
UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Form 10-K

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

For the fiscal year ended December 31, 2019

or

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

For the transition period from ___ to ___

Commission File Number 001-34481

Mistras Group, Inc.

(Exact name of registrant as specified in its charter)

Delaware

*(State or other jurisdiction of
incorporation or organization)*

22-3341267

*(I.R.S. Employer
Identification Number)*

195 Clarksville Road

Princeton Junction, New Jersey 08550

(Address of principal executive offices) (Zip Code)

(609) 716-4000

(Registrant's telephone number, including area code)

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

<i>Title of each class</i>	<i>Trading Symbol</i>	<i>Name of each exchange on which registered</i>
Common Stock, par value \$.01 par value	MG	New York Stock Exchange

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

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

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

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

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

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

Large accelerated filer
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 voting and non-voting common stock held by non-affiliates of the registrant, based on the closing price of \$14.37 on June 28, 2019, the last business day of the registrant's most recently completed second fiscal quarter, as reported on the New York Stock Exchange, was approximately \$255.7 million.

As of March 23, 2020, the Registrant had 29,035,000 shares of common stock outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Information required by Part III (Items 10, 11, 12, 13 and 14) is incorporated by reference to portions of the registrant's definitive proxy statement for its 2020 annual meeting of shareholders (the "Proxy Statement"), which is expected to be filed not later than 120 days after the registrant's fiscal year ended December 31, 2019. Except as expressly incorporated by reference, the Proxy Statement shall not be deemed to be a part of this report on Form 10-K.

MISTRAS GROUP, INC.
ANNUAL REPORT ON FORM 10-K
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ITEM 1. BUSINESS

FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K contains forward-looking statements regarding Mistras Group, Inc. ("Mistras," the Company, "us," "we" and similar expressions) and our business, financial condition, results of operations and prospects within the meaning of Section 27A of the Securities Act of 1933 (Securities Act), and Section 21E of the Securities Exchange Act of 1934 (Exchange Act). Such forward-looking statements include those that express plans, anticipation, intent, contingency, goals, targets or future development and/or otherwise are not statements of historical fact. These forward-looking statements are based on our current expectations and projections about future events and they are subject to risks and uncertainties known and unknown that could cause actual results and developments to differ materially from those expressed or implied in such statements.

In some cases, you can identify forward-looking statements by terminology, such as "goals," "expects," "anticipates," "intends," "plans," "believes," "seeks," "estimates," "may," "could," "should," "would," "predicts," "appears," "projects," or the negative of such terms or other similar expressions. Factors that could cause or contribute to differences in results and outcomes from those in our forward-looking statements include, without limitation, those discussed elsewhere in this Report in Part I, Item 1A. "Risk Factors," Part 2, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations" and in this Item 1, as well as those discussed in our other Securities and Exchange Commission (SEC) filings. We undertake no obligation to (and expressly disclaim any obligation to) revise or update any forward-looking statements made herein whether as a result of new information, future events or otherwise. However, you should consult any further disclosures we may make on these or related topics in our reports on Form 8-K or Form 10-Q filed with the SEC.

The following discussions should be read in conjunction with the sections of this Report entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Risk Factors."

OUR BUSINESS

Asset Protection Industry Overview

We offer our customers "OneSource for Asset Protection Solutions®" and are a leading global provider of technology-enabled asset protection solutions used to evaluate the safety, structural integrity and reliability of critical energy, industrial and public infrastructure.

Our asset protections are intended to help maximize safety and uptime of our customers' assets and facilities. These mission critical solutions enhance our customers' ability to comply with governmental safety and environmental regulations, extend the useful life of their assets, increase productivity, minimize repair costs, manage risk and avoid catastrophic disasters.

We deliver value through a comprehensive "OneSource" portfolio of customized solutions, utilizing a proven systematic method that creates a closed-loop lifecycle for addressing continuous asset protection and improvement.

Our specialized asset protection solutions include:

- Field Inspections
- Consulting
- Maintenance
- Data Management
- Access
- Monitoring
- Laboratory Quality Assurance/Control (QA/QC)
- Equipment

Our OneSource model emphasizes the integration of these solutions and corresponding data to service our customers throughout their assets' lifetimes. Under this business model, many customers outsource their inspection, integrity data management and other asset protection needs to us on a "run-and-maintain" basis to ensure the continued safety and structural and operational integrity of their assets.

We have established long-term relationships as a critical solutions provider to many of the leading companies with asset-intensive infrastructure in our target markets. These markets include:

- Oil & Gas (Downstream, Midstream, Upstream and Petrochemical)
- Aerospace & Defense
- Industrial
- Power Generation and Transmission
- Public Infrastructure, Research and Engineering
- Process Industries

A majority of our revenues are generated by deploying technicians at our customers' locations. Most of our revenues from aerospace and certain manufacturing customers are generated by performing inspections and testing at our various in-house laboratories.

We generated revenues of \$748.6 million, \$742.4 million and \$701.0 million for the years ended December 31, 2019, 2018 and 2017, respectively, net income of \$6.1 million and \$6.8 million for the years ended December 31, 2019 and 2018, respectively, and net loss of \$2.2 million for the year ended December 31, 2017. For the years ended December 31, 2019, 2018 and 2017, we generated approximately 80%, 77% and 78%, respectively, of our revenues from our Services segment. Our revenues are diversified, with our top ten customers accounting for approximately 34%, 34% and 38% of our revenues during the years ended December 31, 2019, 2018 and 2017, respectively.

OUR SPECIALIZED SOLUTIONS

As a OneSource provider of asset protection solutions, MISTRAS combines our industry-leading services, products, data management solutions and technologies to provide a unique, custom-tailored solution for each customer's individual asset protection needs, ranging from routine inspections to complex, plant-wide asset integrity management.

Field Inspections

Our field inspections portfolio includes traditional and advanced Non-Destructive Testing (NDT) techniques, along with predictive maintenance (PdM) assessments of fixed and rotating assets and inline inspection (ILI) for pipelines. We offer these solutions on an individual basis, or as parts of enterprise inspection and testing programs.

NDT is the examination of an asset without materially impacting its integrity. The ability to inspect infrastructure assets and not interfere with their operating performance makes NDT a highly-attractive alternative to many traditional techniques, which may require shutting down an asset or entire facility. Typical issues for which MISTRAS technicians inspect include corrosion, cracking, leaking, faults and flaws in piping, storage tanks, pressure vessels and a wide range of other industrial assets.

Our automated data acquisition solutions utilize smart sensing and monitoring, robotic inspection systems, and digitized spot inspections to provide asset integrity data with greater insight into current and future asset conditions.

Field inspection services lend themselves to integration with our other offerings, and as such have often served as the initial entry point to more advanced customer engagements that require additional solutions. After an initial field inspection is performed, MISTRAS is able to provide multiple supplemental solutions that further serve to solidify our relationships with our customers and drive additional revenue.

Consulting

We provide a broad range of engineering consulting services, primarily for process equipment, technologies and facilities. Our engineering consultations include plant operations and management support, turnaround/shutdown planning, profit improvement, facilities planning studies, engineering design, process safety reviews, energy optimization evaluations, benchmarking/key performance indicator (KPI) development and technical training.

Our Asset Integrity Management/Mechanical Integrity (AIMS/MI) services help improve asset reliability and regulatory compliance through a systematic, engineering-based approach to ensure the ongoing integrity and safety of equipment and industrial facilities. AIMS/MI services can include conducting an inventory of infrastructure assets; developing, implementing and training personnel in executing inspection and maintenance procedures; and managing MI programs. We help to identify gaps between existing and desired practices and establish quality assurance standards for fabrication, engineering and installation of infrastructure assets.

Maintenance

We perform maintenance and light mechanical services to prepare assets for inspection and to return them to working condition post inspection. These services include corrosion removal, mitigation and prevention; insulation installation and removal; electrical services; heat tracing, industrial cleaning; pipefitting; and welding. Our light mechanical services are often offered as complementary, value-added solutions to inspections, such as removing insulation in order to inspect piping, then re-installing insulation.

Our multi-disciplined technicians offer maintenance and light mechanical services in hard-to-access areas, in combination with rope access or diving strategies.

Mechanical services are still a small part of our business, and we carefully try to avoid providing any such services that conflict with our inspection services.

Data Management

MISTRAS has the capability of providing integrated data management solutions throughout the asset protection cycle, including data collection, storage, visualization, and analytics.

Our world-class enterprise inspection database management software (IDMS) - Plant Condition Management Software (PCMS™) - was developed specifically for process industries and equipment, and enables the storage, organization and analysis of inspection data.

PCMS offers wide-ranging support for mechanical integrity programs, including:

- Comprehensive inspection tracking, scheduling and analysis
- Corrosion analysis & trending
- Integrated risk-based inspection (RBI) calculators
- Safety relief valve management

PCMS compares data to prior operations, similar assets, industrial standards and specific risk conditions, such as use with highly-flammable or corrosive materials. It also develops asset integrity management plans based on RBI calculations that specify an optimal schedule for the testing, maintenance and retirement of assets.

In many instances, customers of our field inspections and consulting services also have licensed PCMS for storage and analysis of collected inspection and MI data.

We believe PCMS is one of the most widely used plant condition management software systems in North American refineries. We estimate it is currently used by approximately 50% of the U.S. refining capacity, as well as by leading midstream pipeline energy companies and major energy companies in Canada and Europe. This provides us with recurring maintenance and support fees and additional marketing opportunities for additional software and solutions.

Following our recent acquisitions of companies that support the midstream sector of the Oil & Gas industry, we believe MISTRAS provides amongst the most comprehensive, data-driven pipeline protection solution available to the industry. These proprietary pipeline data analysis solutions enable deep integration of inline inspection (ILI) big data with real-time risk analytics and business intelligence (BI) to provide capabilities for supporting pipeline integrity, which we believe provides us with an important competitive advantage.

MISTRAS also digitizes the transfer of field inspection and monitoring data to inspection data management systems (IDMS). MISTRAS Digital™ is an electronic platform that digitally delivers field inspection assignments and related data, captures inspection results, and delivers electronic reporting and productivity tracking via Key Performance Indicators (KPIs). MISTRAS Digital integrates with PCMS and other inspection data management systems to provide additional productivity improvements. Similarly, our online monitoring systems feed data directly into our cloud-based monitoring portal, providing customers with real-time access to their asset integrity data.

Access

Much of our work is conducted in hard-to-access locations, including those in at-height, subsea and confined locations. We utilize scaffolding and rope access to access at-height and confined assets; certified divers for subsea inspection and maintenance; and unmanned aerial, land-based and subsea systems for a wide range of inspection applications, with an emphasis on minimizing at-height access and confined space entry (CSE).

Monitoring

Our online condition-monitoring solutions provide real-time reports and analysis of infrastructure to alert facility personnel to damages before critical failures occur, while our flexible, Industrial Internet of Things (IIoT)-compatible, cloud-based online monitoring portal centralizes and analyzes all collected monitoring data. These monitoring solutions are often installed in hazardous or hard-to-reach locations, helping to enhance safety by reducing the need to send technicians into unsafe locations. We offer monitoring solutions for a wide range of assets and applications, including:

- Tube Leaking
- Power Transformer Health & Reliability
- Stator Vane Cracking
- Bridge Structural Health Monitoring (SHM)
- Wall Thickness Tracking
- High-Energy Piping (HEP) Integrity
- Fluid Corrosivity
- Through-Valve Leaking

With expertise in monitoring hardware and services, MISTRAS designs and installs monitoring systems, and provides commissioning, training, reporting, technical support and annual maintenance services. We offer a variety of secure, web-based solutions that monitor structural integrity and analyze conditions against our library of historical inspection data, allowing users to stay aware of potential concerns and prioritize future inspections and maintenance. We also offer custom-developed software that integrates into onsite IDMSs, stores and trends monitoring data and provides immediate automated data analysis.

We provide continuous, periodic and conditional monitoring, depending on the type of asset and its operating condition. Continuous monitoring is applied on critical assets to observe the earliest onset of a defect to predict its progress and to track its progression to help avoid catastrophic failure. Periodic monitoring, or “walk around” monitoring, is a preventative maintenance technique to observe changes in an asset's condition over a specified period of time. Conditional monitoring solutions are typically used when there is a known defect that needs to be monitored until the asset is repaired or replaced.

Laboratory Quality Assurance/Control (QA/QC)

Our network of in-house laboratories located across North America and Europe offers quality assurance and quality control (QA/QC) solutions for new and existing metal and alloy components, materials and composites.

Our in-house labs work with our customers throughout their components' lifetimes, from preparation and production to post-processing and in-service component monitoring. MISTRAS' laboratory QA/QC solutions help to meet customer needs throughout their manufacturing cycles, with a focus on optimizing production logistics. Our in-house lab solutions include:

- Non-destructive evaluation/inspection (NDE/NDI)
- Destructive testing (DT)
- Metallurgical testing
- Chemical analysis testing
- Mechanical services
- Pre-machining
- Finishing services

We often inspect and test components prior to assembly to screen for defects and discontinuities introduced in the manufacturing process. We also inspect existing components to ensure they remain fit-for-purpose.

Our labs hold a wide variety of certifications that allow them to perform inspections to meet or exceed stringent regulatory requirements, such as: Nadcap (formerly NADCAP, the National Aerospace and Defense Contractors Accreditation Program), AS9100/ISO-9001, Federal Aviation Administration (FAA) Repair Station, the International Traffic in Arms Regulations/Export Administration Regulations (ITAR/EAR) and manufacturers' requirements. With these certifications comes a comprehensive range of approvals from prime contractors of major projects, militaries, and internationally-renowned original equipment manufacturers (OEMs) from many of our key markets, including the oil and gas, aerospace and defense, power generation, and industrial markets.

Equipment

We design and manufacture portable, handheld, wireless and turnkey NDT equipment, along with corresponding data acquisition sensors and software, for spot inspections and long-term, unattended monitoring applications.

We sell these solutions as individual components, or as complete systems, which include a combination of sensors, amplifiers, signal processing electronics, knowledge-based software and decision and feedback electronics. We also sell integrated service-and-system technology packages, in which our field technicians utilize our proprietary and specialized testing procedures and hardware, advanced pattern recognition, neural network software and databases to compare test results against our prior testing data or industry standards.

We provide a range of acoustic emission (AE) products and are a leader in the design and manufacture of AE sensors, instruments and turnkey systems used for monitoring and testing materials, pressure components, processes and structures. MISTRAS also designs and manufactures ultrasonic testing (UT) equipment.

Most of our hardware products are fabricated, assembled and tested in our ISO-9001-certified facility in Princeton Junction, New Jersey. We also design and manufacture automated ultrasonic systems and scanners in France.

Centers of Excellence

Another differentiator in our business model are our Centers of Excellence (COEs), which offer support for asset, technology, or industry-specific solutions. Our subject matter experts engage in strategic sales opportunities to offer customers value-added solutions using advanced technologies and methods. The COEs help to standardize our approach to common problems in our key market segments. Our COEs include:

- Acoustic Emission
- Aerospace
- American Petroleum Institute (API) Turnarounds
- AIMS/MI/Engineering
- Automated Ultrasonics
- Fossil Power
- Guided Wave Ultrasonics
- Infrastructure
- PCMS Software & Services
- Mechanical Services
- Nuclear Power
- Offshore
- Phased Array
- Pipeline
- Power Generation
- Predictive Maintenance
- Refractory Inspection
- Rope Access/Wind
- Substation Reliability
- Tank Inspection
- Transportation
- Tube Inspection
- Unmanned Systems

ASSET PROTECTION INDUSTRY OVERVIEW

Asset protection plays a crucial role in assuring the integrity and reliability of critical infrastructure. As an asset protection solutions provider, MISTRAS seeks to maximize the uptime and safety of critical infrastructure, by helping customers to detect, locate, mitigate and prevent damages such as corrosion, cracks, leaks, manufacturing flaws and other concerns to operating and structural integrity. In addition to these core utilities, the storage and analysis of collected inspection and mechanical integrity data is also a key aspect of asset protection.

NDT has historically been a prominent solution in the asset protection industry due to its capacity to detect defects without compromising the integrity of the tested materials or equipment. The supply of NDT inspection services has traditionally come from many small vendors, who provide services to a small geographic region. A trend has emerged, however, for customers to engage a select few vendors capable of providing a wider spectrum of asset protection solutions for global infrastructure, in addition to an increased demand for advanced non-destructive testing (ANDT) solutions and data acquisition software, both of which require a highly-trained workforce.

Due to these trends, those vendors offering integrated solutions, scalable operations, skilled personnel and a global footprint will have a distinct competitive advantage. Moreover, we believe that vendors that are able to effectively deliver both advanced solutions and data analytics, by virtue of their access to customers' data, create a significant barrier to entry for competitors, leading to the opportunity to further create significant recurring revenues.

Key Dynamics of the Asset Protection Industry

We believe the following represent key dynamics of the asset protection industry, and that the market available to us will continue to grow as these macro-market trends continue to develop:

Extending the Useful Life of Aging Infrastructure While Increasing Utilization. Due to the prohibitive costs and challenges of building new infrastructure, many companies have chosen to extend the useful life of existing assets through enhancements, rather than replacing these assets. This has resulted in the significant aging and increased utilization of existing infrastructure in our target markets. Demand for refined petroleum products, combined with high plant-utilization rates, drives refineries to upgrade facilities to make them more efficient and expand capacities. Because aging infrastructure requires more frequent inspection and maintenance in comparison to new infrastructure, companies and public authorities continue to spend on asset protection to ensure their aging infrastructure assets continue to operate effectively.

Outsourcing of Non-Core Activities and Technical Resource Constraints. Due to the increasing sophistication and automation of NDT programs, a decreasing supply of skilled professionals and increasing governmental regulations, companies are increasingly outsourcing NDT to third-party providers with advanced solution portfolios, engineering expertise and trained workforces.

Increasing Corrosion from Low-Quality Inputs. The increased availability and low cost of crude oil from areas such as shale plays and oil sands resources have led to the use of lower-grade raw materials and feedstock. This leads to higher rates of corrosion, especially in refining processes involving petroleum with higher sulfur content, which increases the need for asset protection solutions to detect and/or proactively prevent corrosion-related issues.

Increasing Use of Advanced Materials. Customers in various of our target markets - particularly aerospace and defense - are increasingly utilizing advanced materials, such as composites and other unique technologies in their assets. These materials often cannot be tested using traditional NDT techniques. We believe that demand for more advanced testing and assessment solutions will increase along with the demand for these advanced materials during the design, manufacturing, operating and quality control phases.

Meeting Safety Regulations. Owners and operators of refineries, pipelines and petrochemical and chemical plants increasingly face strict government regulations and more stringent process safety enforcement standards. This includes the continued implementation of the Occupational Safety and Health Administration's (OSHA) National Emphasis Program (NEP). Failure to meet these standards can result in significant financial liabilities, increased scrutiny by government and industry regulators, higher insurance premiums and tarnished corporate brand value. As a result, these owners and operators are seeking highly-reliable asset protection suppliers with a track record of assisting organizations in meeting increasingly stringent regulations. Our customers benefit from MISTRAS' extensive engineering consulting base that supports them in devising mechanical integrity programs that both meet regulatory compliance standards and enable enhanced safety and uptime at their facilities.

Expanding Addressable End-Markets. The continued emergence of and advances in asset protection technologies and software-based systems are increasing the demand for asset protection solutions in applications where existing techniques were previously ineffective.

Expanding Aerospace Industry. We believe that increased demand will continue to come from the aerospace industry due to the approximately decade-long backlog for next-generation commercial aircraft to be built, driving the need for advanced solutions that drive cost and quality efficiencies.

Crude Oil Prices. We expect the current range for crude oil prices to continue for the foreseeable future. With the prices lower than the 2006 to 2014 time period, we continue to see reductions in NDT and maintenance spending, although not to the extent as experienced in recent years, due in part to the price stabilization. We expect customers may continue to defer inspection or maintenance spending into early 2020.

Expanding Pipeline Integrity Regulations: The United States Pipeline & Hazardous Materials Safety Administration's (PHMSA) "Mega Rule" adopted in October 2019, expands pipeline integrity regulations on more than 500,000 miles of pipelines that carry natural gas, oil and other hazardous materials throughout the U.S. Some of these requirements will take operators decades to fulfill. These regulations require inspection and integrity data records throughout a pipeline's lifetime to be "reliable, traceable, verifiable, and complete," increasing the demand for integrated inspection, engineering, monitoring, and data management and analysis solutions.

Our Competitive Strengths

We believe the following competitive strengths contribute to our being a leading provider of asset protection solutions and will allow us to further capitalize on growth opportunities in our industry:

One Source Provider for Asset Protection Solutions. We believe we have one of the most comprehensive portfolios of integrated asset protection solutions worldwide, which positions us to be a leading single-source provider for our customers' asset protection requirements. This is particularly a competitive strength in regards to turnarounds and shutdowns - during which facilities temporarily cease operations in order to perform plant-wide inspections, maintenance and repairs - as these work stoppages make up significant portions of refinery, process and power plant maintenance budgets. Demand for our solutions increases during these outages, as facilities seek third-party providers to perform a wide spectrum of asset protection operations while the plant is offline. In addition, as companies are increasingly outsourcing their NDT needs to third-party providers, we believe that the ability to offer a comprehensive package of solutions provides us with a competitive advantage.

Integrated Data Management: MISTRAS' expertise and proprietary research and development in data solutions throughout the asset protection cycle provides a competitive advantage. With solutions for integrated data acquisition, storage, visualization and analytics, our integrated data management solutions are ahead of the industry's trend towards centralizing asset protection to fewer, highly-skilled and multi-disciplined vendors. Many of our data solutions are platform-agnostic, which expands the potential customer pool for our solutions as we can integrate into customers' existing operations.

Long-Standing Trusted Provider to a Diversified and Growing Customer Base. We have become a trusted partner to a large and growing customer base across numerous global markets through our proven, decades-long track record of successful operations. Our customers include some of the largest and most well-recognized firms in the oil and gas, chemicals, power generation and aerospace and defense industries, as well as public authorities.

Repository of Customer-Specific Inspection Data. Through our PCMS world-class enterprise data management and analysis software, we have accumulated extensive, proprietary process data that allows us to provide our customers with value-added services, such as benchmarking, risk-based inspection (RBI) and reliability-centered maintenance (RCM).

Proprietary Products, Software and Technology Packages. Our deep knowledge base in asset protection services and equipment enables us to offer technology packages, in which our field technicians utilize our proprietary and specialized testing procedures and hardware, advanced pattern recognition, neural network software and databases to compare test results against our prior testing data or national and international structural integrity standards.

Deep Domain Knowledge and Extensive Industry Experience. We have extensive asset protection experience and data, dating back several decades of operations. We have gained this through our industry leadership in developing advanced asset protection solutions, including research and development of advanced NDT technologies and applications; process engineering technologies; online plant asset integrity management with sensor fusion; and enterprise software solutions for plant-wide and fleet-wide inspection data archiving and management.

Technological Research and Development. The NDT industry continues to move towards more advanced, automated solutions, requiring service providers to find safer and more cost-efficient inspection techniques. We believe that we remain ahead of the technological curve by backing our extensive industry expertise with the investment of resources in research and development (R&D). Some of the advanced inspection technologies developed by our internal R&D teams include an automated radiographic testing (aRT) crawler for corrosion under insulation (CUI) inspections in aboveground pipelines; our Large Structure Inspection (LSI) scanner; and our real-time radiography (RTR) crawler for 360° inspections of pipeline girth welds.

Collaborating with Our Customers. We have historically expanded our asset protection solution portfolio in response to our customers' unique performance specifications. Our technology packages have often been developed in close cooperation and partnership with key customers and industry organizations.

Experienced Management Team. Our management team has a track record of asset protection organizational leadership. These individuals also have successfully driven operational growth organically and through acquisitions, which we believe is important to facilitate future growth in the asset protection industry.

Our Growth Strategy

Our growth strategy emphasizes the following key elements:

Expand Our Focus in the Aerospace Industry. We believe that the introduction of next-generation airframes and aircraft engines has created an inherent demand for inspection, testing, machining and mechanical services required for the production of parts. The recent interest in the use of additive manufacturing techniques to create components also necessitates advanced inspection and testing solutions. The Company consummated two acquisitions of aerospace inspection companies in 2017. These recent actions are driven by our increased focus to provide solutions to our customers throughout their manufacturing value chains in this growing area.

Expand Our Focus in the Pipeline Integrity Industry. MISTRAS intends to continue broadening our solutions for the pipeline market. Recent industry regulations significantly expanded pipeline integrity management regulations, requiring pipeline owner/operators to inspect, document, and assess the risk of operating conditions for existing lines. This provides MISTRAS with the opportunity to provide asset protection solutions for both the new construction and integrity phases. In 2019, we acquired a company that provides pipeline integrity management software and services to energy transportation companies. We acquired an inline inspection provider based in Canada in 2018 with operations in the U.S. and have implemented our PCMS software for several pipeline operators to support their integrity data management.

Expanding our Mechanical Services Portfolio. We believe that performing mechanical services to complement inspections, such as removing and reapplying insulation or preparing surfaces for coating or painting, is an important market differentiator for us. This is particularly true when considering the cost-efficiencies our customers realize when our rope access technicians perform these services at height without the use of scaffolding. Many of our customers already require these services, but utilize multiple vendors to do so, creating an opportunity for us to provide greater value to a customer base that increasingly requires enhanced speed and efficiency.

Continue to Develop Technology-Enabled & Digital Asset Protection Solutions. We intend to maintain and enhance our technological leadership by continuing to invest in developing new technology, applications and data services. We intend to continue deepening synergies between our solutions to provide our customers with uniquely-integrated offerings, which we believe makes us a more attractive vendor for customers seeking to centralize their asset protection. We also intend to continue to develop technologies that enhance the flow of data throughout multiple operational phases and facilities, through solutions such as MISTRAS Digital, our integrated pipeline integrity data portfolio, and our cloud-based monitoring data portal.

Expand our Solution Offerings to Existing Customers. We believe that branching into adjacent, complementary services, such as mechanical services, increases our value proposition and our ability to capture additional business. Many of our customers are multinational corporations with asset protection requirements at multiple locations. We believe that expanding our solution offerings, combined with the trend of customers outsourcing asset protection to service providers with integrated offerings, provides opportunities for significant additional recurring revenues.

Continue to Expand Our Customer Base into New End Markets. We believe we have significant opportunities to expand our customer base in relatively new end markets, including wind and other alternative energy, natural gas transportation industries pipeline integrity and additive manufacturing. The expansion of our addressable markets is being driven by the increased recognition and adoption of advanced asset protection technologies that are supplanting traditional methods.

Capitalize on Acquisitions. We have completed several acquisitions to supplement and enhance our solutions, add new customers, expand our sales channels and accelerate our expected growth. Due to our current debt levels and restrictions related to the debt covenants in our credit facility, we do not expect to make any acquisitions in 2020. However, once we reduce our debt, we expect to make selective acquisitions beyond 2020.

Our Segments

The Company has three operating segments:

Services. This segment provides asset protection solutions predominantly in North America, with the largest concentration in the United States, consisting primarily of non-destructive testing, inspection, mechanical and engineering services that are used to evaluate the structural integrity and reliability of critical energy, industrial and public infrastructure.

International. This segment offers services, products and systems similar to those of our Services and Products and Systems segments to select markets within Europe, the Middle East, Africa, Asia and South America, but not to customers in China and South Korea, which are served by our Products and Systems segment.

Products and Systems. This segment designs, manufactures, sells, installs and services our asset protection products and systems, including equipment and instrumentation, predominantly in the United States.

For a discussion of segment revenues, operating results and other financial information, including geographic areas in which we generated revenues, see “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in Item 7, as well as Note 2—*Revenue* in the notes to consolidated financial statements in Item 8 of this Annual Report.

Our Target Markets

Overview

Mistras operates in a highly competitive, but fragmented market. Domestically, the market is serviced by several national competitors and many regional and/or local companies. Internationally, our primary competitors are divisions of large companies, with additional competition from small independent local companies which may be limited to a specific product, service or technology and focused on a niche market or geographic region. We focus our strategic sales, marketing and product development efforts on a range of infrastructure-intensive based industries and governmental authorities. We view energy-related infrastructure and commercial aerospace as the Company’s largest market opportunities. We perform inspection and mechanical services for customers in both industries.

In the energy market, there are various economic indicators that drive our business, especially in the U.S. domestic markets. These factors are excerpted below from various Energy Information Administration (EIA) outlook reports:

The electricity generation mix is projected to continue to experience a rapid rate of change, with renewables the projected fastest-growing source of electricity generation through 2050 because of continuing declines in the capital costs for solar and wind that are supported by federal tax credits and higher state-level renewables targets. With slow load growth and increasing electricity production from renewables, U.S. coal-fired and nuclear electricity generation is projected to decline, with most of the decline occurring by the mid-2020s. The United States is projected to continue to produce historically high levels of crude oil and natural gas. The EIA forecasts U.S. crude oil production will average 13.2 million barrels per day (bpd) in 2020, up 1.0 million bpd from 2019, and then rise to 13.6 million bpd in 2021. In addition, the EIA estimates that production of U.S. crude oil reaches 14.0 million bpd by 2022 and remains near this level through 2045. The global competitiveness of the U.S. refining sector and the ability of the United States to increase exports as domestic consumption falls is projected to keep domestic refinery utilization near recent levels, between 90% and 93%.

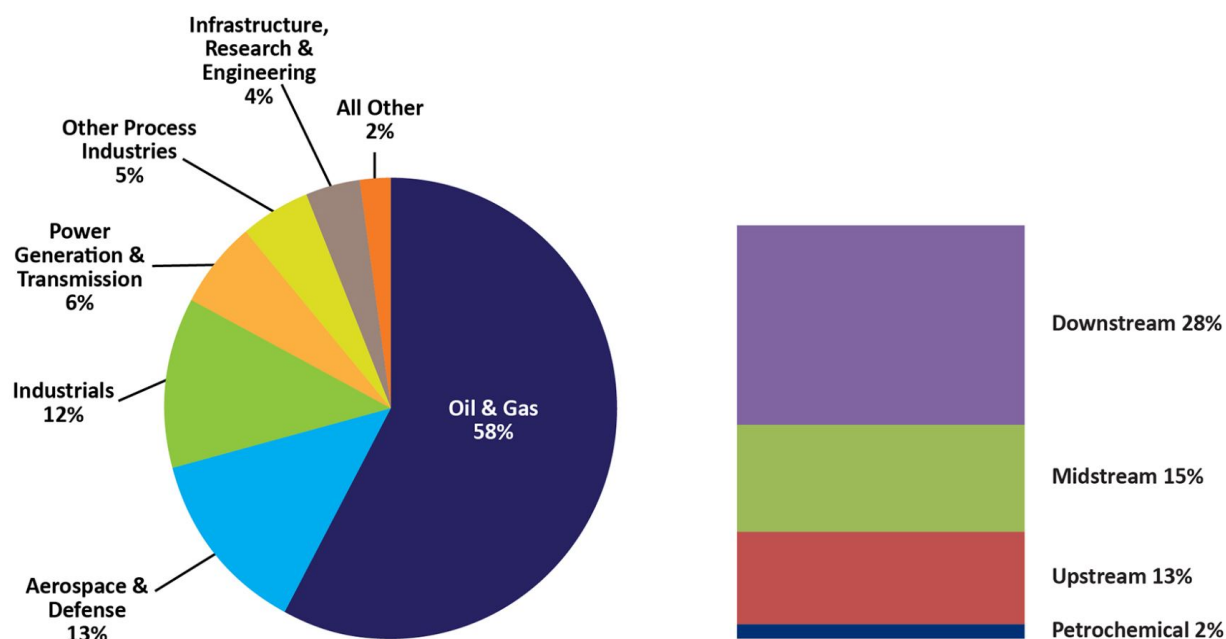
There are a number of economic factors which drive the aerospace market, including:

- The approximately decade-long backlog for next generation commercial aircraft to be built, including several large and mid-sized aircraft built by Boeing and Airbus, among other manufacturers;
- At CFM International’s planned full Leap production rate of 2,000-plus engines a year from 2020 onward, the existing order backlog represents eight full years of production; and
- The continuing regulatory scrutiny to ensure public safety serves to ensure the continued need for inspection and mechanical services to be performed.

Revenue by Target Market

The following chart represents the percentage of consolidated revenues we generated from our various markets for the year ended December 31, 2019:

**Mistras Revenues by Target Market
(Year ended December 31, 2019)**



Oil and Gas

MISTRAS supplies oil and gas asset protection solutions to downstream (refining), midstream (transportation and storage), upstream (exploration and production) and petrochemical operations.

We use our vast solutions portfolio to help identify current and future asset performance, and actively prevent, mitigate or otherwise address potential issues, including corrosion, cracking, leaking and other damages that may lead to safety, productivity or environmental concerns. Our solutions help identify conditions that could lead to potential catastrophic failures in tanks, vessels, valves, buried and above ground pipelines, pumps, motors, compressors and other critical assets found throughout the oil & gas production and delivery supply chain.

