreign income from foreign entities' deficit earnings and profits as of December 31, 2017 that remain untaxed as a result of the Tax Act and \$49 million of untaxed earnings and profits generated during 2018. In addition, the Company recognized \$4 million of GILTI included in the Tax Act which increases earnings previously taxed in the U.S. Further, it is impracticable for the Company to estimate any future tax costs for any unrecognized deferred tax liabilities associated with its indefinite reinvestment assertion, because the actual tax liability, if any, would be dependent on complex analysis and calculations considering various tax laws, exchange rates, circumstances existing when a repatriation, sale, or liquidation occurs, or other factors.

The Company recognizes accrued interest and penalty expense related to unrecognized income tax benefits in income tax expense. During 2018 and 2016, the Company recognized an income tax benefit of \$0.2 million and \$1.7 million, respectively, for interest and penalties primarily due to the expiration of statutes of limitation and resolution of examinations. The Company did not recognize any income tax expense or benefit for interest and penalties during 2017. The Company has accrued \$0.9 million, \$1.1 million and \$1.1 million for the payment of interest and penalties at December 31, 2018, 2017 and 2016 respectively.

A reconciliation of the change in the unrecognized income tax benefits balance from January 1, 2016 to December 31, 2018 is as follows:

(In thousands)	Unrecognized Income Tax Benefits	Deferred Income Tax Benefits	Unrecognized Income Tax Benefits, Net of Deferred Income Tax Benefits
Balances, January 1, 2016	\$ 5,161	\$ (44)	\$ 5,117
Additions for tax positions related to the current year (includes currency translation adjustment)	744	(1)	743
Additions for tax positions related to prior years (includes currency translation adjustment)	358	(14)	344
Other reductions for tax positions related to prior years	(837)	—	(837)
Statutes of limitation expirations	(817)	27	(790)
Settlements	(27)	2	(25)
Balance at December 31, 2016	4,582	(30)	4,552
Additions for tax positions related to the current year (includes currency translation adjustment)	658	(2)	656
Other reductions for tax positions related to prior years	(321)	—	(321)
Statutes of limitation expirations	(1,296)	1	(1,295)
Balance at December 31, 2017	3,623	(31)	3,592
Additions for tax positions related to the current year (includes currency translation adjustment)	196	(1)	195
Statutes of limitation expirations	(1,397)	6	(1,391)
Total unrecognized income tax benefits that, if recognized, would impact the effective income tax rate at December 31, 2018	<u>\$ 2,422</u>	<u>\$ (26)</u>	<u>\$ 2,396</u>

Within the next twelve months, it is reasonably possible that up to \$0.1 million of unrecognized income tax benefits will be recognized upon settlement of income tax examinations and the expiration of various statutes of limitations.

The Company files income tax returns as prescribed by the tax laws of the jurisdictions in which it operates. With few exceptions, the Company is no longer subject to U.S and international income tax examinations by tax authorities through 2012.

12. Commitments and Contingencies

Environmental

The Company is involved in a number of environmental remediation investigations and cleanups and, along with other companies, has been identified as a "potentially responsible party" for certain byproduct disposal sites. While each of these matters is subject to various uncertainties, it is probable that the Company will agree to make payments toward funding certain of these activities and it is possible that some of these matters will be decided unfavorably to the Company. The Company has evaluated its potential liability, and its financial exposure is dependent upon such factors as the continuing evolution of environmental laws and regulatory requirements, the availability and application of technology, the allocation of cost among potentially responsible parties, the years of remedial activity required and the remediation methods selected. The Company did not have any material accruals or record any material expenses related to environmental matters during the periods presented.

The Company evaluates its liability for future environmental remediation costs on a quarterly basis. Although actual costs to be incurred at identified sites in future periods may vary from the estimates (given inherent uncertainties in evaluating environmental exposures), the Company does not expect that any costs that are reasonably possible to be incurred by the Company in connection with environmental matters in excess of the amounts accrued would have a material adverse effect on the Company's financial condition, results of operations or cash flows.

Brazilian Tax Disputes

The Company is involved in a number of tax disputes with federal, state and municipal tax authorities in Brazil. These disputes are at various stages of the legal process, including the administrative review phase and the collection action phase, and include assessments of fixed amounts of principal and penalties, plus interest charges that increase at statutorily determined amounts per month and are assessed on the aggregate amount of the principal and penalties. In addition, the losing party at the collection action or court of appeals phase could be subject to a charge to cover statutorily mandated legal fees, which are generally calculated as a percentage of the total assessed amounts due, inclusive of penalty and interest. Many of the claims relate to value-added ("ICMS"), services and social security tax disputes. The largest proportion of the assessed amounts relate to ICMS claims filed by the State Revenue Authorities from the State of São Paulo, Brazil (the "SPRA"), encompassing the period from January 2002 to May 2005.

In October 2009, the Company received notification of the SPRA's final administrative decision regarding the levying of ICMS in the State of São Paulo in relation to services provided to a customer in the State between January 2004 and May 2005. As of December 31, 2018, the principal amount of the tax assessment from the SPRA with regard to this case is approximately \$2 million, with penalty, interest and fees assessed to date increasing such amount by an additional \$21 million. Any change in the aggregate amount since the Company's last Annual Report on Form 10-K for the year ended December 31, 2017 is due to an increase in assessed interest and statutorily mandated legal fees for the period, as well as foreign currency translation. On June 4, 2018, the Appellate Court of the State of São Paulo ruled in favor of the SPRA, but ruled that the assessed penalty should be reduced to approximately \$2 million. After calculating the interest accrued on the penalty, the Company estimates that this ruling reduces the current overall liability for this case to approximately \$9 million. The Company has filed a series of motions for clarification on the ruling, one of which is still pending before the court. In the event the motion for clarification is unsuccessful, the Company plans to appeal both the liability ruling and the amount assessed. Due to multiple court precedents in the Company's favor, as well as the Company's ability to seek clarification as well as appeal, the Company does not believe a loss is probable.

Another ICMS tax case involving the SPRA refers to the tax period from January 2002 to December 2003. In December 2018, the administrative tribunal hearing the case upheld the Company's liability. The Company plans to appeal to the judicial phase. The aggregate amount assessed by the tax authorities in August 2005 was \$6.5 million (the amounts with regard to this claim are valued as of the date of the assessment since it has not yet reached the collection phase), composed of a principal amount of \$1.5 million, with penalty and interest assessed through that date increasing such amount by an additional \$5.0 million. On December 6, 2018, the administrative tribunal reduced the applicable penalties to \$1.2 million. After calculating the interest accrued on the current penalty, the Company estimates that this ruling reduces the current overall liability for this case to approximately \$10 million. All such amounts include the effect of foreign currency translation. Due to multiple court precedents in the Company's favor the Company does not believe a loss is probable.

The Company continues to believe that sufficient coverage for these claims exists as a result of the indemnification obligations of the Company's customer and such customer's pledge of assets in connection with the October 2009 notice, as required by Brazilian law.

The Company intends to continue its practice of vigorously defending itself against these tax claims under various alternatives, including judicial appeal. The Company will continue to evaluate its potential liability with regard to these claims on a quarterly basis; however, it is not possible to predict the ultimate outcome of these tax-related disputes in Brazil. No loss provision has been recorded in the Company's consolidated financial statements for the disputes described above because the

loss contingency is not deemed probable, and the Company does not expect that any costs that are reasonably possible to be incurred by the Company in connection with Brazilian tax disputes would have a material adverse effect on the Company's financial condition, results of operations or cash flows.

Brazilian Labor Disputes

The Company is subject to ongoing collective bargaining and individual labor claims in Brazil through the Harsco Metals & Minerals Segment which allege, among other things, the Company's failure to pay required amounts for overtime and vacation at certain sites. The Company is vigorously defending itself against these claims; however, litigation is inherently unpredictable, particularly in foreign jurisdictions. While the Company does not currently expect that the ultimate resolution of these claims will have a material adverse effect on the Company's financial condition, results of operations or cash flows, it is not possible to predict the ultimate outcome of these labor-related disputes. As of December 31, 2018 and 2017, the Company has established reserves of \$7.1 million and \$9.6 million, respectively, on the Company's Consolidated Balance Sheets for amounts considered to be probable and estimable.

Customer Disputes

The Company may, in the normal course of business, become involved in commercial disputes with subcontractors or customers. Although results of operations and cash flows for a given period could be adversely affected by a negative outcome in these or other lawsuits, claims or proceedings, management believes that the ultimate outcome of any ongoing matters will not have a material adverse effect on the Company's financial condition, results of operations or cash flows.

Lima Refinery Litigation

On April 8, 2016, Lima Refining Company filed a lawsuit against the Company in the District Court of Harris County, Texas related to a January 2015 explosion at an oil refinery operated by Lima Refining Company. The action seeks approximately \$317 million plus interest in property damages and lost profits and business interruption damages. The action alleges the explosion occurred because of a defect in a heat exchange cooler manufactured by Hammco Corporation ("Hammco") in 2009, prior to the Company's acquisition of Hammco in 2014. The Company is vigorously contesting the allegations against it. The Company has both an indemnity right from the sellers of Hammco and liability insurance coverage under various primary and excess policies that the Company believes will be available, if necessary, to cover substantially all of any such liability that might ultimately be incurred in the above action. As a result, the Company believes the situation will not result in a net unreimbursed loss.

Compliance Matter

In 2017, the Company undertook an internal investigation, with the assistance of outside counsel, after it became aware of allegations involving an employee and an agent of the Harsco Rail subsidiary in China ("Harsco Rail China"). During this investigation the Company learned about certain payments that potentially violate the Foreign Corrupt Practices Act. Revenues attributed to Harsco Rail China were approximately 2% of the Company's consolidated revenues for each of the prior three completed fiscal years. Based on information known to date, the Company believes the amount of the potential improper payments are not material to the condensed consolidated financial statements. Any determination that the Company's operations or activities were not in compliance with existing laws or regulations could result in the imposition of fines and penalties. No provision with respect to this matter has been made in the Company's condensed consolidated financial statements.

The Company had previously voluntarily self-reported its initial findings to the SEC and the U.S. Department of Justice (the "DOJ"). At this time, the Company cannot predict any outcome or impact of the investigation or the reviews by the SEC and the DOJ. However, based on information available at this time, the Company does not believe any potential liability would be material to the Company's condensed consolidated financial position, although an amount recorded, if any, could be material to the results of operations for the period in which it may be recorded. The Company has fully cooperated with the agencies in their review and the Company has not been advised that either agency intends to take any action against the Company.

Other

The Company is named as one of many defendants (approximately 90 or more in most cases) in legal actions in the U.S. alleging personal injury from exposure to airborne asbestos over the past several decades. In their suits, the plaintiffs have named as defendants, among others, many manufacturers, distributors and installers of numerous types of equipment or products that allegedly contained asbestos.

The Company believes that the claims against it are without merit. The Company has never been a producer, manufacturer or processor of asbestos fibers. Any asbestos-containing part of a Company product used in the past was purchased from a supplier and the asbestos encapsulated in other materials such that airborne exposure, if it occurred, was not harmful and is not associated with the types of injuries alleged in the pending actions.

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At December 31, 2018, there were approximately 17,134 pending asbestos personal injury actions filed against the Company. Of those actions, approximately 16,592 were filed in the New York Supreme Court (New York County), approximately 116 were filed in other New York State Supreme Court Counties and approximately 426 were filed in courts located in other states.

The complaints in most of those actions generally follow a form that contains a standard damages demand of \$20 million or \$25 million, regardless of the individual plaintiff's alleged medical condition, and without identifying any specific Company product.

At December 31, 2018, approximately 16,550 of the actions filed in New York Supreme Court (New York County) were on the Deferred/Inactive Docket created by the court in December 2002 for all pending and future asbestos actions filed by persons who cannot demonstrate that they have a malignant condition or discernible physical impairment. The remaining approximately 42 cases in New York County are pending on the Active or In Extremis Docket created for plaintiffs who can demonstrate a malignant condition or physical impairment.

The Company has liability insurance coverage under various primary and excess policies that the Company believes will be available, if necessary, to substantially cover any liability that might ultimately be incurred in the asbestos actions referred to above. The costs and expenses of the asbestos actions are being paid by the Company's insurers.

In view of the persistence of asbestos litigation in the U.S., the Company expects to continue to receive additional claims in the future. The Company intends to continue its practice of vigorously defending these claims and cases. At December 31, 2018, the Company has obtained dismissal in approximately 28,173 cases by stipulation or summary judgment prior to trial.

It is not possible to predict the ultimate outcome of asbestos-related actions in the U.S. due to the unpredictable nature of this litigation, and no loss provision has been recorded in the Company's consolidated financial statements because a loss contingency is not deemed probable or estimable. Despite this uncertainty, and although results of operations and cash flows for a given period could be adversely affected by asbestos-related actions, the Company does not expect that any costs that are reasonably possible to be incurred by the Company in connection with asbestos litigation would have a material adverse effect on the Company's financial condition, results of operations or cash flows.