We actively seek to evolve our solutions through technological enhancements and R&D to discover new applications. Online monitoring and permanently-mounted sensors, as well as the use of drones and other alternative delivery devices, are all being considered as oil and gas infrastructure owners look to “smart” technologies that reduce human intervention while delivering highly-accurate inspection & integrity data. We also have actively sought to further enhance our integrated approach to asset protection, through the development of our complementary mechanical service portfolio.

In general, the energy market is poised to leverage digital solutions to facilitate process improvements as well as increase plant reliability and improve process and personnel safety. This provides an opportunity for the Company to synergistically leverage our asset protection solutions into our new MISTRAS Digital platform. Digital transmission of data in various industry sectors, with built-in analytic functions, will allow our customers to better leverage inspection data that is being generated in the field.

While we expect off-stream inspection of critical assets to remain a routine practice, we anticipate an increase in the demand for non-invasive, or on-stream inspections. Non-invasive inspections enable companies to minimize the costs associated with shutting down equipment during testing, while enabling the economic and safety advantages of advanced planning and/or predictive maintenance.

Aerospace and Defense

The aerospace industry is undergoing unprecedented growth with many original equipment manufacturers (OEMs) reporting record-high backlogs of up to ten years. We serve this rapidly-growing target market by providing a full range of inspection, testing, machining, mechanical, finishing, additive manufacturing and equipment solutions, which we are Nadcap certified. Our state-of-the-art in-house labs maintain numerous accreditations from industry organizations, including Nadcap and some of the largest prime manufacturers in the world, such as Boeing, Safran, Airbus, Bombardier and Embraer.

Advanced composite materials found in new classes of aircraft require advanced asset protection solutions, including x-ray of critical engine components, ultrasonic fatigue testing of complete aircraft structures and corrosion detection and other critical components. Many OEMs are shifting towards condition-based maintenance utilizing embedded monitoring sensors to track component structural and operational integrity over time as opposed to performing maintenance on time-based intervals. We expect demand for our solutions to increase with the adoption of these new-age materials and distributed online sensor networks. We also expect demand for asset protection solutions to increase with the continued adoption of additive manufacturing techniques.

Industrial

The quality control requirements driven by the need for zero-to-low-defect component tolerance within automated, robotic-intensive industries such as automotive, consumer electronics and medical industries serve as key drivers for increased demand in asset protection, particularly for in-house inspection and testing. We expect that increasingly stringent quality-control requirements and competitive forces will drive the demand for more-costly finishing and polishing which, in turn, creates opportunities for integrated partnerships between MISTRAS and our customers throughout the production lifecycle.

Power Generation and Transmission

MISTRAS provides asset protection solutions for customers in the combined cycle, fossil, nuclear, transmission & distribution and wind/alternative energy industries. We believe that in recent years, acceptance of asset protection solutions has grown in this industry due to the aging of critical power generation and transmission infrastructure.

The growing availability of cheap natural gas, along with environmental concerns with coal, has stimulated the construction of new natural gas-fired power plants across North America, creating opportunities for MISTRAS to provide specialized solutions in multiple phases. These include facility design consultations, NDT services during construction and plant operations and long-term condition monitoring. We anticipate sharp growth in these types of plants as natural gas pricing remains low, and the environmental impacts of coal remain unattractive to the public.

Process Industries

Our asset protection solutions are crucial for process industries, or industries in which raw materials are treated or prepared in a series of stages, including chemicals, pharmaceuticals, food processing, pulp and paper and metals and mining. As the process facilities are increasingly facing aging infrastructure, high utilization, growing capacity constraints and increasing capital costs, we believe asset protection solutions will continue to grow in importance in maintenance planning, quality and cost control and prevention of catastrophic failure.

Public Infrastructure, Research and Engineering

We believe that high-profile infrastructure catastrophes have caused public authorities to more actively seek ways to prevent similar events from occurring. Public authorities tasked with new construction and maintenance of existing public infrastructure increasingly use asset protection solutions to inspect these assets, including the use of embedded sensors to enable online monitoring throughout the life of the asset.

We have provided testing and structural health monitoring (SHM) solutions on bridges and structures worldwide, including some of the largest and most well-known bridges in the United States and United Kingdom. Our sensors continuously monitor these assets, alerting owner/operators when defects are detected. Our monitoring teams also provide regular reports that include early warnings of suspect areas before an alarm is generated.

Customers

We provide our asset protection solutions to a global customer base of diverse companies primarily in our target markets. No customer represented 10% or more of our revenue for either of the years ended December 31, 2019 or 2018.

Geographic Areas

We have operations in 10 countries and occasionally conduct business in a few other countries. Most of our revenues are derived from our U.S., Canadian and European operations. See Note 2—*Revenue* and Note 19—*Segment Disclosure* to the consolidated financial statements in this Annual Report for further disclosure of our revenues, long-lived assets and other financial information regarding our international operations.

Sales and Marketing

We sell our asset protection solutions through our direct sales and marketing teams within all of our offices worldwide. In addition, our project and laboratory managers, as well as our management, are trained on our solutions and often are the source of sales leads and customer contacts. Our direct sales and marketing teams work closely with our customers' research and design personnel, reliability engineers and facilities maintenance engineers to demonstrate the benefits and capabilities of our asset protection solutions, refine our asset protection solutions based on changing market and customer needs and identify potential sales opportunities. We divide our sales and marketing efforts into services sales, products and systems sales and marketing and utilize customer relationship management (CRM) systems to collect, manage and collaborate customer information with our teams globally. Our CRM's also provide critical data to provide accurate forecasting and reporting.

Manufacturing

Most of our hardware products are manufactured in our Princeton Junction, New Jersey facility. Our Princeton Junction facility includes the capabilities and personnel to fully produce all of our AE products and NDT Automation Ultrasonic equipment. We also design and manufacture automated ultrasonic systems and scanners in France.

Employees

Providing our asset protection solutions requires a highly-skilled and technically proficient employee base. As of December 31, 2019, we had approximately 5,500 employees worldwide, of which approximately 65% were based in the United States. Less than 0.5% of our employees in the United States are unionized. We believe that we have good relations with our employees.

Seasonality

Our business is seasonal. This seasonality relates primarily to our oil and gas business. U.S. refineries' non-peak periods are generally in the fall, when they are retooling to produce more heating oil for winter, and in the spring, when they are retooling to produce more gasoline for summer. The peak periods for these customers are the summer and winter months, when they run at peak capacity and are not retooling or performing turnarounds or shut downs. As a result, our revenues in the summer and winter months are typically lower than our revenues in the fall and spring because demand for our asset protection solutions from the oil and gas as well as the fossil and nuclear power industries increases during their non-peak production periods. Because we are increasing our work in the fall and spring, our cash flows are lower in those quarters than in the summer and winter, as collections of receivables lag behind revenues. We expect that this seasonality will continue.

Competition

We operate in a highly competitive, but fragmented, market. Our primary competitors are divisions of large companies and various small companies which generally are limited to a specific product or technology and focused on a niche market or geographic region. We believe that few, if any, of our competitors currently provide the full range of asset protection and NDT products, enterprise software (PCMS) and the traditional and advanced services solutions that we offer. Our competition with respect to NDT services include the Acuren division of Rockwood Service Corporation, SGS Group, the Team Qalspec division of Team, Inc. and APPLUS RTD. Our competition with respect to our PCMS software includes UltraPIPE, Lloyd's Register Capstone, Inc. and Meridium Systems. In the traditional NDT market, we believe the principal competitive factors include project management, availability of qualified personnel, execution, price, reputation and quality; whereas in the advanced NDT market, reputation, quality and size tend to be the most significant competitive factors. We believe that the NDT market has significant barriers to entry which would make it difficult for new competitors to enter the market. These barriers include: (1) having to acquire or develop advanced NDT services, products and systems technologies, which in our case occurred over many years of customer engagements and at significant internal research and development expense, (2) complex regulations and safety codes that require significant industry experience, (3) license requirements and evolved quality and safety programs, (4) costly and time-consuming certification processes, (5) capital requirements and (6) emphasis by large customers on size and critical mass, length of relationship and past service record.

Research and Development

Our research and development is principally conducted by engineers and scientists at our Princeton Junction, New Jersey headquarters, and supplemented by other employees in the United States and throughout the world, including France, Greece the United Kingdom, Brazil and the Netherlands. Our total professional staff includes employees who hold Ph.D.'s and engineers and employees who hold Level III certification, the highest level of certification from the American Society of Non-Destructive Testing (ASNT).

MISTRAS makes strategic R&D investments in technologies that support integration with our other solution offerings to enhance cost- and time-efficiencies, maximize uptime and safety and improve the flow of data from field technicians to inspection databases. We are investing resources in the development of MISTRAS Digital, an electronic platform that will digitally deliver field inspection assignments and related data, capture inspection results, and provide electronic reporting and productivity tracking. MISTRAS also invested significant R&D in pre-machining and advanced testing technologies in a purpose-built facility for an aerospace customer, with the goal of reducing the customer's production cycle logistics and costs.

We also work with customers to develop new products or applications for our technology, including:

- Testing of new composites
- Detecting crack propagation
- Wireless and communications technologies
- Development of permanently embedded inspection systems to provide continuous, online, in-service monitoring of critical structural components

Research and development expenses are reflected on our consolidated statements of income as research and engineering expenses. Our company-sponsored research and engineering expenses were approximately \$3.0 million, \$3.3 million and \$2.3 million for the years ended December 31, 2019, 2018 and 2017, respectively. While we have historically funded most of our research and development expenditures, from time to time we also receive customer-sponsored research and development funding. Most of the projects are in our target markets; however, a few of the projects could lead to other future market opportunities.

Intellectual Property

Our success depends, in part, on our ability to maintain and protect our proprietary technology and to conduct our business without infringing on the proprietary rights of others. We utilize a combination of intellectual property safeguards, including patents, copyrights, trademarks and trade secrets, as well as employee and third-party confidentiality agreements, to protect our intellectual property.

As of December 31, 2019, we held two U.S. patents (by direct ownership or exclusive licensing), which will expire in 2021 and 2026, respectively, and had four patents pending in the U.S. for applications filed in 2018 and 2019, and had licenses to certain other patents. However, we do not principally rely on these patents or licenses to provide our proprietary asset protection solutions. Our trademarks and service marks provide us and our solutions with a certain amount of brand recognition in our markets. We do not consider any single patent, trademark or service mark material to our financial condition or results of operations.

As of December 31, 2019, the primary trademarks and service marks that we held in the United States included MISTRAS® and our stylized globe design. Other key trademarks or service marks that we utilize in localized markets or product advertising include:

- One Source for Asset Protection Solutions®
- PCMS®
- Streamview™
- Ropeworks®
- Sensor Highway™
- TankPAC®
- CALIPERAY®
- VPAC™
- Transformer Clinic™

Many elements of our asset protection solutions involve proprietary know-how, technology or data that are not covered by patents or patent applications because they are not patentable or would be difficult to enforce, including technical processes, equipment designs, algorithms and procedures. We believe that this proprietary know-how, technology and data is the most

important component of our intellectual property used in our asset protection solutions and is a primary differentiator of our solutions from those of our competitors. We rely on various trade secret protection techniques and agreements with our customers, service providers and vendors to protect these assets. All of our employees are subject to confidentiality requirements through our employee handbook. In addition, many of our employees have entered into confidentiality and proprietary information agreements with us. Our employee handbook and these agreements require our employees not to use or disclose our confidential information, to assign to us all the inventions, designs and technologies they develop during the course of employment with us and to otherwise address intellectual property protection issues. We also seek confidentiality agreements from our customers and business partners before we disclose any sensitive aspects of our technologies or business strategies. We are not currently involved in any material intellectual property claims.

Environmental Matters

We are subject to numerous environmental, legal and regulatory requirements related to our operations worldwide. In the United States, these laws and regulations include, among others: the Comprehensive Environmental Response, Compensation, and Liability Act, the Resources Conservation and Recovery Act, the Clean Air Act, the Federal Water Pollution Control Act, the Toxic Substances Control Act, the Atomic Energy Act, the Energy Reorganization Act of 1974, and applicable regulations. In addition to the federal laws and regulations, states and other countries where we do business often have numerous environmental, legal and regulatory requirements by which we must abide. We evaluate and address the environmental impact of our operations by assessing properties in order to avoid future liabilities and comply with environmental, legal and regulatory requirements.

We received a notice in May 2015 that the U.S. Environmental Protection Agency (“EPA”) performed a preliminary assessment of a leased facility we operate in Cudahy, California. Based upon the preliminary assessment, the EPA conducted an investigation of the sites to determine whether any hazardous materials were released from the facility. We were informed that certain hazardous materials and pollutants have been found in the ground water in the general vicinity of the site and the EPA is attempting to ascertain the origination or source of these materials and pollutants. Given the historic industrial use of the site, the EPA determined that the site of our Cudahy facility should be examined along with numerous other sites in the vicinity. In 2018, the California Department of Toxic Substances Control notified the owner of the property that it may perform additional investigation of the property. At this time, we are not able to determine whether we have any liability in connection with this matter and if so, the amount or range of any such liability.

Executive Officers

The following are our executive officers and other key employees as of December 31, 2019 and their background and experience:

Name	Age	Position
Sotirios J. Vahaviolos	73	Executive Chairman and Director
Dennis Bertolotti	60	President, Chief Executive Officer and Director
Edward J. Prajzner	53	Executive Vice President, Chief Financial Officer and Treasurer
Michael C. Keefe	63	Executive Vice President, General Counsel and Secretary
Michael J. Lange	59	Senior Executive Vice President of Global Business Development, Marketing & Strategic Planning, and Director
Jonathan H. Wolk	58	Senior Executive Vice President and Chief Operating Officer

Sotirios J. Vahaviolos has been Executive Chairman since August 10, 2017. Prior to being named Executive Chairman, Dr. Vahaviolos had been our Chairman and Chief Executive Officer since he founded Mistras in 1978 under the name Physical Acoustics Corporation and was also our President until June 1, 2016. Prior to joining Mistras, Dr. Vahaviolos worked at AT&T Bell Laboratories. Dr. Vahaviolos received a B.S. in Electrical Engineering and graduated first in his engineering class from Fairleigh Dickinson University and received Masters Degrees in Electrical Engineering and Philosophy and a Ph.D. (EE) from the Columbia University School of Engineering. During Dr. Vahaviolos’ career in non-destructive testing, he has been elected Fellow of The Institute of Electrical and Electronics Engineers, a member of The American Society for Nondestructive Testing (ASNT) where he served as its President from 1992-1993 and its Chairman from 1993-1994, a member of Acoustic Emission Working Group (AEWG) and an honorary life member of the International Committee for Nondestructive Testing. Additionally, he was the recipient of ASNT’s Gold Medal in 2001 and AEWG’s Gold Medal in 2005. He was also one of the six founders of NDT Academia International in 2008 headquartered in Brescia, Italy.

Dennis Bertolotti joined Mistras when Conam Inspection Services was acquired in 2003, where Mr. Bertolotti was a Vice President at the time of the acquisition. Since then, Mr. Bertolotti has had increasing levels of responsibility with Mistras, and became our President and Chief Executive Officer and Director, effective August 10, 2017. From June 1, 2016 to August 9, 2017, Mr. Bertolotti was our President and Chief Operating Officer. Mr. Bertolotti has been in the NDT business for over 30 years, and previously held ASNT Level III certifications and various American Petroleum Institute, or API, certifications, and received his Associate of Science degree in NDT from Moraine Valley Community College in 1983. Mr. Bertolotti has also received a Bachelor of Science and MBA from Otterbein College.

Edward J. Prajzner joined Mistras in January 2018. Prior to joining Mistras, Mr. Prajzner worked at CECO Environmental Corp., a global service provider to environmental, energy and filtration industries, and served as Chief Financial Officer and Secretary from 2014 to 2017, Vice President of Finance and Chief Accounting Officer from 2013 until his appointment as CFO in 2014, and Corporate Controller and Chief Accounting Officer from 2012 to 2013. Mr. Prajzner also served in senior finance roles at CDI Corporation (now AE Industrial Partners), and American Infrastructure (now Allan Myers). Mr. Prajzner began his career in public accounting at Ernst & Young, received his B.S. in accountancy from Villanova University, his MBA in finance from Temple University and is a certified public accountant.

Michael C. Keefe joined Mistras in December 2009. Prior to joining Mistras, Mr. Keefe worked at International Fight League, a publicly-traded sports promotion company, from 2007 until 2009, in various executive positions. From 1990 until 2006, Mr. Keefe served in various legal roles with Lucent Technologies and AT&T, the last four years as Vice President, Corporate and Securities Law and Assistant Secretary. Mr. Keefe received a BS in Business Administration (Accounting) from Seton Hall University and a J.D. from Seton Hall University School of Law.

Michael J. Lange joined Mistras when we acquired Quality Services Laboratories in November 2000, and was elected a Director in 2003. Mr. Lange has held various executive level positions with Mistras, becoming Vice Chairman in July 2015 and Senior Executive Vice President, effective June 1, 2016. Mr. Lange is a well-recognized authority in Radiography and has held an ASNT Level III Certificate for almost 20 years. Mr. Lange received an Associate of Science degree in NDT from the Spartan School of Aeronautics.

Jonathan H. Wolk joined Mistras in November 2013 and served as Executive Vice President, Chief Financial Officer and Treasurer until August 10, 2017, when Mr. Wolk became Senior Executive Vice President and Chief Operating Officer. Mr. Wolk was also acting Chief Financial Officer from August 10, 2017 until the appointment of Mr. Prajzner on January 5, 2018. Prior to joining Mistras, Mr. Wolk served as Senior Vice President, Chief Financial Officer and Secretary of American Woodmark Corporation from 2004 until August 2013. Prior to American Woodmark, he served as the Chief Financial Officer and Treasurer of Tradecard, Inc., from 2000 to 2004, and was the global controller of GE Capital Real Estate from 1998 to 2000. Mr. Wolk started his career in public accounting at KPMG, received his B.S. in accounting from State University of New York-Albany and is a certified public accountant.

Our executive officers are elected by, and serve at the discretion of, our board of directors. There are no family relationships among any of our directors or executive officers.

Our Website and Available Information

Our website address is www.mistrasgroup.com. We file reports with the SEC, including Quarterly Reports on Form 10-Q, Annual Reports on Form 10-K, Current Reports on Form 8-K and Proxy Statements. All of the materials we file with or furnish to the SEC are available free of charge on our website at <http://investors.mistrasgroup.com/sec.cfm>, as soon as reasonably practicable after having been electronically submitted to the SEC. Information contained on or connected to our website is not incorporated by reference into this Annual Report on Form 10-K and should not be considered part of this report or any other filing with the SEC. All of our SEC filings are also available at the SEC's website at www.sec.gov. In addition, materials we file with the SEC may be read and copied at the SEC's Public Reference Room at 100 F Street, NE, Washington, DC 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330.

ITEM 1A. RISK FACTORS

This section describes the major risks to us, our business and our common stock. You should carefully read and consider the risks described below, together with the other information contained in this Annual Report, including our financial statements and the notes thereto and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” (MD&A) before making an investment decision. The statements contained in this section constitute cautionary statements under the Private Securities Litigation Reform Act of 1995. If any of these risks occur, our business, financial condition, results of operations and future growth prospects may be adversely affected. As a result, the trading price of our common stock would likely decline, and you may lose all or part of your investment. You should understand that it is not possible to predict or identify all risk factors that could impact us. For example, the current pandemic created by the COVID-19 coronavirus is causing a dramatic negative impact on the health of citizens of many countries, which in turn has caused major disruptions in economies and markets around the world, including our key markets. Accordingly, you should not consider the following to be a complete discussion of all risks and uncertainties pertaining to us and our common stock.

Risks Related to Our Business

Our long-term growth strategy includes acquisitions. We may not be able to identify suitable acquisition candidates or integrate acquired businesses successfully, which may adversely impact our results. In addition, due to our current debt levels and the restrictions related to the debt covenants in our credit facility, we do not expect to complete any acquisitions in 2020. Furthermore, acquisitions that we have completed or may complete in the future could expose us to a number of unanticipated operational and financial risks.

A significant factor in our growth has been and will continue to be based upon our ability to make acquisitions and successfully integrate these acquired businesses. We have used acquisitions both to expand into new markets and to enhance our position in existing markets. This strategy has provided us with many benefits and has helped fuel our growth, but also carries with it many risks. Some of the risks associated with our acquisition strategy include:

- whether we successfully identify suitable acquisition candidates, negotiate appropriate acquisition terms, and complete proposed acquisitions;
- whether we can successfully integrate acquired businesses into our current operations, including our accounting, internal control and information technology systems, marketing and other key infrastructure;
- whether we can adequately capture opportunities that an acquired business may offer, including the expansion into new markets in which we have little to no experience or presence;
- whether we value an acquired business properly when determining the purchase price and terms, and whether we are able to achieve the returns on the investment we expect;
- whether an acquired business can achieve levels of revenues, profitability, productivity or cost savings we expect;
- whether an acquired business is compatible with our culture and philosophy of doing business;
- the unexpected loss of key personnel and customers of an acquired business;
- the assumption of liabilities and risks (including environmental-related costs) of an acquired business, some of which may not be anticipated;
- the potential disruption of our ongoing business and distraction of management and other personnel of us and the acquired business resulting from the efforts to acquire, then integrate, an acquired business;
- the potential for greater exposure to risks associated with international operations; and
- the amount and cost of funding (including borrowings under our credit agreement) to acquire and integrate other businesses (some of which may require substantial funding) and the impact of the acquisition and borrowing on our continued compliance with covenants in our credit agreement.

Our ability to undertake acquisitions is limited by our financial resources, including available cash and borrowing capacity. Due to our current debt levels and restrictions related to the debt covenant in our credit facility, we do not expect to make any acquisitions in 2020. Future acquisitions could result in potentially dilutive issuances of equity securities, the incurrence of substantial additional indebtedness and other expenses, any of which could adversely impact our financial condition and results of operations. Although management intends to: (i) evaluate the risks inherent in any particular transaction, (ii) assume only

risks management believes to be acceptable, and (iii) develop plans to mitigate such risks, there are no assurances that we will properly ascertain or accurately assess the extent of all such risks. Difficulties encountered with acquisitions may adversely impact our business, financial condition and results of operations.

In addition, we have a significant amount of goodwill and other intangible assets on our balance sheet from our acquisitions. This will increase as we complete more acquisitions. If our acquisitions do not perform as planned and we do not realize the benefits and profitability we expect, we could incur significant write-downs and impairment charges to our earnings due to the impairment of the goodwill and other intangible assets we have acquired or acquire in the future.

Our international operations are subject to risks relating to non-U.S. operations.

For the years ended December 31, 2019, 2018 and 2017, we generated approximately 34%, 34%, and 33% of our revenues outside the United States, respectively. In addition, our international operations as a percentage of our business may increase over time. Our primary operations outside the United States are in Canada, Germany, France, the United Kingdom and Brazil. We also have operations in the Netherlands, Belgium, Greece and India. There are numerous risks inherent in doing business in international markets, including:

- fluctuations in currency exchange rates and interest rates;
- varying regional and geopolitical business and economic conditions and demands;
- compliance with applicable foreign regulations and licensing requirements, and U.S. laws and regulation with respect to our business in other countries, including export controls and anti-bribery laws;
- the cost and uncertainty of obtaining data and creating solutions that are relevant to particular geographic markets;
- the need to provide sufficient levels of technical support in different locations;
- the complexity of maintaining effective policies and procedures in locations around the world;
- political instability and civil unrest;
- restrictions or limitations on outsourcing contracts or services abroad;
- the impact of the United Kingdom exiting the European Union; the ultimate effects of Brexit on the Company are difficult to predict. The Company currently has subsidiaries that operate in the United Kingdom and Europe and our UK subsidiary and other European subsidiaries from time to time share employees and equipment. Brexit will make this sharing of employees and equipment more time consuming and expensive, which could cause disruptions and adversely affect the Company's financial condition, operating results and cash flows.
- restrictions or limitations on the repatriation of funds, or tax consequences on the non-repatriation of overseas operationally generated funds; and
- other potentially adverse tax consequences.

Due to our dependency on customers in the oil and gas industry, we are susceptible to prolonged negative trends relating to this industry that could adversely affect our operating results.

Our customers in the oil and gas industry (including the petrochemical market) have accounted for a substantial portion of our historical revenues. Specifically, they accounted for approximately 58%, 56%, and 58% of our revenues for the years ended December 31, 2019, 2018 and 2017, respectively. Although we have expanded our customer base into industries other than the oil and gas industry, we still receive a majority of our revenues from this industry. Our services are vital to the operators of plants and refineries and we have expanded our services offerings, such as expanding our mechanical services capabilities. However, economic slowdowns or low oil prices have, and could continue to, result in cutbacks in contracts for our services. In addition, low oil prices could depress the level of new exploration and construction, which would adversely affect our market opportunities. If the oil and gas industry were to continue to operate in a market with low oil prices, our revenues, profits and cash flows may be reduced. While we continue to expand our market presence in the aerospace, power generation and transmission, and the chemical processing industries, among others, these markets are also cyclical in nature and as such, are subject to economic downturns.

We expect to continue expanding and our success depends on how effectively we manage our growth.

We expect to continue experiencing growth in the number of employees and the scope of our operations over the long-term. To effectively manage our anticipated future growth, we must continue to implement and improve our managerial, operational, compliance, financial and reporting systems and capabilities, expand our facilities and continue to recruit and train additional qualified personnel. We expect that all these measures will require significant expenditures and will demand the attention of management. Failure to manage our growth effectively could lead us to over or under-invest in technology and operations, result in weaknesses in our infrastructure, systems, compliance programs or controls, and give rise to operational mistakes, the loss of business opportunities, the loss of employees and reduced productivity among remaining employees. Our expected growth could require significant capital expenditures and may divert financial resources from other projects, such as the development of new solutions. If our management is unable to effectively manage our expected growth, our expenses may increase more than expected, our profit margins may suffer, our revenues could decline or may grow more slowly than expected and we may be unable to implement our business strategy as anticipated.

Our operating results could be adversely affected by a reduction in business with our significant customers.

We derive a significant amount of revenues from a few customers. Taken as a group, our top ten customers were responsible for approximately 34%, 34%, and 38% of our revenues for the years ended December 31, 2019, 2018 and 2017, respectively. This concentration pertains almost exclusively to our Services segment, which accounted for more than 70% of our revenues for the years ended December 31, 2019, 2018 and 2017. These customers are primarily in the oil and gas sector. Generally, our customers do not have an obligation to make purchases from us and may stop ordering our products and services or may terminate existing orders or contracts at any time with little or no financial penalty. The loss of any of our significant customers, any substantial decline in sales to these customers or any significant change in the timing or volume of purchases by our customers could result in lower revenues and could harm our business, financial condition or results of operations.

An accident or incident involving our asset protection solutions could expose us to claims, harm our reputation and adversely affect our ability to compete for business and, as a result, harm our operating performance.

We could be exposed to liabilities arising out of the solutions we provide. For instance, we furnish the results of our testing and inspections for use by our customers in their assessment of their assets, facilities, plants and other structures. If such results were to be incorrect or incomplete, as a result of, for instance, poorly designed inspections, malfunctioning testing equipment or our employees' failure to adequately test or properly record data, we could be subject to claims. Further, if an accident or incident involving a structure we tested occurs and causes personal injuries or property damage, such as the collapse of a bridge or an explosion in a facility, and particularly if these injuries or damages could have been prevented by our customers had we provided them with correct or complete results, we would likely face significant claims relating to personal injury, property damage or other losses. Even if our results are correct and complete, we may face claims for such injuries or damage simply because we tested the structure or facility in question. In addition, during the course of a single engagement, such as the inspection of a pipeline, we often perform tests on thousands of welds. Even if the accuracy of only a small number of these test results are questioned, a customer may attempt to refuse payment for the entire project. While we do have insurance, our insurance coverage does not cover non-payment by customers and may not be adequate to cover the damages from any such claims, forcing us to bear these uninsured damages directly, which could harm our operating results and may result in additional expenses and possible loss of revenues. An accident or incident for which we are found partially or fully responsible, even if fully insured, or even an incident at a customer or site for which we provide services although we were found not to be responsible, may also result in negative publicity, which would harm our reputation among our customers and the public, cause us to lose existing and future contracts or make it more difficult for us to compete effectively, thereby significantly harming our operating performance. In addition, the occurrence of an accident or incident might also make it more expensive or extremely difficult for us to insure against similar events in the future.

Many of the sites at which we work are inherently dangerous workplaces. If we fail to maintain a safe work environment, we may incur losses and lose business.

Many of our customers, particularly in the oil and gas and chemical industries, require their inspectors and other contractors working at their facilities to have good safety records because of the inherent danger at these sites. If our employees are injured at the work place, we could incur costs for the injuries and lost productivity. In addition, safety records are impacted by the number and amount of workplace incidents involving a contractor's employees. If our safety record is not within the levels required by our customers, or compares unfavorably to our competitors, we could lose business, be prevented from working at certain facilities or suffer other adverse consequences, all of which could negatively impact our business, revenues, reputation and profitability.

We may face risks regarding our information technology and security.

Significant disruptions of our information technology systems or breaches of information security could adversely affect our business. We rely upon information technology systems to operate many parts of our business. We routinely collect, store and transmit large amounts of sensitive or confidential information, including data from the results of our testing and inspections. We deploy and operate various technical and procedural controls to maintain the confidentiality and integrity of such sensitive or confidential information. Furthermore, as we automate more of our inspection process and procedures, including through the use of Mistras Digital, we become more vulnerable to security breaches and other system disruptions. In addition, we rely on third parties for significant elements of our information technology infrastructure and, as a result, we are managing many independent vendor relationships with third parties who may or could have access to our confidential information. The size and complexity of our information technology and information security systems, and those of our third-party vendors with whom we contract (and the large amounts of confidential information that is present on them), make such systems potentially vulnerable to service interruptions or to security breaches from inadvertent or intentional actions by our employees or vendors, or from attacks by malicious third parties. Such attacks are of ever-increasing levels of sophistication and expertise, including organized criminal groups, “hacktivists,” and others. Due to the nature of some of these attacks, there is a risk that they may remain undetected for a period of time. While we have invested in the protection of data and information technology, there can be no assurance that our efforts will prevent service interruptions or security breaches. Any such interruption or breach of our systems could adversely affect our business operations and/or result in the loss of critical or sensitive confidential information, and could result in financial, legal, business and reputational harm to us. We maintain cyber liability insurance; however this insurance may not be sufficient to cover the financial, legal, business or reputational losses that may result from an interruption or breach of our systems. The occurrence or perception of security breaches in connection with our asset protection solutions or our customers’ concerns about internet security or the security of our solutions, whether warranted or not, would likely harm our reputation and business, inhibit market acceptance of our asset protection solutions and cause us to lose customers, any of which would harm our financial condition and results of operations.

In addition, much of our computer and communications hardware is located at a single facility. We have a back-up data-center and storage in a different geographic area. Should a natural disaster or some other event occur that damages our primary data center or significantly disrupts its operation, such as human error, fire, flood, power loss, telecommunications failure, break-ins, terrorist attacks, acts of war and similar events, we could suffer temporary interruption of key functions and capabilities before the back-up facility is fully operational.

We are subject to privacy and data security/protection laws in the jurisdictions in which we operate and may be exposed to substantial costs and liabilities associated with such laws and regulations.

The regulatory environment surrounding information security and privacy is increasingly demanding, with frequent imposition of new and changing requirements. The European Union’s General Data Protection Regulation (“GDPR”), which became effective in May 2018, imposed significant new requirements on how companies process and transfer personal data, as well as significant fines for non-compliance. In addition to GDPR, many states in the U.S. have enacted, or are considering, data privacy requirements similar to GDPR, and thus we will need to ensure our procedures comply with these various state laws. Compliance with changes in privacy and information security laws and standards may result in significant expense due to increased investment in technology and the development of new operational processes, which could have a material adverse effect on our financial condition and results of operations. In addition, the payment of potentially significant fines or penalties in the event of a breach of the GDPR or other privacy and information security laws, as well as the negative publicity associated with such a breach, could damage the Company’s reputation and adversely impact product demand and customer relationships.

If our software or system produces inaccurate information or are incompatible with the systems used by our customers and make us unable to successfully provide our solutions, it could lead to a loss of revenues and customers.

Our software and systems are complex and, accordingly, may contain undetected errors or failures. Software or system defects or inaccurate data may cause incorrect recording, reporting or display of information related to our asset protection solutions. Any such failures, defects and inaccurate data may prevent us from successfully providing our asset protection solutions, which could result in lost revenues. Software or system defects or inaccurate data may lead to customer dissatisfaction and could cause our customers to seek to hold us liable for any damages incurred. As a result, we could lose customers, our reputation may be harmed and our financial condition and results of operations could be materially adversely affected.

We currently serve a commercial, industrial and governmental customer base that uses a wide variety of constantly changing hardware, software solutions and operating systems. Our asset protection solutions need to interface with these non-standard systems in order to gather and assess data. Our business depends on the following factors, among others:

- our ability to integrate our technology with new and existing hardware and software systems;
- our ability to anticipate and support new standards, especially internet-based standards; and
- our ability to integrate additional software modules under development with our existing technology and operational processes.

If we are unable to adequately address any of these factors, our results of operations and prospects for growth and profitability would be adversely impacted.

If we are unable to attract and retain a sufficient number of trained certified technicians, engineers and scientists at competitive wages, our operational performance may be harmed and our costs may increase.

We believe that our success depends, in part, upon our ability to attract, develop and retain a sufficient number of trained certified technicians, engineers and scientists at competitive wages. The demand for such employees fluctuates as the demand for NDT and inspection services fluctuates. When the demand for qualified technicians increases, we will often experience increased labor costs, which we may not recover in the amounts we can charge our customers. The markets for our products and services require us to use personnel trained and certified in accordance with standards set by domestic or international standard-setting bodies, such as the American Society of Non-Destructive Testing or the American Petroleum Institute. Because of the limited supply of these certified technicians, we expend substantial resources maintaining in-house training and certification programs. If we fail to attract sufficient new personnel or fail to motivate and retain our current personnel, our ability to perform under existing contracts and orders or to pursue new business may be harmed, preventing us from growing our business or causing us to lose customers and revenues, and the costs of performing such contracts and orders may increase, which would likely reduce our margins.

We operate in competitive markets and if we are unable to compete successfully, we could lose market share and revenues and our margins could decline.

We face strong competition from NDT and a variety of niche asset protection providers, both larger and smaller than we are. Some of our competitors have greater financial resources than we do and could focus their substantial financial resources to develop a competing business model or develop products or services that are more attractive to potential customers than what we offer. Some of our competitors are business units of companies substantially larger than us and could attempt to combine asset protection solutions into an integrated offering to customers who already purchase other types of products or services from them. Our competitors may offer asset protection solutions at lower prices than ours in order to attempt to gain market share. Smaller niche competitors with small customer bases could be aggressive in their pricing in order to retain customers. These competitive factors could reduce our market share, revenues and profits.

Due to the participation in multi-employer pension plans by our subsidiaries, these subsidiaries may face withdrawal liability.

Some of our workforce is unionized and the terms of employment for these workers are governed by collective bargaining agreements, or CBAs. Under these CBAs, we are required to contribute to the national pension funds for the unions representing these employees, which are multi-employer pension plans. Significant reductions in contributions to these pension plans, or events that result in our subsidiaries no longer contributing to these pension plans, can result in a complete or partial withdrawal liability under ERISA, which can be significant and adversely impact our earnings and cash flow. The Company recorded a charge of \$5.9 million during 2018 and \$0.8 million during 2019 for this potential withdrawal liability.

Events such as natural disasters, industrial accidents, epidemics, pandemics, war and acts of terrorism, and adverse weather conditions could disrupt our business or the business of our customers, which could significantly harm our operations, financial results and cash flow.

Our operations and those of our customers are susceptible to the occurrence of catastrophic events outside our control, which may include events like epidemics, pandemics and other health crises, severe weather conditions, industrial accidents, and acts of war and terrorism, to name a few. Any such events could cause a serious business disruption that reduces our customers' need or interest in purchasing our asset protection solutions. In the past, such events have resulted in order cancellations and delays because customer equipment, facilities or operations have been damaged, or are not then operational or available. A large portion of our customer base has operations in the Gulf of Mexico, which is subject to hurricanes and tropical storms.

Hurricane-related disruptions to our customers' operations have adversely affected our revenues in the past. Such events in the future may result in substantial delays in the provision of solutions to our customers and the loss of valuable equipment. In addition, our results can be adversely impacted by severe winter weather conditions, which can result in lost workdays and temporary closures of customer facilities or outdoor projects. While our business may not be directly impacted by the COVID-19 coronavirus like other industries such as travel and restaurants, the safety measures being taken in an attempt to slowdown the spread of COVID-19 has resulted in a slowdown of our business. If there is a significant outbreak in the areas of one of our major locations or a major customer location, our business would be hampered by a customer facility shut down, quarantine or other actions taken to control the spread of the COVID-19. Because much of our revenue is generated by our technicians working at customer sites, our revenue will be reduced if the customer site reduces or eliminates the presence of third-party contractors and service providers, such as our technicians. Any cancellations, delays or losses due to such events may significantly reduce our revenues and harm our operating performance.

In addition, these events could disrupt commodity prices or financial markets or have other negative macroeconomic impacts, such as those being caused by COVID-19 coronavirus, which could harm our business.

If we lose key members of our senior management team upon whom we are dependent, we may be less effective in managing our operations and may have more difficulty achieving our strategic objectives.

Our future success depends to a considerable degree upon the availability, contributions, vision, skills, experience and effort of our senior management team. We have in place various compensation programs, such as an annual cash incentive program, equity incentive program and a severance policy, each designed to incentivize and retain our key senior managers. At this time, we do not have any reason to believe that we may lose the services of any of these key persons in the foreseeable future and we believe our compensation programs will help us retain these individuals. We believe we have sufficient depth in our executive management to continue our success if we were to lose the services of an executive. However, an unplanned loss or interruption of the service of numerous key members of our senior management team could harm our business, financial condition and results of operations and could significantly reduce our ability to manage our operations and implement our strategy.

Deteriorations in economic conditions in certain markets or other factors may cause us to recognize impairment charges for our goodwill.

As of December 31, 2019, the carrying amount of our goodwill was approximately \$282.4 million, of which \$247.2 million and \$35.2 million relate to our Services and International segments, respectively. Our Services segment is predominantly concentrated in North America whereas a significant portion of our International segment are concentrated in Europe and Brazil. Significant deterioration in industry or economic conditions in which we operate, disruptions to our business, not effectively integrating acquired businesses, or other factors, may cause impairment charges to goodwill in future periods.

The success of our businesses depends, in part, on our ability to develop new asset protection solutions, increase the functionality of our current offerings and meet the needs and demands of our customers.

The market for asset protection solutions is impacted by technological change, uncertain product lifecycles, shifts in customer demands and evolving industry standards and regulations. We may not be able to successfully develop and market new asset protection solutions that comply with present or emerging industry regulations and technology standards. Also, new regulations or technology standards could increase our cost of doing business.

From time to time, our customers have requested greater value and functionality in our solutions. As part of our strategy to enhance our asset protection solutions and grow our business, we continue to make investments in the research and development of new technologies, inspection tools and methodologies. We believe our future success will depend, in part, on our ability to continue to design new, competitive and broader asset protection solutions, enhance our current solutions and provide new, value-added services. Many traditional NDT and inspection services are subject to price competition by our customers. Accordingly, the need to demonstrate our value-added services is becoming more important. Developing new solutions will require continued investment, and we may experience unforeseen technological or operational challenges. In addition, our asset protection software is complex and can be expensive to develop, and new software and software enhancements can require long development and testing periods. If we are unable to develop new asset protection solutions or enhancements that meet market demands on a timely basis, we may experience a loss of customers or otherwise be likely to lose opportunities to earn revenues and to gain customers or access to markets, and our business and results of operations will be adversely affected.

Even if we develop new solutions, if our customers, or potential customers, do not see the value our solutions have over competing products and services, our operating results could be adversely impacted. In addition, because the asset protection solutions industry is rapidly evolving, we could lose insight into trends that may be emerging, which would further harm our competitive position by making it difficult to predict and respond to customer needs. If the market for our asset protection solutions does not continue to develop, our ability to grow our business would be limited and we might not be able to maintain profitability. If we cannot convince our customers of the advantages and value of our advanced NDT services, we could lose large contracts or suffer lower profit margin.

The seasonal nature of our business reduces our revenues and profitability in the winter and summer and related cash flows.

Our business is seasonal. The fall and spring revenues are typically higher than our revenues in the winter and summer because demand for our asset protection solutions from the oil and gas as well as the fossil and nuclear power industries increases during their non-peak production periods. For instance, U.S. refineries' non-peak periods are generally in the fall, when they are retooling to produce more heating oil for winter, and in the spring, when they are retooling to produce more gasoline for summer. As a result of these trends, we generally have reduced cash flows in the fall and spring, as collections of receivables lag behind revenues, possibly requiring us to borrow under our credit agreement. In addition, most of our operating expenses, such as employee compensation and property rental expense, are relatively fixed over the short term. Moreover, our spending levels are based in part on our expectations regarding future revenues. As a result, if revenues for a particular quarter are below expectations, we may not be able to proportionately reduce operating expenses for that quarter. We expect that the impact of seasonality will continue.

Our business, and the industries we currently serve, are currently subject to governmental regulation, and may become subject to modified or new government regulation that may negatively impact our ability to market our asset protection solutions.

We incur substantial costs in complying with various government regulations and licensing requirements. For example, the transportation and overnight storage of radioactive materials used in providing certain of our asset protection solutions such as radiography are subject to regulation under federal and state laws and licensing requirements. Our Services segment is currently licensed to handle radioactive materials by the U.S. Nuclear Regulatory Commission (NRC), over 20 state regulatory agencies and the Canadian Nuclear Safety Commission. If we allegedly fail to comply with these regulations, we may be investigated and incur significant legal expenses associated with such investigations, and if we are found to have violated these regulations, we may be fined or lose one or more of our licenses or permits, which would prevent or restrict our ability to provide radiography services. In addition, while we are investigated, we may be required to suspend work on the projects associated with our alleged noncompliance, resulting in loss of profits or customers, and damage to our reputation. Many of our customers have strict requirements concerning safety or loss time occurrences and if we are unable to meet these requirements it could result in lost revenues. In the future, governmental agencies may seek to change current regulations or impose additional regulations on our business. Any modified or new government regulation applicable to our current or future asset protection solutions may negatively impact the marketing and provision of those solutions and increase our costs of providing these solutions and have a corresponding adverse effect on our margins.

Additionally, greenhouse gases that result from human activities, including burning of fossil fuels, have been the focus of increased scientific and political scrutiny and are being subjected to various legal requirements. International agreements, national laws, state laws and various regulatory schemes limit or otherwise regulate emissions of greenhouse gases, and additional restrictions are under consideration by different governmental entities. We derive a significant amount of revenues and profits from such industries, including oil and gas, power generation and transmission, and chemicals processing. Such regulations could negatively impact our customers, which could negatively impact the market for the services and products we provide. This could materially adversely affect our business, financial condition, results of operations and cash flows.

We rely on certification of our NDT solutions by industry standards-setting bodies. We and/or our subsidiaries currently have International Organization for Standardization (ISO) 9001:2008 certification, ISO 14001:2004 certification and OHSAS 18001:2007 certification. In addition, we currently have NADCAP (formerly National Aerospace and Defense Contractors Accreditation Program) and similar certifications for certain of our locations. We continually review our NDT solutions for compliance with the requirements of industry specification standards and the NADCAP special processes quality requirements. However, if we fail to maintain our ISO, Nadcap or other certifications, our business may be harmed because our customers generally require that we have these certifications before they purchase our NDT solutions.

Intellectual property may impact our business and results of operations.

Our ability to compete effectively depends in part upon the maintenance and protection of the intellectual property related to our asset protection solutions. Patent protection is unavailable for certain aspects of the technology and operational processes important to our business and any patent or patent applications, trademarks or copyrights held by us or to be issued to us, may not adequately protect us. Some of our trademarks that are not in use may become available to others. To date, we have relied principally on copyright, trademark and trade secrecy laws, as well as confidentiality agreements and licensing arrangements, to establish and protect our intellectual property. However, we have not obtained confidentiality agreements from all our customers and vendors. Although we obligate our employees to confidentiality, we cannot be certain that these obligations will be honored or enforceable.

We may require additional capital to support business growth, which might not be available.

We intend to continue making investments to support our business growth and may require additional funds to respond to business challenges or opportunities, including the need to develop new, or enhance our current, asset protection solutions, enhance our operating infrastructure or acquire businesses and technologies. Accordingly, we may need to engage in equity or debt financings to secure additional funds. If we raise additional funds through further issuances of equity or convertible debt securities, our current stockholders could suffer significant dilution, and any new equity securities we issue could have rights, preferences and privileges superior to those of holders of our common stock. Our current credit facility meets our current needs, except that due to our current debt levels, the facility limits our ability to make acquisitions until our debt ratio improves. If we were to secure other debt financing in the future, it could involve restrictive covenants relating to our capital-raising activities and other financial and operational matters, which may make it more difficult for us to obtain additional capital and to pursue business opportunities, including potential acquisitions. In addition, no assurance can be given that adequate or acceptable financing will be available to us, in which case we may not be able to grow our business, including through acquisitions, or respond to business challenges.

Our credit agreement contains financial and operating restrictions that may limit our access to credit. If we fail to comply with financial or other covenants in our credit agreement, we may be required to repay indebtedness to our existing lenders, which may harm our liquidity.

Our credit agreement contains financial covenants that require us to maintain compliance with specified financial ratios. If we fail to comply with these covenants, the lenders could prevent us from borrowing under our credit agreement, require us to pay all amounts outstanding, require that we cash collateralize letters of credit issued under the credit agreement and restrict us from making acquisitions. If the maturity of our indebtedness is accelerated, we then may not have sufficient funds available for repayment or the ability to borrow or obtain sufficient funds to replace the accelerated indebtedness on terms acceptable to us, or at all.

Our current credit agreement also imposes restrictions on our ability to engage in certain activities, such as creating liens, making certain investments, incurring more debt, disposing of certain property, paying dividends and making distributions and entering into a new line of business. While these restrictions have not impeded our business operations to date, if our plans change, these restrictions could be burdensome or require that we pay fees to have the restrictions waived. In addition, due to our current debt levels and financial ratios, we do not expect to make any acquisitions in 2020 due to restrictions related to the financial covenants in our credit agreement.

Risks Related to Our Common Stock

Our stock price could fluctuate for numerous reasons, including variations in our results.

Our quarterly operating results have fluctuated in the past and may do so in the future. Accordingly, we believe that period-to-period comparisons of our results of operations may be the best indicators of our business. You should not rely upon the results of one quarter as an indication of future performance. Our revenues and operating results may fall below the expectations of securities analysts or investors in any future period. Our failure to meet these expectations may cause the market price of our common stock to decline, perhaps substantially. Our quarterly revenues and operating results may vary depending on a number of factors, including those listed previously under “Risks Related to Our Business.” In addition, the price of our common stock is subject to general economic, market, industry, and competitive conditions, the risk factors discussed below and numerous other conditions outside of our control.

A significant stockholder controls the direction of our business. The concentrated ownership of our common stock may prevent other stockholders from influencing significant corporate decisions.

Dr. Sotirios J. Vahaviolos, our founder and Executive Chairman, owns approximately 36% of our outstanding common stock. As a result, Dr. Vahaviolos has significant control over our Company and has the ability to exert substantial influence over all matters requiring approval by our shareholders, including the election and removal of directors, amendments to our certificate of incorporation, and any proposed merger, consolidation or sale of all or substantially all of our assets and other corporate transactions. This concentration of ownership could be disadvantageous to other shareholders with differing interests from Dr. Vahaviolos.

We currently have no plans to pay dividends on our common stock.

We have not declared or paid any cash dividends on our common stock to date, and we do not anticipate declaring or paying any dividends on our common stock in the foreseeable future. To the extent we do not pay dividends on our common stock, investors must look solely to stock appreciation for a return on their investment.

Shares eligible for future sale may cause the market price for our common stock to decline even if our business is doing well.

Future sales by us or by our existing shareholders of substantial amounts of our common stock in the public market, or the perception that these sales may occur, could cause the market price of our common stock to decline. This could also impair our ability to raise additional capital in the future through the sale of our equity securities. Under our certificate of incorporation, we are authorized to issue up to 200,000,000 shares of common stock, of which approximately 29,035 thousand shares of common stock were outstanding as of March 23, 2020. In addition, we have approximately 824 thousand shares of common stock reserved for issuance related to stock options and restricted stock units that were outstanding as of March 23, 2020. We cannot predict the size of future issuances of our common stock or the effect, if any, that future sales and issuances of shares of our common stock, or the perception of such sales or issuances, would have on the market price of our common stock.

Provisions of our charter, bylaws and of Delaware law could discourage, delay or prevent a change of control of our company, which may adversely affect the market price of our common stock.

Certain provisions of our certificate of incorporation and bylaws could discourage, delay or prevent a merger, acquisition, or other change of control that stockholders may consider favorable, including transactions in which our stockholders might otherwise receive a premium for their shares. These provisions also could limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. Stockholders who wish to participate in these transactions may not have the opportunity to do so. Furthermore, these provisions could prevent or frustrate attempts by our stockholders to replace or remove our management. These provisions:

- allow the authorized number of directors to be changed only by resolution of our board of directors;
- require that vacancies on the board of directors, including newly created directorships, be filled only by a majority vote of directors then in office;
- authorize our board of directors to issue, without stockholder approval, preferred stock that, if issued, could operate as a “poison pill” to dilute the stock ownership of a potential hostile acquirer to prevent an acquisition that is not approved by our board of directors;
- require that stockholder actions must be effected at a duly called stockholder meeting by prohibiting stockholder action by written consent;
- prohibit cumulative voting in the election of directors, which may otherwise allow holders of less than a majority of stock to elect some directors; and
- establish advance notice requirements for stockholder nominations to our board of directors or for stockholder proposals that can be acted on at stockholder meetings and limit the right to call special meetings of stockholders to the Chairman of the Board, the Chief Executive Officer, the board of directors acting pursuant to a resolution adopted by a majority of directors or the Secretary upon the written request of stockholders entitled to cast not less than 35% of all the votes entitled to be cast at such meeting.

In addition, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the Delaware General Corporation Law, which may, unless certain criteria are met, prohibit large stockholders, in particular those owning 15% or more of our outstanding voting stock, from merging or combining with us for a prescribed period of time.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

As of December 31, 2019, we operated approximately 120 facilities in 10 countries, with our corporate headquarters located in Princeton Junction, New Jersey. Our headquarters in Princeton Junction is our primary location, where most of our manufacturing and research and development is conducted. While we lease most of our facilities, as of December 31, 2019, we owned properties located in Monroe, North Carolina; Trainer, Pennsylvania; LaPorte, Texas; Burlington, Washington; Evanston, Wyoming and Jonquiere, Quebec. Our Services segment utilizes approximately 80 facilities throughout North America (including Canada). Our Products and Systems segment's primary location is in our Princeton Junction, NJ facility. Our International segment has approximately 40 facilities including locations in Belgium, Brazil, France, Germany, Greece, India, the Netherlands and the United Kingdom. We believe that all of our facilities are well maintained and are suitable and adequate for the foreseeable future.

ITEM 3. LEGAL PROCEEDINGS

We are subject to periodic legal proceedings, investigations and claims that arise in the ordinary course of business. See "Litigation" in Note 18–*Commitments and Contingencies* to the consolidated financial statements contained in Item 8 of this Annual Report for a description of legal proceedings involving us and our business, which is incorporated herein by reference.

ITEM 4. MINE SAFETY DISCLOSURES

None.

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

Market for Common Stock

Our common stock currently trades on the New York Stock Exchange (NYSE) under the ticker symbol "MG."

Holders of Record

As of March 23, 2020, there were 7 holders of record of our Common Stock. The number of record holders was determined from the records of our transfer agent and does not include beneficial owners of common stock whose shares are held in the names of various security brokers, dealers, and registered clearing agencies. The transfer agent of our common stock is American Stock Transfer & Trust Company, 6201 15th Avenue, Brooklyn, New York 11219.

Dividends

No cash dividends have been paid on our Common Stock to date. We currently intend to retain our future earnings, if any, to finance the expansion of our business and do not expect to pay any cash dividends in the foreseeable future.

Purchases of Equity Securities

The Company's Board of Directors approved a \$50 million stock repurchase plan in 2015. The Company retired all its repurchased shares during the fourth quarter of 2017. The Board of Directors approved the termination of the stock repurchase plan effective on April 1, 2019. There were no repurchases of common stock during 2019.

ITEM 6. SELECTED FINANCIAL DATA

The following table presents selected financial data for the years ended December 31, 2019, 2018 and 2017, the transition period ended December 31, 2016 (see footnote 4 below) and the fiscal years ended May 31, 2016 and 2015. This selected financial data should be read in conjunction with “Management’s Discussion and Analysis of Financial Condition and Results of Operations” in Item 7 and the audited consolidated financial statements and the notes thereto in Item 8 in this Annual Report.

	For the year ended December 31,			For the Transition period ended	For the year ended May 31,	
	2019 ⁽¹⁾	2018 ⁽²⁾	2017 ⁽³⁾	December 31, 2016 ⁽⁴⁾	2016 ⁽⁵⁾	2015 ⁽⁵⁾
(\$ in thousands, except per share data)						
Statement of Income Data:						
Revenues	\$ 748,586	\$ 742,354	\$ 700,970	\$ 404,161	\$ 719,181	\$ 711,252
Gross profit	217,297	207,874	187,712	117,004	203,008	184,733
Income from operations	24,137	22,221	4,160	17,533	43,177	30,353
Net income (loss) attributable to Mistras Group, Inc.	\$ 6,060	\$ 6,836	\$ (2,175)	\$ 9,568	\$ 24,654	\$ 16,081
Per Share Information:						
Weighted average common shares outstanding:						
Basic	28,740	28,406	28,422	28,989	28,856	28,613
Diluted	29,046	29,427	28,422	30,125	29,891	29,590
Earnings (loss) per common share:						
Basic	\$ 0.21	\$ 0.24	\$ (0.08)	\$ 0.33	\$ 0.85	\$ 0.56
Diluted	\$ 0.21	\$ 0.23	\$ (0.08)	\$ 0.32	\$ 0.82	\$ 0.54
Balance Sheet Data:						
Cash and cash equivalents	\$ 15,016	\$ 25,544	\$ 27,541	\$ 19,154	\$ 21,188	\$ 10,555
Total assets	719,878	694,037	554,441	469,427	482,675	471,727
Total long-term debt and obligations under finance leases, including current portion	271,887	303,617	181,491	103,466	104,776	132,822
Total Mistras Group, Inc. stockholders’ equity	\$ 285,822	\$ 270,897	\$ 270,619	\$ 270,582	\$ 276,163	\$ 244,819
Cash Flow Data:						
Net cash provided by operating activities	\$ 59,110	\$ 41,664	\$ 55,799	\$ 30,259	\$ 68,124	\$ 49,840
Net cash (used in) investing activities	(25,280)	(155,450)	(102,797)	(17,374)	(16,752)	(49,651)
Net cash (used in) provided by financing activities	\$ (44,137)	\$ 113,969	\$ 53,045	\$ (12,869)	\$ (40,378)	\$ 2,066

1 - Includes pre-tax charges of \$5.7 million relating to special items. See the Income from Operations table in Item 7 for a description of these items. The impact of these items, net of taxes, on net income and diluted earnings per share was \$2.9 million and \$0.10, respectively.

2 - Includes pre-tax charges of \$9.4 million relating to special items. See the Income from Operations table in Item 7 for a description of these items. The impact of these items, net of taxes, on net income and diluted earnings per share was \$9.3 million and \$0.32, respectively, including a \$1.7 million tax charge related to the Tax Act.

3 - Includes pre-tax charges of \$21.0 million relating to special items. The impact of these items, net of taxes, on net income and diluted earnings per share was \$14.9 million and \$0.51, respectively, including a \$2.0 million tax charge related to the Tax Act.

4 - On January 3, 2017, the Company's Board of Directors approved a change in the Company's fiscal year end from May 31 to December 31, effective December 31, 2016. In connection with this change, we previously filed a Transition Report on Form 10-K to report the results of the seven-month transition period from June 1, 2016 to December 31, 2016. The transition period ended December 31, 2016 is the seven-month period from June 1, 2016 to December 31, 2016. Includes pre-tax charges of \$2.2 million relating to special items. The impact of these items, net of taxes, on net income and diluted earnings per share was \$1.6 million and \$0.05, respectively.

5 - Includes pre-tax charges (benefits) of \$6.0 million in fiscal 2016 and \$0.1 million in fiscal 2015 relating to special items. Net income was (decreased) increased by these items, net of taxes, by (\$3.2) million in fiscal 2016 and \$1.0 million in fiscal 2015, respectively. The (decrease) increase of these items on diluted earnings per share were (\$0.11) in fiscal 2016 and \$0.03 in fiscal 2015, respectively.

ITEM 7. MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATION

The following Management’s Discussion and Analysis (“MD&A”) provides a discussion of our results of operations and financial position for the year ended December 31, 2019. A discussion of our results of operations and financial position for the year ended December 31, 2018 is included in Part II–Item 7, *Management’s Discussion and Analysis of Financial Condition and Results of Operations* of our Annual Report on Form 10-K for the fiscal year ended December 31, 2018 filed with the SEC on March 18, 2019, which discussion is incorporated herein by reference. The MD&A should be read together with our consolidated financial statements and related notes included in Item 8 in this Annual Report on Form 10-K. Unless otherwise specified or the context otherwise requires, “Mistras,” “the Company,” “we,” “us” and “our” refer to Mistras Group, Inc. and its consolidated subsidiaries. The MD&A includes the following sections:

- Forward-Looking Statements
- Overview
- Note about Non-GAAP Measures
- Consolidated Results of Operations
- Liquidity and Capital Resources
- Critical Accounting Estimates
- Recent Accounting Pronouncements

Forward-Looking Statements

This Annual Report on Form 10-K contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 (Securities Act), and Section 21E of the Securities Exchange Act of 1934 (Exchange Act). Such forward-looking statements include those that express plans, anticipation, intent, contingency, goals, targets or future development and/or otherwise are not statements of historical fact. See “Forward-Looking Statements” at the beginning of Item 1 of this Annual Report.

At the time of this report, the COVID-19 coronavirus is having a negative impact on our key markets and is causing significant economic disruption worldwide. Our discussion below is qualified by the unknown impact that the COVID-19 coronavirus could have on our business and the economy in general, including the duration of the health risk the virus will cause and resulting economic disruption.

Overview

We offer our customers “OneSource for Asset Protection Solutions®” and are a leading global provider of technology-enabled asset protection solutions used to evaluate the structural integrity and reliability of critical energy, commercial aerospace and defense, industrial and public infrastructure. We combine industry-leading products and technologies, expertise in mechanical integrity (MI), Non-Destructive Testing (NDT), Destructive Testing (DT), mechanical and predictive maintenance (PdM) services, process and fixed asset engineering and consulting services, proprietary data analysis and our world class enterprise inspection database management and analysis software, PCMS, to deliver a comprehensive portfolio of customized solutions, ranging from routine inspections to complex, plant-wide asset integrity management and assessments. These mission critical solutions enhance our customers’ ability to comply with governmental safety and environmental regulations, extend the useful life of their assets, increase productivity, minimize repair costs, manage risk and avoid catastrophic disasters. Our comprehensive “OneSource” portfolio of customized solutions, utilizing a proven systematic method that creates a closed-loop lifecycle for addressing continuous asset protection and improvement, helps us to deliver value to our customers.

Our operations consist of three reportable segments: Services, International, and Products and Systems.

- *Services* provides asset protection solutions predominantly in North America, with the largest concentration in the United States, followed by Canada, consisting primarily of NDT, inspection, mechanical and engineering services that are used to evaluate the structural integrity and reliability of critical energy, industrial and public infrastructure.
- *International* offers services, products and systems similar to those of the other segments to select markets within Europe, the Middle East, Africa, Asia and South America, but not to customers in China and South Korea, which are served by the Products and Systems segment.

- *Products and Systems* designs, manufactures, sells, installs and services the Company's asset protection products and systems, including equipment and instrumentation, predominantly in the United States.

Given the role our solutions play in enhancing the safe and efficient operation of infrastructure, we have historically provided a majority of our solutions to our customers on a regular, recurring basis. We perform these services largely at our customers' facilities, while primarily servicing our aerospace customers at our growing network of state-of-the-art, in-house laboratories. These solutions typically include NDT and inspection services, and can also include a wide range of mechanical services, including engineering assessments, heat tracing, pre-inspection insulation stripping, inspections, coating applications, re-insulation, and long-term condition-monitoring. Under this business model, many customers outsource their inspection to us on a "run and maintain" basis. We have established long-term relationships as a critical solutions provider to many of the leading companies with asset-intensive infrastructure in our target markets. These markets include oil and gas (downstream, midstream, upstream and petrochemical), commercial aerospace and defense, power generation (natural gas, fossil, nuclear, alternative, renewable, and transmission and distribution), public infrastructure, chemicals, transportation, primary metals and metalworking and research and engineering institutions.

We have focused on providing our advanced asset protection solutions to our customers using proprietary, technology-enabled software and testing instruments, including those developed by our Products and Systems segment. We have made numerous acquisitions in an effort to grow our base of experienced, certified personnel, expand our service lines and technical capabilities, increase our geographical reach and leverage our fixed costs. We have increased our capabilities and the size of our customer base through the development of applied technologies and managed support services, organic growth and the integration of acquired companies. These acquisitions have provided us with additional service lines, technologies, resources and customers that we believe will enhance our advantages over our competition.

The acquisition of Onstream, completed in December 2018, helps support many of our Corporate initiatives. Onstream's strong presence in inline inspection provides us with a strong foundation within the midstream oil and gas market, which is an important piece of our overall growth strategy. We have already generated new business opportunities through introduction of our inline inspection capabilities to existing midstream customers. The acquisition of Onstream also provides us with an additional digital solution, Streamview™ software, which is an innovative application of advanced digital technology.

We believe long-term growth can be realized in all of our target markets. We expect the timing of our oil and gas customers inspection spend to be impacted by oil price fluctuations. Demand for our services in the aerospace industry are strong and we continue to focus on expanding our capabilities to service this market. In addition, we have increased our capabilities and the size of our customer base through the development of applied technologies and managed support services, organic growth and the integration of acquired companies. Recent acquisitions have provided us with additional products, technologies, resources and customers that we believe will enhance our advantages over our competition.

Note about Non-GAAP Measures

In this MD&A under the heading "Income from Operations", the non-GAAP financial performance measure "Income (loss) before special items" is used for each of our three segments, the Corporate segment and the Total Company, with tables reconciling the measure to a financial measure under GAAP. This non-GAAP measure excludes from the GAAP measure "Income (loss) from Operations" (a) transaction expenses related to acquisitions, such as professional fees and due diligence costs, (b) the net changes in the fair value of acquisition-related contingent consideration liabilities, (c) impairment charges, (d) reorganization and other costs, which includes items such as severance, labor relations matters and asset and lease termination costs and (e) other special items. These adjustments have been excluded from the GAAP measure because these expenses and credits are not related to the Company's or Segment's core business operations. The acquisition related costs and special items can be a net expense or credit in any given period.

We believe investors and other users of our financial statements benefit from the presentation of "Income (loss) before special items" for each of our three segments, the Corporate segment and the Total Company in evaluating our performance. Income (loss) before special items excludes the identified adjustments, which provides additional tools to compare our core business operating performance on a consistent basis and measure underlying trends and results in our business. Income (loss) before special items is not used to determine incentive compensation for executives or employees, nor is it a replacement for GAAP and/or necessarily comparable to other companies' non-GAAP financial measures.

Consolidated Results of Operations

Year ended December 31, 2019 vs. Year ended December 31, 2018

The following table summarizes our consolidated statements of operations for the years ended December 31, 2019 and 2018:

	For the year ended December 31,	
	2019	2018
	(\$ in thousands)	
Revenues	\$ 748,586	\$ 742,354
Gross profit	217,297	207,874
<i>Gross profit as a % of Revenue</i>	29.0 %	28.0 %
Total operating expenses	193,160	185,653
<i>Operating expenses as a % of Revenue</i>	25.8 %	25.0 %
Income from operations	24,137	22,221
<i>Income from operations as a % of Revenue</i>	3.2 %	3.0 %
Interest expense	13,698	7,950
Income before provision for income taxes	10,439	14,271
Provision for income taxes	4,359	7,426
Net income	6,080	6,845
Less: net income attributable to noncontrolling interests, net of taxes	20	9
Net income attributable to Mistras Group, Inc.	<u>\$ 6,060</u>	<u>\$ 6,836</u>

Revenues

Revenues by segment for the years ended December 31, 2019 and 2018 were as follows:

	For the year ended December 31,	
	2019	2018
	(\$ in thousands)	
Revenues		
Services	\$ 595,130	\$ 574,619
International	144,271	153,448
Products and Systems	18,583	23,426
Corporate and eliminations	(9,398)	(9,139)
	<u>\$ 748,586</u>	<u>\$ 742,354</u>

Revenue was \$748.6 million for the year ended December 31, 2019, an increase of \$6.2 million, or 0.8%, compared with the year ended December 31, 2018. The increase was driven by the Services segment, which increased by \$20.5 million, or 3.6%, driven by mid-single-digit acquisition growth primarily relating to the acquisition of Onstream in the fourth quarter of 2018, partially offset by low single-digit organic decline and the unfavorable impact of foreign exchange rates. The International segment revenues decreased 6.0%, driven primarily by the unfavorable impact of foreign exchange rates. The Products and Systems segment decreased 20.7%, driven by lower sales volume and by the sale of a subsidiary during the third quarter of 2018.