As previously disclosed, the Company has had ongoing meetings with the Supreme Council for Environment in Bahrain ("SCE") over processing a byproduct ("salt cakes") stored at the Al Hafeerah site. The Company's Bahrain operations that produced the salt cakes has ceased operations and are owned under a strategic venture for which its strategic venture partner owns a 35% minority interest. An Environmental Impact Assessment and Technical Feasibility Study were approved by the SCE during the first quarter of 2018. The Company has previously established a reserve of \$7.0 million, which represents the Company's best estimate of the ultimate costs to be incurred to resolve this matter. The Company continues to evaluate this reserve and any future change in estimated costs could be material to the Company's results of operations in any one period.

On July 27, 2018, Brazil's Federal and Rio de Janeiro State Public Prosecution Offices (MPF and MPE) filed a Civil Public Action against one of the Company's customers (CSN), the Company's Brazilian subsidiary, the Municipality of Volta Redonda, Brazil, and the Instituto Estadual do Ambiente (local environmental protection agency) seeking the implementation of various measures to limit and reduce the accumulation of customer-owned slag at the site in Brazil. On August 6, 2018, the 3rd Federal Court in Volta Redonda granted the MPF and MPE an injunction against the same parties requiring, among other things, CSN and the Company's Brazilian subsidiary to limit the volume of slag sent to the site. Because the customer owns the site and the slag located on the site, the Company believes that complying with this injunction is the steel producer's responsibility. Nevertheless, if the customer does not comply, the Company's Brazilian subsidiary, as a party to the injunction, could be assessed fines for non-compliance or could incur other losses related to the issue. Both the Company and CSN continue to have discussions with the governmental authorities on the injunction. The Company does not believe that a loss relating to this matter is probable or estimable at this point.

On October 19, 2018, local environmental authorities issued an enforcement action against the Company concerning the Company's operations at a customer site in Ijmuiden, Netherlands. The enforcement action alleges violations of the Company's environmental permit at the site, which restricts the release of any visible dust emissions. The enforcement action ordered the Company to cease all violations of the permit by October 31, 2018. The authorities have issued fines of approximately \$0.3 million, with the possibility of additional fines for any future violations. The Company is vigorously contesting the enforcement action and fines and is also working with its customer to ensure the control of emissions. The Company has contractual indemnity rights from its customer, should it be required to pay the assessed fines.

The Company is subject to various other claims and legal proceedings covering a wide range of matters that arose in the ordinary course of business. In the opinion of management, all such matters are adequately covered by insurance or by established reserves, and, if not so covered, are without merit or are of such kind, or involve such amounts, as would not have a material adverse effect on the financial position, results of operations or cash flows of the Company.

Insurance liabilities are recorded when it is probable that a liability has been incurred for a particular event and the amount of loss associated with the event can be reasonably estimated. Insurance reserves have been estimated based primarily upon actuarial calculations and reflect the undiscounted estimated liabilities for ultimate losses, including claims incurred but not reported. Inherent in these estimates are assumptions that are based on the Company's history of claims and losses, a detailed analysis of existing claims with respect to potential value, and current legal and legislative trends. If actual claims differ from those projected by management, changes (either increases or decreases) to insurance reserves may be required and would be recorded through income in the period the change was determined. When a recognized liability is covered by third-party insurance, the Company records an insurance claim receivable to reflect the covered liability. Insurance claim receivables are included in Other receivables on the Company's Consolidated Balance Sheets. See Note 1, Summary of Significant Accounting Policies, for additional information on Accrued insurance and loss reserves.

13. Capital Stock

The authorized capital stock of the Company consists of 150,000,000 shares of common stock and 4,000,000 shares of preferred stock, both having a par value of \$1.25 per share. The preferred stock is issuable in series with terms as fixed by the Board of Directors (the "Board"). No preferred stock has been issued. The following table summarizes the Company's common stock:

	Shares Issued	Treasury Shares (a)	Outstanding Shares
Outstanding, January 1, 2016	112,405,302	32,310,937	80,094,365
Shares issued for vested restricted stock units	94,572	13,974	80,598
Outstanding, December 31, 2016	112,499,874	32,324,911	80,174,963
Shares issued for vested restricted stock units	375,355	105,431	269,924
Stock appreciation rights exercised	12,897	3,932	8,965
Outstanding, December 31, 2017	112,888,126	32,434,274	80,453,852
Shares issued for vested restricted stock units	545,908	161,774	384,134
Stock appreciation rights exercised	39,917	11,808	28,109
Treasury shares purchased	—	1,321,072	(1,321,072)
Outstanding, December 31, 2018	113,473,951	33,928,928	79,545,023

(a) The Company repurchases shares in connection with the issuance of shares under stock-based compensation programs and in accordance with Board authorized share repurchase programs.

The following is a reconciliation of the average shares of common stock used to compute basic earnings per common share to the shares used to compute diluted earnings per common share as shown on the Consolidated Statements of Operations:

(In thousands, except per share data)	2018	2017	2016
Income (loss) from continuing operations attributable to Harsco Corporation common stockholders	\$ 136,783	\$ 7,626	\$ (86,336)
Weighted-average shares outstanding—basic	80,716	80,553	80,333
Dilutive effect of stock-based compensation	2,879	2,287	—
Weighted-average shares outstanding—diluted	83,595	82,840	80,333
Income (loss) from continuing operations per common share, attributable to Harsco Corporation common stockholders:			
Basic	\$ 1.69	\$ 0.09	\$ (1.07)
Diluted	\$ 1.64	\$ 0.09	\$ (1.07)

The following average outstanding stock-based compensation units were not included in the computation of diluted earnings per share because the effect was antidilutive:

(In thousands)	2018	2017	2016
Restricted stock units	—	—	810
Stock options	—	52	89
Stock appreciation rights	306	811	1,458
Performance share units	—	201	684

14. Stock-Based Compensation

The 2013 Equity and Incentive Plan as amended (the "2013 Plan") authorizes the issuance of up to 7,800,000 shares of the Company's common stock for use in paying incentive compensation awards in the form of stock options or other equity awards such as restricted stock, restricted stock units ("RSUs"), stock appreciation rights ("SARs") or performance share units ("PSUs"). Of the 7,800,000 shares authorized, a maximum of 4,621,000 shares may be issued for awards other than option rights or SARs, as defined in the 2013 Plan. The 2016 Non-Employee Directors' Long-Term Equity Compensation Plan (the "2016 Plan") authorizes the issuance of up to 400,000 shares of the Company's common stock for equity awards. Both plans have been approved by the Company's stockholders. At December 31, 2018, there were 3,695,156 shares available for granting equity awards under the 2013 Plan, of which 2,374,533 shares were available for awards other than option rights or SARs. At December 31, 2018, there were 194,370 shares available for granting equity awards under the 2016 Plan.

Restricted Stock Units

The Company's Board approves the granting of performance-based RSUs as the long-term equity component of director, officer and certain key employee compensation. The RSUs require no payment from the recipient and compensation cost is measured based on the market price of the Company's common stock on the grant date and is generally recorded over the vesting period. RSUs granted to officers and certain key employees in 2016, 2017 and 2018 either vest on a pro-rata basis over three years or upon attainment of specified retirement or years of service criteria. Upon vesting, each RSU is exchanged for an equal number of shares of the Company's common stock. The vesting period for RSUs granted to non-employee directors is one year and each RSU is exchanged for an equal number of shares of the Company's common stock upon vesting for awards issued under the 2016 Plan and following the termination of the participant's service as a director under prior plans. RSUs do not have an option for cash payment.

The following table summarizes RSUs issued and the compensation expense recorded for the years ended December 31, 2018, 2017 and 2016:

(Dollars in thousands, except per unit)	RSUs (a)	Weighted Average Fair Value	Expense		
			2018	2017	2016
Directors:					
2015	59,985	\$ 15.69	—	—	314
2016	109,998	\$ 7.00	—	257	513
2017	56,203	\$ 13.70	179	641	—
2018	43,821	\$ 20.54	511	—	—
Employees:					
2013	170,582	\$ 20.63	—	—	66
2014	190,832	\$ 25.21	—	316	669
2015	239,679	\$ 16.53	230	597	880
2016	536,773	\$ 7.09	935	1,011	995
2017	286,251	\$ 13.70	1,019	1,417	—
2018	242,791	\$ 19.93	1,656	—	—
Total			\$ 4,530	\$ 4,239	\$ 3,437

(a) Represents number of awards originally issued.

RSU activity for the year ended December 31, 2018 was as follows:

	Number of Shares	Weighted Average Grant-Date Fair Value
Non-vested at December 31, 2017	801,939	\$ 11.73
Granted	286,612	20.03
Vested	(478,917)	12.48
Forfeited	(26,254)	14.11
Non-vested at December 31, 2018	<u>583,380</u>	<u>15.08</u>

At December 31, 2018, the total unrecognized compensation expense related to non-vested RSUs was \$4.9 million, which will be recognized over a weighted-average period of 1.7 years. There was a \$1.1 million decrease in excess tax benefits from RSUs recognized in equity in 2016. Upon the adoption of changes issued by the FASB amending the accounting for stock-based compensation, the Company records any excess tax benefits or shortfalls as a component of income tax expense. See Note 2, Recently Adopted and Recently Issued Accounting Standards, for additional information.

Stock Appreciation Rights

The Company's Board approves the granting of SARs to officers and certain key employees under the 2013 Plan. The SARs generally vest on a pro-rata three year basis from the grant date or upon specified retirement or years of service criteria and expire no later than ten years after the grant date. The exercise price of the SARs is equal to the fair value of Harsco common stock on the grant date. Upon exercise, shares of the Company's common stock are issued based on the increase in the fair value of the Company's common stock over the exercise price of the SAR. SARs do not have an option for cash payment.

During 2016, the Company issued SARS covering 554,719 shares in May and 21,686 shares in November under the 2013 Plan. During 2017, the Company issued SARS covering 266,540 shares in March under the 2013 Plan. During 2018, the Company issued SARS covering 221,818 shares in March and 7,622 in July under the 2013 Plan.

The fair value of each SAR grant was estimated on the grant date using a Black-Scholes pricing model with the following assumptions:

	Risk-free Interest rate	Dividend Yield	Expected Life (Years)	Volatility	SAR Grant Price	Fair Value of SAR
May 2016 Grant	1.39%	—%	6.0	42.1%	7.00	2.93
November 2016 Grant	1.74%	—%	6.0	43.8%	12.25	5.38
March 2017 Grant	2.17%	—%	6.0	43.9%	13.70	6.13
March 2018 Grant	2.69%	—%	6.0	44.6%	19.80	9.16
July 2018 Grant	2.87%	—%	6.0	44.7%	24.65	11.48

SARs activity for the year ended December 31, 2018 was as follows:

	Number of Shares	Weighted Average Exercise Price	Aggregate Intrinsic Value (in millions) (b)
Outstanding, December 31, 2017	1,679,276	\$ 15.40	\$ 7.9
Granted	229,440	19.99	
Exercised	(150,013)	17.88	
Forfeited/Expired	(13,256)	24.53	
Outstanding, December 31, 2018	1,745,447	15.73	8.9

(b) Intrinsic value is defined as the difference between the current market value and the exercise price, for those SARs where the market price exceeds the exercise price.

The total intrinsic value of SARs exercised in 2018 and 2017 was \$0.5 million and \$0.3 million respectively. No SARs were exercised in 2016.

The following table summarizes information concerning outstanding and exercisable SARs at December 31, 2018:

Range of exercisable prices	SARs Outstanding				SARs Exercisable	
	Vested	Non-vested	Weighted-Average Exercise Price per Share	Weighted-Average Remaining Contractual Life in Years	Number Exercisable	Weighted-Average Exercise Price per Share
\$7.00 - \$13.70	484,331	242,513	\$ 9.41	7.65	484,331	\$ 9.24
\$16.53 - \$22.70	532,700	217,343	18.58	6.78	532,700	18.08
\$23.03 - \$26.92	260,938	7,622	24.84	5.45	260,938	24.84
	1,277,969	467,478	15.73	6.94	1,277,969	16.11

Total compensation expense related to SARs was \$1.9 million, \$2.0 million and \$1.7 million for the years ended December 31, 2018, 2017 and 2016, respectively. Vested and currently exercisable SARs have a weighted-average remaining contractual life of 6.94 years and an intrinsic value of 8.9 million at December 31, 2018 and total unrecognized compensation expense related to non-vested SARs was \$2.2 million, which will be recognized over a weighted average period of 1.8 years.