Revenues from oil and gas customers comprised 58% and 56% for the years ended December 31, 2019 and 2018, respectively. Revenues from aerospace and defense customers comprised 13% and 15% for the years ended December 31, 2019 and 2018, respectively. This decrease in aerospace and defense customer revenues is attributed to the run-off of the German staff leasing contracts in the International segment, as more fully described in Note 18–*Commitments and Contingencies* to the consolidated financial statements, and the increase in volume in the oil and gas market is due to the Onstream acquisition completed in the fourth quarter of 2018.

Gross Profit

Gross profit by segment for the years ended December 31, 2019 and December 31, 2018 was as follows:

	For the year ended December 31,	
	2019	2018
(\$ in thousands)		
Gross profit		
Services	\$ 165,513	\$ 151,974
<i>% of segment revenue</i>	27.8 %	26.4 %
International	43,145	45,464
<i>% of segment revenue</i>	29.9 %	29.6 %
Products and Systems	8,639	10,560
<i>% of segment revenue</i>	46.5 %	45.1 %
Corporate and eliminations	—	(124)
	<u>\$ 217,297</u>	<u>\$ 207,874</u>
<i>% of total revenue</i>	29.0 %	28.0 %

Gross profit increased \$9.4 million, or 4.5%, for the year ended December 31, 2019 compared to the year ended December 31, 2018, with a sales increase of 0.8%. Gross profit margin was 29.0% and 28.0% for the years ended December 31, 2019 and 2018, respectively. Services segment gross profit margins had a year-on-year increase of 140 basis points to 27.8% for the year ended December 31, 2019, due primarily to favorable operating leverage and service mix. International segment gross margins had a year-on-year increase of 30 basis points to 29.9% for the year ended December 31, 2019, due primarily to favorable sales mix. Products and Systems segment gross margins improved by 140 basis points for the year ended December 31, 2019 to 46.5%, driven by favorable sales mix.

Operating Expenses

Operating expenses for the years ended December 31, 2019 and December 31, 2018 was as follows:

	For the year ended December 31,	
	2019	2018
(\$ in thousands)		
Operating Expenses		
Selling, general and administrative expenses	\$ 168,621	\$ 165,702
Bad debt provision for troubled customers, net of recoveries	3,038	650
Pension withdrawal expense	848	5,886
Gain on sale of subsidiary	—	(2,384)
Research and engineering	3,045	3,310
Depreciation and amortization	16,733	11,957
Acquisition-related expense, net	875	532
	<u>\$ 193,160</u>	<u>\$ 185,653</u>
<i>% of total revenue</i>	25.8 %	25.0 %

Operating expenses increased \$7.5 million, or 4.0%, for the year ended December 31, 2019 compared to the year ended December 31, 2018. Operating expenses, as a percentage of revenue, increased to 25.8% for the year ended December 31, 2019 compared to 25.0% for the year ended December 31, 2018. Operating expenses related to the 2019 and 2018 acquisitions within our Services segment contributed approximately \$13.6 million of additional expenses, inclusive of approximately \$5.5 million in depreciation and amortization. Transactional foreign exchange expense was approximately \$1.8 million lower in 2019 as compared to 2018, primarily as a result of a stronger Canadian dollar compared to the U.S. dollar during 2019. The Company incurred approximately \$1.7 million in additional bad debt expense mainly attributable to customer disputes (see Note 4—*Accounts Receivable* to the consolidated financial statements). Legal related expenses were approximately \$1.0 million lower in 2019 as compared with 2018, primarily due to the pension withdrawal and legal related matters as discussed in Note 18—

Commitments and Contingencies to the consolidated financial statements. There were approximately \$3.8 million less operating expenses related to special items as presented below.

The workforce of certain of the Company's subsidiaries are unionized and the terms of employment for these workers are governed by collective bargaining agreements, or CBAs. Under these CBAs, the Company's subsidiaries are required to contribute to the national pension funds for the unions representing these employees, which are multi-employer pension plans. The Company was notified that a significant project was awarded to another contractor in January 2018, and as a result, one of the Company's subsidiaries experienced a significant reduction in the number of its employees covered by one of the CBAs. Under certain circumstances, such a reduction in the number of employees participating in multi-employer pension plans pursuant to this CBA could result in a complete or partial withdrawal liability to these multi-employer pension plans under the Employee Retirement Income Security Act of 1974 ("ERISA"). Management explored options to retain a level of union work that would avoid withdrawal liability to the pension plans, but concluded during the third quarter of 2018 that the Company's subsidiaries probably would not obtain sufficient union work to avoid withdrawal liability. Therefore, the Company determined that it is probable that its subsidiary will incur a withdrawal liability related to these multi-employer pension plans. Accordingly, the Company recorded a charge of \$5.9 million during 2018 and \$0.8 million during 2019 for this potential withdrawal liability. The Company's subsidiary reached an agreement with one of the pension funds in September 2019 and made a final payment of \$0.9 million in complete satisfaction of the withdrawal liability of the subsidiary. Excluding the settlement payment, the Company has made monthly payments totaling \$3.3 million through December 31, 2019. The balance of the estimated total amount of this potential liability as of December 31, 2019 is approximately \$2.5 million.

The Company's German subsidiary provides employees to customers under temporary staff leasing arrangements. In April 2017, the German Labor Lease Act was passed in Germany limiting the duration of temporary workers to eighteen months, or longer as subsequently agreed with by a customer appropriate authority. Since the passing of the German Labor Lease Act, the Company explored selling its staff leasing services and concluded during the third quarter of 2018 that a sale would not be probable. As a result, the Company decided that it would not renew several of these leasing services contracts when they expired beginning in 2019. Due to the limit on the length of service allowed under the German Labor Lease Act, employees are being transitioned off the customer contracts. The German subsidiary has terminated, or will terminate, some of these employees, creating a severance obligation to the terminated employees, and has transitioned, or will transition other employees to the Company's other customers. During December 2019, the Company executed an agreement to sell the rights of certain customer contracts for total consideration of approximately \$0.1 million, effective January 1, 2020. No other assets or liabilities other than those employee benefits related to employees working on the customer contracts were included in the sale. As of December 31, 2019, the Company accrued approximately \$0.8 million for estimated severance payment obligations, which takes into account the Company's estimate with respect to the employees that have been or will be transitioned to the German subsidiaries' other customers. The \$0.8 million of estimated obligations is net of \$0.2 million in payments and \$0.5 million in reversals due to employees being transitioned to customer contracts.

During 2018, the Company recorded approximately \$1.2 million in charges related to labor claims against its Brazilian subsidiary, which are included within Selling, general and administrative expenses. These claims related to employees in a company acquired by the Brazilian subsidiary in a prior period. The Company believes it is entitled to indemnification from the sellers of the acquired company for most of these charges but has not recorded the expected recovery of indemnification for these labor claims as the amount and timing of collection is uncertain as of December 31, 2019.

Income from Operations

The following table shows a reconciliation of segment income from operations to income before special items for the years ended December 31, 2019 and 2018:

	For the year ended December 31,	
	2019	2018
(\$ in thousands)		
Services:		
Income from operations (GAAP)	\$ 49,593	\$ 47,126
Pension withdrawal expense	848	5,886
Bad debt provision for troubled customers, net of recoveries	3,018	650
Reorganization and other costs	302	458
Acquisition-related expense, net	541	576
Income before special items (non-GAAP)	<u>\$ 54,302</u>	<u>\$ 54,696</u>
International:		
Income from operations (GAAP)	\$ 5,856	\$ 3,953
Reorganization and other costs	266	3,966
Acquisition-related (benefit), net	—	(409)
Bad debt provision for troubled customers, net of recoveries	20	—
Income before special items (non-GAAP)	<u>\$ 6,142</u>	<u>\$ 7,510</u>
Products and Systems:		
Income (loss) from operations (GAAP)	\$ (529)	\$ 2,368
Gain on sale of subsidiary	—	(2,384)
Reorganization and other costs	218	29
Income (loss) before special items (non-GAAP)	<u>\$ (311)</u>	<u>\$ 13</u>
Corporate and Eliminations:		
Loss from operations (GAAP)	\$ (30,783)	\$ (31,226)
Reorganization and other costs	104	305
Acquisition-related expense, net	334	365
Loss before special items (non-GAAP)	<u>\$ (30,345)</u>	<u>\$ (30,556)</u>
Total Company:		
Income from operations (GAAP)	\$ 24,137	\$ 22,221
Pension withdrawal expense	848	5,886
Gain on sale of subsidiary	—	(2,384)
Bad debt provision for troubled customers, net of recoveries	3,038	650
Reorganization and other costs	890	4,758
Acquisition-related expense, net	875	532
Income before special items (non-GAAP)	<u>\$ 29,788</u>	<u>\$ 31,663</u>

Operating expenses, excluding special items (non-GAAP), as a percentage of revenue, was 25.0% for the year ended December 31, 2019 compared to 23.7% for the year ended December 31, 2018. Total Company income from operations (GAAP) increased by \$1.9 million, or 8.6% compared to the year ended December 31, 2018. Total Company income before special items (non-GAAP) decreased by \$1.9 million or 5.9% compared with the year ended December 31, 2018. Income before

special items decreased by 30 basis points to 4.0% for the year ended December 31, 2019 from 4.3% for the year ended December 31, 2018.

Interest Expense

Interest expense was \$13.7 million and \$8.0 million for the years ended December 31, 2019 and December 31, 2018, respectively. The increase is related to higher average levels of borrowings on the Company's credit agreement, which is primarily attributable to the Onstream acquisition completed during the fourth quarter of 2018, and to a lesser extent, from an increase in the base borrowing rate.

Income Taxes

Our effective income tax rate was approximately 41.8% for the year ended December 31, 2019, compared to 52.0% for the year ended December 31, 2018. The change in effective tax rate was primarily driven by decrease due to a tax reform in the United States resulting in a transition tax impact in prior years, a decrease in a Canadian provincial tax rate, partially offset by an increase in nondeductible share-based compensation.

On June 28, 2019, the Canadian province of Alberta enacted the Job Creation Tax Cut which reduced the Alberta corporate income tax rate from 12% to 11% starting in 2019 with further annual reductions to 10% in 2020, 9% in 2021, and 8% in 2022. This rate reduction had a favorable impact of approximately \$1.9 million on the Company's net deferred tax liabilities in this jurisdiction.

The United States enacted the Coronavirus Aid, Relief, and Economic Security Act (CARES Act). The CARES Act is an approximately \$2 trillion emergency economic stimulus package in response to the Coronavirus outbreak, which among other things contains numerous income tax provisions. Some of these tax provisions are expected to be effective retroactively for years ending before the date of enactment. The Company is currently evaluating the impact of the CARES Act on its consolidated financial position, results of operations, and cash flows.

On December 22, 2017, the United States enacted fundamental changes to federal tax law following the passage of the Tax Cuts and Jobs Act (the "Tax Act"). The Tax Act is complex and significantly changes the U.S. corporate tax system. During the year ended December 31, 2018, the Company completed the accounting for the effects of the Tax Act on the period ended December 31, 2017, which resulted in income tax expense of \$1.7 million. This consisted primarily of an increase of \$0.1 million in our net deferred tax liabilities due to the reduction in the federal corporate rate from 35% to 21%, an increase of \$1.3 million in tax expense attributable to the transition tax, and a decrease in deferred tax assets of \$0.4 million due to changes made to executive compensation.

Income tax expense varies as a function of pre-tax income and the level of non-deductible expenses, such as certain amounts of meals and entertainment expense, valuation allowances, and other permanent differences. It is also affected by discrete items that may occur in any given year, but are not consistent from year to year. Our effective income tax rate may fluctuate over the next few years due to many variables including the amount and future geographic distribution of our pre-tax income, changes resulting from our acquisition strategy, and increases or decreases in our permanent differences.

Liquidity and Capital Resources

Overview

The Company has funded its operations from cash provided from operations, bank borrowings and lease financings. Management believes that the Company's existing cash and cash equivalents, anticipated cash flows from operating activities, and available borrowings under our credit agreement will be more than sufficient to meet anticipated cash needs over the next 12 months. The Company generated operating cash flow of \$59.1 million and \$41.7 million for the years ended December 31, 2019 and 2018, respectively. Capital expenditures for the purchase of property, plant and equipment and of intangible assets was \$22.9 million and \$21.1 million for the years ended December 31, 2019 and 2018, respectively.

Cash Flows Table

The following table summarizes our cash flows for the years ended December 31, 2019 and 2018:

(\$ in thousands)	For the year ended December 31,	
	2019	2018
Net cash provided by (used in):		
Operating activities	\$ 59,110	\$ 41,664
Investing activities	(25,280)	(155,450)
Financing activities	(44,137)	113,969
Effect of exchange rate changes on cash	(221)	(2,180)
Net change in cash and cash equivalents	\$ (10,528)	\$ (1,997)

Cash Flows from Operating Activities

Cash provided by operating activities for the year ended December 31, 2019 was \$59.1 million, an increase of \$17.4 million from the prior year. The increase was primarily attributable to movements in working capital.

Cash Flows from Investing Activities

Net cash used in investing activities for the year ended December 31, 2019 was \$25.3 million, a decline of \$130.2 million from the prior year. In addition, the Company used \$1.8 million less for purchases of property, plant and equipment and intangible assets in 2019 compared to 2018. In 2018, the Company used \$135.7 million for acquisitions, net of dispositions.

Cash Flows from Financing Activities

Net cash used by financing activities for the year ended December 31, 2019 was \$44.1 million, compared to net cash provided by financing activities of \$114.0 million for the year ended December 31, 2018. In 2018, the Company had net borrowings of \$125.2 million, the proceeds of which were primarily used to fund acquisitions, of which approximately \$29.7 million was repaid during 2019.

Cash Balance and Credit Facility Borrowings

As of December 31, 2019, the Company had cash and cash equivalents totaling \$15.0 million and available borrowing capacity of up to \$149.6 million under its credit agreement (as defined below). Borrowings of \$246.7 million and letters of credit of \$3.7 million were outstanding under the credit agreement at December 31, 2019. We finance our operations primarily through our existing cash balances, cash collected from operations, bank borrowings and lease financing. We believe these sources are sufficient to fund our operations for the foreseeable future.

On December 13, 2018, the Company entered into a Fifth Amended and Restated Credit Agreement (“Credit Agreement”). The Credit Agreement increased the Company’s revolving line of credit from \$250 million to \$300 million and provides that under certain circumstances the line of credit can be increased to \$450 million. In addition, the Credit Agreement provided the Company with a \$100 million senior secured term loan A facility. The Company increased its borrowing capacity under the Credit Agreement primarily to fund an acquisition in December 2018. Both the revolving line of credit and the term loan A facility under the Credit Agreement have a maturity date of December 12, 2023. The Company may continue to borrow up to \$100 million in non-U.S. Dollar currencies and use up to \$20 million of the credit limit for the issuance of letters of credit.

Loans under the Credit Agreement bear interest at LIBOR plus an applicable LIBOR margin ranging from 1% to 2%, or a base rate less a margin of 1.25% to 0.375%, at the option of the Company, based upon the Company’s Funded Debt Leverage Ratio. Funded Debt Leverage Ratio is generally the ratio of (1) all outstanding indebtedness for borrowed money and other interest-bearing indebtedness as of the date of determination to (2) EBITDA (which is (a) net income, less (b) income (or plus loss) from discontinued operations and extraordinary items, plus (c) income tax expenses, plus (d) interest expense, plus (e) depreciation, depletion, and amortization (including non-cash loss on retirement of assets), plus (f) stock compensation expense, less (g) cash expense related to stock compensation, plus (h) certain amounts of EBITDA of acquired business for the prior twelve months, plus (i) certain expenses related to the closing of the Credit Agreement, plus (j) non-cash expenses which do not (in the current or any future period) represent a cash item (excluding non-cash gains which increase net income), plus (k) non-recurring charges (not to exceed \$10 million in the four consecutive quarters immediately preceding the date of

determination) for items such as severance, lease termination charges, asset write-offs and litigation settlements paid, and multi-employer pension plan withdrawal liabilities, all determined for the period of four consecutive fiscal quarters immediately preceding the date of determination of EBITDA. The Company has the benefit of the lowest margin if its Funded Debt Leverage Ratio is equal to or less than 1.0 to 1, and the margin increases as the ratio increases, to the maximum margin if the ratio is greater than 3.25 to 1. The Company will also bear additional costs for market disruption, regulatory changes affecting the lenders' funding costs, and default pricing of an additional 2% interest rate margin on any amounts not paid when due. Amounts borrowed under the Credit Agreement are secured by liens on substantially all of the assets of the Company and is guaranteed by some of our subsidiaries.

The Credit Agreement contains financial covenants requiring that the Company maintain a Funded Debt Leverage Ratio of no greater than 4.25 to 1 through December 31, 2018, reducing to a maximum permitted ratio of 3.50 to 1 as of March 31, 2020 and all quarterly periods thereafter, and a Fixed Charge Coverage Ratio of at least 1.25 to 1. Fixed Charge Coverage Ratio means the ratio, as of any date of determination, of (a) (i) EBITDA for the 12 month period immediately preceding the date of determination, taken together as one accounting period, less (ii) the aggregate amount of all capital expenditures made during the period, less (iii) taxes paid in cash during the period, less (iv) Restricted Payments paid in cash during the period, -to- (b) the sum of (i) all interest, premium payments, debt discount, fees, charges and related expenses of us and our subsidiaries in connection with borrowed money (including capitalized interest) or in connection with the deferred purchase price of assets, in each case, to the extent treated as interest in accordance with U.S. generally accepted accounting principles ("GAAP") and to the extent paid in cash during the period, (ii) the aggregate principal amount of all redemptions or similar acquisitions for value of outstanding debt for borrowed money or regularly scheduled principal payments made during the period, but excluding any such payments to the extent refinanced through the incurrence of additional Indebtedness otherwise expressly permitted under the Credit Agreement, and (iii) payments made during the period under all leases that have been or should be, in accordance with GAAP as in effect for our 2017 audited financial statement, recorded as capitalized leases.

On March 9, 2020, the Credit Agreement was amended to provide that the maximum Funded Debt Leverage Ratio is 4.0 to 1 for the quarters ended December 31, 2019 through June 30, 2020; 3.75 to 1 for the quarter ending September 30, 2020; and 3.5 to 1 for the quarter ending December 31, 2020 and each quarter end thereafter, and increased the maximum LIBOR margin from 2.0% to 2.25% if the Funded Debt Leverage Ratio exceeds 3.75 to 1. Beginning in 2020, the Company can elect to increase the maximum Funded Debt Leverage Ratio to 4.0 to 1 for four fiscal quarters immediately following the fiscal quarter in which the Company acquires another business, with the maximum permitted ratio reducing back to 3.5 to 1 in the fifth fiscal quarter following such acquisition. The Company can make this election twice during the term of the Credit Agreement.

The Credit Agreement also limits the Company's ability to, among other things, create liens, make investments, incur more indebtedness, merge or consolidate, make dispositions of property, pay dividends and make distributions to stockholders or repurchase our stock, enter into a new line of business, enter into transactions with affiliates and enter into burdensome agreements. The Credit Agreement does not limit the Company's ability to acquire other businesses or companies except that the acquired business or company must be in the Company's line of business, the Company must be in compliance with the financial covenants on a pro forma basis after taking into account the acquisition, and, if the acquired business is a separate subsidiary, in certain circumstances the lenders will receive the benefit of a guaranty of the subsidiary and liens on its assets and a pledge of its stock. However, as amended on March 9, 2020, for acquisitions completed prior to April 1, 2021, (a) the aggregate consideration for all acquisitions made on or after March 9, 2020 and prior to April 1, 2021 shall not exceed \$5,000,000, and (b) prior to the first of any such acquisition, the Company shall have demonstrated a Funded Debt Leverage Ratio of not greater than 3.0 to 1.0 for two consecutive fiscal quarters immediately prior to such acquisition.

As of December 31, 2019, the Company was in compliance with the terms of the Credit Agreement, and has undertaken to continuously monitor compliance with these covenants.

Liquidity and Capital Resources Outlook

Future Sources of Cash

We expect our future sources of cash to include cash flow generated from our operating activities and borrowings under our Credit Agreement. Our revolving credit facility is available for cash advances required for working capital and for letters of credit to support our operations. Acquisitions are funded through available cash and borrowings under the Credit Agreement.

Future Uses of Cash

We expect our future uses of cash will primarily be for repayment of debt, international expansion, stock repurchases, purchases or manufacture of field-testing equipment to support growth, additional investments in technology and software products and the replacement of existing assets and equipment used in our operations. We often make purchases to support new sources of revenues, particularly in our Services segment. In addition, we will need to fund a certain amount of replacement equipment, including our fleet vehicles. We historically spend approximately 2% to 3% of our total revenues on capital expenditures, excluding acquisitions, and expect to fund these expenditures through a combination of cash and lease financing. Our cash capital expenditures, excluding acquisitions, for each of the years ended December 31, 2019 and 2018 were approximately 3% of revenues. However, the current COVID-19 coronavirus pandemic will negatively impact our cash flow and our uses of cash, particularly if we experience a material reduction in our revenues due to actions taken to combat the spread of the virus. We are taking steps to reduce spending and preserve cash.

As a result of restrictions in our credit agreement, as amended, we do not expect to make any acquisitions in 2020. We acquired one company during each of the years ended December 31, 2019 and 2018, for an aggregate cash outlay of \$144.2 million. In some cases, additional equipment will be needed to upgrade the capabilities of these acquired companies. In addition, our future capital spending may increase as we pursue growth opportunities. Other investments in infrastructure, training and software may also be required to match our growth, but we plan to continue using a disciplined approach to building our business. In addition, we will use cash to fund our operating leases, finance leases, long-term debt repayments and various other obligations as they arise.

We also expect to use cash to support our working capital requirements for our operations, particularly in the event of further growth and due to the impacts of seasonality on our business. Our future working capital requirements will depend on many factors, including the rate of our revenue growth, our introduction of new solutions and enhancements to existing solutions and our expansion of sales and marketing and product development activities. To the extent that our cash and cash equivalents and future cash flows from operating activities are insufficient to fund our future activities, we may need to raise additional funds through bank credit arrangements, public or private equity financings, or debt financings. We also may need to raise additional funds in the event we determine in the future to effect one or more acquisitions of businesses, technologies or products that will complement our existing operations. In the event additional funding is required, we may not be able to obtain bank credit arrangements or effect an equity or debt financing on acceptable terms.

Contractual Obligations

We generally do not enter into long-term minimum purchase commitments. Our principal commitments, in addition to those related to our long-term debt discussed below, consist of obligations under facility leases for office space and equipment leases and contingent consideration obligations in connection with our acquisitions.

The following table summarizes our outstanding contractual obligations as of December 31, 2019:

(\$ in thousands)	Total	2020	2021	2022	2023	2024	Thereafter
Long-term debt ⁽¹⁾	\$ 254,713	\$ 6,593	\$ 8,864	\$ 11,210	\$ 225,343	\$ 890	\$ 1,813
Finance lease obligations ⁽²⁾	18,864	6,241	4,255	3,381	2,489	1,607	891
Right-of-use obligations ⁽²⁾	56,285	12,466	10,347	8,193	6,790	5,224	13,265
Contingent consideration obligations ⁽³⁾	3,216	2,614	301	301	—	—	—
Purchase commitments ⁽⁴⁾	1,442	—	1,442	—	—	—	—
Total	\$ 334,520	\$ 27,914	\$ 25,209	\$ 23,085	\$ 234,622	\$ 7,721	\$ 15,969

⁽¹⁾ Consists primarily of the principal portion of borrowings from our senior credit facility in connection with our acquisitions and includes the current portion outstanding.

⁽²⁾ Includes minimum lease payments over the remaining terms of the leases.

⁽³⁾ Fair Value of payments deemed reasonably likely to occur in connection with our acquisitions.

⁽⁴⁾ Consists of the remaining portion of a three-year cumulative agreement to purchase products from the buyer associated with the sale of a subsidiary.

Off-Balance Sheet Arrangements

During the years ended December 31, 2019 and 2018, we did not have any relationships with unconsolidated entities or financial partnerships, such as entities often referred to as structured finance or special purpose entities, which would have been established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes.

Critical Accounting Policies and Estimates

The preparation of financial statements in accordance with generally accepted accounting principles requires that we make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of financial statements and the reported amounts of revenues and expenses during the reporting period. The accounting policies that we believe require more significant estimates and assumptions include: revenue recognition, long-lived assets and goodwill. We base our estimates and assumptions on historical experience, known or expected trends and various other assumptions that we believe to be reasonable. As future events and their effects cannot be determined with precision, actual results could differ significantly from these estimates, which may cause our future results to be significantly affected.

We believe that the following critical accounting policies comprise the more significant estimates and assumptions used in the preparation of our consolidated financial statements.

Revenue Recognition

The majority of the Company's revenues are derived from providing services on a time and material basis and are short-term in nature. The Company accounts for revenue in accordance with ASC Topic 606, *Revenue from Contracts with Customers*.

Performance Obligations

A performance obligation is a promise in a contract to transfer a distinct good or service to the customer, and is the unit of account in ASC Topic 606. A contract's transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, the performance obligation is satisfied. The majority of our contracts have a single performance obligation as the promise to transfer the individual goods or services is not separately identifiable from other promises in the contracts and is, therefore, not distinct. The Company provides highly integrated and bundled inspection services to its customers. Some of our contracts have multiple performance obligations, most commonly due to the contract providing both goods and services. For contracts with multiple performance obligations, the Company allocates the contract's transaction price to each performance obligation using our best estimate of the standalone selling price of each distinct good or service in the contract. The primary method used to estimate standalone selling price is a relative selling price based on price lists.

Contract modifications are not routine in the performance of our contracts. Generally, when contracts are modified, the modification is to account for changes in scope to the goods and services that are provided. In most instances, contract modifications are for goods or services that are distinct, and, therefore, are accounted for as a separate contract.

Our performance obligations are satisfied over time as work progresses or at a point in time. The majority of our revenue recognized over time as work progresses is related to our service deliverables, which includes providing testing, inspection and mechanical services to our customers. Revenue is recognized over time based on time and material incurred to date which best portrays the transfer of control to the customer. The Company also utilizes an available practical expedient that provides for revenue to be recognized in an amount that corresponds directly with the value to the customer of the entity's performance completed to date. Fixed fee arrangements are determined based on expected labor, material, and overhead to be consumed on fulfillment of such services. Revenue is recognized on a cost-to-cost method tracked on an input basis.

The majority of our revenue recognized at a point in time is related to product sales when the customer obtains control of the asset, which is generally upon shipment to the customer. Contract costs include labor, material and overhead.

The Company expects any significant remaining performance obligations to be satisfied within one year.

Contract Estimates

The majority of our revenues are short-term in nature. The Company has many Master Service Agreements (MSAs) that specify an overall framework and terms of contract when the Company and customers agree upon services or products to be provided. The actual contracting to provide services or furnish products are triggered by a work order, purchase order, or some similar document issued pursuant to a MSA which sets forth the scope of services and/or identifies the products to be provided. From time-to-time, the Company may enter into long-term contracts, which can range from several months to several years. Revenue on such long-term contracts is recognized as work is performed based on total costs incurred to date in relation to the total

estimated costs for the performance of the contract at completion. This includes contract estimates of costs to be incurred for the performance of the contract. Cost estimation is based upon the professional knowledge and experience of our project managers, engineers and financial professionals. Factors that are considered in estimating the work to be completed include the availability of materials, the effect of any delays in our project performance and the recoverability of any claims. Whenever revisions of estimates, contract costs and/or contract values indicate that the contract costs will exceed estimated revenues, thus creating a loss, a provision for the total estimated loss is recorded in that period.

Long-Lived Assets

We perform a review of long-lived assets (or asset groups) for impairment when events or changes in circumstances indicate the carrying value of such assets may not be recoverable. If an indication of impairment is present, we compare the estimated undiscounted future cash flows to be generated by the asset (or asset group) to its carrying amount. If the undiscounted future cash flows are less than the carrying amount of the asset (or asset group), we record an impairment loss equal to the excess of the asset's carrying amount over its fair value. We estimate fair value based on valuation techniques such as a discounted cash flow analysis or a comparison to fair values of similar assets. As of December 31, 2019 and December 31, 2018, we had \$98.6 million and \$93.9 million in net property, plant and equipment, respectively, and \$109.5 million and \$111.4 million in intangible assets, net, respectively.

Goodwill

Goodwill represents the excess purchase price of acquired businesses over the fair values attributed to underlying net tangible assets and identifiable intangible assets. We test goodwill for impairment at a "reporting unit" level (which for the Company is represented by (i) our Services segment, (ii) our Products and Systems segment, and (iii) the European component of our International segment and (iv) the Brazilian component of our International segment). Our annual impairment test is conducted on the first day of our fourth quarter, which is October 1. Goodwill is also tested for impairment whenever an event occurs or circumstances change that would more likely than not reduce the fair value of a reporting unit below its carrying amount.

If the fair value of a reporting unit is less than its carrying value, this is an indicator that the goodwill assigned to that reporting unit may be impaired. As a result of the Company adopting ASU 2017-04, impairment will be recorded in the amount that fair value is less than carrying value, as the ASU eliminated step two of the goodwill impairment process. The Company considers the income and market approaches to estimating the fair value of our reporting units, which requires significant judgment in evaluation of economic and industry trends, estimated future cash flows, discount rates and other factors. Sustained declines in the Company's stock price and related market capitalization could impact key assumptions in the overall estimated fair values of its reporting units and could result in non-cash impairment charges that could be material to the Company's consolidated balance sheet or results of operations. As of December 31, 2019, there are no indicators of an impairment. See Note 8—*Goodwill* to the consolidated financial statements for additional information.

Acquisitions

We allocate the purchase price of acquired businesses to their identifiable tangible assets and liabilities as well as identifiable intangible assets, such as customer relationships, technology, non-compete agreements and trade names. Allocations are based on estimated fair values of assets and liabilities, which reflects assumptions that would be made by typical market participants if they were to buy or sell each asset on an individual asset basis. Certain estimates and judgments are required in the application of the fair value techniques, including estimates of the respective acquisitions' future performance and related cash flows, selection of a discount rate and economic lives, and use of Level 3 measurements as defined in Accounting Standards Update ("ASC") 820 *Fair Value Measurements and Disclosure*. Deferred taxes are recorded for any differences between the assigned values and tax bases of assets and liabilities. We typically engage third-party valuation experts to assist in determining the fair values for both identifiable tangible and intangible assets. The judgments made in determining the estimated fair value assigned to each class of assets acquired and liabilities assumed, as well as asset lives, could materially impact our results of operations. See Note 7—*Acquisitions and Disposition* to the consolidated financial statements for additional information.

Recent Accounting Pronouncements

For information about recent accounting pronouncements, see Note 1—*Summary of Significant Accounting Policies and Practices* to the consolidated financial statements.

ITEM 7A. Quantitative and Qualitative Disclosures About Market Risk

Interest Rate Sensitivity

The Company's investment portfolio primarily includes cash equivalents for which the market values are not significantly affected by changes in interest rates. Our interest rate risk results primarily from our variable rate indebtedness under our credit facility, which is influenced by movements in short-term rates. Borrowings under our \$300.0 million revolving credit facility as well as our \$100.0 million senior secured term loan A facility are based on LIBOR, plus an additional margin based on our Funded Debt Leverage Ratio. Based on the amount of variable rate debt, \$246.7 million at December 31, 2019, an increase in interest rates by one hundred basis points from our current rate would increase annual interest expense by approximately \$2.5 million.

Foreign Currency Risk

We have foreign currency exposure related to our operations in foreign locations. This foreign currency exposure, particularly the Euro, British Pound Sterling, Brazilian Real, Canadian Dollar and the Indian Rupee, arises primarily from the translation of our foreign subsidiaries' financial statements into U.S. Dollars. For example, a portion of our annual sales and operating costs are denominated in British Pound Sterling and we have exposure related to sales and operating costs increasing or decreasing based on changes in currency exchange rates. If the U.S. Dollar increases in value against these foreign currencies, the value in U.S. Dollars of the assets and liabilities originally recorded in these foreign currencies will decrease. Conversely, if the U.S. Dollar decreases in value against these foreign currencies, the value in U.S. Dollars of the assets and liabilities originally recorded in these foreign currencies will increase. Thus, increases and decreases in the value of the U.S. Dollar relative to these foreign currencies have a direct impact on the value in U.S. Dollars of our foreign currency denominated assets and liabilities, even if the value of these items has not changed in their original currency. Translation adjustments for these movements are recorded as a separate component of Accumulated Other Comprehensive Income in Stockholder Equity. We do not currently enter into forward exchange contracts to hedge exposures denominated in foreign currencies. An unfavorable 10% change (strengthening) in the average U.S. Dollar exchange rates for the year ended December 31, 2019 would cause a decrease in consolidated operating income of approximately \$0.4 million. We may consider entering into hedging or forward exchange contracts in the future, as sales in international currencies increase due to growth in our International segment.