Weighted-average grant date fair value of non-vested SARs for the year ended December 31, 2018 was as follows:

	Number of Shares	Weighted-Average Grant Date Fair Value
Non-vested shares, December 31, 2017	877,417	\$ 4.42
Granted	229,440	9.17
Vested	(626,123)	4.63
Forfeited	(13,256)	7.51
Non-vested shares, December 31, 2018	467,478	6.65

Performance Share Units

The Company's Board approves the granting of PSUs to officers and certain key employees that may be earned based on the Company's total shareholder return over the three-year performance period. PSUs are paid out at the end of each performance period based on the Company's performance, which is measured by determining the percentile rank of the total shareholder return of the Company's common stock in relation to the total shareholder return of a specific peer group of companies. For PSUs issued in 2016, 2017 and 2018, the peer group of companies utilized is the S&P 600 Industrial Index. The payment of PSUs following the performance period will be based in accordance with the scale set forth in the PSU agreements, and may range from 0% to 200% of the initial grant. PSUs do not have an option for cash payment.

During the year ended December 31, 2016, the Company granted 527,249 shares in May and 9,524 shares in November under the 2013 plan. During the year ended December 31, 2017, the Company granted 286,251 shares in March under the 2013 Plan.

During the year ended December 31, 2018, the Company granted 233,266 shares in March and 6,742 shares in July under the 2013 Plan. The fair value of PSUs granted was estimated on the grant date using a Monte Carlo pricing model with the following assumptions:

	Risk-free Interest rate	Dividend Yield	Expected Life (Years)	Volatility	Fair Value of PSU
May 2016 Grant	0.84%	—%	2.65	33.3%	\$ 7.19
November 2016 Grant	0.96%	—%	2.14	35.2%	17.84
March 2017 Grant	1.54%	—%	2.83	34.2%	17.05
March 2018 Grant	2.36%	—%	2.83	34.7%	29.56
July 2018 Grant	2.69%	—%	2.42	33.1%	39.06

Total compensation expense related to PSUs was \$4.8 million, \$3.5 million and \$2.5 million for the years ended December 31, 2018, 2017 and 2016, respectively. At December 31, 2018, total unrecognized compensation expense related to non-vested PSUs was \$5.9 million, which will be recognized over a weighted average period of 1.8 years.

A summary of the Company's non-vested PSU activity during the year ending December 31, 2018 was as follows:

	Number of Shares	Weighted-Average Grant Date Fair Value
Non-vested shares, December 31, 2017	743,583	\$ 10.91
Granted	240,008	29.83
Forfeited	(34,426)	13.33
Vested, not issued (c)	(454,283)	7.41
Non-vested shares, December 31, 2018	494,882	23.13

(c) The measurement period for PSUs issued in 2016 ended on December 31, 2018 and these shares vested but will not be issued until the Board of Directors certifies the measurement period results in early 2019. A total of 908,566 shares are expected to be issued and have been included in the Company's calculation of diluted weighted average shares at the end of December 31, 2018.

Stock Options

The Company's Board approves the granting of incentive stock options and nonqualified stock options to officers, certain key employees and non-employee directors under the plans noted above. The stock options would generally vest three years from the grant date, which is the date the Board approved the grants, and expire no later than seven years after the grant date. The exercise price of the stock option would be the fair value on the grant date. Upon exercise, shares of the Company's common stock are issued based on the increase in the fair value of the Company's common stock over the exercise price of the stock options. All stock options are vested and there was no compensation expense related to stock options in 2018, 2017, and 2016. There were no stock options exercised and no net cash proceeds from the exercise of stock options in 2018, 2017 and 2016. All stock options outstanding at December 31, 2017 were forfeited during 2018 and there are no remaining stock options outstanding at December 31, 2018.

15. Financial Instruments

Off-Balance Sheet Risk

As collateral for the Company's performance and to insurers, the Company is contingently liable under standby letters of credit, bonds and bank guarantees in the amounts of \$285.4 million, \$275.4 million and \$273.1 million at December 31, 2018, 2017 and 2016, respectively. These standby letters of credit, bonds and bank guarantees are generally in force for up to 2 years. Certain issues have no scheduled expiration date. The Company pays fees to various banks and insurance companies that range from 0.4% to 3.9% per annum of the instrument's face value. If the Company were required to obtain replacement standby letters of credit, bonds and bank guarantees at December 31, 2018 for those currently outstanding, it is the Company's opinion that the replacement costs would be within the present fee structure.

The Company has currency exposures in approximately 30 countries. The Company's primary foreign currency exposures during 2018 were in the European Union, the U.K. and Brazil.

Off-Balance Sheet Risk—Third-Party Guarantees

During June 2014, the Company provided a guarantee to Brand as part of the net working capital settlement related to the Infrastructure Transaction, for certain matters occurring prior to closing. The remaining term of this guarantee is 2 years at December 31, 2018. The maximum potential amount of future payments related to this guarantee is approximately \$3 million at December 31, 2018. There is no recognition of this potential future payment in the consolidated financial statements as the Company believes the potential for making this payment is remote.

Any liabilities related to the Company's obligation to stand ready to act on third-party guarantees are included in Other current liabilities or Other liabilities (as appropriate) on the Consolidated Balance Sheets. Any recognition of these liabilities did not have a material impact on the Company's financial position or results of operations for 2018, 2017 or 2016.

In the normal course of business, legal indemnifications are provided related primarily to the performance of the Company's products and services and patent and trademark infringement of the products and services sold. These indemnifications generally relate to the performance (regarding function, not price) of the respective products or services and therefore no liability is recognized related to the fair value of such guarantees.

Derivative Instruments and Hedging Activities

The Company uses derivative instruments, including foreign currency exchange forward contracts, interest rate swaps and cross-currency interest rate swaps ("CCIRs"), to manage certain foreign currency and interest rate exposures. Derivative instruments are viewed as risk management tools by the Company and are not used for trading or speculative purposes. All derivative instruments are recorded on the Consolidated Balance Sheets at fair value.

Fair value is 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 (an exit price). The Company utilizes market data or assumptions that the Company believes market participants would use in valuing the asset or liability, including assumptions about risk and the risks inherent in the inputs to the valuation technique.

The fair value hierarchy distinguishes between (1) market participant assumptions developed based on market data obtained from independent sources (observable inputs), and (2) an entity's own assumptions about market participant assumptions based on the best information available in the circumstances (unobservable inputs). The fair value hierarchy consists of three broad levels, which give the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3).

The three levels of the fair value hierarchy are described below:

- Level 1—Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities.
- Level 2—Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly, including quoted prices for similar assets or liabilities in active markets; quoted prices for identical or similar assets or liabilities in markets that are not active; inputs other than quoted prices that are observable for the asset or liability (e.g., interest rates); and inputs that are derived principally from or corroborated by observable market data by correlation or other means.
- Level 3—Inputs that are both significant to the fair value measurement and unobservable.

In instances in which multiple levels of inputs are used to measure fair value, hierarchy classification is based on the lowest level input that is significant to the fair value measurement in its entirety. The Company's assessment of the significance of a particular input to the fair value measurement in its entirety requires judgment and considers factors specific to the asset or liability.

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The Company primarily applies the market approach for recurring fair value measurements and endeavors to utilize the best available information. Accordingly, the Company utilizes valuation techniques that maximize the use of observable inputs, such as forward rates, interest rates, the Company's credit risk and counterparties' credit risks, and which minimize the use of unobservable inputs. The Company is able to classify fair value balances based on the ability to observe those inputs. Foreign currency exchange forward contracts, interest rate swaps and CCIRs are based upon pricing models using market-based inputs (Level 2). Model inputs can be verified and valuation techniques do not involve significant management judgment.

The fair value of outstanding derivative contracts recorded as assets and liabilities on the Consolidated Balance Sheets was as follows:

(In thousands)	Balance Sheet Location	Fair Value of Derivatives Designated as Hedging Instruments	Fair Value of Derivatives Not Designated as Hedging Instruments	Total Fair Value
December 31, 2018				
Asset derivatives (Level 2):				
Foreign currency exchange forward contracts	Other current assets	\$ 2,970	\$ 589	\$ 3,559
Interest rate swaps	Other current assets	1,331	—	1,331
Interest rate swaps	Other assets	128	—	128
Total		<u>\$ 4,429</u>	<u>\$ 589</u>	<u>\$ 5,018</u>
Liability derivatives (Level 2):				
Foreign currency exchange forward contracts	Other current liabilities	\$ 24	\$ 2,910	\$ 2,934
Interest rate swaps	Other liabilities	1,849	—	1,849
Total		<u>\$ 1,873</u>	<u>\$ 2,910</u>	<u>\$ 4,783</u>
December 31, 2017				
Asset derivatives (Level 2):				
Foreign currency exchange forward contracts	Other current assets	\$ 2,329	\$ 2,915	\$ 5,244
Interest rate swaps	Other current assets	464	—	464
Interest rate swaps	Other assets	170	—	170
Total		<u>\$ 2,963</u>	<u>\$ 2,915</u>	<u>\$ 5,878</u>
Liability derivatives (Level 2):				
Foreign currency exchange forward contracts	Other current liabilities	\$ 153	\$ 6,970	\$ 7,123
Interest rate swaps	Other liabilities	1,368	—	1,368
Total		<u>\$ 1,521</u>	<u>\$ 6,970</u>	<u>\$ 8,491</u>

All of the Company's derivatives are recorded on the Consolidated Balance Sheets at gross amounts and not offset. All of the Company's interest rate swaps, CCIRs and certain foreign currency exchange forward contracts are transacted under International Swaps and Derivatives Association ("ISDA") documentation. Each ISDA master agreement permits the net settlement of amounts owed in the event of default. The Company's derivative assets and liabilities subject to enforceable master netting arrangements resulted in a \$0.1 million and \$0.2 million net liability at December 31, 2018 and December 31, 2017, respectively.

The effect of derivative instruments on the Consolidated Statements of Operations and the Consolidated Statements of Comprehensive Income (Loss):

Derivatives Designated as Hedging Instruments

(In thousands)	Amount of Gain (Loss) Recognized in Other Comprehensive Income ("OCI") on Derivative—Effective Portion	Location of Gain (Loss) Reclassified from Accumulated OCI into Income—Effective Portion	Amount of Gain (Loss) Reclassified from Accumulated OCI into Income—Effective Portion	Location of Gain (Loss) Recognized in Income on Derivative—Ineffective Portion and Amount Excluded from Effectiveness Testing	Amount of Gain (Loss) Recognized in Income on Derivative—Ineffective Portion and Amount Excluded from Effectiveness Testing
Twelve Months Ended December 31, 2018:					
Foreign currency exchange forward contracts	\$ 1,935	Product revenues / Cost of services and products sold	\$ (374)		\$ —
Foreign currency forward exchange contracts	—	Retained earnings	(1,520) ^(b)		—
Interest rate swaps	1,451	Interest expense	(1,108)		—
Cross-currency interest rate swaps	63 ^(a)	Interest expense	1,264		—
	<u>\$ 3,449</u>		<u>\$ (1,738)</u>		<u>\$ —</u>
Twelve Months Ended December 31, 2017:					
Foreign currency exchange forward contracts	\$ 3,547	Product revenues/Cost of services and products sold	\$ (954)		\$ —
Interest rate swaps	(734)		—		—
Cross-currency interest rate swaps	(205) ^(a)	Interest expense	1,002	Cost of services and products sold	420 ^(c)
	<u>\$ 2,608</u>		<u>\$ 48</u>		<u>\$ 420</u>
Twelve Months Ended December 31, 2016:					
Foreign currency exchange forward contracts	\$ 2,294	Cost of services and products sold	\$ (410)		\$ —
Cross-currency interest rate swaps	(1,549)		—	Cost of services and products sold	4,042 ^(c)
	<u>\$ 745</u>		<u>\$ (410)</u>		<u>\$ 4,042</u>

(a) Amounts represent changes in foreign currency translation related to balances in Accumulated other comprehensive loss.

(b) The Company has adopted the new revenue recognition standard utilizing the modified retrospective transition method, including use of practical expedients. See Note 2, Recently Adopted and Recently Issued Accounting Standards for additional information.

(c) These gains (losses) offset foreign currency fluctuation effects on the debt principal.

Derivatives Not Designated as Hedging Instruments

(In thousands)	Location of Gain (Loss) Recognized in Income on Derivatives	Amount of Gain (Loss) Recognized in Income on Derivatives for the Twelve Months Ended December 31(d)		
		2018	2017	2016
Foreign currency exchange forward contracts	Cost of services and products sold	\$ 17,262	\$ (23,572)	\$ 15,875

(d) These gains (losses) offset amounts recognized in cost of service and products sold principally as a result of intercompany or third-party foreign currency exposures.

Foreign Currency Exchange Forward Contracts

The Company conducts business in multiple currencies and, accordingly, is subject to the inherent risks associated with foreign exchange rate movements. Foreign currency-denominated assets and liabilities are translated into U.S. dollars at the exchange rates existing at the respective balance sheet dates, and income and expense items are translated at the average exchange rates during the respective periods.

The Company uses derivative instruments to hedge cash flows related to foreign currency fluctuations. Foreign currency exchange forward contracts outstanding are part of a worldwide program to minimize foreign currency exchange operating income and balance sheet exposure by offsetting foreign currency exposures of certain future payments between the Company and various subsidiaries, suppliers or customers. The unsecured contracts are with major financial institutions. The Company may be exposed to credit loss in the event of non-performance by the contract counterparties. The Company evaluates the creditworthiness of the counterparties and does not expect default by them. Foreign currency exchange forward contracts are used to hedge commitments, such as foreign currency debt, firm purchase commitments and foreign currency cash flows for certain export sales transactions.

Changes in the fair value of derivatives used to hedge foreign currency denominated balance sheet items are reported directly in earnings, along with offsetting transaction gains and losses on the items being hedged. Derivatives used to hedge forecasted cash flows associated with foreign currency commitments may be accounted for as cash flow hedges, as deemed appropriate, if the criteria for hedge accounting are met. Gains and losses on derivatives designated as cash flow hedges are deferred in Accumulated other comprehensive loss, a separate component of equity, and reclassified to earnings in a manner that matches the timing of the earnings impact of the hedged transactions. The ineffective portion of all hedges, if any, is recognized currently in earnings.

The recognized gains and losses offset amounts recognized in cost of services and products sold principally as a result of intercompany or third-party foreign currency exposures. At December 31, 2018 and December 31, 2017, the notional amounts of foreign currency exchange forward contracts were \$423.9 million and \$671.9 million, respectively. These contracts primarily hedge British pounds sterling and euros against other currencies and mature through October 2021.

In addition to foreign currency exchange forward contracts, the Company designates certain loans as hedges of net investments in international subsidiaries. The Company recorded pre-tax net losses of \$9.9 million, pre-tax net gains of \$17.4 million and pre-tax net losses of \$37.5 million related to hedges of net investments during 2018, 2017 and 2016, respectively, in Accumulated other comprehensive loss.

Interest Rate Swaps

The Company uses interest rate swaps in conjunction with certain debt issuances in order to secure a fixed interest rate. Changes in the fair value attributed to the effect of the swaps' interest spread and changes in the credit worthiness of the counter-parties are recorded in Accumulated other comprehensive loss.

In January 2017 and February 2018, the Company entered into a series of interest rate swaps that cover the period from 2018 through 2022 and had the effect of converting \$300.0 million of the Term Loan Facility from floating-rate to fixed-rate beginning in 2018. The fixed rates provided by the swaps replace the adjusted LIBOR rate in the interest calculation, ranging from 1.65% for 2018 to 3.12% for 2022. The total notional of the Company's interest rate swaps was \$300.0 million as of December 31, 2018.

Cross-Currency Interest Rate Swaps

The Company may use CCIRs in conjunction with certain debt issuances in order to secure a fixed local currency interest rate. Under these CCIRs, the Company receives interest based on a fixed or floating U.S. dollar rate and pays interest on a fixed local currency rate based on the contractual amounts in dollars and the local currency, respectively. At maturity, there is also the payment of principal amounts between currencies. Changes in the fair value attributed to the effect of the swaps' interest spread and changes in the credit worthiness of the counter-parties are recorded in Accumulated other comprehensive loss. Changes in value attributed to the effect of foreign currency fluctuations are recorded in the Consolidated Statements of Operations and offset currency fluctuation effects on the debt principal. The Company had no outstanding CCIRs at December 31, 2018 or December 31, 2017.

Fair Value of Other Financial Instruments

The carrying amounts of cash and cash equivalents, accounts receivable, accounts payable, accrued liabilities and short-term borrowings approximate fair value due to the short-term maturities of these assets and liabilities. At December 31, 2018 and 2017, the total fair value of long-term debt, including current maturities, was \$592.0 million and \$599.1 million, respectively, compared with a carrying value of \$605.4 million and \$593.7 million, respectively. Fair values for debt are based upon pricing models using market-based inputs (Level 2) for similar issues or on the current rates offered to the Company for debt of the same remaining maturities.

Concentrations of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk consist principally of cash and cash equivalents and accounts receivable. The Company places cash and cash equivalents with high-quality financial institutions and, by policy, limits the amount of credit exposure to any single institution.

Concentrations of credit risk with respect to accounts receivable are generally limited in the Harsco Industrial Segment. However, the Company's Harsco Metals & Minerals Segment and, to a lesser extent, the Harsco Rail Segment have several large customers throughout the world with significant accounts receivable balances. Consolidation in the global steel or rail industries could result in an increase in concentration of credit risk for the Company.

The Company generally does not require collateral or other security to support customer receivables. If a receivable from one or more of the Company's larger customers becomes uncollectible, it could have a material effect on the Company's results of operations or cash flows.

16. Information by Segment and Geographic Area

The Company reports information about operating segments using the "management approach," which is based on the way management organizes and reports the segments within the enterprise for making operating decisions and assessing performance. The Company's reportable segments are identified based upon differences in products, services and markets served. In 2018, the Company had three reportable segments. These segments and the types of products and services offered include the following:

Harsco Metals & Minerals Segment

Global expertise in providing on-site services for product quality improvement; resource recovery from steel and metals manufacturing; and material logistics; value added environmental solutions for industrial co-products; as well as aluminum dross and scrap process systems. Major customers include steel mills and asphalt roofing manufacturers.

Harsco Industrial Segment

Major products include air-cooled heat exchangers; industrial grating and high-security fencing; and boilers and water heaters. Major customers include industrial plants and the non-residential, commercial and public construction and retrofit markets; and the natural gas, natural gas processing and petrochemical industries.

Harsco Rail Segment

This Segment manufactures railway track maintenance and safety equipment and provides track maintenance services. The major customers include private and government-owned railroads and urban mass transit systems worldwide.

Other Information

The measurement basis of segment profit or loss is operating income. There are no significant inter-segment sales. Corporate assets, at December 31, 2018 and 2017, include principally cash, prepaid taxes, fair value of derivative instruments and U.S. deferred income taxes. Countries with revenues from unaffiliated customers or net property, plant and equipment of ten percent or more of the consolidated totals (in at least one period presented) are as follows:

Information by Geographic Area (a)

(In thousands)	Revenues from Unaffiliated Customers		
	Year Ended December 31		
	2018	2017	2016
U.S.	\$ 812,941	\$ 697,663	\$ 614,327
U.K.	143,346	146,624	156,552
All Other	766,093	762,775	680,344
Totals including Corporate	\$ 1,722,380	\$ 1,607,062	\$ 1,451,223

(a) Revenues are attributed to individual countries based on the location of the facility generating the revenue.

(In thousands)	Property, Plant and Equipment, Net		
	Balances at December 31		
	2018	2017	2016
U.S.	\$ 135,086	\$ 120,555	\$ 125,386
China	89,503	95,569	90,288
Brazil	36,960	54,704	62,597
All Other	208,351	208,919	211,984
Totals including Corporate	\$ 469,900	\$ 479,747	\$ 490,255

No single customer provided in excess of 10% of the Company's consolidated revenues in 2018, 2017 and 2016.

In 2018, 2017 and 2016, the Harsco Metals & Minerals Segment had one customer that provided in excess of 10% of this Segment's revenues under multiple long-term contracts at several mill sites. Should additional consolidations occur involving some of the steel industry's larger companies which are customers of the Company, it would result in an increase in concentration of credit risk for the Company. The loss of any one of the contracts would not have a material adverse effect upon the Company's financial position or cash flows; however, it could have a significant effect on quarterly or annual results of operations.

In 2018 and 2016, the Harsco Industrial Segment had no customers and in 2017 one customer that provided in excess of 10% of the Segment's revenues. In 2018, 2017 and 2016, the Harsco Rail Segment had one customer that provided in excess of 10% of the Segment's revenues. The loss of any of these customers would not have a material adverse impact on the Company's financial positions or cash flows; however, it could have a material effect on quarterly or annual results of operations.

Operating Information by Segment:

(In thousands)	Twelve Months Ended		
	December 31		
	2018	2017	2016
Revenues			
Harsco Metals & Minerals	\$ 1,068,304	\$ 1,011,328	\$ 965,540
Harsco Industrial	374,708	299,592	247,542
Harsco Rail	279,294	295,999	238,107
Corporate	74	143	34
Total Revenues	\$ 1,722,380	\$ 1,607,062	\$ 1,451,223
Operating Income (Loss)			
Harsco Metals & Minerals	\$ 121,195	\$ 102,362	\$ 78,590
Harsco Industrial	54,665	35,532	23,804
Harsco Rail	37,341	32,953	(16,592)
Corporate	(22,274)	(25,453)	(20,919)
Total Operating Income	\$ 190,927	\$ 145,394	\$ 64,883
Total Assets			
Harsco Metals & Minerals	\$ 1,230,152	\$ 1,184,280	\$ 1,181,602
Harsco Industrial	163,324	113,410	107,987
Harsco Rail	186,049	237,135	204,477
Corporate	53,342	43,860	87,272
Total Assets	\$ 1,632,867	\$ 1,578,685	\$ 1,581,338
Depreciation and Amortization			
Harsco Metals & Minerals	\$ 115,059	\$ 112,329	\$ 120,611
Harsco Industrial	7,729	7,360	7,223
Harsco Rail	4,287	4,221	5,383
Corporate	5,710	6,027	8,269
Total Depreciation and Amortization	\$ 132,785	\$ 129,937	\$ 141,486
Capital Expenditures			
Harsco Metals & Minerals	\$ 114,142	\$ 87,526	\$ 62,322
Harsco Industrial	7,561	6,895	5,118
Harsco Rail	9,152	2,403	1,696
Corporate	1,313	1,490	204
Total Capital Expenditures	\$ 132,168	\$ 98,314	\$ 69,340

Reconciliation of Segment Operating Income to Consolidated Income (Loss) From Continuing Operations Before Income Taxes and Equity Income:

(In thousands)	Twelve Months Ended December 31		
	2018	2017	2016
Segment operating income	\$ 213,201	\$ 170,847	\$ 85,802
General Corporate expense	(22,274)	(25,453)	(20,919)
Operating income from continuing operations	190,927	145,394	64,883
Interest income	2,155	2,469	2,475
Interest expense	(38,148)	(47,552)	(51,584)
Defined benefit pension income (expense)	3,447	(2,595)	(1,414)
Loss on early extinguishment of debt	(1,127)	(2,265)	(35,337)
Change in fair value to the unit adjustment liability and loss on dilution and sale of equity method investment	—	—	(58,494)
Income (loss) from continuing operations before income taxes and equity income	\$ 157,254	\$ 95,451	\$ (79,471)

17. Revenue Recognition

The Company recognizes revenues to depict the transfer of promised services and products to customers in an amount that reflects the consideration the Company expects to receive in exchange for those services or products. Service revenues include the service components of the Harsco Metals & Minerals and Harsco Rail Segments. Product revenues include the Harsco Industrial Segment and the product revenues of the Harsco Metals & Minerals and Harsco Rail Segments. See Note 1, Summary of Significant Accounting Policies, Revenue Recognition, for additional information.

A summary of the Company's revenues by primary geographical markets as well as by key product and service groups is as follows:

(In thousands)	Twelve Months Ended December 31, 2018				
	Harsco Metals & Minerals Segment	Harsco Industrial Segment	Harsco Rail Segment	Corporate	Consolidated Totals
Primary Geographical Markets (a):					
North America	\$ 302,238	\$ 354,558	\$ 205,212	\$ 74	\$ 862,082
Western Europe	390,840	—	48,016	—	438,856
Latin America (b)	151,886	20,150	3,977	—	176,013
Asia-Pacific	145,761	—	22,089	—	167,850
Middle East and Africa	50,003	—	—	—	50,003
Eastern Europe	27,576	—	—	—	27,576
Total Revenues (c)	\$ 1,068,304	\$ 374,708	\$ 279,294	\$ 74	\$ 1,722,380
Key Product and Service Groups:					
On-site services and material logistics, product quality improvement and resource recovery for iron, steel and metals manufacturing; value-added environmental solutions for industrial co-products; as well as aluminum dross and scrap processing systems	\$ 1,068,304	\$ —	\$ —	\$ —	\$ 1,068,304
Railway track maintenance services and equipment	—	—	279,294	—	279,294
Air-cooled heat exchangers	—	207,184	—	—	207,184
Industrial grating products	—	127,419	—	—	127,419
Heat transfer products	—	40,105	—	—	40,105
General Corporate	—	—	—	74	74
Total Revenues (c)	\$ 1,068,304	\$ 374,708	\$ 279,294	\$ 74	\$ 1,722,380

Twelve Months Ended December 31, 2017					
(In thousands)	Harsco Metals & Minerals Segment	Harsco Industrial Segment	Harsco Rail Segment	Corporate	Consolidated Totals
Primary Geographical Markets (a):					
North America	\$ 274,476	\$ 273,775	\$ 196,567	\$ 143	\$ 744,961
Western Europe	369,763	—	78,698	—	448,461
Latin America (b)	159,130	21,369	2,827	—	183,326
Asia-Pacific	138,311	4,448	17,907	—	160,666
Middle East and Africa	42,700	—	—	—	42,700
Eastern Europe	26,948	—	—	—	26,948
Total Revenues (c)	<u>\$ 1,011,328</u>	<u>\$ 299,592</u>	<u>\$ 295,999</u>	<u>\$ 143</u>	<u>\$ 1,607,062</u>