Fair Value of Financial Instruments

We do not have material exposure to market risk with respect to investments, as our investments consist primarily of highly liquid investments purchased with a remaining maturity of three months or less. We do not use derivative financial instruments for speculative or trading purposes; however, this does not preclude our adoption of specific hedging strategies in the future.

Effects of Inflation and Changing Prices

Our results of operations and financial condition have not been significantly affected by inflation and changing prices.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Mistras Group, Inc.:

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of Mistras Group, Inc. and subsidiaries (the Company) as of December 31, 2019 and 2018, the related consolidated statements of income (loss), comprehensive income (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2019, and the related notes (collectively, the consolidated financial statements). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2019 and 2018, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2019, in conformity with U.S. generally accepted accounting principles.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission, and our report dated March 27, 2020 expressed an adverse opinion on the effectiveness of the Company's internal control over financial reporting.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We are a public accounting firm registered with the 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 audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audits 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. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 2013.

Short Hills, New Jersey
March 27, 2020

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Mistras Group, Inc.:

Opinion on Internal Control Over Financial Reporting

We have audited Mistras Group, Inc. and subsidiaries' (the Company) internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. In our opinion, because of the effect of the material weaknesses, described below, on the achievement of the objectives of the control criteria, the Company has not maintained effective internal control over financial reporting as of December 31, 2019, based on criteria established in Internal Control – Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated balance sheets of the Company as of December 31, 2019 and 2018, the related consolidated statements of income (loss), comprehensive income (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2019, and the related notes (collectively, the consolidated financial statements), and our report dated March 27, 2020 expressed an unqualified opinion on those consolidated financial statements.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis. Material weaknesses have been identified and included in management's assessment related to risk assessment not sufficiently considering changes in business processes and not having a sufficient complement of trained resources with knowledge of financial reporting processes and internal control related to accounting for income taxes. As a consequence, process level controls over the completeness, existence, accuracy, valuation and presentation of the income tax provision, including deferred tax assets and liabilities and valuation allowance, were not effective. The material weaknesses were considered in determining the nature, timing, and extent of audit tests applied in our audit of the 2019 consolidated financial statements, and this report does not affect our report on those consolidated financial statements.

The Company acquired New Century Software, LLC during 2019, and management excluded from its assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2019, New Century Software, LLC's internal control over financial reporting associated with total assets of 0.2% and total revenues of 0.3% included in the consolidated financial statements of the Company as of and for the year ended December 31, 2019. Our audit of internal control over financial reporting of the Company also excluded an evaluation of the internal control over financial reporting of New Century Software, LLC.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the 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 audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit 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 audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

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 (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding

prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

/s/ KPMG LLP

Short Hills, New Jersey
March 27, 2020

Mistras Group, Inc. and Subsidiaries
Consolidated Balance Sheets
(in thousands, except share and per share data)

	December 31,	
	2019	2018
ASSETS		
Current Assets		
Cash and cash equivalents	\$ 15,016	\$ 25,544
Accounts receivable, net	135,997	148,324
Inventories	13,413	13,053
Prepaid expenses and other current assets	14,729	15,870
Total current assets	179,155	202,791
Property, plant and equipment, net	98,607	93,895
Intangible assets, net	109,537	111,395
Goodwill	282,410	279,259
Deferred income taxes	1,786	1,930
Other assets	48,383	4,767
Total Assets	\$ 719,878	\$ 694,037
LIABILITIES AND EQUITY		
Current Liabilities		
Accounts payable	\$ 15,033	\$ 13,863
Accrued expenses and other current liabilities	81,389	73,895
Current portion of long-term debt	6,593	6,833
Current portion of finance lease obligations	4,131	3,922
Income taxes payable	2,094	1,958
Total current liabilities	109,240	100,471
Long-term debt, net of current portion	248,120	283,787
Obligations under finance leases, net of current portion	13,043	9,075
Deferred income taxes	21,290	23,148
Other long-term liabilities	42,163	6,482
Total Liabilities	\$ 433,856	\$ 422,963
Commitments and contingencies		
Equity		
Preferred stock, 10,000,000 shares authorized	—	—
Common stock, \$0.01 par value, 200,000,000 shares authorized, 28,945,472 and 28,562,608 shares issued	289	285
Additional paid-in capital	229,205	226,616
Retained earnings	77,613	71,553
Accumulated other comprehensive loss	(21,285)	(27,557)
Total Mistras Group, Inc. stockholders' equity	285,822	270,897
Non-controlling interests	200	177
Total Equity	286,022	271,074
Total Liabilities and Equity	\$ 719,878	\$ 694,037

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

Mistras Group, Inc. and Subsidiaries
Consolidated Statements of Income (Loss)
(in thousands, except per share data)

	For the year ended December 31,		
	2019	2018	2017
Revenue	\$ 748,586	\$ 742,354	\$ 700,970
Cost of revenue	509,489	512,024	492,238
Depreciation	21,800	22,456	21,020
Gross profit	217,297	207,874	187,712
Selling, general and administrative expenses	168,621	165,702	151,825
Bad debt provision for troubled customers, net of recoveries	3,038	650	1,200
Impairment charges	—	—	15,810
Pension withdrawal expense	848	5,886	—
Gain on sale of subsidiary	—	(2,384)	—
Research and engineering	3,045	3,310	2,272
Depreciation and amortization	16,733	11,957	10,363
Acquisition-related expense, net	875	532	482
Litigation charges	—	—	1,600
Income from operations	24,137	22,221	4,160
Interest expense	13,698	7,950	4,386
Income (loss) before provision for income taxes	10,439	14,271	(226)
Provision for income taxes	4,359	7,426	1,942
Net income (loss)	6,080	6,845	(2,168)
Less: net income attributable to noncontrolling interests, net of taxes	20	9	7
Net income (loss) attributable to Mistras Group, Inc.	\$ 6,060	\$ 6,836	\$ (2,175)
Earnings (loss) per common share			
Basic	\$ 0.21	\$ 0.24	\$ (0.08)
Diluted	\$ 0.21	\$ 0.23	\$ (0.08)
Weighted average common shares outstanding:			
Basic	28,740	28,406	28,422
Diluted	29,046	29,427	28,422

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

Mistras Group, Inc. and Subsidiaries
Consolidated Statements of Comprehensive Income (Loss)
(in thousands)

	For the year ended December 31,		
	2019	2018	2017
Net income (loss)	\$ 6,080	\$ 6,845	\$ (2,168)
Other comprehensive income (loss):			
Foreign currency translation adjustments	6,272	(10,752)	12,919
Comprehensive income (loss)	12,352	(3,907)	10,751
Less: net income attributable to noncontrolling interests	20	9	7
Foreign currency translation adjustments attributable to noncontrolling interests	3	(5)	4
Comprehensive income (loss) attributable to Mistras Group, Inc.	<u>\$ 12,335</u>	<u>\$ (3,921)</u>	<u>\$ 10,748</u>

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

Mistras Group, Inc. and Subsidiaries
Consolidated Statements of Equity
(in thousands)

	Common Stock		Treasury Stock		Additional paid-in capital	Retained earnings	Accumulated other comprehensive income (loss)	Total Mistras Group, Inc. Stockholders' Equity	Noncontrolling Interest	Total Equity
	Shares	Amount	Shares	Amount						
Balance at December 31, 2016	29,217	\$ 292	(420)	\$ (9,000)	\$ 217,211	\$ 91,803	\$ (29,724)	\$ 270,582	\$ 162	\$ 270,744
Net loss	—	—	—	—	—	(2,175)	—	(2,175)	7	(2,168)
Other comprehensive income, net of tax	—	—	—	—	—	—	12,919	12,919	4	12,923
Share-based payments	—	—	—	—	6,588	—	—	6,588	—	6,588
Net settlement on vesting of restricted stock units	187	2	—	—	(1,649)	—	—	(1,647)	—	(1,647)
Retirement of treasury stock	(1,146)	(12)	1,146	24,923	—	(24,911)	—	—	—	—
Purchase of treasury stock	—	—	(726)	(15,923)	—	—	—	(15,923)	—	(15,923)
Exercise of stock options	37	—	—	—	275	—	—	275	—	275
Balance at December 31, 2017	28,295	\$ 282	—	\$ —	\$ 222,425	\$ 64,717	\$ (16,805)	\$ 270,619	\$ 173	\$ 270,792
Net income	—	—	—	—	—	6,836	—	6,836	9	6,845
Other comprehensive income, net of tax	—	—	—	—	—	—	(10,752)	(10,752)	(5)	(10,757)
Share-based payments	243	3	—	—	6,106	—	—	6,109	—	6,109
Net settlement on vesting of restricted stock units	—	—	—	—	(2,188)	—	—	(2,188)	—	(2,188)
Exercise of stock options	25	—	—	—	273	—	—	273	—	273
Balance at December 31, 2018	28,563	\$ 285	—	\$ —	\$ 226,616	\$ 71,553	\$ (27,557)	\$ 270,897	\$ 177	\$ 271,074
Net income	—	—	—	—	—	6,060	—	6,060	20	6,080
Other comprehensive income, net of tax	—	—	—	—	—	—	6,272	6,272	3	6,275
Share-based payments	30	—	—	—	5,759	—	—	5,759	—	5,759
Net settlement of options and restricted stock units	349	4	—	—	(3,202)	—	—	(3,198)	—	(3,198)
Exercise of stock options	3	—	—	—	32	—	—	32	—	32
Balance at December 31, 2019	28,945	\$ 289	—	\$ —	\$ 229,205	\$ 77,613	\$ (21,285)	\$ 285,822	\$ 200	\$ 286,022

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

Mistras Group, Inc. and Subsidiaries
Consolidated Statements of Cash Flows
(in thousands)

	For the year ended December 31,		
	2019	2018	2017
Cash flows from operating activities			
Net income (loss)	\$ 6,080	\$ 6,845	\$ (2,168)
Adjustments to reconcile net income (loss) to net cash provided by operating activities			
Depreciation and amortization	38,533	34,413	31,383
Deferred income taxes	(3,599)	1,859	(4,854)
Share-based compensation expense	5,766	6,107	6,574
Impairment charges	—	—	15,810
Bad debt provision for troubled customers	3,038	650	1,200
Foreign currency (gain) loss	(535)	1,311	604
Gain on sale of subsidiary	—	(2,384)	—
Fair value adjustments to contingent consideration	511	(716)	(463)
Other	1,804	462	(525)
Changes in operating assets and liabilities, net of effect of acquisitions			
Accounts receivable	8,298	(10,349)	2,490
Inventories	(302)	(2,764)	(117)
Prepaid expenses and other assets	3,289	1,400	(1,904)
Accounts payable	1,138	2,948	2,574
Accrued expenses and other liabilities	(5,042)	5,663	4,188
Income taxes payable	131	(3,781)	1,007
Net cash provided by operating activities	59,110	41,664	55,799
Cash flows from investing activities			
Purchase of property, plant and equipment	(22,047)	(20,584)	(19,314)
Purchase of intangible assets	(873)	(541)	(1,255)
Disposition of business	—	4,239	—
Acquisition of businesses, net of cash acquired	(4,228)	(139,980)	(83,424)
Proceeds from sale of equipment	1,868	1,416	1,196
Net cash used in investing activities	(25,280)	(155,450)	(102,797)
Cash flows from financing activities			
Repayment of finance lease obligations	(4,545)	(5,813)	(6,492)
Proceeds from borrowings of long-term debt	983	2,358	6,653
Repayment of long-term debt	(6,857)	(2,746)	(2,101)
Proceeds from revolver	32,000	175,176	124,000
Repayments of revolver	(61,700)	(49,991)	(50,600)
Payments of debt issuance costs	—	(826)	(560)
Payment of contingent consideration for business acquisitions	(852)	(2,277)	(560)
Purchases of treasury stock	—	—	(15,923)
Taxes paid related to net share settlement of share-based awards	(3,198)	(2,185)	(1,647)
Proceeds from the exercise of stock options	32	273	275
Net cash provided by (used in) financing activities	(44,137)	113,969	53,045
Effect of exchange rate changes on cash and cash equivalents	(221)	(2,180)	2,340
Net change in cash and cash equivalents	(10,528)	(1,997)	8,387
Cash and cash equivalents:			
Beginning of period	25,544	27,541	19,154
End of period	\$ 15,016	\$ 25,544	\$ 27,541
Supplemental disclosure of cash paid			
Interest	\$ 14,158	\$ 7,751	\$ 4,264
Income taxes	\$ 6,096	\$ 10,983	\$ 3,063
Noncash investing and financing			
Equipment acquired through finance lease obligations	\$ 9,502	\$ 4,845	\$ 3,185

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

Mistras Group, Inc. and Subsidiaries
Notes to Consolidated Financial Statements
(tabular dollars in thousands, except per share data)

1. Summary of Significant Accounting Policies and Practices

Description of Business

Mistras Group, Inc. and subsidiaries (the Company) is a leading “one source” global provider of technology-enabled asset protection solutions used to evaluate the structural integrity and reliability of critical energy, industrial, public infrastructure and commercial aerospace components. The Company combines industry-leading products and technologies, expertise in mechanical integrity (MI), non-destructive testing (NDT) and mechanical services and proprietary data analysis software to deliver a comprehensive portfolio of customized solutions, ranging from routine inspections to complex, plant-wide asset integrity assessments and management. These mission critical solutions enhance customers’ ability to extend the useful life of their assets, increase productivity, minimize repair costs, comply with governmental safety and environmental regulations, manage risk and avoid catastrophic disasters. The Company serves a global customer base of companies with asset-intensive infrastructure, including companies in the oil and gas, commercial aerospace and defense, fossil and nuclear power, alternative and renewable energy, public infrastructure, chemicals, transportation, primary metals and metalworking, pharmaceutical/biotechnology and food processing industries, and research and engineering institutions.

Principles of Consolidation

The accompanying audited consolidated financial statements include the accounts of Mistras Group, Inc. and its wholly and majority-owned subsidiaries. For subsidiaries in which the Company’s ownership interest is less than 100%, the non-controlling interests are reported in stockholders’ equity in the accompanying consolidated balance sheets. The non-controlling interests in net income, net of tax, is classified separately in the accompanying consolidated statements of income (loss). All significant intercompany accounts and transactions have been eliminated in consolidation.

Reclassifications

Certain amounts in prior periods have been reclassified to conform to the current year presentation. Such reclassifications did not have a material effect on the Company’s financial condition or results of operations as previously reported.

Use of Estimates

The preparation of financial statements in accordance with U.S. generally accepted accounting principles (GAAP) requires that the Company make estimates and assumptions that affect the reported amounts of assets, liabilities, revenue and expenses and disclosure of contingent assets and liabilities at the date of financial statements. The Company bases its estimates and assumptions on historical experience, known or expected trends and various other assumptions that it believes to be reasonable. As future events and their effects cannot be determined with precision, actual results could differ significantly from these estimates, which may cause the Company’s future results to be significantly affected.

Cash and Cash Equivalents

The Company considers all highly liquid investments purchased with an original maturity of three months or less to be cash equivalents.

Accounts Receivable

Accounts receivable are stated net of an allowance for doubtful accounts and sales allowances. Outstanding accounts receivable balances are reviewed periodically, and allowances are provided at such time that management believes it is probable that such balances will not be collected within a reasonable period of time, to the extent reasonably estimable. The Company extends credit to its customers based upon credit evaluations in the normal course of business, primarily with 30-day terms. Bad debts are provided for based on historical experience and management’s evaluation of outstanding accounts receivable. Accounts are written off when they are deemed uncollectible under GAAP accounting standards.

Concentration of Credit Risk

For each of the years ended December 31, 2019 and 2018, no customer represented 10% or more of the Company's revenue. One customer represented 11% of the Company's revenue for the year ended December 31, 2017, which was primarily generated from the Services segment.

Financial instruments that potentially subject the Company to concentrations of credit risk consist principally of cash and cash equivalents and accounts receivable. At times, cash deposits may exceed the limits insured by the Federal Deposit Insurance Corporation. The Company believes it is not exposed to any significant credit risk or risk of nonperformance of financial institutions.

Inventories

Inventories are stated at the lower of cost or net realizable value, as determined by using the first-in, first-out method, or market. Work in process and finished goods inventory include material, direct labor, variable costs and overhead.

Purchased and Internal-Use Software

The Company capitalizes certain costs that are incurred to purchase or to create and implement internal-use software, which includes software coding, installation and testing. Capitalized costs are amortized on a straight-line basis over three years, the estimated useful life of the software.

Property, Plant and Equipment

Property, plant and equipment are recorded at cost. Depreciation of property, plant and equipment is computed utilizing the straight-line method over the estimated useful lives of the assets. Amortization of leasehold improvements is computed utilizing the straight-line method over the shorter of the remaining lease term or estimated useful life. Repairs and maintenance costs are expensed as incurred.

Goodwill

Goodwill represents the excess purchase price of acquired businesses over the fair values attributed to underlying net tangible assets and identifiable intangible assets. The Company tests goodwill for impairment at a "reporting unit" level (which for the Company is represented by (i) our Services segment, (ii) our Products and Systems segment, and (iii) the European component of our International segment and (iv) the Brazilian component of our International segment). Our annual impairment test is conducted on the first day of our fourth quarter, which is October 1. Goodwill is also tested for impairment whenever an event occurs or circumstances change that would more likely than not reduce the fair value of a reporting unit below its carrying amount.

If the fair value of a reporting unit is less than its carrying value, this is an indicator that the goodwill assigned to that reporting unit may be impaired. As a result of the Company adopting Accounting Standards Update ("ASU") No. 2017-04, *Intangibles-Goodwill and Other (Topic 350)*, impairment will be recorded in the amount that fair value is less than carrying value, as the ASU eliminated step two of the goodwill impairment process. The Company considers the income and market approaches to estimating the fair value of our reporting units, which requires significant judgment in evaluation of economic and industry trends, estimated future cash flows, discount rates and other factors.

Impairment of Long-lived Assets

The Company reviews the recoverability of its long-lived assets (or asset groups) whenever events or changes in circumstances indicate that the carrying amount of the long-lived asset (group) might not be recoverable. The assessment for potential impairment is based primarily on the Company's ability to recover the carrying value of its long-lived assets from expected future undiscounted cash flows. If the total expected future undiscounted cash flows are less than the carrying amount of the assets, a loss is recognized for the difference between fair value (computed based upon the expected future discounted cash flows) and the carrying value of the assets.

Acquisitions

The Company allocates the purchase price of acquired businesses to their identifiable tangible assets and liabilities as well as identifiable intangible assets, such as customer relationships, technology, non-compete agreements and trade names. Certain estimates and judgments are required in the application of the fair value techniques, including estimates of the respective acquisition's future performance and related cash flows, selection of a discount rate and economic lives, and use of Level 3 measurements as defined in ASC No. 820, *Fair Value Measurements and Disclosure*. Deferred taxes are recorded for any differences between the assigned values and tax bases of assets and liabilities.

Research and Engineering

Research and product development costs are expensed as incurred.

Advertising, Promotions and Marketing

The costs for advertising, promotion and marketing programs are expensed as incurred and are included in selling, general and administrative expenses. Advertising expense was approximately \$2.1 million, \$2.1 million and \$1.9 million for the years ended December 31, 2019, 2018 and 2017, respectively.

Fair Value of Financial Instruments

The carrying amounts of cash and cash equivalents, accounts receivable, accounts payable and other financial current assets and liabilities approximate fair value based on the short-term nature of the items.

Foreign Currency Translation

The financial position and results of operations of the Company's foreign subsidiaries are measured using their functional currencies, which are their local currencies. Assets and liabilities of foreign subsidiaries are translated into the U.S. Dollar at the exchange rates in effect at the balance sheet date. Income and expenses are translated at the average exchange rate during the period. Translation gains and losses are reported as a component of other comprehensive (loss) income for the period and included in accumulated other comprehensive (loss) income within stockholders' equity.

Foreign currency (gains) and losses arising from transactions denominated in currencies other than the functional currency are included in net income, reported in selling, general and administrative expenses, and were approximately \$(0.5) million, \$1.3 million, and \$0.6 million for the years ended December 31, 2019, 2018 and 2017, respectively.

Self-Insurance

The Company is self-insured for certain losses relating to workers' compensation and health benefit claims. The Company maintains third-party excess insurance coverage for all workers' compensation and health benefit claims in excess of approximately \$0.3 million per occurrence to reduce its exposure from such claims. Self-insured losses are accrued when it is probable that an uninsured claim has been incurred but not reported and the amount of the loss can be reasonably estimated at the balance sheet date.

Share-based Compensation

The value of services received from employees and directors in exchange for an award of an equity instrument is measured based on the grant-date fair value of the award. Such value is recognized as a non-cash expense on a straight-line basis over the period the individual provides services, which is typically the vesting period of the award with the exception of awards with graded vesting that contain an internal performance measure where each tranche is recognized on a straight-line basis over its vesting period subject to the probability of meeting the performance requirements and adjusted for the number of shares expected to be earned. As share-based compensation expense is based on awards ultimately expected to vest, the amount of expense is reduced for estimated forfeitures. The cost of these awards is recorded in selling, general and administrative expense in the Company's consolidated statements of income.

Income Taxes

Income taxes are accounted for under the asset and liability method. Deferred income tax assets and liabilities are recognized for the future tax consequences attributable to differences between the financial statement carrying amounts of existing assets and liabilities and their respective tax bases and tax credit carry-forwards. Deferred income tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred income tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date. A valuation allowance is provided if it is more likely than not that some or all of a deferred income tax asset will not be realized. Financial accounting standards prescribe a minimum recognition threshold a tax position is required to meet before being recognized in the financial statements. These standards also provide guidance on de-recognition, measurement, and classification of amounts relating to uncertain tax positions, accounting for and disclosure of interest and penalties, accounting in interim periods and disclosures required. Interest and penalties related to unrecognized tax positions are recognized as incurred within “provision for income taxes” in the consolidated statements of income.

Recent Accounting Pronouncements

In February 2016, the Financial Accounting Standards Board (“FASB”) issued ASU No. 2016-02, *Leases (Topic 842)*, which the Company adopted as of January 1, 2019. Topic 842 requires the recognition of lease rights and obligations as assets and liabilities on the balance sheet. The Company elected the modified retrospective method permitted by the standard, upon which prior-period information has not been restated.

The standard provided for several practical expedient options for use in transition. The Company elected to utilize the “package of practical expedients,” which permits the Company not to reassess previous conclusions reached on lease identification, lease classification and initial direct costs. The Company also elected to utilize the practical expedient available to not separate lease and non-lease components within the lease and has therefore accounted for all lease components as a single lease component.

Adoption of the new standard resulted in the recording of a right-of-use (ROU) asset and liability related to the Company’s operating leases of approximately \$38 million as of January 1, 2019. The new standard did not have a material impact to our statements of income or cash flows.

In January 2017, the FASB issued ASU No. 2017-04, *Intangibles-Goodwill and Other (Topic 350)*. This amendment eliminates Step Two of the goodwill impairment test. Under the amendments in this update, entities should perform the annual goodwill impairment test by comparing the carrying value of their reporting units to their fair value. An entity should record an impairment charge for the amount by which the carrying amount exceeds the reporting unit’s fair value. Tax deductibility of goodwill should be considered in evaluating any reporting unit’s impairment loss to be taken. ASU 2017-04 is effective for fiscal years beginning after December 15, 2019, with early adoption permitted. The Company early adopted ASU 2017-04 in the third quarter of 2017 for its consolidated financial statements and related disclosures.

In December 2019, the FASB issued ASU No. 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes* (“ASU 2019-12”). ASU 2019-12 simplifies the accounting for income taxes by eliminating certain exceptions related to the approach for intraperiod tax allocation, the methodology for calculating income taxes in an interim period, and the recognition of deferred tax liabilities related to outside basis differences. The standard is effective for interim and annual periods beginning January 1, 2021, with certain amendments applied prospectively and others requiring retrospective application. Early adoption is permitted, with any adjustments reflected as of the beginning of the fiscal year of adoption. If early adoption is elected, all changes as a result of the standard must be adopted in the same period. The Company is currently evaluating the impact of this guidance on its consolidated financial position, results of operations, and cash flows.

2. Revenue

The majority of the Company’s revenues are derived from providing services on a time and material basis and are short-term in nature.

Performance Obligations

A performance obligation is a promise in a contract to transfer a distinct good or service to the customer, and is the unit of account in ASC Topic 606. A contract’s transaction price is allocated to each distinct performance obligation and recognized as revenue when, or as, the performance obligation is satisfied. The majority of our contracts have a single performance obligation as the promise to transfer the individual goods or services is not separately identifiable from other promises in the contracts and is, therefore, not distinct. The Company provides highly integrated and bundled inspection services to its customers. Some of our contracts have multiple performance obligations, most commonly due to the contract providing both goods and services.

For contracts with multiple performance obligations, the Company allocates the contract's transaction price to each performance obligation using our best estimate of the standalone selling price of each distinct good or service in the contract. The primary method used to estimate standalone selling price is a relative selling price based on price lists.

Contract modifications are not routine in the performance of our contracts. Generally, when contracts are modified, the modification is to account for changes in scope to the goods and services that are provided. In most instances, contract modifications are for goods or services that are distinct, and, therefore, are accounted for as a separate contract.

Our performance obligations are satisfied over time as work progresses or at a point in time. The majority of our revenue recognized over time as work progresses is related to our service deliverables, which includes providing testing, inspection and mechanical services to our customers. Revenue is recognized over time based on time and material incurred to date which best portrays the transfer of control to the customer. The Company also utilizes an available practical expedient that provides for revenue to be recognized in an amount that corresponds directly with the value to the customer of the entity's performance completed to date. Fixed fee arrangements are determined based on expected labor, material, and overhead to be consumed on fulfillment of such services. Revenue is recognized on a cost-to-cost method tracked on an input basis.

The majority of our revenue recognized at a point in time is related to product sales when the customer obtains control of the asset, which is generally upon shipment to the customer. Contract costs include labor, material and overhead.

The Company expects any significant remaining performance obligations to be satisfied within one year.

Contract Estimates

The majority of our revenues are short-term in nature. The Company has many Master Service Agreements (MSAs) that specify an overall framework and terms of contract when the Company and customers agree upon services or products to be provided. The actual contracting to provide services or furnish products are triggered by a work order, purchase order, or some similar document issued pursuant to a MSA which sets forth the scope of services and/or identifies the products to be provided. From time-to-time, the Company may enter into long-term contracts, which can range from several months to several years. Revenue on such long-term contracts is recognized as work is performed based on total costs incurred to date in relation to the total estimated costs for the performance of the contract at completion. This includes contract estimates of costs to be incurred for the performance of the contract. Cost estimation is based upon the professional knowledge and experience of our project managers, engineers and financial professionals. Factors that are considered in estimating the work to be completed include the availability of materials, the effect of any delays in our project performance and the recoverability of any claims. Whenever revisions of estimates, contract costs and/or contract values indicate that the contract costs will exceed estimated revenues, thus creating a loss, a provision for the total estimated loss is recorded in that period.

Revenue by category

The following series of tables present our disaggregated revenues:

Revenue by industry was as follows:

Year ended December 31, 2019	Services	International	Products & Systems	Corp/Elim	Total
Oil & Gas	\$ 390,815	\$ 44,447	\$ 756	\$ —	\$ 436,018
Aerospace & Defense	51,390	41,224	1,237	—	93,851
Industrials	64,622	21,405	3,187	—	89,214
Power generation & Transmission	30,300	10,289	2,726	—	43,315
Other Process Industries	28,495	10,196	418	—	39,109
Infrastructure, Research & Engineering	14,269	9,520	9,316	—	33,105
Other	15,239	7,190	943	(9,398)	13,974
Total	\$ 595,130	\$ 144,271	\$ 18,583	\$ (9,398)	\$ 748,586

Year ended December 31, 2018	Services	International	Products & Systems	Corp/Elim	Total
Oil & Gas	\$ 378,904	\$ 37,953	\$ 1,255	\$ —	\$ 418,112
Aerospace & Defense	50,500	54,853	2,355	—	107,708
Industrials	60,594	26,209	3,097	—	89,900
Power generation & Transmission	30,687	8,522	4,904	—	44,113
Other Process Industries	26,425	9,497	124	—	36,046
Infrastructure, Research & Engineering	11,283	9,032	5,246	—	25,561
Other	16,226	7,382	6,445	(9,139)	20,914
Total	\$ 574,619	\$ 153,448	\$ 23,426	\$ (9,139)	\$ 742,354

Revenue per key geographic location was as follows:

Year ended December 31, 2019	Services	International	Products & Systems	Corp/Elim	Total
United States	\$ 487,408	\$ 631	\$ 12,011	\$ (4,918)	\$ 495,132
Other Americas	104,081	7,659	407	(407)	111,740
Europe	2,342	127,581	1,940	(3,978)	127,885
Asia-Pacific	1,299	8,400	4,225	(95)	13,829
Total	\$ 595,130	\$ 144,271	\$ 18,583	\$ (9,398)	\$ 748,586

Year ended December 31, 2018	Services	International	Products & Systems	Corp/Elim	Total
United States	\$ 478,853	\$ 568	\$ 11,493	\$ (3,500)	\$ 487,414
Other Americas	90,823	7,995	1,068	(1,638)	98,248
Europe	4,252	138,948	3,958	(3,846)	143,312
Asia-Pacific	691	5,937	6,907	(155)	13,380
Total	\$ 574,619	\$ 153,448	\$ 23,426	\$ (9,139)	\$ 742,354

Contract Balances

The timing of revenue recognition, billings and cash collections results in billed accounts receivable, unbilled receivables (contract assets), and customer advances and deposits (contract liabilities) on the consolidated balance sheet. Amounts are generally billed as work progresses in accordance with agreed-upon contractual terms, generally at periodic intervals (e.g., weekly, bi-weekly or monthly). Generally, billing occurs subsequent to revenue recognition, resulting in contract assets. However, the Company sometimes receives advances or deposits from our customers before revenue is recognized, resulting in contract liabilities. These assets and liabilities are aggregated on an individual contract basis and reported on the consolidated balance sheet at the end of each reporting period within accounts receivables or accrued expenses and other current liabilities.

Revenue recognized for 2019 and 2018, that was included in the contract liability balance at the beginning of the year was \$4.3 million and \$5.3 million, respectively. Changes in the contract asset and liability balances during the years ended December 31, 2019 and 2018, were not impacted by any other factors. The Company applies the practical expedient to expense incremental costs incurred related to obtaining a contract when the asset that the Company otherwise would have recognized is one year or less.

3. Earnings per Share

Basic earnings per share is computed by dividing net income attributable to common stockholders by the weighted average number of shares outstanding during the period. Diluted earnings per share is computed by dividing net income attributable to common stockholders by the sum of (1) the weighted average number of shares of common stock outstanding during the period, and (2) the dilutive effect of assumed conversion of equity awards using the treasury stock method. With respect to the number of weighted average shares outstanding (denominator), diluted shares reflect: (i) only the exercise of options to acquire common

stock to the extent that the options' exercise prices are less than the average market price of common shares during the period and (ii) the pro forma vesting of restricted stock units.

The following table sets forth the computations of basic and diluted earnings per share:

	For the year ended December 31,		
	2019	2018	2017
Basic earnings (loss) per share:			
Numerator:			
Net income (loss) attributable to Mistras Group, Inc.	\$ 6,060	\$ 6,836	\$ (2,175)
Denominator			
Weighted average common shares outstanding	28,740	28,406	28,422
Basic earnings (loss) per share	\$ 0.21	\$ 0.24	\$ (0.08)
Diluted earnings (loss) per share:			
Numerator:			
Net income (loss) attributable to Mistras Group, Inc.	\$ 6,060	\$ 6,836	\$ (2,175)
Denominator			
Weighted average common shares outstanding	28,740	28,406	28,422
Dilutive effect of stock options outstanding	98	683	—
Dilutive effect of restricted stock units outstanding	208	338	—
	29,046	29,427	28,422
Diluted earnings (loss) per share	\$ 0.21	\$ 0.23	\$ (0.08)

The following potential common shares were excluded from the computation of diluted earnings per share, as the effect would have been anti-dilutive:

	For the year ended December 31,		
	2019	2018	2017
Potential common stock attributable to restricted stock units (RSUs) and performance stock units (PSUs) outstanding ⁽¹⁾	42	1	353
Potential common stock attributable to stock options outstanding ⁽¹⁾	5	5	810
Total	47	6	1,163

⁽¹⁾ For the twelve months ended December 31, 2017, 805 and 351 shares related to stock options and RSUs/PSUs, respectively, were excluded from the calculation of diluted EPS due to the net loss for the period.

4. Accounts Receivable

Accounts receivable consist of the following:

	December 31,	
	2019	2018
Trade accounts receivable	\$ 144,282	\$ 152,511
Allowance for doubtful accounts	(8,285)	(4,187)
Accounts receivable, net	<u>\$ 135,997</u>	<u>\$ 148,324</u>

The Company had \$22.2 million and \$16.1 million of unbilled revenues accrued as of December 31, 2019 and December 31, 2018, respectively, which is included within the trade accounts receivable balance above. Unbilled revenues as of December 31, 2019 are expected to be billed in the first quarter of 2020.

In the fourth quarter of 2018, the Company recorded a reserve of \$0.7 million for a renewable energy industry customer, based in part on the available information about the financial difficulties of the customer. This customer filed for a voluntary

insolvency proceeding on April 9, 2019 at which time payments under the previously agreed upon payment plan ceased. As a result, during the first quarter of 2019, the Company recorded an additional charge of \$5.7 million to fully reserve for the amount of the exposure related to this customer. During the second quarter of 2019, the Company reversed \$1.0 million of this reserve based on additional information obtained during the quarter. There were no changes during the third and fourth quarters of 2019.

During 2019, the Company sold to an unaffiliated third party, without recourse, its remaining outstanding receivables owed from a customer which filed for bankruptcy, and for which the Company had initially recorded a charge during the second quarter of 2017. During the first quarter of 2019, the Company recorded a recovery of \$0.2 million and during the second quarter of 2019, the Company recorded a recovery \$1.7 million, related to a bad debt provision for the receivables due from this customer. This matter is considered fully resolved.

The Company was contracted to perform inspections of welds on various pipeline projects in Texas for a customer. As of December 31, 2019, approximately \$1.4 million of past due receivables were outstanding from this customer. The Company received notice from the customer in December 2019, alleging that the work performed was not in compliance with the contract. The Company filed a lawsuit to recover the \$1.4 million and other amounts due to the Company and the customer filed a counterclaim, alleging breach of contract and seeking its damages. Accordingly, the Company recorded a full reserve in the amount of \$1.4 million during 2019 for these past due receivables. See Note 18—*Commitments and Contingencies* for additional details.

5. Inventories

Inventories consist of the following:

	December 31,	
	2019	2018
Raw materials	\$ 5,314	\$ 6,975
Work in progress	1,549	1,019
Finished goods	3,957	2,640
Consumable supplies	2,593	2,419
Inventories	<u>\$ 13,413</u>	<u>\$ 13,053</u>

6. Property, Plant and Equipment

Property, plant and equipment consist of the following:

	Useful Life (Years)	December 31,	
		2019	2018
Land		\$ 2,672	\$ 2,680
Building and improvements	30-40	24,537	24,338
Office furniture and equipment	5-8	17,227	16,170
Machinery and equipment	5-7	225,974	208,245
		<u>270,410</u>	<u>251,433</u>
Accumulated depreciation and amortization		(171,803)	(157,538)
Property, plant and equipment, net		<u>\$ 98,607</u>	<u>\$ 93,895</u>

Depreciation expense was approximately \$24.2 million, \$24.2 million, and \$22.4 million for the years ended December 31, 2019, 2018 and 2017, respectively.

7. Acquisitions and Disposition

Acquisitions

During the year ended December 31, 2019, the Company completed one acquisition that provides pipeline integrity management software and services to energy transportation companies. The Company acquired all the equity interest of the acquiree in exchange for aggregate consideration of \$4.4 million in cash, contingent consideration of up to \$4.3 million to be earned based upon the acquired business achieving specific performance metrics over the initial three years of operations from the acquisition date and working capital adjustments. The goodwill recorded is primarily attributable to expected synergies and is generally fully deductible for tax purposes. The Company is still in the process of completing its valuation of the assets acquired and liabilities assumed.

The following table summarizes the estimated fair value of the assets acquired and liabilities assumed, the Company's allocation of purchase price and any subsequent adjustments made during the year ended December 31, 2019 for the 2019 acquisition:

	2019
Cash paid	\$ 4,380
Working capital adjustments	(152)
Fair value of contingent consideration	1,142
Total consideration	<u>\$ 5,370</u>
Current net assets	\$ 142
Other assets	34
Property, plant and equipment	65
Intangibles	3,594
Goodwill	1,535
Net assets acquired	<u>\$ 5,370</u>

The results of operations of the business acquired in September 2019 have been included in the Services segment within the Consolidated Statements of Income (Loss) from the transaction closing date and approximates \$2.0 million of revenues and an operating loss of \$0.4 million for the year ended December 31, 2019.

During the year ended December 31, 2018, the Company completed one acquisition that performs inline inspection services, with headquarters in Canada and a location in the U.S. The acquired company has been included in the Services segment and primarily provides services to the midstream area within the oil and gas industry. The Company acquired 100% of the equity interests of the acquiree's Canadian and U.S. entities in exchange for aggregate consideration of \$143.1 million in cash. The goodwill recorded is primarily attributable to expected synergies and the assembled workforce and is not deductible for tax purposes. The Company has filed a claim with the seller and the Company's insurance carrier. See Note 18—*Commitments and Contingencies* to these consolidated financial statements for further discussion.

During 2019, the Company finalized valuations for of the assets acquired and liabilities assumed related to the 2018 acquisition and adjusted provisional amounts as follows:

- The Company increased the \$59.6 million provisional fair value of intangibles by \$4.8 million with a corresponding decrease to goodwill.
- The Company decreased the \$8.5 million provisional fair value of property, plant and equipment by \$0.7 million with a corresponding increase to goodwill.
- The Company increased the \$5.0 million provisional fair value of debt and other liabilities by \$0.4 million with a corresponding increase to goodwill.
- The Company increased the \$12.7 million provisional fair value of the deferred tax liability by \$1.4 million with a corresponding increase to goodwill.

The Company accounted for the acquisitions completed in 2019 and 2018 in accordance with the acquisition method of accounting for business combinations. Assets and liabilities of the acquired businesses were included in the consolidated balance sheet based on their respective estimated fair value on the date of acquisition as determined in a purchase price

allocation, using available information and making assumptions management believes are reasonable. The amortization period for the intangible assets acquired range from one to eighteen years.

Disposition

During the third quarter of 2018, substantially all of the assets and liabilities of a subsidiary in the Products and Systems segment were sold for approximately \$4.3 million. For the year ended December 31, 2018, the Company recognized a gain of approximately \$2.4 million related to the sale, which is reported as a Gain on sale of subsidiary on the Consolidated Statements of Income (Loss). The sale also included a three-year agreement to purchase products from the buyer, with a cumulative commitment of \$2.3 million (see Note 18—*Commitments and Contingencies*).

Acquisition-Related expense

In the course of its acquisition activities, the Company incurs costs in connection with due diligence, professional fees, and other expenses. Additionally, the Company adjusts the fair value of acquisition-related contingent consideration liabilities on a quarterly basis. These amounts are recorded as acquisition-related expense, net, on the consolidated statements of income and were as follows for the years ended December 31, 2019, 2018 and 2017:

	For the year ended December 31,		
	2019	2018	2017
Due diligence, professional fees and other transaction costs	\$ 364	\$ 1,248	\$ 945
Adjustments to fair value of contingent consideration liabilities	511	(716)	(463)
Acquisition-related expense, net	\$ 875	\$ 532	\$ 482

The Company's contingent consideration liabilities are recorded on the Consolidated Balance Sheets in Accrued expenses and other current liabilities and Other long-term liabilities.

8. Goodwill

The changes in the carrying amount of goodwill by segment is shown below:

	Services	International	Products and Systems	Total
Balance at December 31, 2017	\$ 165,801	\$ 37,637	\$ —	\$ 203,438
Goodwill acquired during the year	83,163	—	—	83,163
Adjustments to preliminary purchase price allocations	(1,977)	—	—	(1,977)
Foreign currency translation	(3,511)	(1,854)	—	(5,365)
Balance at December 31, 2018	\$ 243,476	\$ 35,783	\$ —	\$ 279,259
Goodwill acquired during the year	1,535	—	—	1,535
Adjustments to preliminary purchase price allocations	(2,332)	—	—	(2,332)
Foreign currency translation	4,536	(588)	—	3,948
Balance at December 31, 2019	\$ 247,215	\$ 35,195	\$ —	\$ 282,410

The Company conducted its annual goodwill impairment test of its reporting units as of October 1, 2019 and concluded that there was no impairment. As of December 31, 2019, the Company did not identify any changes in circumstances that would indicate the remaining carrying value of goodwill may not be recoverable.

The Company's cumulative goodwill impairment as of December 31, 2019 and December 31, 2018 was \$23.1 million, of which \$13.2 million is related to the Products and Systems segment and \$9.9 million is related to the International segment.

9. Intangible Assets

The gross carrying amount and accumulated amortization of intangible assets were as follows:

	Useful Life (Years)	December 31,					
		2019			2018		
		Gross Amount	Accumulated Amortization	Net Carrying Amount	Gross Amount	Accumulated Amortization	Net Carrying Amount
Customer relationships	5-18	\$ 113,861	\$ (67,853)	\$ 46,008	\$ 112,624	\$ (60,993)	\$ 51,631
Software/Technology	3-15	77,914	(18,756)	59,158	67,240	(13,319)	53,921
Covenants not to compete	2-5	12,795	(11,630)	1,165	12,593	(10,825)	1,768
Other	2-12	10,813	(7,607)	3,206	10,317	(6,242)	4,075
Total		\$ 215,383	\$ (105,846)	\$ 109,537	\$ 202,774	\$ (91,379)	\$ 111,395

Amortization expense for the years ended December 31, 2019, 2018 and 2017, was approximately \$14.3 million, \$10.2 million, and \$9.0 million, respectively, including amortization of software/technology for these periods of \$5.6 million, \$1.4 million, and \$1.2 million, respectively.

Amortization expense in each of the five years and thereafter subsequent to December 31, 2019 related to the Company's intangible assets is expected to be as follows:

	Expected Amortization Expense
2020	\$ 13,864
2021	12,474
2022	12,042
2023	10,987
2024	9,870
Thereafter	50,300
Total	\$ 109,537

10. Accrued Expenses and Other Current Liabilities

Accrued expenses and other current liabilities consist of the following:

	December 31,	
	2019	2018
Accrued salaries, wages and related employee benefits	\$ 30,072	\$ 29,959
Contingent consideration	2,614	1,687
Accrued workers' compensation and health benefits	4,467	5,086
Deferred revenues	5,860	5,046
Right-of-use liability - Operating	10,133	—
Pension accrual	2,519	5,585
Other accrued expenses	25,724	26,532
Total accrued expenses and other current liabilities	\$ 81,389	\$ 73,895

11. Long-Term Debt

Long-term debt consists of the following:

	December 31,	
	2019	2018
Senior credit facility	\$ 151,773	\$ 181,656
Senior secured term loan, net of debt issuance costs of \$0.1 million	94,919	99,897
Notes payable	—	68
Other	8,021	8,999
Total debt	254,713	290,620
Less: Current portion	(6,593)	(6,833)
Long-term debt, net of current portion	\$ 248,120	\$ 283,787

Senior Credit Facility

The Company's revolving credit agreement with its banking group ("Credit Agreement") provides the Company with a \$300 million revolving line of credit, which, under certain circumstances, can be increased to \$450 million with the approval of the banks. In addition, the Credit Agreement provides the Company with a \$100 million senior secured term loan A facility. Both the revolving line of credit and the term loan A facility under the Credit Agreement have a maturity date of December 12, 2023. The Company may borrow up to \$100 million in non-U.S. Dollar currencies and use up to \$20 million of the credit limit for the issuance of letters of credit. At December 31, 2019, the Company had borrowings of \$246.7 million and letters of credit of \$3.7 million were outstanding under the Credit Agreement. The Company had remaining capitalized costs of \$0.8 million associated with debt modifications as of December 31, 2019, included in Other assets within the accompanying Consolidated Balance Sheets.

Loans under the Credit Agreement bear interest at the London Interbank Offered Rate ("LIBOR") plus an applicable LIBOR margin ranging from 1% to 2%, or a base rate less a margin of 1.25% to 0.375%, at the option of the Company, based upon the Company's Funded Debt Leverage Ratio. Funded Debt Leverage Ratio is generally the ratio of (1) all outstanding indebtedness for borrowed money and other interest-bearing indebtedness as of the date of determination to (2) EBITDA (which is (a) net income, less (b) income (or plus loss) from discontinued operations and extraordinary items, plus (c) income tax expenses, plus (d) interest expense, plus (e) depreciation, depletion, and amortization (including non-cash loss on retirement of assets), plus (f) stock compensation expense, less (g) cash expense related to stock compensation, plus (h) certain amounts of EBITDA of acquired business for the prior twelve months, plus (i) certain expenses related to the closing of the Credit Agreement, plus (j) non-cash expenses which do not (in the current or any future period) represent a cash item (excluding non-cash gains which increase net income), plus (k) non-recurring charges (not to exceed \$10 million in the four consecutive quarters immediately preceding the date of determination) for items such as severance, lease termination charges, asset write-offs and litigation settlements paid, and multi-employer pension plan withdrawal liabilities, all determined for the period of four consecutive fiscal quarters immediately preceding the date of determination of EBITDA. The Company has the benefit of the lowest margin if its Funded Debt Leverage Ratio is equal to or less than 1.0 to 1, and the margin increases as the ratio increases, to the maximum margin if the ratio is greater than 3.25 to 1. The Company will also bear additional costs for market disruption, regulatory changes affecting the lenders' funding costs, and default pricing of an additional 2% interest rate margin on any amounts not paid when due. Amounts borrowed under the Credit Agreement are secured by liens on substantially all of the assets of the Company and is guaranteed by some of our subsidiaries.

The Credit Agreement contains financial covenants requiring that the Company maintain a Funded Debt Leverage Ratio of no greater than 4.25 to 1 through December 31, 2018, reducing to a maximum permitted ratio of 3.50 to 1 as of March 31, 2020 and all quarterly periods thereafter, and a Fixed Charge Coverage Ratio of at least 1.25 to 1. Fixed Charge Coverage Ratio means the ratio, as of any date of determination, of (a) (i) EBITDA for the 12 month period immediately preceding the date of determination, taken together as one accounting period, less (ii) the aggregate amount of all capital expenditures made during the period, less (iii) taxes paid in cash during the period, less (iv) Restricted Payments (as defined in the Credit Agreement) paid in cash during the period, -to- (b) the sum of (i) all interest, premium payments, debt discount, fees, charges and related expenses of us and our subsidiaries in connection with borrowed money (including capitalized interest) or in connection with the deferred purchase price of assets, in each case, to the extent treated as interest in accordance with GAAP and to the extent paid in cash during the period, (ii) the aggregate principal amount of all redemptions or similar acquisitions for value of outstanding debt for borrowed money or regularly scheduled principal payments made during the period, but excluding any such payments to the extent refinanced through the incurrence of additional Indebtedness otherwise expressly permitted under

the Credit Agreement, and (iii) payments made during the period under all leases that have been or should be, in accordance with GAAP as in effect for the Company's 2017 audited financial statement, recorded as capitalized leases. Beginning in 2020, the Company can elect to increase the maximum Funded Debt Leverage Ratio to 4.0 to 1 for four fiscal quarters immediately following the fiscal quarter in which the Company acquires another business, with the maximum permitted ratio reducing back to 3.5 to 1 in the fifth fiscal quarter following such acquisition. The Company can make this election twice during the term of the Credit Agreement.

The Credit Agreement also limits the Company's ability to, among other things, create liens, make investments, incur more indebtedness, merge or consolidate, make dispositions of property, pay dividends and make distributions to stockholders or repurchase our stock, enter into a new line of business, enter into transactions with affiliates and enter into burdensome agreements. The Credit Agreement does not limit the Company's ability to acquire other businesses or companies except that the acquired business or company must be in the Company's line of business, the Company must be in compliance with the financial covenants on a pro forma basis after taking into account the acquisition, and, if the acquired business is a separate subsidiary, in certain circumstances the lenders will receive the benefit of a guaranty of the subsidiary and liens on its assets and a pledge of its stock.

As of December 31, 2019, the Company was in compliance with the terms of the Credit Agreement, and has undertaken to continuously monitor compliance with these covenants.

Subsequent Event

On March 9, 2020, the Credit Agreement was amended to provide that the maximum Funded Debt Leverage Ratio is 4.0 to 1 for the quarters ended December 31, 2019 through June 30, 2020; 3.75 to 1 for the quarter ending September 30, 2020; and 3.5 to 1 for the quarter ending December 31, 2020 and or each quarter end thereafter, and increased the maximum LIBOR margin from 2.0% to 2.25% if the Funded Debt Leverage Ratio exceeds 3.75 to 1. The amendment also requires that prior to the first time the Company makes an election to increase the Funded Debt Leverage Ratio to 4.0 to 1 in connection with an acquisition, the Company must obtain the consent of lenders (in their sole discretion) holding at least 66-2/3% of the credit exposure under the Credit Agreement.

The March 9, 2020 amendment to the Credit Agreement also provides that for acquisitions completed prior to April 1, 2021, (a) the aggregate consideration for all acquisitions made on or after March 9, 2020 and prior to April 1, 2021 shall not exceed \$5,000,000, and (b) prior to the first of any such acquisition, the Company shall have demonstrated a Funded Debt Leverage Ratio of not greater than 3.0 to 1.0 for two consecutive fiscal quarters immediately prior to such acquisition.

Notes Payable and Other Debt

The Company's other debt includes local bank financing provided at the local subsidiary levels used to support working capital requirements and fund capital expenditures. At December 31, 2019, there was approximately \$8.0 million outstanding, payable at various times through 2029. Monthly payments range from \$1 thousand to \$18 thousand. Interest rates range from 0.4% to 6.2%.

Scheduled principal payments due under all borrowing agreements in each of the five years and thereafter subsequent to December 31, 2019 are as follows:

2020	\$	6,593
2021		8,864
2022		11,210
2023		225,343
2024		890
Thereafter		1,813
Total	\$	<u>254,713</u>

12. Fair Value Measurements

The Company performs fair value measurements in accordance with the guidance provided by ASC 820, *Fair Value Measurements and Disclosures*. ASC 820 defines fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. It also establishes a three level hierarchy that prioritizes the inputs used to measure fair value. The three levels of the hierarchy are defined as follows:

Level 1 — Inputs are unadjusted quoted prices in active markets for identical assets or liabilities that the Company has the ability to access at the measurement date.

Level 2 — Observable inputs other than quoted prices included in Level 1, including quoted prices for similar assets or liabilities in active markets, quoted prices for identical assets or liabilities in inactive markets, inputs other than quoted prices that are observable for the asset or liability and inputs derived principally from or corroborated by observable market data.

Level 3 — Unobservable inputs reflecting the Company's own assumptions about inputs that market participants would use in pricing the asset or liability based on the best information available.

Financial instruments measured at fair value on a recurring basis

The fair value of contingent consideration liabilities was estimated using a discounted cash flow technique with significant inputs that are not observable in the market and thus represents a Level 3 fair value measurement as defined in ASC 820. The significant inputs in the Level 3 measurement not supported by market activity include the probability assessments of expected future cash flows related to the acquisitions, appropriately discounted considering the uncertainties associated with the obligation, and as calculated in accordance with the terms of the applicable acquisition agreements.

The following table represents the changes in the fair value of Level 3 contingent consideration:

Balance at December 31, 2017	\$	5,508
Acquisitions		—
Payments		(2,277)
Accretion of liability		175
Revaluation		(891)
Foreign currency translation		(150)
Balance at December 31, 2018	\$	2,365
Acquisitions		1,142
Payments		(852)
Accretion of liability		92
Revaluation		419
Foreign currency translation		50
Balance at December 31, 2019	\$	3,216

Financial instruments not measured at fair value on a recurring basis

The Company has evaluated current market conditions and borrower credit quality and has determined that the carrying value of its long-term debt approximates fair value. The fair value of the Company's notes payable and finance and operating lease obligations approximates their carrying amounts based on anticipated interest rates which management believes would currently be available to the Company for similar issuances of debt.

13. Share-Based Compensation

The Company has share-based incentive awards outstanding to its eligible employees and directors under two employee stock ownership plans: (i) the 2009 Long-Term Incentive Plan (the "2009 Plan") and (ii) the 2016 Long-Term Incentive Plan (the "2016 Plan"). No further awards may be granted under the 2009 Plan, although awards granted under the 2009 Plan remain outstanding in accordance with their terms. Awards granted under the 2016 Plan may be in the form of stock options, restricted stock units and other forms of share-based incentives, including performance restricted stock units, stock appreciation rights and deferred stock rights. The 2016 Plan allows for the grant of awards of up to approximately 1,700,000 shares of common stock, of which 718,000 shares were available for future grants as of December 31, 2019. As of December 31, 2019, there was

an aggregate of approximately 5,000 stock options outstanding and approximately 101,000 unvested restricted stock units outstanding under the 2009 Plan.

Stock Options

For the years ended December 31, 2019, 2018 and 2017, the Company did not have any share-based compensation expense related to stock option awards. No stock options were granted during the years ended December 31, 2019, 2018 and 2017. As of December 31, 2019, no unrecognized compensation costs remained related to stock option awards. Cash proceeds from, and the intrinsic value of, stock options exercised during the years ended December 31, 2019, 2018 and 2017 were as follows (in thousands):

	For the year ended December 31,		
	2019	2018	2017
Cash proceeds from options exercised	\$ 32	\$ 273	\$ 275
Aggregate intrinsic value of options exercised	\$ 4,530	\$ 277	\$ 580

¹ During 2019, 2.1 million stock options were net exercised, wherein the option holders surrendered a portion of the underlying stock option awards to pay the exercise price and required minimum tax withholding.

A summary of the stock option activity, weighted average exercise prices, and options outstanding and exercisable as of December 31, 2019, 2018 and 2017 is as follows (in thousands, except per share amounts and years):

	For the years ended December 31,					
	2019		2018		2017	
	Common Stock Options	Weighted Average Exercise Price	Common Stock Options	Weighted Average Exercise Price	Common Stock Options	Weighted Average Exercise Price
Outstanding at beginning of year:	2,105	\$ 13.47	2,130	\$ 13.43	2,167	\$ 13.33
Granted	—	\$ —	—	\$ —	—	\$ —
Exercised	(2,093)	\$ 13.45	(25)	\$ 10.75	(37)	\$ 7.39
Expired or forfeited	(7)	\$ 10.00	—	\$ —	—	\$ —
Outstanding at end of year:	5	\$ 22.35	2,105	\$ 13.47	2,130	\$ 13.43

Exercise Price	December 31, 2019				
	Total Options Outstanding	Options Outstanding		Options Exercisable	
		Weighted Average Remaining Life (Years)	Weighted Average Exercise Price	Number Exercisable	Weighted Average Exercise Price
\$22.35	5	2.2	\$ 22.35	5	\$ 22.35
Aggregate Intrinsic Value	\$ —			\$ —	

Restricted Stock Unit Awards

Restricted Stock Units generally vest ratably on each of the first four anniversary dates of issuance. The Company recognized approximately \$4.0 million, \$4.2 million and \$4.5 million of share-based compensation for the years ended December 31, 2019, 2018 and 2017, respectively, related to restricted stock unit awards. As of December 31, 2019, there were approximately \$6.7 million of unrecognized compensation costs, net of estimated forfeitures, related to restricted stock unit awards, which are expected to be recognized over a remaining weighted average period of 2.4 years. Upon vesting, restricted stock units are generally net share-settled to cover the required minimum withholding tax and the remaining amount is converted into an equivalent number of shares of common stock.

A summary of the vesting activity of restricted stock unit awards, with the respective fair value of the awards, is as follows: (in thousands):

	For the year ended December 31,		
	2019	2018	2017
Restricted stock awards vested	172	258	185
Fair value of awards vested	\$ 2,495	\$ 5,319	\$ 3,429

A summary of the fully-vested common stock the Company issued to its six non-employee directors, in connection with its non-employee director compensation plan, is as follows (in thousands):

	For the year ended December 31,		
	2019	2018	2017
Awards issued	30	19	21
Grant date fair value of awards issued	\$ 450	\$ 400	\$ 438

A summary of the Company's outstanding, non-vested restricted share units is presented below (in thousands, except per share amounts):

	For the year ended December 31,					
	2019		2018		2017	
	Units	Weighted Average Grant-Date Fair Value	Units	Weighted Average Grant-Date Fair Value	Units	Weighted Average Grant-Date Fair Value
Outstanding at beginning of period:	443	\$ 20.55	532	\$ 21.05	569	\$ 20.81
Granted	339	\$ 14.04	211	\$ 19.20	183	\$ 21.26
Released	(172)	\$ 20.38	(258)	\$ 20.48	(185)	\$ 20.49
Forfeited	(51)	\$ 17.71	(42)	\$ 20.52	(35)	\$ 21.45
Outstanding at end of period:	559	\$ 16.92	443	\$ 20.55	532	\$ 21.05

Performance Restricted Stock Units

The Company maintains Performance Restricted Stock Units (PRSUs) that have been granted to select executives and senior officers whose ultimate payout is based on the Company's performance over a one-year period based on three metrics, as defined: (1) Operating Income, (2) Adjusted EBITDAS (defined as net income attributable to MISTRAS Group, Inc. plus: interest expense, provision for income taxes, depreciation and amortization, share-based compensation expense and certain acquisition related costs (including transaction due diligence costs and adjustments to the fair value of contingent consideration) and (3) Revenue. There is a discretionary portion of the PRSUs based on individual performance, at the discretion of the Compensation Committee (Discretionary PRSUs). PRSUs and Discretionary PRSUs generally vest ratably on each of the first four anniversary dates upon completion of the performance period, for a total requisite service period of up to five years and have no dividend rights.

PRSUs are equity-classified and compensation costs are initially measured using the fair value of the underlying stock at the date of grant, assuming that the target performance conditions will be achieved. Cumulative compensation costs related to the PRSUs are subsequently adjusted for changes in the expected outcomes of the performance conditions.

Discretionary PRSUs are liability-classified and adjusted to fair value (with a corresponding adjustment to compensation expense) based upon the targeted number of shares to be awarded and the fair value of the underlying stock each reporting period until approved by the Compensation Committee, at which point they are classified as equity.

A summary of the Company's PRSU activity is presented below (in thousands, except per share amounts):

	For the year ended December 31,					
	2019		2018		2017	
	Units	Weighted Average Grant-Date Fair Value	Units	Weighted Average Grant-Date Fair Value	Units	Weighted Average Grant-Date Fair Value
Outstanding at beginning of period:	277	\$ 17.80	278	\$ 17.00	290	\$ 16.01
Granted	190	\$ 13.63	129	\$ 19.46	128	\$ 20.42
Performance condition adjustments, net	(106)	\$ 13.77	(50)	\$ 19.48	(68)	\$ 20.55
Released	(101)	\$ 17.19	(68)	\$ 16.03	(72)	\$ 15.82
Forfeited	—	\$ —	(12)	\$ 16.16	—	\$ —
Outstanding at end of period:	260	\$ 16.77	277	\$ 17.80	278	\$ 17.00

For the year ended December 31, 2019, 190,000 PRSUs were granted. There was a 103,000 unit reduction to these awards, which represents Company performance below target, during the year ended December 31, 2019. As of December 31, 2019, the aggregate liability related to 29,000 outstanding discretionary PRSUs was less than \$0.1 million and is classified within Accrued expenses and other liabilities on the consolidated balance sheet.

For the year ended December 31, 2018, 129,000 PRSUs were granted. There was a 54,000 unit reduction to these awards, which represents Company performance below target, during the year ended December 31, 2018. As of December 31, 2018, the aggregate liability related to 22,000 outstanding discretionary PRSUs was less than \$0.1 million and is classified within Accrued expenses and other liabilities on the consolidated balance sheet. The Compensation Committee approved these PRSUs during the first quarter of 2019, which further reduced these awards by 3,000 units. The discretionary portion of these awards were reclassified from a liability to equity on the consolidated balance sheet upon Compensation Committee approval.

For the year ended December 31, 2017, 128,000 PRSUs were granted. There was a 65,000 unit reduction to these awards, which represents Company performance below target, during the year ended December 31, 2017. The Compensation Committee approved these PRSUs in the first quarter of 2018, which increased them by 4,000 units. The discretionary portion of these awards were reclassified from a liability to equity on the consolidated balance sheet upon Compensation Committee approval.

Compensation expense related to all PRSUs described above was \$1.3 million, \$1.5 million, and \$1.7 million for the years ended December 31, 2019, 2018 and 2017, respectively. At December 31, 2019, there was \$1.7 million of total unrecognized compensation costs related to approximately 260,000 unvested performance restricted stock units. These costs are expected to be recognized over a weighted-average period of approximately 2.0 years.

For the years ended December 31, 2019, 2018 and 2017, the income tax benefit recognized on all share based compensation arrangements referenced above was approximately \$2.1 million, \$1.0 million, and \$2.2 million, respectively.

14. Income Taxes

Income before provision for income taxes is as follows:

	For the year ended December 31,		
	2019	2018	2017
Income (loss) before provision for income taxes from:			
U.S. operations	\$ 7,334	\$ 9,853	\$ (7,303)
Foreign operations	3,105	4,418	7,077
Earnings (loss) before income taxes	\$ 10,439	\$ 14,271	\$ (226)

The provision for income taxes consists of the following:

	For the year ended December 31,		
	2019	2018	2017
Current			
Federal	\$ 2,712	\$ 790	\$ 3,558
States and local	519	533	39
Foreign	4,572	3,824	3,131
Reserve for uncertain tax positions	99	337	71
Total current	7,902	5,484	6,799
Deferred			
Federal	315	2,966	(3,857)
States and local	(32)	399	(810)
Foreign	(4,095)	(2,089)	(159)
Total deferred	(3,812)	1,276	(4,826)
Net change in valuation allowance	269	666	(31)
Net deferred	(3,543)	1,942	(4,857)
Provision for income taxes	\$ 4,359	\$ 7,426	\$ 1,942

The provision for income taxes differs from the amount computed by applying the statutory federal tax rate to income tax as follows:

	For the years ended December 31,					
	2019		2018		2017	
Federal tax at statutory rate	\$ 2,192	21.0 %	\$ 2,997	21.0 %	\$ (79)	35.0 %
State taxes, net of federal benefit	377	3.6 %	737	5.1 %	(502)	221.6 %
Foreign tax	982	9.4 %	807	5.7 %	217	(95.8) %
Contingent consideration	29	0.3 %	(6)	— %	(63)	27.7 %
Nondeductible compensation	1,581	15.2 %	183	1.3 %	—	— %
US taxation of foreign earnings	213	2.0 %	228	1.6 %	—	— %
Permanent differences	464	4.4 %	361	2.5 %	377	(166.4) %
Transition tax, net of foreign tax credits	—	— %	1,158	8.1 %	3,942	(1,741.4) %
Federal tax rate change due to the Tax Act	—	— %	87	0.6 %	(1,956)	864.0 %
Other	134	1.3 %	208	1.4 %	37	(16.3) %
Change in valuation allowance	269	2.6 %	666	4.7 %	(31)	13.7 %
Impact of foreign tax rate changes	(1,882)	(18.0) %	—	— %	—	— %
Total provision for income taxes	\$ 4,359	41.8 %	\$ 7,426	52.0 %	\$ 1,942	(857.9) %

The permanent differences identified above include normal recurring differences, such as meals, entertainment and parking fringe benefits.

On June 28, 2019, the Canadian province of Alberta enacted the Job Creation Tax Cut which reduced the Alberta corporate income tax rate from 12% to 11% starting in 2019 with further annual reductions to 10% in 2020, 9% in 2021, and 8% in 2022. This rate reduction had a favorable impact of approximately \$1.9 million on the Company's net deferred tax liabilities in this jurisdiction.

On December 22, 2017, the United States enacted fundamental changes to the federal tax law following the passage of the Tax Cuts and Jobs Act (the "Tax Act").

The Tax Act is complex and significantly changes the U.S. corporate tax system by, among other things, (a) reducing the federal corporate tax rate from 35% to 21% for tax years beginning after December 31, 2017, (b) replacing the prior system of taxing corporations on foreign earnings of their foreign subsidiaries when the earnings are repatriated with a partial territorial tax system that provides a 100% dividends-received deduction (DRD) to domestic corporations for foreign-sourced dividends received from 10%-or-more owned foreign corporations, (c) subjecting certain unrepatriated foreign earnings to a mandatory one-time transition tax on post-1986 earnings and profits ("the transition tax"), and (d) further limiting a public entity's ability to deduct compensation in excess of \$1 million for covered employees.

The United States enacted the Coronavirus Aid, Relief, and Economic Security Act (CARES Act). The CARES Act is an approximately \$2 trillion emergency economic stimulus package in response to the Coronavirus outbreak, which among other things contains numerous income tax provisions. Some of these tax provisions are expected to be effective retroactively for years ending before the date of enactment. The Company is currently evaluating the impact of the CARES Act on its consolidated financial position, results of operations, and cash flows.