Key Product and Service Groups:

On-site services and material logistics, product quality improvement and resource recovery for iron, steel and metals manufacturing; value-added environmental solutions for industrial co-products; as well as aluminum dross and scrap processing systems	\$ 1,011,328	\$ —	\$ —	\$ —	\$ 1,011,328
Railway track maintenance services and equipment	—	—	295,999	—	295,999
Air-cooled heat exchangers	—	144,955	—	—	144,955
Industrial grating products	—	116,598	—	—	116,598
Heat transfer products	—	38,039	—	—	38,039
General Corporate	—	—	—	143	143
Total Revenues (c)	<u>\$ 1,011,328</u>	<u>\$ 299,592</u>	<u>\$ 295,999</u>	<u>\$ 143</u>	<u>\$ 1,607,062</u>

Twelve Months Ended December 31, 2016					
(In thousands)	Harsco Metals & Minerals Segment	Harsco Industrial Segment	Harsco Rail Segment	Corporate	Consolidated Totals
Primary Geographical Markets (a):					
North America	\$ 247,287	\$ 215,322	\$ 191,726	\$ 34	\$ 654,369
Western Europe	388,336	—	30,270	—	418,606
Latin America (b)	134,071	28,256	2,014	—	164,341
Asia-Pacific	119,873	3,964	13,025	—	136,862
Middle East and Africa	45,659	—	1,072	—	46,731
Eastern Europe	30,314	—	—	—	30,314
Total Revenues (c)	<u>\$ 965,540</u>	<u>\$ 247,542</u>	<u>\$ 238,107</u>	<u>\$ 34</u>	<u>\$ 1,451,223</u>

Key Product and Service Groups:

On-site services and material logistics, product quality improvement and resource recovery for iron, steel and metals manufacturing; value-added environmental solutions for industrial co-products; as well as aluminum dross and scrap processing systems	\$ 965,540	\$ —	\$ —	\$ —	\$ 965,540
Railway track maintenance services and equipment	—	—	238,107	—	238,107
Air-cooled heat exchangers	—	93,616	—	—	93,616
Industrial grating products	—	115,914	—	—	115,914
Heat transfer products	—	38,012	—	—	38,012
General Corporate	—	—	—	34	34
Total Revenues (c)	<u>\$ 965,540</u>	<u>\$ 247,542</u>	<u>\$ 238,107</u>	<u>\$ 34</u>	<u>\$ 1,451,223</u>

(a) Revenues are attributed to individual countries based on the location of the facility generating the revenue.

(b) Includes Mexico.

(c) The Company has adopted the new revenue recognition standard utilizing the modified retrospective transition method, including use of practical expedients. Comparative information has not been restated and continues to be reported under U.S. GAAP in effect for those periods. See Note 2, Recently Adopted and Recently Issued Accounting Standards for additional information.

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The Company may receive payments in advance of earning revenue, which are treated as Advances on contracts on the Consolidated Balance Sheets. The Company may recognize revenue in advance of being able to contractually invoice the customer, which is treated as Contract assets on the Consolidated Balance Sheets. Contract assets are transferred to Trade accounts receivable, net when right to payment becomes unconditional. Contract assets and Contract liabilities are reported as a net position, on a contract-by-contract basis, at the end of each reporting period. These instances are primarily related to the Harsco Rail Segment and air-cooled heat exchangers business of the Harsco Industrial Segment.

The Company had Contract assets totaling \$21.8 million at January 1, 2018 and \$24.3 million at December 31, 2018. The increase is due principally to revenue recognized in excess of amounts reclassified to trade accounts receivable, net of approximately \$5 million and the Altek acquisition partially offset by a contract termination. The Company had Advances on contracts totaling \$64.0 million at January 1, 2018 and \$69.0 million at December 31, 2018. The increase is due principally to advances on contracts received in excess of revenue recognized of approximately \$2 million as well as the Altek acquisition and foreign currency translation.

At December 31, 2018, the Harsco Metals & Minerals Segment had remaining, fixed, unsatisfied performance obligations, where the expected contract duration exceeds one year totaling \$148.1 million. Of this amount, \$44.3 million is expected to be fulfilled by December 31, 2019, \$39.6 million by December 31, 2020, \$24.9 million by December 31, 2021, \$24.1 million by December 31, 2022 and the remainder thereafter. These amounts exclude any variable fees, fixed fees subject to indexation and any performance obligations expected to be satisfied within one year.

At December 31, 2018, the Harsco Rail Segment had remaining, fixed, unsatisfied performance obligations, where the expected contract duration exceeds one year totaling \$209.8 million. Of this amount, \$65.5 million is expected to be fulfilled by December 31, 2019, \$70.8 million by December 31, 2020, \$50.9 million by December 31, 2021, \$18.7 million by December 31, 2022 and the remainder thereafter. These amounts exclude any variable fees, fixed fees subject to indexation and any performance obligations expected to be satisfied within one year.

The Company provides assurance type warranties primarily for product sales in the Harsco Industrial and Harsco Rail Segments. These warranties are typically not priced or negotiated separately (there is no option to separately purchase the warranty) or the warranty does not provide customers with a service in addition to the assurance that the product complies with agreed-upon specifications. Accordingly, such warranties do not represent separate performance obligations. See Note 1, Summary of Significant Accounting Policies for additional information on warranties.

The Company has elected to utilize the following practical expedients on an ongoing basis as part of the adoption:

- The Company has not adjusted the promised amount of consideration for the effects of a significant financing component if the Company expects, at contract inception, that the period between when the Company transfers the promised good or services to the customer and when the customer pays for that good or service would be one year or less; and
- The Company has elected to exclude disclosures related to unsatisfied performance obligations where the related contract has a duration of one year or less; or where the consideration is entirely variable. Accordingly, the Company's disclosure related to unsatisfied performance obligations is limited to the railway track maintenance equipment in the Harsco Rail Segment and the fixed portion of fees related to metals services in the Harsco Metals & Minerals Segment.

Taxes assessed by governmental authorities that are both imposed on and concurrent with a specific revenue-producing transaction, that are collected by the Company from a customer, are excluded from revenue. Additionally, in certain contracts, the Company facilitates shipping and handling activities after control has transferred to the customer. The Company has elected to record all shipping and handling activities as costs to fulfill a contract. In situations where the shipping and handling costs have not been incurred at the time revenue is recognized, the respective shipping and handling costs are accrued.

18. Other (Income) Expenses, Net

The major components of this Consolidated Statements of Operations caption are as follows:

(In thousands)	2018	2017	2016
Net gains			
Harsco Metals & Minerals Segment	\$ (2,650)	\$ (1,354)	\$ (1,828)
Harsco Industrial Segment	—	(3,782)	64
Corporate	(1,218)	—	—
Total net gains	(3,868)	(5,136)	(1,764)
Employee termination benefit costs			
Harsco Metals & Minerals Segment	2,853	4,411	8,491
Harsco Industrial Segment	220	617	947
Harsco Rail Segment	704	1,133	297
Corporate	1,206	1,189	1,042
Total employee termination benefit costs	4,983	7,350	10,777
Other costs to exit activities			
Harsco Metals & Minerals Segment	352	706	220
Harsco Industrial Segment	258	371	40
Corporate	(182)	556	180
Total other costs to exit activities	428	1,633	440
Impaired asset write-downs			
Harsco Metals & Minerals Segment	104	706	399
Harsco Industrial Segment	9	151	—
Corporate	—	168	—
Total impaired asset write-downs	113	1,025	399
Harsco Metals & Minerals Segment contingent consideration adjustments	(2,939)	—	—
Harsco Metals & Minerals Segment separation costs	—	—	3,235
Other income	(239)	(231)	(467)
Total other (income) expenses, net	\$ (1,522)	\$ 4,641	\$ 12,620

Net Gains

Net gains result from the sales of redundant properties (primarily land, buildings and related equipment) and non-core assets. In 2018, gains related to assets sold principally in Eastern Europe, Western Europe and Asia Pacific. In 2017, gains related to assets sold principally in Latin America and Western Europe. In 2016, gains related to assets sold principally in Western Europe, North America and Latin America. Cash proceeds associated with these gains are included in Proceeds from sales of assets, in the cash flows from investing activities section of the Consolidated Statements of Cash Flows.

Employee Termination Benefit Costs

Costs and the related liabilities associated with involuntary termination benefit costs associated with one-time benefit arrangements provided as part of an exit or disposal activity are recognized by the Company when a formal plan for reorganization is approved at the appropriate level of management and communicated to the affected employees. Additionally, costs associated with ongoing benefit arrangements, or in certain countries where statutory requirements dictate a minimum required benefit, are recognized when they are probable and estimable. The employee termination benefits costs in 2018 related principally to the Harsco Metals & Minerals Segment, primarily in Asia Pacific and Western Europe and Corporate in North America. The employee termination benefits costs in 2017 related principally to the Harsco Metals & Minerals Segment, primarily in Latin America and Western Europe. The employee termination benefits costs in 2016 related principally to the Harsco Metals & Minerals Segment, including a probable site exit and the impact of Harsco Metals & Minerals Segment's Improvement Plan, primarily in Western Europe, Latin America and North America.

Other Costs to Exit Activities

Costs associated with exit or disposal activities include costs to terminate a contract and other costs associated with exit or disposal activities. Costs to terminate a contract that is not a capital lease are recognized when an entity terminates the contract or when an entity ceases using the right conveyed by the contract. This includes the costs to terminate the contract before the end of its term or the costs that will continue to be incurred under the contract for its remaining term without economic benefit to the entity (e.g., lease run-out costs). Other costs associated with exit or disposal activities (e.g., costs to consolidate or close facilities and relocate equipment or employees) are recognized and measured at their fair value in the period in which the liability is incurred. In 2018, \$0.4 million of exit costs were incurred across several regions. In 2017, \$1.6 million of exit costs were incurred, principally in Western Europe and North America. In 2016, \$0.4 million of exit costs were incurred, principally in North America and Western Europe.

Impaired Asset Write-downs

Impaired asset write-downs are measured as the amount by which the carrying amount of assets exceeds their fair value. Fair value is estimated based upon the expected future realizable cash flows including anticipated selling prices. Non-cash impaired asset write-downs are included in, Other, net, on the Consolidated Statements of Cash Flows as adjustments to reconcile net income (loss) to net cash provided by operating activities. In 2017, \$1.0 million of impaired asset write-downs were incurred principally in the Harsco Metals & Minerals Segment, mostly in the Asia Pacific and North America regions. In 2016, \$0.4 million of impaired asset write-downs were incurred principally in the Harsco Metals & Minerals Segment, mostly in the Asia Pacific region.

Harsco Metals & Minerals Segment Contingent Consideration Adjustments

The Company acquired Altek during 2018 and the purchase price included contingent consideration based on the performance of Altek through 2021. During 2018, the Company's assessment of these performance goals resulted in a \$2.9 million reduction to the previously recognized contingent consideration liability in the Harsco Metals & Minerals Segment. Each quarter until settlement of the contingency, the Company will assess the likelihood that Altek will achieve the performance goals and the resulting fair value of the contingent consideration and any future adjustments (increases or decreases) will be included in operating results.

19. Components of Accumulated Other Comprehensive Loss

Accumulated other comprehensive loss is included on the Consolidated Statements of Stockholders' Equity. The components of Accumulated other comprehensive loss, net of the effect of income taxes, and activity for the years ended December 31, 2018 and 2017 are as follows:

(In thousands)	Components of Accumulated Other Comprehensive Income (Loss) - Net of Tax				
	Cumulative Foreign Exchange Translation Adjustments	Effective Portion of Derivatives Designated as Hedging Instruments	Cumulative Unrecognized Actuarial Losses on Pension Obligations	Unrealized Loss on Marketable Securities	Total
Balance at December 31, 2016	\$ (144,534)	\$ (1,089)	\$ (461,094)	\$ (5)	\$ (606,722)
Other comprehensive income before reclassifications	36,011 ^(a)	1,967 ^(b)	5,143 ^(c)	22	43,143
Amounts reclassified from accumulated other comprehensive loss, net of tax	—	(70)	20,111	—	20,041
Total other comprehensive income	36,011	1,897	25,254	22	63,184
Less: Other comprehensive income attributable to noncontrolling interests	(3,044)	—	—	—	(3,044)
Other comprehensive income attributable to Harsco Corporation	32,967	1,897	25,254	22	60,140
Balance at December 31, 2017	\$ (111,567)	\$ 808	\$ (435,840)	\$ 17	\$ (546,582)

(In thousands)	Components of Accumulated Other Comprehensive Income (Loss) - Net of Tax				
	Cumulative Foreign Exchange Translation Adjustments	Effective Portion of Derivatives Designated as Hedging Instruments	Cumulative Unrecognized Actuarial Losses on Pension Obligations	Unrealized Loss on Marketable Securities	Total
Balance at December 31, 2017	\$ (111,567)	\$ 808	\$ (435,840)	\$ 17	\$ (546,582)
Adoption of new accounting standard (c)		(1,520)			(1,520)
Balance at January 1, 2018	(111,567)	(712)	(435,840)	17	(548,102)
Other comprehensive income (loss) before reclassifications	(50,743) ^(a)	2,466 ^(b)	8,450 ^(c)	(48)	(39,875)
Amounts reclassified from accumulated other comprehensive loss, net of tax	—	(365)	18,735	—	18,370
Total other comprehensive income (loss)	(50,743)	2,101	27,185	(48)	(21,505)
Less: Other comprehensive loss attributable to noncontrolling interests	2,500	—	—	—	2,500
Other comprehensive income (loss) attributable to Harsco Corporation	(48,243)	2,101	27,185	(48)	(19,005)
Balance at December 31, 2018	\$ (159,810)	\$ 1,389	\$ (408,655)	\$ (31)	\$ (567,107)

(a) Principally foreign currency fluctuation.

(b) Principally net change from periodic revaluations.

(c) Principally changes due to annual actuarial remeasurements.

Amounts reclassified from accumulated other comprehensive loss for 2018 and 2017 are as follows:

(In thousands)	Year Ended December 31 2018	Year Ended December 31 2017	Affected Caption on the Consolidated Statements of Operations
Amortization of defined benefit pension items (d):			
Actuarial losses	\$ 20,014	\$ 21,985	Defined benefit pension income (expense)
Prior-service costs	(139)	219	Defined benefit pension income (expense)
Settlement/curtailment losses	249	—	Defined benefit pension income (expense)
Total before tax	20,124	22,204	
Tax benefit	(1,389)	(2,093)	
Total reclassification of defined benefit pension items, net of tax	\$ 18,735	\$ 20,111	
Amortization of cash flow hedging instruments:			
Foreign currency exchange forward contracts	\$ (374)	\$ (936)	Product revenues
Foreign currency exchange forward contracts	—	(18)	Cost of services and products sold
Cross-currency interest rate swaps	1,264	1,002	Interest expense
Interest rate swaps	(1,108)	—	Interest expense
Total before tax	(218)	48	
Tax benefit	(147)	(118)	
Total reclassification of cash flow hedging instruments	\$ (365)	\$ (70)	

(d) These accumulated other comprehensive loss components are included in the computation of NPPC. See Note 10, Employee Benefit Plans, for additional information.

Two-Year Summary of Quarterly Results (Unaudited)
(In millions, except per share amounts)

Quarterly	2018 (a)			
	First	Second	Third	Fourth
Revenues	\$ 408.0	\$ 432.0	\$ 445.5	\$ 436.9
Gross profit (b)	96.7	113.1	118.8	105.1
Net income attributable to Harsco Corporation	17.8	40.5	32.8	45.9
Basic income (loss) per share attributable to Harsco Corporation common stockholders:				
Continuing operations	\$ 0.23	\$ 0.49	\$ 0.41	\$ 0.56
Discontinued operations (c)	(0.01)	0.01	—	0.01
Basic income per share attributable to Harsco Corporation common stockholders	\$ 0.22	\$ 0.50	\$ 0.41	\$ 0.57 (d)
Diluted income (loss) per share attributable to Harsco Corporation common stockholders:				
Continuing operations	\$ 0.22	\$ 0.48	\$ 0.40	\$ 0.55
Discontinued operations (c)	(0.01)	0.01	—	0.01
Diluted income per share attributable to Harsco Corporation common stockholders	\$ 0.21	\$ 0.48 (d)	\$ 0.39 (d)	\$ 0.55 (d)

Quarterly	2017 (a)			
	First	Second	Third	Fourth
Revenues	\$ 372.5	\$ 394.9	\$ 384.7	\$ 455.0
Gross profit (b)	84.3	100.9	94.3	104.6
Net income (loss) attributable to Harsco Corporation	8.9	19.0	13.3	(33.4)
Basic income (loss) per share attributable to Harsco Corporation common stockholders:				
Continuing operations	\$ 0.12	\$ 0.23	\$ 0.17	\$ (0.42)
Discontinued operations (c)	—	0.01	—	0.01
Basic income (loss) per share attributable to Harsco Corporation common stockholders	\$ 0.11 (d)	\$ 0.24	\$ 0.16 (d)	\$ (0.41)
Diluted loss per share attributable to Harsco Corporation common stockholders:				
Continuing operations	\$ 0.11	\$ 0.22	\$ 0.16	\$ (0.42)
Discontinued operations (c)	—	—	—	0.01
Diluted income (loss) per share attributable to Harsco Corporation common stockholders	\$ 0.11	\$ 0.23 (d)	\$ 0.16	\$ (0.41)

(a) Sum of the quarters may not equal the total year due to rounding.

(b) Gross profit is defined as Revenues less costs and expenses associated directly with or allocated to products sold or services rendered.

(c) Discontinued operations related principally to the Gas Technologies Segment which was sold in the fourth quarter of 2007.

(d) Does not total due to rounding.

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

None.

Item 9A. Controls and Procedures.

Based on the evaluation required by Securities Exchange Act Rules 13a-15(b) and 15d-15(b), the Company's management, including the Chief Executive Officer and Chief Financial Officer, conducted an evaluation of the effectiveness of disclosure controls and procedures, as defined in Securities Exchange Act Rules 13a-15(e) and 15d-15(e), at December 31, 2018. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer concluded that the disclosure controls and procedures were effective at December 31, 2018. There were no changes in internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, internal control over financial reporting during the fourth quarter of 2018.

Management's Report on Internal Controls Over Financial Reporting is included in Part II, Item 8, "Financial Statements and Supplementary Data." The effectiveness of the Company's internal control over financial reporting at December 31, 2018 has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in the Report of Independent Registered Public Accounting Firm appearing in Part II, Item 8, "Financial Statements and Supplementary Data."

Item 9B. Other Information.

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information regarding executive officers of the Company required by this Item is set forth as a Supplementary Item, titled "Executive Officers of the Registrant," at the end of Part I of this Annual Report on Form 10-K (pursuant to Instruction 3 to Item 401(b) of Regulation S-K) and is incorporated herein by reference. The other information required by this Item is incorporated herein by reference from the disclosures that will be included under the sections entitled "Corporate Governance," "Proposal 1: Election of Directors - Nominees for Director," "Meetings and Committees of the Board," "Report of the Audit Committee" and "Section 16(a) Beneficial Ownership Reporting Compliance" of the Company's Definitive Proxy Statement for its 2019 Annual Meeting of Stockholders (the "2019 Proxy Statement"), which will be filed pursuant to SEC Regulation 14A not later than 120 days after the end of the Company's fiscal year ended December 31, 2018.

The Company's Code of Conduct (the "Code"), which applies to all officers, directors and employees of the Company, may be found on the Company's Internet website, www.harsco.com. The Company intends to disclose on its website any amendments to the Code or any waiver from a provision of the Code granted to an executive officer or director of the Company. The Code is available in print, without charge, to any person who requests it. To request a copy of the Code please contact the Company's Vice President—Corporate Communications at (717) 730-3683.

Item 11. Executive Compensation.

The information regarding compensation of executive officers and directors required by this Item is incorporated herein by reference from the disclosures that will be included under the sections entitled "Compensation Discussion and Analysis," "Discussion and Analysis of 2018 Compensation" and "Non-Employee Director Compensation" of the 2019 Proxy Statement. The other information required by this Item is incorporated herein by reference from the disclosures that will be included under the sections entitled "Compensation Committee Interlocks and Insider Participation" and "Compensation Committee Report" of the 2019 Proxy Statement.

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

The information regarding security ownership of certain beneficial owners and management required by this Item is incorporated herein by reference from the disclosures that will be included under the section entitled "Share Ownership of Directors, Management and Certain Beneficial Owners" of the 2019 Proxy Statement.

Equity compensation plan information is incorporated herein by reference from the disclosures that will be included under the section entitled "Equity Compensation Plan Information (As of December 31, 2018)" of the 2019 Proxy Statement.

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

The information regarding certain relationships and related transactions required by this Item is incorporated herein by reference from the disclosures that will be included under the section entitled "Transactions with Related Persons" of the 2019 Proxy Statement. The information regarding director independence required by this Item is incorporated herein by reference from the disclosures that will be included under the section entitled "Corporate Governance" of the 2019 Proxy Statement.

Item 14. Principal Accounting Fees and Services.

The information regarding principal accounting fees and services required by this Item is incorporated herein by reference from the disclosures that will be included under the sections entitled "Report of the Audit Committee" and "Fees Billed by the Independent Auditors for Audit and Non-Audit Services" of the 2019 Proxy Statement.

PART IV

Item 15. Exhibits, Financial Statement Schedules.

- (a) 1. The Index to Consolidated Financial Statements and Supplementary Data is located under Part II, Item 8, "Financial Statements and Supplementary Data."

	Page
Index to Consolidated Financial Statements and Supplementary Data	35

2. The following financial statement schedule should be read in conjunction with the Consolidated Financial Statements under Part II, Item 8, "Financial Statements and Supplementary Data":

	Page
Schedule II—Valuation and Qualifying Accounts for the years 2018, 2017 and 2016	94

Financial statement schedules other than that listed above are omitted because the required information is not applicable, or because the information required is included in the consolidated financial statements.

SCHEDULE II. VALUATION AND QUALIFYING ACCOUNTS

Continuing Operations

(In thousands)

COLUMN A	COLUMN B	COLUMN C	COLUMN D		COLUMN E
Description	Balance at Beginning of Period	Additions (Deductions) Charged to Cost and Expenses	Additions (Deductions) Due to Currency Translation Adjustments	Other	Balance at End of Period
For the year 2018:					
Allowance for Doubtful Accounts	\$ 4,731	\$ 372	\$ (154)	\$ (315) ^(a)	\$ 4,634
Deferred Tax Assets—Valuation Allowance	174,227	(19,990)	(8,693)	(6,682) ^(b)	138,862
For the year 2017:					
Allowance for Doubtful Accounts	\$ 11,800	\$ 5,346	\$ 533	\$ (12,948) ^(a)	\$ 4,731
Deferred Tax Assets—Valuation Allowance	146,097	33,041	10,097	(15,008) ^(b)	174,227
For the year 2016:					
Allowance for Doubtful Accounts	\$ 25,649	\$ (38)	\$ (320)	\$ (13,491) ^(a)	\$ 11,800
Deferred Tax Assets—Valuation Allowance	110,680	38,490	(6,323)	3,250	146,097

(a) Includes the write-off of previously reserved accounts receivable balances.

(b) Includes a decrease of \$5.4 million related to a change in estimate of interest deductions and a decrease of \$1.1 million due to capital loss carryforward expiring in the U.S in 2018. Includes a decrease of \$11.6 million related to pension adjustments recorded through Accumulated other comprehensive loss and a \$4.6 million decrease related to a U.S. tax rate change in 2017.

Listing of Exhibits Filed with Form 10-K

	Description of Exhibit
3(a)	Restated Certificate of Incorporation (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2013, Commission File Number 001-03970).
3(b)	Certificate of Designation filed September 25, 1997 (incorporated by reference to Exhibit 3.A to the Company's Annual Report on Form 10-K for the period ended December 31, 1997, Commission File Number 001-03970).
3(c)	Certificate of Amendment to the Restated Certificate of Incorporation, dated April 29, 2015 (incorporated by reference to the Company's Current Report on Form 8-K/A dated May 22, 2015, Commission File Number 001-03970).
3(d)	By-laws, as amended October 28, 2014 (incorporated by reference to the Company's Current Report on Form 8-K dated October 28, 2014, Commission File Number 001-03970).
4	Form of Specimen Common Stock Certificate (incorporated by reference to Exhibit 4(h) to the Company's Registration Statement on Form S-3 dated December 15, 1994, Registration No. 33-56885).