For the financial statements for the year ended December 31, 2017, the Company had reasonably estimated the tax effects of the Tax Act. The effect of the change in federal corporate tax rate from 35% to 21% was subject to change based on resolution of estimates used in determining the amounts of deferred tax assets and liabilities that were remeasured. The Company's calculation of the transition tax was subject to further refinement as more information was gathered from its foreign subsidiaries, estimates used in the calculation were resolved, and as states provided guidance on how the transition tax may or may not apply in their respective jurisdictions. The Company also anticipated that the deferred tax asset related to executive compensation would change based upon actual 2018 compensation as compared to its projections of compensation that were limited. Finally, the Tax Act also imposes a minimum tax on certain foreign income deemed to be in excess of a routine return based on tangible asset investment, which is designed to discourage income shifting by subjecting certain foreign intangibles and other income to current US tax. Effective for tax years beginning after 2017, US shareholders of certain foreign corporations are subject to current U.S. tax on their global intangible low-taxed income (GILTI). As of December 31, 2017, the Company had not yet evaluated its potential liability, if any, under the minimum tax for GILTI in 2018 or future years. Accordingly, the Company had not yet made an accounting policy election either to account for these effects in the future period when the tax arises or to recognize them as part of the deferred taxes. The impact on income tax expense related to the Tax Act for 2017 was \$1.9 million. This amount reflects a net tax benefit of \$2.3 million as a result of the Tax Act due to the remeasurement of federal deferred tax assets and liabilities from 35% to 21%. This amount also includes a charge of \$3.9 million due to the transition tax. Additionally, the Company incurred a charge attributable to reducing its deferred tax assets by \$0.3 million due to changes made to executive compensation rules pursuant to the Tax Act.

During the year ended December 31, 2018, the Company completed its accounting for the effects of the Tax Act on the period ended December 31, 2017, which resulted in income tax expense of \$1.7 million. This consisted primarily of \$0.1 million of an increase in the Company's net deferred tax liabilities due to the reduction in the federal corporate rate from 35% to 21%, an increase of \$1.3 million in tax expense attributable to the transition tax and a decrease in deferred tax assets of \$0.4 million due to changes made to executive compensation.

Deferred income tax attributes resulting from differences between financial accounting amounts and income tax basis of assets and liabilities are as follows:

	December 31,	
	2019	2018
Deferred income tax assets		
Allowance for doubtful accounts	\$ 1,186	\$ 951
Inventory	359	285
Intangible assets	1,795	1,230
Accrued expenses	4,421	4,408
Net operating loss carryforward	3,832	3,653
Finance lease obligations	1,067	731
Capital losses	463	462
Deferred share-based compensation	1,145	3,728
Interest carryforward	1,372	—
Right-of-use liability	11,891	—
Other	398	699
Deferred income tax assets	27,929	16,147
Valuation allowance	(4,067)	(3,999)
Net deferred income tax assets	23,862	12,148
Deferred income tax liabilities		
Property and equipment	(6,485)	(7,597)
Goodwill	(10,652)	(9,302)
Intangible assets	(14,311)	(16,459)
Right-of-use asset	(11,891)	—
Other	(27)	(8)
Deferred income tax liabilities	(43,366)	(33,366)
Net deferred income taxes	\$ (19,504)	\$ (21,218)

As of December 31, 2019, the Company had federal net operating loss carry forwards (NOLs) in the amount of approximately \$0.2 million which may be utilized subject to limitation under Internal Revenue Code section 382. The federal NOLs expire at various times from 2032 to 2038. In addition, as of December 31, 2019, the Company had state and foreign NOLs of \$7.2 million and \$12.3 million, respectively. The state NOLs expire at various times from 2025 to 2039. Approximately \$0.6 million of the foreign NOLs expire at various times from 2025 to 2039, while the remainder of the Company's foreign NOLs do not expire.

In assessing the ability to realize deferred tax assets, management considers whether it is more likely than not that some portion or all of the deferred tax assets will be realized. Valuation allowances are provided when management believes the Company's deferred tax assets are not recoverable based on an assessment of estimated future taxable income that incorporates ongoing, prudent and feasible tax planning strategies. At December 31, 2019 and December 31, 2018, the Company has a valuation allowance of approximately \$4.1 million and \$4.0 million, respectively, primarily against certain state and foreign NOLs, capital losses generated by the disposals of certain foreign subsidiaries and other specific deferred tax assets. The increase of \$0.1 million is primarily attributable to foreign net operating losses. Except for those deferred tax assets subject to the valuation allowance, management believes that it will realize all deferred tax assets as a result of sufficient future taxable income in each tax jurisdiction in which the Company has deferred tax assets.

The following table summarizes the changes in the Company's gross unrecognized tax benefits, excluding interest and penalties:

	For the year ended December 31,	
	2019	2018
Balance at beginning of period	\$ 723	\$ 156
Additions for tax positions related to the current fiscal period	—	1
Additions for tax positions related to prior years	217	341
Decreases for tax positions related to prior years	—	(2)
Current year acquisitions	—	270
Impact of foreign exchange fluctuation	13	—
Settlements	(465)	(4)
Reductions related to the expiration of statutes of limitations	(95)	(39)
Balance at end of period	\$ 393	\$ 723

The Company has recorded the unrecognized tax benefits in other long-term liabilities in the consolidated balance sheets. As of December 31, 2019 and December 31, 2018, there were approximately \$0.4 million and \$0.7 million of unrecognized tax benefits, respectively, including penalties and interest. If the Company recognized these unrecognized tax benefits, approximately \$0.1 million would favorably affect the effective tax rate for both December 31, 2019 and 2018. Interest and penalties related to unrecognized tax benefits are recorded in income tax expense and are not significant for the years ended December 31, 2019, 2018 and 2017. The Company anticipates a decrease to its unrecognized tax benefits of less than \$0.1 million excluding interest and penalties within the next 12 months.

The Company is subject to taxation in the United States and various states and foreign jurisdictions. The Company is no longer subject to U.S. federal income tax examinations for years ending before May 31, 2016 and generally is no longer subject to state, local or foreign income tax examinations by tax authorities for years ending before May 31, 2016.

Net income (loss) of foreign subsidiaries was \$2.5 million, \$2.0 million, and \$4.1 million for the years ended December 31, 2019, 2018 and 2017, respectively. Generally, it has been the Company's practice and intention to reinvest the earnings of its non-U.S. subsidiaries in those operations. As previously noted, the Tax Act made significant changes to the taxation of undistributed earnings, requiring that all previously untaxed earnings and profits of the Company's controlled foreign operations be subjected to the transition tax. Since these earnings have now been subjected to U.S. federal tax they would only be potentially subject to limited other taxes, including foreign withholding and certain state taxes. As of December 31, 2019, the Company has not recognized a deferred tax liability for foreign withholdings and state taxes on its undistributed international earnings or losses of its foreign subsidiaries since it intends to indefinitely reinvest the earnings outside the United States. The Company has estimated that the amount of the unrecorded deferred tax liability related to undistributed international earnings is approximately \$1.1 million.

15. Employee Benefit Plans

The Company provides a 401(k) savings plan for eligible U.S. based employees. Employee contributions are discretionary up to the IRS limits each year and catch up contributions are allowed for employees 50 years of age or older. Under the 401(k) plan, employees become eligible to participate on the first day of the month after three months of continuous service. Under this plan, the Company matches 50% of the employee's contributions up to 6% of the employee's annual compensation, as defined by the plan. There is a five-year vesting schedule for the Company match. The Company's contribution to the plan was \$4.1 million, \$3.9 million, and \$3.7 million for the years ended December 31, 2019, 2018 and 2017, respectively.

The Company's subsidiary participated with other employers in contributing to the Boilermaker-Blacksmith National Pension Trust (EIN 48-6168020) ("Boilermakers") and Plumbers and Pipefitters National Pension Fund (EIN 52-6152779) ("Pipefitters"), multi-employer defined benefit pension plans, which covers certain U.S. based union employees. The plans provide multiple plan benefits with corresponding contribution rates that are collectively bargained between participating employers and their affiliated Boilermakers and Pipefitters local unions. Both the Boilermakers and Pipefitters plans are between 65 percent and 80 percent funded as of the latest Form 5500 filed. The Company did not make any contributions to the Boilermakers or Pipefitters plans during the year ended December 31, 2019. The Company's contributions to the Boilermakers and Pipefitters plans, collectively, were \$0.6 million and \$2.4 million for the years ended December 31, 2018 and 2017, respectively. See Note 18—*Commitments and Contingencies, Pension Related Contingencies*, for additional detail.

The Company has other benefit plans covering certain employees throughout the Company. Amounts charged to expense under these plans were not significant in any year.

16. Related Party Transactions

The Company leases its headquarters under an operating lease from a shareholder and officer of the Company. On August 1, 2014, the Company extended its lease at its headquarters requiring monthly payments through October 2024. Total rent payments made during the year ended December 31, 2019 were approximately \$1.0 million. See Note 17—Leases for further detail.

The Company receives benefits consulting services from Capital Management Enterprise (“CME”), which is owned by one of its non-employee directors, Manuel N. Stamatakis. The Company does not pay any fees directly to CME. Any compensation CME receives is from third-party benefit providers.

17. Leases

The Company leases certain office and operating facilities, machinery, equipment, and vehicles. Concurrent with the adoption of ASC 842, the Company recognized a right-of-use (ROU) asset and lease liability based on the present value of the future lease payments over the lease term for each lease agreement. The Company has elected not to recognize a ROU asset and lease liability for leases with terms of 12 months or less and will continue to recognize lease expense for these leases on a straight-line basis over the lease term. The Company has leases with both lease components and non-lease components, such as common area maintenance, utilities, or other repairs and maintenance. For all asset classes, the Company decided to utilize the practical expedient to include both fixed lease components and fixed non-lease components in calculating the ROU asset and lease liability. The Company identified variable lease payments, such as maintenance payments based on actual activities performed or costs incurred, at lease commencement by assessing the nature of the payment provisions, including whether the payments are subject to a minimum charge. Many of our leases include one or more options to renew. When it is reasonably certain that we will exercise the option, we include the impact of the option in the lease term for purposes of determining future lease payments. As the Company is unable to determine the discount rate implicit in its lease agreements, the Company uses its incremental borrowing rate on the commencement date to calculate the present value of future payments.

The Company’s Consolidated Balance Sheets include the following related to operating leases as of December 31, 2019:

Leases	Classification	2019
Assets:		
ROU assets	Other Assets	\$ 45,817
Liabilities:		
ROU liability - current	Accrued and other current liabilities	\$ 10,133
ROU liability - long-term	Other liabilities	36,750
Total ROU liabilities		<u>\$ 46,883</u>

Included within the balance of operating leases is a lease for the Company’s headquarters which is with a related party. The ROU liability for this facility is approximately \$4.5 million as of December 31, 2019 and total rent payments made during the year ended December 31, 2019 approximates \$1.0 million. As of December 31, 2019, the total ROU assets attributable to finance leases are approximately \$19.2 million, which is included in Property, plant, and equipment, net on the Consolidated Balance Sheets.

The components of lease costs for the year ended December 31, 2019 is as follows:

	Classification	2019
Finance lease expense:		
Amortization of ROU assets	Depreciation and amortization	\$ 5,091
Interest on lease liabilities	Interest expense	824
Operating lease expense	Cost of revenue; Selling, general & administrative expenses	12,937
Short-term lease expense	Cost of revenue; Selling, general & administrative expenses	43
Variable lease expense	Cost of revenue; Selling, general & administrative expenses	1,220
Total		<u>\$ 20,115</u>

Additional information related to leases as of December 31, 2019 is as follows:

	2019
Cash paid for amounts included in the measurement of lease liabilities for finance leases:	
Finance - financing cash flows	\$ 4,545
Finance - operating cash flows	824
Operating - operating cash flows	12,773
ROU assets obtained in the exchange for lease liabilities:	
Finance leases	\$ 9,502
Operating leases	18,965
Weighted-average remaining lease term (in years):	
Finance leases	5.9
Operating leases	6.2
Weighted-average discount rate:	
Finance leases	5.8 %
Operating leases	5.9 %

Maturities of lease liabilities as of December 31, 2019 is as follows:

	Finance	Operating
2020	\$ 6,241	\$ 12,466
2021	4,255	10,347
2022	3,381	8,193
2023	2,489	6,790
2024	1,607	5,224
Thereafter	891	13,265
Total	<u>18,864</u>	<u>56,285</u>
Less: Present value discount	1,690	9,402
Lease liability	<u>\$ 17,174</u>	<u>\$ 46,883</u>

Pursuant to the Company's adoption of the new lease accounting guidance using a modified retrospective transition approach, as permitted, comparative information has not been restated and continues to be reported under the accounting standards in effect for those periods. As previously disclosed in its 2018 Annual Report, the following table presents the Company's future minimum operating lease commitments as of December 31, 2018:

2019	\$	10,939
2020		8,764
2021		6,327
2022		4,826
2023		4,239
Thereafter		10,667
Total	\$	45,762

18. Commitments and Contingencies

Legal Proceedings and Government Investigations

The Company is subject to periodic lawsuits, investigations and claims that arise in the ordinary course of business. The Company cannot predict with certainty the ultimate resolution of lawsuits, investigations and claims asserted against it. Except possibly for certain of the matters described below, the Company does not believe that any currently pending legal proceeding to which the Company is a party will have a material adverse effect on its business, results of operations, cash flows or financial condition. The costs of defense and amounts that may be recovered against the Company may be covered by insurance for certain matters.

Litigation and Commercial Claims

The Company was contracted to perform inspections of welds on various pipeline projects in Texas for a customer. As of December 31, 2019, approximately \$1.4 million of past due receivables were outstanding from this customer. The customer provided the Company with notice in December 2019, alleging that the Company's inspection of 66 welds (out of approximately 16,000 welds inspected) were not in compliance with the contract, claimed approximately \$7.6 million in damages, and requested that the Company pay these damages and any other damages incurred. The Company has filed a lawsuit in the District Court of Bexar County, Texas, 37th Judicial District, in an action captioned *Mistras Group, Inc. v. Epic Y-Grade Pipeline LP*, to recover the \$1.4 million and other amounts due to the Company. The customer filed a counterclaim, alleging breach of contract and seeking recovery of its alleged damages. The Company believes that any successful claim by the customer regarding the Company's workmanship will be covered by insurance, subject to payment of a deductible. At this time, the Company is unable to determine whether it has any liability in connection with this matter and if so, the amount or range of any such liability, and accordingly, has not established any accruals for this matter.

A Company vehicle was involved in an accident in which individuals were injured, property was damaged, and businesses allegedly impacted by the accident have claimed economic losses. One lawsuit has been filed by one of the injured individuals in the U.S. District Court for the District of Colorado, *McAllister v. Mistras Group, Inc.* The Company has insurance for these types of matters. Most of the claims have been settled, including the claims covered by the *McAllister* case, with the two remaining unresolved claims being for economic loss and property damage. All of the claims, including the two that have not yet been resolved, have been or are expected to be fully covered by the Company's insurance.

Government Investigations

In May 2015, the Company received a notice from the U.S. Environmental Protection Agency ("EPA") that it performed a preliminary assessment at a leased facility the Company operates in Cudahy, California and would be investigating the site. The purpose of the investigation was to determine whether any hazardous materials were released from the facility. The Company has been informed that certain hazardous materials and pollutants have been found in the ground water in the general vicinity of the site and the EPA is attempting to ascertain the origination or source of these materials and pollutants. Given the historic industrial use of the site, the EPA determined that the site of the Cudahy facility should be examined, along with numerous other sites in the vicinity. The Company has not received any further notices from EPA regarding this matter. In addition, in 2018, the California Department of Toxic Substances Control notified the owner of the property that it will be performing an additional investigation at the property. At this time, the Company is unable to determine whether it has any liability in

connection with this matter and if so, the amount or range of any such liability, and accordingly, has not established any accruals for this matter.

Pension Related Contingencies

The workforce of certain of the Company's subsidiaries are unionized and the terms of employment for these workers are governed by collective bargaining agreements, or CBAs. Under these CBAs, the Company's subsidiaries are required to contribute to the national pension funds for the unions representing these employees, which are multi-employer pension plans. The Company was notified that a significant project was awarded to another contractor in January 2018, and as a result, one of the Company's subsidiaries experienced a significant reduction in the number of its employees covered by one of the CBAs. Under certain circumstances, such a reduction in the number of employees participating in multi-employer pension plans pursuant to this CBA could result in a complete or partial withdrawal liability to these multi-employer pension plans under the Employee Retirement Income Security Act of 1974 ("ERISA"). Management explored options to retain a level of union work that would avoid withdrawal liability to the pension plans, but concluded during the third quarter of 2018 that the Company's subsidiaries probably would not obtain sufficient union work to avoid withdrawal liability. Therefore, the Company determined that it is probable that its subsidiary will incur a withdrawal liability related to these multi-employer pension plans. Accordingly, the Company recorded a charge of \$5.9 million during 2018 and \$0.8 million during 2019 for this potential withdrawal liability. The Company's subsidiary reached an agreement with one of the pension funds in September 2019 and made a final payment of \$0.9 million in complete satisfaction of the withdrawal liability of the subsidiary. Excluding the settlement payment, the Company has made monthly payments totaling \$3.3 million through December 31, 2019. The balance of the estimated total amount of this potential liability as of December 31, 2019 is approximately \$2.5 million.

Severance and labor disputes

The Company's German subsidiary provides employees to customers under temporary staff leasing arrangements. In April 2017, the German Labor Lease Act was passed in Germany limiting the duration of temporary workers to eighteen months, or longer as subsequently agreed with by a customer appropriate authority. Since the passing of the German Labor Lease Act, the Company explored selling its staff leasing services and concluded during the third quarter of 2018 that a sale would not be probable. As a result, the Company decided that it would not renew several of these leasing services contracts when they expired beginning in 2019. Due to the limit on the length of service allowed under the German Labor Lease Act, employees are being transitioned off the customer contracts. The German subsidiary has terminated, or will terminate, some these employees, creating a severance obligation to the terminated employees, and has transitioned, or will transition other employees to the Company's other customers. During December 2019, the Company executed an agreement to sell the rights of certain customer contracts for total consideration of approximately \$0.1 million, effective January 1, 2020. No other assets or liabilities other than those employee benefits related to employees working on the customer contracts were included in the sale. As of December 31, 2019, the Company accrued approximately \$0.8 million for estimated severance payment obligations, which takes into account the Company's estimate with respect to the employees that have been or will be transitioned to the German subsidiaries' other customers. The \$0.8 million of estimated obligations is net of \$0.2 million in payments and \$0.5 million in reversals due to employees being transitioned to customer contracts.

During 2018, the Company recorded approximately \$1.2 million in charges related to labor claims against its Brazilian subsidiary, which are included within Selling, general and administrative expenses. These claims related to employees in a company acquired by the Brazilian subsidiary in a prior period. The Company believes it is entitled to indemnification from the sellers of the acquired company for most of these charges but has not recorded the expected recovery of indemnification for these labor claims as the amount and timing of collection is uncertain as of December 31, 2019.

Acquisition and disposition related contingencies

The Company is liable for contingent consideration in connection with certain of its acquisitions. As of December 31, 2019, total potential acquisition-related contingent consideration ranged from zero to approximately \$7.9 million and would be payable upon the achievement of specific performance metrics by certain of the acquired companies over the next 2.8 years.

With respect to the acquisition made in 2018, the Company has filed a claim with the sellers and the Company's insurance carrier through which the Company has representations and warranty insurance concerning certain matters that may impact the purchase price. This matter is currently being investigated and discussed with the sellers and the Company's insurance carrier.

During 2018, the Company sold a subsidiary in the Products and Systems segment. As part of the sale, the Company entered into a three-year agreement to purchase products from the buyer, with a cumulative commitment of \$2.3 million, of which

\$1.4 million is remaining as of December 31, 2019. The agreement is based on third party pricing and the Company's planned purchase requirements over the three year purchase period to meet the minimum contractual purchases.

19. Segment Disclosure

The Company's three operating segments are:

- *Services*. This segment provides asset protection solutions predominantly in North America, with the largest concentration in the United States, followed by Canada, consisting primarily of NDT and inspection and engineering services that are used to evaluate the safety, structural integrity and reliability of critical energy, industrial and public infrastructure and commercial aerospace components.
- *International*. This segment offers services as well as products and systems, similar to those of the other segments, to select markets within Europe, the Middle East, Africa, Asia and South America, but not to customers in China and South Korea, which are served by the Products and Systems segment.
- *Products and Systems*. This segment designs, manufactures, sells, installs and services the Company's asset protection products and systems, including equipment and instrumentation, predominantly in the United States.

Costs incurred for general corporate services, including finance, legal, and certain other costs that are provided to the segments are reported within Corporate and eliminations. Sales to the International segment from the Products and Systems segment and subsequent sales by the International segment of the same items are recorded and reflected in the operating performance of both segments. Additionally, engineering charges and royalty fees charged to the Services and International segments by the Products and Systems segment are reflected in the operating performance of each segment. All such intersegment transactions are eliminated in the Company's consolidated financial reporting.

The accounting policies of the reportable segments are the same as those described in Note 1—*Summary of Significant Accounting Policies and Practices*. Segment income from operations is one of the primary performance measures used by the Chief Executive Officer, who is the chief operating decision maker, to assess the performance of each segment and make resource allocation decisions. Certain general and administrative costs such as human resources, information technology and training are allocated to the segments. Segment income from operations excludes interest and other financial charges and income taxes. Corporate and other assets are comprised principally of cash, deposits, property, plant and equipment, domestic deferred taxes, deferred charges and other assets. Corporate loss from operations consists of administrative charges related to corporate personnel and other charges that cannot be readily identified for allocation to a particular segment.

Selected financial information by segment for the periods shown was as follows (intercompany transactions are eliminated in Corporate and eliminations):

	For the year ended December 31,		
	2019	2018	2017
Revenues			
Services	\$ 595,130	\$ 574,619	\$ 543,565
International	144,271	153,448	144,265
Products and Systems	18,583	23,426	23,297
Corporate and eliminations	(9,398)	(9,139)	(10,157)
	<u>\$ 748,586</u>	<u>\$ 742,354</u>	<u>\$ 700,970</u>
	For the year ended December 31,		
	2019	2018	2017
Gross profit			
Services	\$ 165,513	\$ 151,974	\$ 139,160
International	43,145	45,464	38,974
Products and Systems	8,639	10,560	9,798
Corporate and eliminations	—	(124)	(220)
	<u>\$ 217,297</u>	<u>\$ 207,874</u>	<u>\$ 187,712</u>

	For the year ended December 31,		
	2019	2018	2017
Income from operations			
Services	\$ 49,593	\$ 47,126	\$ 46,677
International	5,856	3,953	3,537
Products and Systems	(529)	2,368	(16,991)
Corporate and eliminations	(30,783)	(31,226)	(29,063)
	<u>\$ 24,137</u>	<u>\$ 22,221</u>	<u>\$ 4,160</u>

	For the year ended December 31,		
	2019	2018	2017
Depreciation and amortization			
Services	\$ 28,854	\$ 24,079	\$ 21,649
International	8,285	8,846	7,768
Products and Systems	1,213	1,429	2,180
Corporate and eliminations	181	59	(214)
	<u>\$ 38,533</u>	<u>\$ 34,413</u>	<u>\$ 31,383</u>

	December 31,	
	2019	2018
Intangible assets, net		
Services	\$ 98,284	\$ 98,362
International	9,814	11,143
Products and Systems	1,181	1,438
Corporate and eliminations	258	452
	<u>\$ 109,537</u>	<u>\$ 111,395</u>

	December 31,	
	2019	2018
Total assets		
Services	\$ 537,518	\$ 523,506
International	153,380	146,535
Products and Systems	16,028	12,264
Corporate and eliminations	12,952	11,732
	<u>\$ 719,878</u>	<u>\$ 694,037</u>

	December 31,	
	2019	2018
Long-lived assets		
United States	\$ 233,679	\$ 230,140
Other Americas	181,550	177,628
Europe	75,325	76,781
	<u>\$ 490,554</u>	<u>\$ 484,549</u>

	December 31, 2017
Revenue	
United States	\$ 466,683
Other Americas	86,870
Europe	132,421
Asia-Pacific	14,996
	<u>\$ 700,970</u>

Refer to Note 2–*Revenue*, for revenues by geographic area for the years ended December 31, 2019 and 2018.

20. Repurchase of Common Stock

On October 7, 2015, the Company's Board of Directors approved a \$50 million stock repurchase plan. The Company retired all of its repurchased shares during the fourth quarter of 2017. The Board of Directors approved the termination of the stock repurchase plan effective April 1, 2019. There were no repurchases of common stock under the stock repurchase plan during 2019 and 2018.

21. Selected Quarterly Financial Information (unaudited)

The following is a summary of the quarterly results of operations for calendar years 2019, 2018 and 2017.

Quarter ended	December 31, 2019	September 30, 2019	June 30, 2019	March 31, 2019
Revenues	\$ 178,991	\$ 192,192	\$ 200,616	\$ 176,787
Gross Profit	50,583	57,769	60,071	48,874
Income (loss) from operations	2,335	10,779	15,419	(4,396)
Net income (loss) attributable to Mistras Group, Inc.	\$ 829	\$ 3,093	\$ 7,431	\$ (5,293)
Earnings (loss) per common share:				
Basic	\$ 0.03	\$ 0.11	\$ 0.26	\$ (0.19)
Diluted	\$ 0.03	\$ 0.11	\$ 0.26	\$ (0.19)

Quarter ended	December 31, 2018	September 30, 2018	June 30, 2018	March 31, 2018
Revenues	\$ 180,762	\$ 182,169	\$ 191,793	\$ 187,630
Gross Profit	52,315	52,332	55,083	48,144
Income from operations	2,502	3,017	10,304	6,398
Net income (loss) attributable to Mistras Group, Inc.	\$ (1,061)	\$ (1,011)	\$ 6,000	\$ 2,908
Earnings (loss) per common share:				
Basic	\$ (0.04)	\$ (0.04)	\$ 0.21	\$ 0.10
Diluted	\$ (0.04)	\$ (0.04)	\$ 0.20	\$ 0.10

Quarter ended	December 31, 2017	September 30, 2017	June 30, 2017	March 31, 2017
Revenues	\$ 187,643	\$ 179,570	\$ 170,439	\$ 163,318
Gross Profit	50,319	47,897	46,343	43,153
Income (loss) from operations	6,282	(10,375)	5,003	3,250
Net income (loss) attributable to Mistras Group, Inc.	\$ 884	\$ (6,968)	\$ 2,217	\$ 1,692
Earnings (loss) per common share:				
Basic	\$ 0.03	\$ (0.25)	\$ 0.08	\$ 0.06
Diluted	\$ 0.03	\$ (0.25)	\$ 0.07	\$ 0.06

22. Subsequent Events

In March 2020, the World Health Organization recognized the novel strain of coronavirus, COVID-19, as a pandemic. The coronavirus outbreak has severely restricted the level of economic activity around the world. In response to this coronavirus outbreak, the governments of many countries, states, cities and other geographic regions have taken preventative or protective actions, such as imposing restrictions on travel and business operations and advising or requiring individuals to limit or forgo their time outside of their homes. Temporary closures of businesses have been ordered and numerous other businesses have temporarily closed voluntarily or restricted access to their premises. Further, individuals' ability to travel has been curtailed through mandated travel restrictions and may be further limited through additional voluntary or mandated closures of travel-related businesses. A significant portion of the Company's business and revenue is derived from our technicians and service people being physically located on site at our customer's facilities. It is unclear at this point, as a result of government impositions and those of our customers, whether our personnel will be able to travel and gain admittance to our customer's sites. In addition, to the extent COVID-19 impacts the financial performance of our customers, these customers may likewise look to further control their outside expenditures, including with respect to services performed by and products of the Company. As a result, the coronavirus outbreak may have a material adverse impact on the Company's financial position, operations and cash flows in 2020. Given the uncertainty regarding the spread of this coronavirus, the related financial impact cannot be reasonably predicted or estimated at this time.

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

None.

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Pursuant to Rule 13a-15(b) under the Exchange Act, our management carried out an evaluation, under the supervision and with the participation of our President and Chief Executive Officer and our Executive Vice President, Chief Financial Officer and Treasurer, of the effectiveness of the design and operation of our disclosure controls (as defined in Rule 13a-15(e) of the Exchange Act) and procedures. Based upon that evaluation, our President and Chief Executive Officer and our Executive Vice President, Chief Financial Officer and Treasurer concluded that, as of December 31, 2019, our disclosure controls and procedures were not effective, due to material weaknesses in our internal control over financial reporting as discussed below.

However, giving full consideration to the material weaknesses, management has concluded that the Consolidated Financial Statements included in this Annual Report on Form 10-K present fairly, in all material respects, the Company's financial position, results of operations and cash flows for the periods disclosed in conformity with U.S. generally accepted accounting principles.

Management's Report on Internal Control Over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934, as amended (the Exchange Act). Our internal control over financial reporting is a process designed by, or under the supervision of, our President and Chief Executive Officer and our Executive Vice President, Chief Financial Officer and Treasurer, and effected by the Company's board of directors, management and other personnel 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.

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 policies or procedures may deteriorate.

A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the Company's annual or interim financial statements will not be prevented or detected on a timely basis.

Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2019. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in the updated *Internal Control — Integrated Framework* issued in 2013. As part of that assessment, the Company identified material weaknesses as our risk assessment did not sufficiently consider changes in our business processes and we did not have a sufficient complement of trained resources with knowledge of our financial reporting processes and internal control related to accounting for income taxes. As a consequence, process level controls over the completeness, existence, accuracy, valuation and presentation of the income tax provision, including deferred tax assets and liabilities and valuation allowance, were not effective. Based on the material weaknesses described above, management concluded that, as of December 31, 2019, our internal control over financial reporting was ineffective.

The control deficiencies described above resulted in immaterial misstatements in the preliminary consolidated financial statements as of and for the fiscal year ended December 31, 2019 related to income taxes that were corrected in the December 31, 2019 consolidated financial statements. However, these control deficiencies create a reasonable possibility that a material misstatement to the consolidated financial statements will not be prevented or detected on a timely basis, and therefore we concluded that the deficiencies represent material weaknesses in internal control over financial reporting.

The Company's independent registered public accounting firm, KPMG LLP, has audited the financial statements included in this Annual Report on Form 10-K and, as part of its audit, has issued an adverse opinion on the effectiveness of the Company's internal control over financial reporting as of December 31, 2019, which appears in Part II, Item 8, "Financial Statements and Supplementary Data – Report of Independent Registered Public Accounting Firm" of this Annual Report on Form 10-K.

The Company acquired one entity during 2019, accounting for total assets of 0.2% and total revenues of 0.3% included in the consolidated financial statements of the Company as of and for the year ended December 31, 2019. Management excluded from its assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2019, this acquired entity's internal control over financial reporting associated with its assets and revenues that are included in the consolidated financial statements of the Company as of and for the year ended December 31, 2019.

Remediation Plans

Our management, with oversight from the Audit Committee of the Board of Directors, is actively engaged in remediation efforts to address the identified material weaknesses over income taxes. We have identified the following preliminary steps:

- Accelerate the risk assessment process related to changes in the business;
- Enhance the design of controls surrounding the preparation and review of the income tax provision, and enhance the automation of the income tax processes and controls to allow for a timelier completion and review of internal controls; and
- Accelerate all key activities within the income tax accounting and reporting process and controls by further increasing and expanding the capabilities of the income tax accounting resources in order to devote additional time and resources to the consolidated income tax accounting and reporting processes and controls.

The Company remains committed to an effective internal control environment and management believes that these actions, and the improvements management expects to achieve as a result, will remediate the material weakness. However, the material weaknesses will not be considered remediated until the controls operate for a sufficient period of time and management has concluded through testing that these controls operate effectively.

Changes in Internal Control over Financial Reporting

Except for the material weaknesses described above, there have been no changes in our internal control over financial reporting during the quarter ended December 31, 2019 that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

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

Certain of the information concerning our executive officers required by this Item 10 is provided under the caption “Executive Officers of the Registrant” in Part I of this Annual Report. The remaining information required by Item 10 is incorporated herein by reference to the relevant information to be included in our definitive proxy statement related to the 2020 annual shareholders meeting.

ITEM 11. EXECUTIVE COMPENSATION

The information required by Item 11 is incorporated by reference to the relevant information to be included in our definitive proxy statement related to the 2020 annual shareholders meeting.

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

The information required by Item 12 regarding Security Ownership of Certain Beneficial Owners and Management and Related Stockholders is incorporated by reference to the relevant information to be included in our definitive proxy statement related to the 2020 annual shareholders meeting.

Equity Compensation Plan Information

The following table provides certain information as of December 31, 2019 concerning the shares of our common stock that may be issued under existing equity compensation plans.

Plan Category	Number of Securities to be Issued Upon Exercise of Outstanding Options	Weighted Average Exercise Price of Outstanding Options	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans
	(in thousands, except exercise price)		
Equity Compensation Plans Approved by Security Holders ⁽¹⁾	5	\$ 22.35	718
Equity Compensation Plans Not Approved by Security Holders	—	—	—
Total	5	\$ 22.35	718

(1) Includes the Company’s 2009 Long-Term Incentive Plan and 2016 Long-Term Incentive Plan. There are no awards outstanding as of December 31, 2019 under the Company’s 2007 Stock Option Plan.

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

The information required by Item 13 is incorporated by reference to the relevant information to be included in our definitive proxy statement related to the 2020 annual shareholders meeting.

ITEM 14. PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required by Item 14 is incorporated by reference to the information to be included in our definitive proxy statement related to the 2020 annual shareholders meeting.