Material Contracts—Credit and Underwriting Agreements

10(a)(i)	Amended and Restated Five-Year Credit Agreement, dated March 2, 2012, among Harsco Corporation, the lenders named therein, Citibank, N.A., as administrative agent, RBS Securities Inc., as syndication agent, and the Bank of Tokyo-Mitsubishi UFJ, Ltd., HSBC Bank USA, National Association, ING Bank N.V., Dublin Branch, JPMorgan Chase Bank, N.A. and Lloyds TSB Bank PLC, as documentation agents (incorporated by reference to the Company's Current Report on Form 8-K dated March 7, 2012, Commission File No. 001-03970).
10(a)(ii)	Amendment No. 1, dated September 12, 2013, to the Amended and Restated Five-Year Credit Agreement, dated March 2, 2012, among Harsco Corporation, the lenders named therein, Citibank, N.A., as administrative agent, RBS Securities Inc., as syndication agent, and the Bank of Tokyo-Mitsubishi UFJ, Ltd., HSBC Bank USA, National Association, ING Bank N.V., Dublin Branch, JPMorgan Chase Bank, N.A. and Lloyds TSB Bank PLC, as documentation agents (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended September 30, 2013, Commission File Number 001-03970).
10(a)(iii)	Amendment No. 2, dated December 20, 2013, to the Amended and Restated Five-Year Credit Agreement, dated March 2, 2012, among Harsco Corporation, the lenders named therein, Citibank, N.A., as administrative agent, RBS Securities Inc., as syndication agent, and the Bank of Tokyo-Mitsubishi UFJ, Ltd., HSBC Bank USA, National Association, ING Bank N.V., Dublin Branch, JPMorgan Chase Bank, N.A. and Lloyds TSB Bank PLC, as documentation agents (incorporated by reference to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2014, Commission File Number 001-03970).
10(a)(iv)	Amendment No. 3, dated as of March 27, 2015, to the Amended and Restated Five-Year Credit Agreement among Harsco Corporation, a Delaware corporation, as Borrower, the Lenders party thereto and Citibank, N.A., as Administrative Agent (incorporated by reference to the Company's Current Report on Form 8-K filed April 1, 2015, Commission File Number 001-03970).
10(a)(v)	Amendment and Restatement Agreement, dated as of December 2, 2015, among Harsco Corporation, the subsidiaries of the Company party thereto, Citibank N.A., as administrative agent, the other agents party thereto and the lenders party thereto including Second Amended and Restated Credit Agreement, dated as of December 2, 2015, among Harsco Corporation, the lenders named therein, Citibank, N.A. and Royal Bank of Canada, as issuing lenders, and Citibank N.A., as administrative agent and as collateral agent (incorporated by reference to the Company's Current Report on Form 8-K dated December 4, 2015, Commission File No. 001-03970).
10(a)(vi)	Amendment and Restatement Agreement and First Amendment to Guarantee and Collateral Agreement, dated as of November 2, 2016, among the Company, the subsidiaries of the Company party thereto, Citibank N.A., as administrative agent and collateral agent and the lenders party thereto (incorporated by reference to the Company's Current Report on Form 8-K filed November 8, 2016, Commission file No. 001-03970).
10(a)(vii)	Amendment No. 1, dated December 8, 2017, among Harsco Corporation, the subsidiaries of the Company party thereto, Citibank N.A., as administrative agent and collateral agent, and the lenders party thereto (incorporated by reference to the Company's Current Report on Form 8-K dated December 13, 2017, Commission File No. 001-03970).
10(a)(viii)	Amendment No. 2, dated as of June 18, 2018, among the Company, the subsidiaries of the Company party thereto, Citibank N.A., as administrative agent and collateral agent and the lenders party thereto (incorporated by reference to the Company's Current Report on Form 8-K dated June 21, 2018, Commission File No. 001-03970).
10(a)(ix)	Amendment No. 3, dated as of June 18, 2018, among the Company, the subsidiaries of the Company party thereto, Citibank N.A., as administrative agent and collateral agent and the lenders party thereto (incorporated by reference to the Company's Current Report on Form 8-K Dated June 21, 2018, Commission File No. 001-03970).

Description of Exhibit	
Material Contracts—Management Contracts and Compensatory Plans	
10(b)	Harsco Corporation Supplemental Retirement Benefit Plan as amended and restated January 1, 2009 (incorporated by reference to the Company's Annual Report on Form 10-K, for the period ended December 31, 2008, Commission File Number 001-03970).
10(c)	Trust Agreement between Harsco Corporation and Dauphin Deposit Bank and Trust Company dated July 1, 1987 relating to the Supplemental Retirement Benefit Plan (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 1987, Commission File Number 001-03970).
10(d)	Stock Option Contract (incorporated by reference to the Company's Current Report on Form 8-K dated January 31, 2011, Commission File Number 001-03970).
10(e)	Harsco Corporation 2013 Equity and Incentive Compensation Plan (incorporated by reference to the Company's Current Report on Form 8-K dated April 26, 2013, Commission File Number 001-03970).
10(f)	Amendment No. 1 to the Harsco Corporation 2013 Equity and Incentive Compensation Plan (incorporated by reference to the Company's Current Report on Form 8-K dated May 1, 2017, Commission File Number 001-03970).
10(g)	Harsco Corporation Form of Stock Appreciation Rights Agreement (effective for grants on and after May 10, 2013) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2013, Commission File Number 001-03970).
10(h)(i)	Harsco Corporation 1995 Non-Employee Directors' Stock Plan as Amended and Restated at January 27, 2004 (incorporated by reference to Proxy Statement dated March 23, 2004 on Exhibit A, pages A-1 through A-9, Commission File Number 001-03970).
10(h)(ii)	Amendment No. 1 to the Harsco Corporation 1995 Non-Employee Directors' Stock Plan (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2008, Commission File Number 001-03970).
10(i)(i)	Harsco Corporation Deferred Compensation Plan for Non-Employee Directors (as Amended and Restated as of December 31, 2008) (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2008, Commission File Number 001-03970).
10(i)(ii)	First Amendment to the Harsco Corporation Deferred Compensation Plan for Non Employee Directors (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2016, Commission File Number 001-03970).
10(j)	Harsco Non-Qualified Retirement Savings & Investment Plan Part B—Amendment and Restatement as of January 1, 2009 (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2008, Commission File Number 001-03970).
10(k)	Form of Change in Control Severance Agreement (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended September 30, 2014, Commission File Number 001-03970).
10(l)	Notification Letter to F. Nicholas Grasberger, III dated March 20, 2013 (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2013, Commission File Number 001-03970).
10(m)	Notification Letter to David Everitt dated March 14, 2014 (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2014, Commission File Number 001-03970).
10(n)	Notification Letter to F. N. Grasberger dated April 8, 2014 (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2014, Commission File Number 001-03970).
10(o)	Notification Letter to F. N. Grasberger dated August 1, 2014 (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended September 30, 2014, Commission File Number 001-03970).
10(p)	Form of Stock Appreciation Rights Agreement (effective for grants on or after April 28, 2014) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2014, Commission File Number 001-03970).
10(q)	Form of Performance Share Units Agreement (effective for grants on or after April 28, 2015) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2015, Commission File Number 001-03970).
10(r)	Form of Stock Appreciation Rights Agreement (effective for grants on or after April 28, 2015) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2015, Commission File Number 001-03970).
10(s)(i)	2016 Non-Employee Directors' Long-Term Equity Compensation Plan (incorporated by reference to the Company's Form S-8 dated May 6, 2016, Commission File Number 001-03970).

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	Description of Exhibit
10(s)(ii)	First Amendment to 2016 Non-Employee Directors' Long-Term Equity Compensation Plan (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2016, Commission File Number 001-03970).
10(t)	Form of Restricted Stock Units Agreement (Non-Employee Director) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended June 30, 2016, Commission File Number 001-03970).
10(u)	Form of Performance Share Units Agreement (effective for grants on or after April 26, 2016) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2016, Commission File Number 001-03970).
10(v)	Form of Restricted Stock Units Agreement (effective for grants on or after April 26, 2016) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2016, Commission File Number 001-03970).
10(w)	Form of Stock Appreciation Rights Agreement (effective for grants on or after April 26, 2016) (incorporated by reference to the Company's Quarterly Report on Form 10-Q for the period ended March 31, 2016, Commission File Number 001-03970).
10(x)	Form of Performance Share Units Agreement (effective for grants on or after February 16, 2017) (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2016, Commission File Number 001-03970).
10(y)	Form of Restricted Stock Units Agreement (effective for grants on or after February 16, 2017) (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2016, Commission File Number 001-03970).
10(z)	Form of Stock Appreciation Rights Agreement (effective for grants on or after February 16, 2017) (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2016, Commission File Number 001-03970).
10(aa)	Form of PSU Award Agreement (for awards granted on or after March 2, 2018) (incorporated by reference to the Company's current report on Form 8-K dated March 8, 2018, Commission File Number 001-03970).
Director Indemnity Agreements	
10(bb)	Form of Director Indemnification Agreement (incorporated by reference to the Company's Annual Report on Form 10-K for the period ended December 31, 2017, Commission File Number 001-03970).
21	Subsidiaries of the Registrant.
23	Consent of Independent Registered Public Accounting Firm.
31.1	Certification Pursuant to Rule 13a-14(a) and 15d-14(a) as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (Chief Executive Officer).
31.2	Certification Pursuant to Rule 13a-14(a) and 15d-14(a) as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (Chief Financial Officer).
32	Certifications Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (Chief Executive Officer and Chief Financial Officer).
101.Def	Definition Linkbase Document
101.Pre	Presentation Linkbase Document
101.Lab	Labels Linkbase Document
101.Cal	Calculation Linkbase Document
101.Sch	Schema Document
101.Ins	Instance Document - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.

Exhibits other than those listed above are omitted for the reason that they are either not applicable or not material.

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.

HARSCO CORPORATION (Registrant)

DATE February 21, 2019

/s/ PETER F. MINAN

Peter F. Minan
Senior Vice President and Chief Financial Officer
(Principal Financial Officer)

DATE February 21, 2019

/s/ SAMUEL C. FENICE

Samuel C. Fenice
Vice President and Corporate Controller
(Principal Accounting Officer)

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

<u>Signature</u>	<u>Capacity</u>	<u>Date</u>
<u>/s/ F. NICHOLAS GRASBERGER III</u> F. Nicholas Grasberger III	Chairman, President, Chief Executive Officer and Director (Principal Executive Officer)	<u>February 21, 2019</u>
<u>/s/ PETER F. MINAN</u> Peter F. Minan	Senior Vice President and Chief Financial Officer (Principal Financial Officer)	<u>February 21, 2019</u>
<u>/s/ DAVID C. EVERITT</u> David C. Everitt	Lead Director	<u>February 21, 2019</u>
<u>/s/ JAMES F. EARL</u> James F. Earl	Director	<u>February 21, 2019</u>
<u>/s/ KATHY G. EDDY</u> Kathy G. Eddy	Director	<u>February 21, 2019</u>
<u>/s/ CAROLANN I. HAZNEDAR</u> Carolann I. Haznedar	Director	<u>February 21, 2019</u>
<u>/s/ MARIO LONGHI</u> Mario Longhi	Director	<u>February 21, 2019</u>
<u>/s/ EDGAR M. PURVIS, JR.</u> Edgar M. Purvis, Jr.	Director	<u>February 21, 2019</u>
<u>/s/ PHILLIP C. WIDMAN</u> Phillip C. Widman	Director	<u>February 21, 2019</u>

HARSCO CORPORATION
Subsidiaries of Registrant

Exhibit 21

Subsidiary	Country of Incorporation	Ownership Percentage
Harsco Metals Argentina S.A.	Argentina	100%
Harsco (Australia) Pty. Limited	Australia	100%
Harsco Industrial Air-X-Changers Pty. Ltd.	Australia	100%
Harsco Metals Australia Pty. Ltd.	Australia	100%
Harsco Metals Australia Holding Investment Co. Pty. Ltd.	Australia	100%
Harsco Rail Pty. Ltd.	Australia	100%
Harsco Minerals Austria GmbH	Austria	100%
AluServ Middle East W.L.L.	Bahrain	65%
Harsco Belgium S.P.R.L.	Belgium	100%
Harsco Metals Belgium S.A.	Belgium	100%
Harsco Metals Emirates Partnership	Belgium	65%
Harsco Rail Emirates Maatschap/Societe de Droit Commun	Belgium	100%
Harsco Brazil Investments SPRL	Belgium	100%
Harsco Chile Investments SPRL	Belgium	100%
Harsco do Brasil Participacoes e Servicos Siderurgicos Ltda.	Brazil	100%
Harsco Metals Limitada	Brazil	100%
Harsco Minerais Limitada	Brazil	100%
Harsco Rail Ltda	Brazil	100%
Heckett Comercio de Rejeitos Industriais, Importacao e Exportacao Ltda	Brazil	100%
Harsco Canada Corporation Societe Harsco Canada	Canada	100%
Harsco Canada General Partner Limited	Canada	100%
Harsco Canada Limited Partnership	Canada	100%
Harsco Nova Scotia Holding Corporation	Canada	100%
Harsco Metals Chile S.A.	Chile	100%
Harsco (Beijing) Fertiliser Co., Ltd	China	100%
Harsco Metals (Ningbo) Pty. Ltd.	China	70%
Harsco Metals Zhejiang Co. Ltd.	China	70%
JiangSu Harsco Industrial Grating Company Limited	China	100%
Shanxi TISCO-Harsco Technology Co., Ltd.	China	60%
Harsco APAC Rail Machinery (Beijing) Co., Ltd.	China	100%
Harsco Technology China Co., Ltd.	China	100%
Harsco (Tangshan) Metallurgical Materials Technology Co., Ltd	China	65%
Harsco (Tangshan) Metallurgical Materials Technology Co., Ltd. - GuYe Branch	China	100%
Harsco (Tangshan) Renewable Resources Development Co., Ltd	China	51%
Harsco Infrastructure CZ s.r.o	Czech Republic	100%
Czech Slag- Nova Hut s.r.o.	Czech Republic	65%
Harsco Metals CZ s.r.o	Czech Republic	100%
Harsco Metals Middle East FZE	Dubai	100%
Harsco Metals Egypt L.L.C.	Egypt	100%
Heckett Bahna Co. For Industrial Operations S.A.E.	Egypt	65%
Heckett MultiServ Bahna S.A.E.	Egypt	65%
Slag Processing Company Egypt (SLAR) S.A.E.	Egypt	60%
MultiServ Oy	Finland	100%

HARSCO CORPORATION
Subsidiaries of Registrant

Exhibit 21

Subsidiary	Country of Incorporation	Ownership Percentage
Harsco Metals and Minerals France S.A.S.	France	100%
Harsco France S.A.S.	France	100%
Harsco Metals Germany GmbH	Germany	100%
Harsco Minerals Deutschland GmbH	Germany	100%
Harsco Rail Europe GmbH	Germany	100%
Harsco (Gibraltar) Holding Limited	Gibraltar	100%
Harsco Metals Guatemala S.A.	Guatemala	100%
Harsco China Holding Company Limited	Hong Kong	100%
Harsco Industrial Grating China Holding Co. Ltd.	Hong Kong	100%
Harsco Infrastructure Hong Kong Ltd	Hong Kong	100%
Harsco India Metals Private Limited	India	99.99%
Harsco India Private Ltd.	India	91.78%
Harsco India Services Private Ltd.	India	100%
Harsco Track Machines and Services Private Limited	India	100%
SGB Scafform Limited	Ireland	100%
Harsco Metals Italia S.R.L.	Italy	100%
Ilserv S.R.L.	Italy	65%
Harsco Metals Nord Italia S.R.L.	Italy	100%
Ballagio S.a.r.l.	Luxembourg	100%
Excell Africa Holdings, Ltd.	Luxembourg	100%
Harsco Luxembourg S.a.r.l	Luxembourg	100%
Harsco Metals Luxembourg S.A.	Luxembourg	100%
Harsco Metals Luxequip S.A.	Luxembourg	100%
Excell Americas Holdings Ltd S.a.r.L.	Luxembourg	100%
Harsco Americas Investments S.a.r.l.	Luxembourg	100%
Harsco International Finance S.a.r.l.	Luxembourg	100%
harsco Metals Kemaman Sdn Bhd	Malaysia	100%
Harsco Rail Malaysia Sdn Bhd	Malaysia	100%
Harsco Industrial IKG de Mexico, S.A. de C.V.	Mexico	100%
Harsco Metals de Mexico S.A. de C.V.	Mexico	100%
Irving, S.A. de C.V.	Mexico	100%
Harsco Asia Investment B.V.	Netherlands	100%
Harsco Asia China Investment B.V.	Netherlands	100%
Harsco Asia Pacific Investment B.V.	Netherlands	100%
GasServ (Netherlands) VII B.V.	Netherlands	100%
Harsco (Mexico) Holdings B.V.	Netherlands	100%
Harsco Infrastructure Industrial Services B.V.	Netherlands	100%
Harsco Infrastructure B.V.	Netherlands	100%
Harsco Infrastructure Construction Services B.V.	Netherlands	100%
Harsco Investments Europe B.V.	Netherlands	100%
Harsco Metals Holland B.V.	Netherlands	100%
Harsco Metals Transport B.V.	Netherlands	100%

HARSCO CORPORATION
Subsidiaries of Registrant

Exhibit 21

Subsidiary	Country of Incorporation	Ownership Percentage
Harsco Metals Oostelijk Staal International B.V.	Netherlands	100%
Harsco Minerals Europe B.V.	Netherlands	100%
Harsco Nederland Slag B.V.	Netherlands	100%
Heckett MultiServ China B.V.	Netherlands	100%
Heckett MultiServ Far East B.V.	Netherlands	100%
Hunnebeck Nederland B.V.	Netherlands	100%
Minerval Metallurgic Additives B.V.	Netherlands	100%
MultiServ Finance B.V.	Netherlands	100%
MultiServ International B.V.	Netherlands	100%
Slag Reductie (Pacific) B.V.	Netherlands	100%
Slag Reductie Nederland B.V.	Netherlands	100%
Harsco (Peru) Holdings B.V.	Netherlands	100%
Harsco Europa B.V.	Netherlands	100%
Harsco Finance B.V.	Netherlands	100%
Harsco Metals Limited	New Zealand	50%
Harsco Infrastructure Norge A.S.	Norway	100%
Harsco Metals Norway A.S.	Norway	100%
Harsco Minerals Arabia LLC (FZC)	Oman	100%
Harsco Steel Mill Trading Arabia LLC	Oman	100%
Harsco Metals Peru S.A.	Peru	100%
Harsco Metals Polska SP Z.O.O.	Poland	100%
Harsco Metals CTS Prestacao de Servicos Tecnicos e Aluguer de Equipamentos LDA Unipessoal	Portugal	100%
Harsco Metals Saudi Arabia, Ltd.	Saudi Arabia	55%
Harsco Metals D.O.O. Smederevo	Serbia	100%
Harsco Infrastructure Slovensko s.r.o.	Slovak Republic	100%
Harsco Metals Slovensko s.r.o.	Slovak Republic	100%
Harsco Minerali d.o.o.	Slovenia	100%
Harsco Metals RSA Africa (Pty.) Ltd.	South Africa	100%
Harsco Metals South Africa (Pty.) Ltd.	South Africa	100%
Harsco Metals SRH Mill Services (Pty.) Ltd.	South Africa	100%
Harsco Metals SteelServ (Pty.) Ltd.	South Africa	100%
Harsco Metals Ilanga Pty. Ltd.	South Africa	100%
Harsco Infrastructure South Africa (Pty.) Ltd.	South Africa	100%
Heckett MultiServ (FS) Pty Ltd	South Africa	100%
Metal Reclamation SPV (Pty.) Ltd.	South Africa	100%
MultiServ Technologies (South Africa) Pty Ltd	South Africa	100%
Harsco Metals Gesmafesa S.A.	Spain	100%
Harsco Metals Lycrete S.A.	Spain	100%
Harsco Metals Reclamet S.A.	Spain	100%
Harsco Infrastructure Sverige A.B.	Sweden	100%
Harsco Metals Sweden A.B.	Sweden	100%
Harsco Rail Filial	Sweden	100%

Montanus Industriforvaltning A.B.	Sweden	100%
MultiServ Nordiska AB	Sweden	100%
MultiServ (Sweden) AB	Sweden	100%
Harsco Rail Switzerland GMBH	Switzerland	100%
Harsco Switzerland Finance GmbH	Switzerland	100%
Harsco Switzerland Holding GmbH	Switzerland	100%
Harsco Metals (Thailand) Company Ltd.	Thailand	100%
Harsco Metals Turkey Celik Limited Sirkety	Turkey	100%
Harsco Sun Demiryolu Ekipmanlari Uretim Ve Ticaret Limited Sirketi	Turkey	51%
Tosyali Harsco Geri Kazanim Teknolojileri Anonim Sirketi	Turkey	50%

HARSCO CORPORATION
Subsidiaries of Registrant

Exhibit 21

Subsidiary	Country of Incorporation	Ownership Percentage
Altek Europe Holdings Ltd.	U.K.	100%
Altek Europe Limited	U.K.	100%
Altek MHD Limited	U.K.	100%
Alusalt Limited	U.K.	100%
Faber Prest Limited	U.K.	100%
Fourninezero Ltd.	U.K.	100%
Harsco (U.K.) Limited	U.K.	100%
Harsco (UK) Group Ltd	U.K.	100%
Harsco (UK) Holdings Ltd	U.K.	100%
Harsco (York Place) Limited	U.K.	100%
Harsco Fairerways Limited Partnership	U.K.	100%
Harsco Fairestways Limited Partnership	U.K.	100%
Harsco Fairways Partnership	U.K.	100%
Harsco Higherlands Limited Partnership	U.K.	100%
Harsco Highestlands Limited Partnership	U.K.	100%
Harsco Infrastructure Group Ltd.	U.K.	100%
Harsco Infrastructure Services Ltd.	U.K.	100%
Harsco Investment Ltd.	U.K.	100%
Harsco Leatherhead Limited	U.K.	100%
Harsco Metals 373 Ltd	U.K.	100%
Harsco Metals 385 plc	U.K.	100%
Harsco Metals Group Limited	U.K.	100%
Harsco Metals Holdings Limited	U.K.	100%
Harsco Metals Limited	U.K.	100%
Harsco Mole Valley Limited	U.K.	100%
Harsco Rail Limited	U.K.	100%
Harsco Surrey Limited	U.K.	100%
Harsco Track Technologies Ltd	U.K.	100%
HLWKH 517 Limited	U.K.	100%
Iductelec Limited	U.K.	100%
Mastclimbers Ltd	U.K.	100%
MultiServ Investment Limited	U.K.	100%
MultiServ Limited	U.K.	100%

MultiServ Logistics Limited	U.K.	100%
Nortal Limited	U.K.	100%
SGB Holdings Limited	U.K.	100%
SGB Investments Ltd.	U.K.	100%
Short Brothers (Plant) Ltd.	U.K.	100%
Altek LLC	U.S.A.	100%
Altek International Sales Company	U.S.A.	100%
Harsco Defense Holding, LLC	U.S.A.	100%
Harsco Financial Holdings Inc.	U.S.A.	100%
Harsco Holdings, Inc.	U.S.A.	100%
Harsco Infrastructure Holdings, Inc.	U.S.A.	100%
Harsco Metals Holding LLC	U.S.A.	100%
Harsco Metals Intermetal LLC	U.S.A.	100%
Harsco Metals Investment LLC	U.S.A.	100%
Harsco Metals Operations LLC	U.S.A.	100%
Harsco Metals SRI LLC	U.S.A.	100%
Harsco Metals VB LLC	U.S.A.	100%
Harsco Metro Rail, LLC	U.S.A.	100%
Harsco Minerals Technologies LLC	U.S.A.	100%
Harsco Minnesota Finance, Inc.	U.S.A.	100%
Harsco Minnesota LLC	U.S.A.	100%
Harsco Rail, LLC	U.S.A.	100%
Harsco Switzerland Finance GmbH, Inc	U.S.A.	100%
Harsco Technologies LLC	U.S.A.	100%
Protran Technology LLC	U.S.A.	100%
Heckett Multiserv MV & MS, CA	Venezuela	100%

HARSCO CORPORATION
Subsidiaries of Registrant

Exhibit 21

Companies in which Harsco Corporation does not exert management control are not consolidated. These companies are listed below as unconsolidated entities.

Company Name	Country of Incorporation	Ownership Percentage
P.T. Puma Baja Heckett	Indonesia	40%

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Forms S-8 (Nos. 333-13175, 333-13173, 333-59832, 333-70710, 333-114958, 333-188448, 333-211203, and 333-217616) of Harsco Corporation of our report dated February 21, 2019 relating to the financial statements, financial statement schedule, and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/PricewaterhouseCoopers LLP
Philadelphia, Pennsylvania
February 21, 2019

HARSCO CORPORATION
CERTIFICATION PURSUANT TO RULE 13a-14(a) OR 15d-14(a)
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, F. Nicholas Grasberger, III, certify that:

1. I have reviewed this Annual Report on Form 10-K of Harsco 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 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(s) 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(s) 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.

February 21, 2019

/s/ F. NICHOLAS GRASBERGER III

F. Nicholas Grasberger III

Chairman, President and Chief Executive Officer

HARSCO CORPORATION
CERTIFICATION PURSUANT TO RULE 13a-14(a) OR 15d-14(a)
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Peter F. Minan, certify that:

1. I have reviewed this Annual Report on Form 10-K of Harsco 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 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(s) 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(s) 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.

February 21, 2019

/s/ PETER F. MINAN

Peter F. Minan

Senior Vice President and Chief Financial Officer

**HARSCO CORPORATION
CERTIFICATIONS PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report of Harsco Corporation (the "Company") on Form 10-K for the period ending December 31, 2018, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), we certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that, to the best of our knowledge:

- (1) The 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 Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

February 21, 2019

/s/ F. NICHOLAS GRASBERGER III

F. Nicholas Grasberger III
Chairman, President and Chief Executive Officer

/s/ PETER F. MINAN

Peter F. Minan
Senior Vice President and Chief Financial Officer

A signed original of this written statement required by Section 906 has been provided to Harsco Corporation and will be retained by Harsco Corporation and furnished to the Securities and Exchange Commission or its staff upon request.