PART IV**ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES**

(1) The following financial statements are filed herewith in Item 8 of Part II above:

	Page
Report of independent registered public accounting firm	43
Consolidated Balance sheets as of December 31, 2019 and December 31, 2018	46
Consolidated Statements of income (loss) for the years ended December 31, 2019, 2018 and 2017	47
Consolidated Statements of comprehensive income (loss) for the years ended December 31, 2019, 2018 and 2017	48
Consolidated Statements of equity for the year ended December 31, 2019, 2018 and 2017	49
Consolidated Statements of cash flows for the years ended December 31, 2019, 2018 and 2017	50
Notes to consolidated financial statements	51

(2) Financial Statement Schedules

All other schedules are omitted because of the absence of conditions under which they are required or because the required information is given in the financial statements or notes thereto.

(3) Exhibits

Exhibit No.	Description
2.1	Membership Interest Purchase Agreement, dated December 15, 2017, among Mistras Group, Inc., WPT Holdings Inc., West Penn Non-Destructive Testing, LLC (formerly known as West Penn Non-Destructive Testing, Inc.), N. David Campbell and James C. DeChellis III (filed as exhibit 2.1 to the Current Report on Form 8-K filed on December 21, 2017 and incorporated herein by reference).
2.2	Share Purchase Agreement, dated as of December 13, 2018, among 2159562 Alberta Ltd., as purchaser, Mistras Group, Inc., as parent of purchaser, the shareholders of Onstream Holdings, Inc. listed in Schedule A thereto, and Onstream Holdings, Inc. (filed as Exhibit 2.1 to Current Report on Form 8-K filed December 13, 2018 and incorporated herein by reference).
2.3	Form of share purchase agreement for the purchase of Onstream Holdings, Inc. shares from each member of the group of shareholders collectively owning 5% of the shares of Onstream Holdings, Inc. (filed as Exhibit 2.2 to Current Report on Form 8-K filed December 13, 2018 and incorporated herein by reference).
3.1	Second Amended and Restated Certificate of Incorporation (filed as exhibit 3.1 to Registration Statement on Form S-1 (Amendment No. 4) filed on September 21, 2009 (Registration No. 333-151559) and incorporated herein by reference).
3.2	Certificate of Amendment to the Second Amended and Restated Certificate of Incorporation (filed as exhibit 3.1 to the Quarterly Report on Form 10-Q filed on January 11, 2017 and incorporated herein by reference).
3.3	Amended and Restated Bylaws, effective July 20, 2016 (filed as exhibit 3.1 to the Quarterly Report on Form 10-Q filed on October 7, 2016 and incorporated herein by reference).
4.1	Specimen certificate evidencing shares of common stock (filed as exhibit 4.1 to Registration Statement on Form S-1 (Amendment No. 5) filed on September 23, 2009 (Registration No. 333-151559) and incorporated herein by reference).
4.2*	Description of Securities Registered Under Section 12 of the Securities Exchange Act of 1934
10.1	Fourth Amended and Restated Credit Agreement dated December 8, 2017 (filed as Exhibit 10.3 to Annual Report on Form 10-K filed March 14, 2018 and incorporated herein by reference).
10.2	Fifth Amended and Restated Credit Agreement dated December 13, 2017 (filed as Exhibit 10.1 to Current Report on Form 8-K filed December 13, 2018 and incorporated herein by reference).
10.3*	First Amendment, dated October 11, 2019, to Fifth Amended and Restated Credit Agreement dated December 13, 2018
10.4	Form of Indemnification Agreement for directors and officers (filed as exhibit 10.1 to Registration Statement on Form S-1 (Amendment No. 4) filed on September 21, 2009 (Registration No. 333-151559) and incorporated herein by reference).

10.5	2007 Stock Option Plan and form of Stock Option Agreement (filed as exhibit 10.5 to Registration Statement on Form S-1 (Amendment No. 4) filed on September 21, 2009 (Registration No. 333-151559) and incorporated herein by reference)
10.6	2009 Long-Term Incentive Plan (filed as exhibit 10.6 to Registration Statement on Form S-1 (Amendment No. 4) filed on September 21, 2009 (Registration No. 333-151559) and incorporated herein by reference)
10.7	Form of 2009 Long-Term Incentive Plan Stock Option Agreement (filed as exhibit 10.7 to Registration Statement on Form S-1 (Amendment No. 4) filed on September 21, 2009 (Registration No. 333-151559) and incorporated herein by reference)
10.8	Form of 2009 Long-Term Incentive Plan Restricted Stock Agreement (filed as exhibit 10.8 to Registration Statement on Form S-1 (Amendment No. 4) filed on September 21, 2009 (Registration No. 333-151559) and incorporated herein by reference)
10.9	Form of Restricted Stock Unit Certificate for awards under 2009 Long-Term Incentive Plan (filed as exhibit 10.1 to Quarterly Report on Form 10-Q filed on January 13, 2011 and incorporated herein by reference)
10.10	2016 Long-Term Incentive Plan (filed as exhibit B to the Definitive Proxy Statement dated September 7, 2016 and incorporated herein by reference)
10.11	Form of Restricted Stock Unit Certificate for awards under the 2016 Long-Term Incentive Plan (filed as Exhibit 10.16 to Transition Report on Form 10-K filed on March 20, 2017 and incorporated herein by reference)
10.12	Mistras Group Severance Plan (filed as Exhibit 10.11 to Annual Report on Form 10-K filed on March 18, 2019 and incorporated herein by reference)
10.13	Employment Agreement between the Company and Sotirios J. Vahaviolos, dated February 28, 2018 (filed as Exhibit 10.1 to Quarterly Report on Form 10-Q filed May 8, 2018 and incorporated by reference herein)
10.14	Employment Agreement between the Company and Dennis Bertolotti, dated March 13, 2018 (filed as Exhibit 10.2 to Quarterly Report on Form 10-Q filed May 8, 2018 and incorporated by reference herein)
10.15	Description of Compensation for Non-Employee Directors (filed as Exhibit 10.19 to Annual Report on Form 10-K filed March 14, 2018 and incorporated herein by reference)
21.1*	Subsidiaries of the Registrant
23.1*	Consent of KPMG LLP
24.1*	Power of Attorney (included as part of the signature page to this report)
31.1*	Certification of Chief Executive Officer pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934
31.2*	Certification of Chief Financial Officer pursuant to Rule 13a-14(a) under the Securities Exchange Act of 1934
32.1**	Certification pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2**	Certification pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS	XBRL Instance Document
101.SCH	XBRL Schema Document
101.CAL	XBRL Calculation Linkbase Document
101.LAB	XBRL Labels Linkbase Document
101.PRE	XBRL Presentation Linkbase Document
101.DEF	XBRL Definition Linkbase Document

Exhibits 10.3 to 10.14 are management contracts or compensatory plans, contracts, or arrangements.

* Filed herewith.

** Furnished herewith.

ITEM 16. FORM 10-K SUMMARY

None.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

MISTRAS GROUP, INC.

By: /s/ Dennis Bertolotti

Dennis Bertolotti

President and Chief Executive Officer

Date: March 27, 2020

We, the undersigned directors and officers of Mistras Group, Inc., hereby severally constitute Dennis Bertolotti, Edward J. Prajzner and Michael C. Keefe, and each of them singly, as our true and lawful attorneys with full power to each of them to sign for us, in our names in the capacities indicated below, any and all amendments to this Annual Report on Form 10-K filed with the Securities and Exchange Commission.

This power of attorney may only be revoked by a written document executed by the undersigned that expressly revokes this power by referring to the date and subject hereof.

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

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Dr. Sotirios J. Vahaviolos</u> Dr. Sotirios J. Vahaviolos	Executive Chairman and Director	March 27, 2020
<u>/s/ Dennis Bertolotti</u> Dennis Bertolotti	President, Chief Executive Officer and Director (<i>Principal Executive Officer</i>)	March 27, 2020
<u>/s/ Edward J. Prajzner</u> Edward J. Prajzner	Executive Vice President, Chief Financial Officer and Treasurer (<i>Principal Financial and Accounting Officer</i>)	March 27, 2020
<u>/s/ Nicholas DeBenedictis</u> Nicholas DeBenedictis	Director	March 27, 2020
<u>/s/ James J. Forese</u> James J. Forese	Director	March 27, 2020
<u>/s/ Richard H. Glanton</u> Richard H. Glanton	Director	March 27, 2020
<u>/s/ Michelle J. Lohmeier</u> Michelle J. Lohmeier	Director	March 27, 2020
<u>/s/ Manuel N. Stamatakis</u> Manuel N. Stamatakis	Director	March 27, 2020
<u>/s/ W. Curtis Weldon</u> W. Curtis Weldon	Director	March 27, 2020

Exhibit 4.2

Description of the Registrant's Securities Registered Under Section 12 of the Securities Exchange Act of 1934

Mistras Group, Inc. ("Mistras," the "Company," "we" or "our") has one class of securities registered under Section 12 of the Securities Exchange Act of 1934 – common stock, par value \$0.01 per share. The following is a summary of the material terms of the common stock of Mistras and does not purport to be complete and is subject to and qualified in its entirety by reference to our second amended and restated certificate of incorporation and bylaws, which are incorporated herein by reference and are included as exhibits to our most recent Annual Report on Form 10-K filed with the Securities and Exchange Commission. For a more complete understanding of our capital stock, we encourage you to read carefully our second amended and restated certificate of incorporation and bylaws, each as may be amended, and the applicable provisions of the Delaware General Corporation Law ("DGCL").

Common Stock

Our authorized capital stock consists of 200,000,000 shares of common stock, with a par value of \$0.01 per share, and 10,000,000 shares of preferred stock, with a par value of \$0.01 per share.

Holders of common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders and do not have cumulative voting rights. Accordingly, holders of a majority of the shares of common stock entitled to vote in any election of directors may elect all of the directors standing for election. In addition, holders of common stock are entitled to receive proportionately any dividends that may be declared by our board of directors, subject to any preferential dividend rights of outstanding preferred stock. Holders of common stock have no preemptive, subscription, redemption or conversion rights.

Upon our liquidation, dissolution or winding-up, the holders of common stock are entitled to receive proportionately our net assets available after the payment of all debts and other liabilities and subject to the prior rights of any outstanding preferred stock.

Our outstanding shares of common stock are validly issued, fully paid and nonassessable. The rights, preferences and privileges of holders of common stock are subject to, and may be impacted by, the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Preferred Stock

Our certificate of incorporation authorizes the issuance of an aggregate of 10,000,000 shares of preferred stock. No shares of preferred stock are currently issued and outstanding.

Our board of directors may, from time to time without shareholder approval, direct the issue of shares of preferred stock in series and may, at the time of issue, determine the designation, powers, rights, preferences and limitations of each series. Satisfaction of any dividend preferences of outstanding preferred stock would reduce the amount of funds available for the payment of dividends on shares of common stock. Holders of preferred stock may be entitled to receive a preference payment in the event of any liquidation, dissolution or winding-up of Mistras before any payment is made to the holders of common stock. Under certain circumstances, the issuance of preferred stock may render more difficult or tend to discourage a merger, tender offer or proxy contest, the assumption of control by a holder of a large block of securities of the Company or the removal of incumbent management. Upon the affirmative vote of a majority of the total number of directors then in office, the board of directors may issue shares of preferred stock with voting and conversion rights that could adversely affect the holders of shares of common stock.

Preemptive Rights

Holders of our common stock are not entitled to preemptive rights to subscribe for additional issuances of common stock or any other class or series of stock or any security convertible into such stock.

Certain provisions of Delaware law, our second amended and restated certificate of incorporation and our bylaws contain provisions that could have the effect of delaying, deferring or discouraging another party from acquiring control of us. These provisions, which are summarized below, may have the effect of discouraging takeover practices and takeover bids.

Undesignated Preferred Stock. As discussed above, our board of directors has the ability to issue preferred stock with voting or other rights or preferences that could impede the success of any attempt to change control of us. These and other provisions may have the effect of deferring hostile takeovers or delaying changes in control or management of our company.

Inability of Stockholders to Act by Written Consent. We have provided in our second amended and restated certificate of incorporation that our stockholders may not act by written consent. This limit on the ability of our stockholders to act by written consent may lengthen the amount of time required to take stockholder actions. As a result, a holder controlling a majority of our capital stock would not be able to amend our bylaws or remove directors without holding a meeting of our stockholders called in accordance with our bylaws.

Calling of Special Meetings of Stockholders. Our bylaws provide that special meetings of the stockholders may be called by the Chairman of the Board, the Chief Executive Officer or by the board of directors acting pursuant to a resolution adopted by a majority of the members. Additionally, our bylaws provide that only stockholders entitled to cast not less than 35% of all the votes entitled to be cast at a special meeting of stockholders can require the Secretary to call such a special meeting, subject to the satisfaction of certain procedural and informational requirements. These provisions may impair or prevent smaller stockholders from forcing consideration of a proposal, including the removal of directors.

Requirements for Advance Notification of Stockholder Nominations and Proposals. Our bylaws establish advance notice procedures with respect to stockholder proposals and the nomination of candidates for election as directors, other than nominations made by or at the direction of the board of directors or a committee of the board of directors. However, our bylaws may have the effect of precluding the conduct of certain business at a meeting if the proper procedures are not followed. Any proposed business other than the nomination of persons for election to our board of directors must constitute a proper matter for stockholder action pursuant to the notice of meeting delivered to us. For notice to be timely, it must be received by our secretary not later than 90 nor earlier than 120 calendar days prior to the first anniversary of the previous year's annual meeting (or if the date of the annual meeting is advanced more than 30 calendar days or delayed by more than 60 calendar days from such anniversary date, not later than 90 nor earlier than 120 calendar days prior to such meeting or the 10th calendar day after public disclosure of the date of such meeting is first made). These provisions may also discourage or deter a potential acquiror from conducting a solicitation of proxies to elect the acquiror's own slate of directors or otherwise attempting to obtain control of our company.

Board Vacancies Filled Only by Majority of Directors Then in Office. Vacancies and newly created seats on our board may be filled only by our board of directors. Only our board of directors may determine the number of directors on our board. The inability of stockholders to determine the number of directors or to fill vacancies or newly created seats on the board makes it more difficult to change the composition of our board of directors.

No Cumulative Voting. The Delaware General Corporation Law provides that stockholders are not entitled to the right to cumulate votes in the election of directors unless our second amended and restated certificate of incorporation provides otherwise. Our second amended and restated certificate of incorporation expressly prohibits cumulative voting.

Delaware Anti-Takeover Statute. We are subject to the provisions of Section 203 of the Delaware General Corporation Law regulating corporate takeovers. In general, Section 203 prohibits a publicly held Delaware corporation from engaging, under certain circumstances, in a business combination with an interested stockholder for a period of three years following the date on which the person became an interested stockholder unless:

- Prior to the date of the transaction, the board of directors of the corporation approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- Upon completion of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, but not the outstanding voting stock owned by the interested stockholder, (1) shares owned by persons who are directors and also officers and (2) shares owned by employee stock plans in which employee participants

do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or

- On or subsequent to the date of the transaction, the business combination is approved by the board of directors and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least $66 \frac{2}{3}$ % of the outstanding voting stock that is not owned by the interested stockholder.

Generally, a business combination includes a merger, asset or stock sale or other transaction resulting in a financial benefit to the interested stockholder. An interested stockholder is a person who, together with affiliates and associates, owns or, within three years prior to the determination of interested stockholder status, did own 15% or more of a corporation's outstanding voting stock.

**FIRST AMENDMENT TO
FIFTH AMENDED AND RESTATED CREDIT AGREEMENT**

THIS FIRST AMENDMENT TO FIFTH AMENDED AND RESTATED CREDIT AGREEMENT (hereinafter referred to as this "Amendment"), dated as of October 11, 2019, is executed by and among,

MISTRAS GROUP, INC., a corporation duly organized, validly existing and in good standing under the laws of the State of Delaware, having its principal office located at 195 Clarksville Road, Princeton Junction, New Jersey 08550 (hereinafter referred to as the "Borrower"),

AND

QUALITY SERVICES LABORATORIES, INC., a corporation duly organized, validly existing and in good standing under the laws of the State of Delaware, having an address at 195 Clarksville Road, Princeton Junction, New Jersey 08550 (hereinafter referred to as "QSL"),

AND

MISTRAS INTERNATIONAL HOLDINGS INC., a corporation duly organized, validly existing and in good standing under the laws of the State of Delaware, having an address at 195 Clarksville Road, Princeton Junction, New Jersey 08550 (hereinafter referred to as "MIH"),

AND

WEST PENN NON-DESTRUCTIVE TESTING, LLC, a limited liability company duly organized, validly existing and in good standing under the laws of the Commonwealth of Pennsylvania, having an address at 195 Clarksville Road, Princeton Junction, New Jersey 08550 (hereinafter referred to as "West Penn"), and hereinafter QSL, MIH, and West Penn shall be collectively referred to as the "Guarantors" and sometimes individually referred to as a "Guarantor"),

AND

BANK OF AMERICA, N.A., a national banking association duly organized and validly existing under the laws of the United States of America, having an office located at 194 Wood Avenue South, Iselin, New Jersey 08830, in its capacity as a Lender and the letter of credit issuer (hereinafter referred to as "Bank of America"),

AND

THOSE OTHER LENDERS SIGNATORY HERETO (hereinafter said lenders, together with Bank of America, shall be sometimes individually referred to as a "Lender" and collectively referred to as the "Lenders"),

AND

BANK OF AMERICA, N.A., a national banking association duly organized and validly existing under the laws of the United States of America, having an office located 194 Wood Avenue South, Iselin, New Jersey 08830, in its capacity as administrative agent for the Lenders (hereinafter referred to as the "Administrative Agent").

WITNESSETH:

WHEREAS, pursuant to the terms, conditions, and provisions of that certain Fifth Amended and Restated Credit Agreement dated December 13, 2018, executed by and among, *inter alia*, the Borrower, as borrower, the Lenders, as lenders, Bank of America, as letter of credit issuer, and the Administrative Agent, as administrative agent (hereinafter referred to as the “Credit Agreement”), the Lenders made available to the Borrower (a) a five (5) year senior secured amended and restated revolving credit facility in the aggregate maximum principal amount of up to US\$300,000,000.00 (hereinafter referred to as the “Revolving Credit Facility”), which Revolving Credit Facility includes (i) a US\$20,000,000.00 sublimit for the issuance of standby and commercial letters of credit and (ii) a US\$100,000,000.00 sublimit for multicurrency borrowings in readily available and freely transferable and convertible currencies, including, but not limited to, Euros, Pounds Sterling, Canadian Dollars, and Japanese Yen, all to be made available to the Borrower for working capital and other lawful corporate purposes, and (b) a five (5) year senior secured term loan facility in the aggregate original principal amount of US\$100,000,000.00 (hereinafter referred to as the “Term Loan Facility”), and hereinafter the Revolving Credit Facility and the Term Loan Facility shall be collectively referred to as the “Loan Facilities”); and

WHEREAS, capitalized terms used herein but not otherwise expressly defined herein shall have the same meanings assigned and ascribed to said terms as set forth in the Credit Agreement; and

WHEREAS, pursuant to the terms, conditions, and provisions of that certain Fifth Amended and Restated Guaranty Agreement dated December 13, 2018, executed by the Guarantors, as guarantors, in favor of the Administrative Agent, for the benefit of the Lenders (hereinafter referred to as the “Guaranty”), the Guarantors guaranteed the payment and performance of all of the obligations of the Borrower owed to the Administrative Agent and the Lenders under the Credit Agreement and the other “Loan Documents” (as such term is defined in the Credit Agreement) (hereinafter collectively referred to as the “Loan Documents”); and

WHEREAS, the parties hereto have agreed to amend and modify the terms, conditions, and provisions of the Credit Agreement, and the other Loan Documents, pursuant to the terms, conditions, and provisions of this Amendment for the purposes more fully set forth and described herein; and

NOW, THEREFORE, in consideration of the agreements hereinafter set forth, and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the parties hereto agree as follows:

ARTICLE I
AMOUNTS OUTSTANDING UNDER THE LOAN FACILITIES

1.1 Amounts Outstanding under the Revolving Credit Facility. There is, as of October 11, 2019, due and owing on the Revolving Credit Facility the principal amount of US\$172,207,936.17, consisting of (i) Committed Loans under the Revolving Credit Facility in the aggregate principal amount of US\$166,768,084.17, and (ii) issued and outstanding Letters of Credit in the aggregate stated amount of US\$5,439,852.00, in the case of each of the foregoing together with unpaid accrued interest, fees, costs and expenses due and owing to the Lenders under the Credit Agreement, all without offset, defense or counterclaim, all of which are hereby expressly waived by the Borrower and the Guarantors as of the date hereof. As of such date, there were no amounts due and owing to the Lenders in connection with any unreimbursed draws on any Letter of Credit.

1.2 Amount Outstanding under the Term Loan Facility. There is, as of October 11, 2019, due and owing on the Term Loan Facility the principal amount of US\$96,250,000.00, together with unpaid accrued interest, fees, costs and expenses due and owing to the Lenders under the Credit Agreement, all without offset, defense or counterclaim, all of which are hereby expressly waived by the Borrower and the Guarantors as of the date hereof.

ARTICLE II AMENDMENTS TO CREDIT AGREEMENT

2.1 New Definitions. The following new defined terms are hereby added to Section 1.01 of the Credit Agreement as follows:

“BHC Act Affiliate” of a party means an “affiliate” (as such term is defined under, and interpreted in accordance with, 12 U.S.C. 1841(k)) of such party.

“Covered Entity” means any of the following: (a) a “covered entity” as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 252.82(b); (b) a “covered bank” as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 47.3(b); or (c) a “covered FSI” as that term is defined in, and interpreted in accordance with, 12 C.F.R. § 382.2(b).

“Covered Party” has the meaning specified in Section 10.24.

“Default Right” has the meaning assigned to that term in, and shall be interpreted in accordance with, 12 C.F.R. §§ 252.81, 47.2 or 382.1, as applicable.

“Onstream” means Onstream Holdings Inc., a Canadian corporation.

“QFC” has the meaning assigned to the term “qualified financial contract” in, and shall be interpreted in accordance with, 12 U.S.C. 5390(c)(8)(D).

“QFC Credit Support” has the meaning specified in Section 10.24.

“Supported QFC” has the meaning specified in Section 10.24.

“U.S. Special Resolution Regimes” has the meaning specified in Section 10.24.

2.2 Amendments to Definition of “Add Back Amounts” in the Credit Agreement. The defined term “Add Back Amounts” set forth in Section 1.01 of the Credit Agreement is hereby amended and restated in its entirety to read as follows:

“Add Back Amounts” means, for the purposes of calculating EBITDA, to the extent that the Borrower or one of its Subsidiaries acquires a Person in accordance with the terms, conditions, and provisions of this Agreement, an amount to be included by the Administrative Agent in such calculation of EBITDA, determined as follows: (a) for the first quarterly test date following such acquisition, 100% of the TTM EBITDA with respect to such acquired Person; (b) for the second quarterly test date following such acquisition, 75% of the TTM EBITDA with respect to such acquired Person; (c) for the third quarterly test date following such acquisition, 50% of the TTM EBITDA with

respect to such acquired Person; and (d) for the fourth quarterly test date following such acquisition, -0-% of the TTM EBITDA with respect to such acquired Person.

Notwithstanding the foregoing to the contrary, solely with respect to the Borrower's acquisition of Onstream, for the fourth quarterly test date (which is the September 30, 2019 test date) following such acquisition, the Administrative Agent shall include in its calculation of EBITDA, an amount equal to 25% of the acquired TTM EBITDA with respect to Onstream, as an "Add Back Amount" (which amount is equal to \$3,000,000.00).

2.3 Amendment to Section 1.02 of the Credit Agreement. The following new clause (d) is hereby inserted into Section 1.02 of the Credit Agreement as follows:

"(d) Any reference herein to a merger, transfer, consolidation, amalgamation, assignment, sale, disposition or transfer, or similar term, shall be deemed to apply to a division of or by a limited liability company, or an allocation of assets to a series of a limited liability company (or the unwinding of such a division or allocation), as if it were a merger, transfer, consolidation, amalgamation, assignment, sale, disposition or transfer, or similar term, as applicable, to, of or with a separate Person. Any division of a limited liability company shall constitute a separate Person hereunder (and each division of any limited liability company that is a Subsidiary, joint venture or any other like term shall also constitute such a Person or entity)."

2.4 Amendment to Section 1.03 of the Credit Agreement. In Section 1.03 of the Credit Agreement, clause (a) is hereby deleted in its entirety and the following new clause (a) is hereby inserted in its place and stead:

"(a) All accounting terms not specifically or completely defined herein shall be construed in conformity with, and all financial data (including financial ratios and other financial calculations) required to be submitted pursuant to this Agreement shall be prepared in conformity with, GAAP applied on a consistent basis, as in effect from time to time, applied in a manner consistent with that used in preparing the Audited Financial Statements, except as otherwise specifically prescribed herein. Notwithstanding the foregoing, for purposes of determining compliance with any covenant (including the computation of any financial covenant) contained herein, (i) Indebtedness of the Borrower and its Subsidiaries shall be deemed to be carried at 100% of the outstanding principal amount thereof, and the effects of FASB ASC 825 and FASB ASC 470-20 on financial liabilities shall be disregarded, (ii) all liability amounts shall be determined excluding any liability relating to any operating lease, all asset amounts shall be determined excluding any right-of-use assets relating to any operating lease, all amortization amounts shall be determined excluding any amortization of a right-of-use asset relating to any operating lease, and all interest amounts shall be determined excluding any deemed interest comprising a portion of fixed rent payable under any operating lease, in each case to the extent that such liability, asset, amortization or interest pertains to an operating lease under which the covenantor or a member of its consolidated group is the lessee and would not have been accounted for as such under GAAP as in effect on December 31, 2015, and (iii) all terms of an accounting or financial nature used herein shall be construed, and all computations of amounts and ratios referred to herein

shall be made, without giving effect to any election under FASB ASC Topic 825 “Financial Instruments” (or any other financial accounting standard having a similar result or effect) to value any Indebtedness of the Borrower or any Subsidiary at “fair value”, as defined therein. For purposes of determining the amount of any outstanding Indebtedness, no effect shall be given to (x) any election by the Borrower to measure an item of Indebtedness using fair value (as permitted by Financial Accounting Standards Board Accounting Standards Codification 825–10–25 (formerly known as FASB 159) or any similar accounting standard) or (y) any change in accounting for leases pursuant to GAAP resulting from the implementation of Financial Accounting Standards Board ASU No. 2016–02, Leases (Topic 842), to the extent such adoption would require recognition of a lease liability where such lease (or similar arrangement) would not have required a lease liability under GAAP as in effect on December 31, 2015.”

2.5 Amendment to Section 1.05 of the Credit Agreement. The following new clause (c) is hereby inserted into Section 1.05 of the Credit Agreement as follows:

“(c) The Administrative Agent does not warrant, nor accept responsibility, nor shall the Administrative Agent have any liability with respect to the administration, submission or any other matter related to the rates in the definition of “Eurocurrency Rate” or with respect to any rate that is an alternative or replacement for or successor to any of such rates (including, without limitation, any LIBOR Successor Rate) or the effect of any of the foregoing, or of any LIBOR Successor Rate Conforming Changes, other than in the case of its own gross negligence or willful misconduct with respect to such administration, submission or other matter related to the “Eurocurrency Rate”, as determined by a court of competent jurisdiction by a final and nonappealable judgment.”

2.6 Amendment to Section 6.18 of the Credit Agreement. Section 6.18 of the Credit Agreement is hereby deleted in its entirety and the following new Section 6.18 is hereby inserted in its place and stead:

“6.18 Anti-Corruption Laws; Sanctions.

Conduct its business in compliance in all material respects with the United States Foreign Corrupt Practices Act of 1977, the UK Bribery Act 2010 and other applicable anti-corruption legislation in other jurisdictions and with all applicable Sanctions, and maintain policies and procedures designed to promote and achieve compliance with such laws and Sanctions.”

2.7 Amendment to Article 10 of the Credit Agreement. The following new Section 10.24 is hereby inserted into Article 10 of the Credit Agreement as follows:

“10.24 Acknowledgement Regarding Any Supported QFCs

To the extent that the Loan Documents provide support, through a guarantee or otherwise, for any Swap Contract or any other agreement or instrument that is a QFC (such support, “QFC Credit Support”, and each such QFC, a “Supported QFC”), the parties acknowledge and agree as follows with respect to the resolution power of the Federal Deposit Insurance Corporation under the Federal Deposit Insurance Act and Title

II of the Dodd-Frank Wall Street Reform and Consumer Protection Act (together with the regulations promulgated thereunder, the “U.S. Special Resolution Regimes”) in respect of such Supported QFC and QFC Credit Support (with the provisions below applicable notwithstanding that the Loan Documents and any Supported QFC may in fact be stated to be governed by the laws of the State of New York and/or of the United States or any other state of the United States): In the event a Covered Entity that is party to a Supported QFC (each, a “Covered Party.”) becomes subject to a proceeding under a U.S. Special Resolution Regime, the transfer of such Supported QFC and the benefit of such QFC Credit Support (and any interest and obligation in or under such Supported QFC and such QFC Credit Support, and any rights in property securing such Supported QFC or such QFC Credit Support) from such Covered Party will be effective to the same extent as the transfer would be effective under the U.S. Special Resolution Regime if the Supported QFC and such QFC Credit Support (and any such interest, obligation and rights in property) were governed by the laws of the United States or a state of the United States. In the event a Covered Party or a BHC Act Affiliate of a Covered Party becomes subject to a proceeding under a U.S. Special Resolution Regime, Default Rights under the Loan Documents that might otherwise apply to such Supported QFC or any QFC Credit Support that may be exercised against such Covered Party are permitted to be exercised to no greater extent than such Default Rights could be exercised under the U.S. Special Resolution Regime if the Supported QFC and the Loan Documents were governed by the laws of the United States or a state of the United States. Without limitation of the foregoing, it is understood and agreed that rights and remedies of the parties with respect to a Defaulting Lender shall in no event affect the rights of any Covered Party with respect to a Supported QFC or any QFC Credit Support.”

ARTICLE III CONDITIONS TO EFFECTIVENESS

3.1 Closing Conditions. This Amendment shall become effective as of the day and year set forth above (hereinafter referred to as the “Amendment Effective Date”) upon satisfaction of the following conditions (in each case, in form and substance reasonably acceptable to the Administrative Agent) on or prior to the Amendment Effective Date:

(a) Executed Amendment. The Administrative Agent shall have received a copy of this Amendment duly executed by each of the Loan Parties, the Lenders and the Administrative Agent.

(b) Default. As of the Amendment Effective Date, no Default or Event of Default shall exist.

(c) Fees and Expenses.

(i) Reserved.

(ii) The Administrative Agent shall have received from the Borrower such other fees and expenses that are payable in connection with the consummation of the transactions contemplated hereby and Administrative Agent’s counsel shall have received from the Borrower payment of all outstanding fees and expenses previously incurred and all fees and expenses

incurred in connection with this Amendment, including, without limitation, the fees, costs, and expenses of Reed Smith LLP.

(d) Miscellaneous. All other documents and legal matters in connection with the transactions contemplated by this Amendment shall be reasonably satisfactory in form and substance to the Administrative Agent and its counsel.

ARTICLE IV MISCELLANEOUS

4.1 Amended Terms. On and after the Amendment Effective Date, all references to the Credit Agreement in each of the Loan Documents shall hereafter mean the Credit Agreement as amended and modified by this Amendment. Except as specifically amended hereby or otherwise agreed, the Credit Agreement is hereby ratified and confirmed and shall remain in full force and effect according to its terms.

4.2 FATCA. Borrower hereby certifies to the Administrative Agent and the Lenders that the obligations of the Borrower set forth in the Credit Agreement, as modified by this Amendment, qualify as a “grandfathered obligation” within the meaning of Treasury Regulation Section 1.1471-2(b)(2)(i). From and after the effective date of this Amendment, the Borrower shall indemnify the Administrative Agent, and hold it harmless from, any and all losses, claims, damages, liabilities and related interest, penalties and expenses, including, without limitation, Taxes and the fees, charges and disbursements of any counsel for any of the foregoing, arising in connection with the Administrative Agent’s treating, for purposes of determining withholding Taxes imposed under the Foreign Account Tax Compliance Act (FATCA), the Credit Amendment as qualifying as a “grandfathered obligation” within the meaning of Treasury Regulation Section 1.1471-2(b)(2)(i). The Borrower’s obligations hereunder shall survive the resignation or replacement of the Administrative Agent or any assignment of rights by, or the replacement of, a Lender, the termination of the Commitments and the repayment, satisfaction or discharge of all of the Obligations.

4.3 Representations and Warranties of Loan Parties. Each of the Loan Parties represents and warrants as follows:

(a) It has taken all necessary action to authorize the execution, delivery and performance of this Amendment;

(b) This Amendment has been duly executed and delivered by such Loan Party and constitutes such Loan Party’s legal, valid and binding obligation, enforceable in accordance with its terms, except as such enforceability may be subject to (i) bankruptcy, insolvency, reorganization, fraudulent conveyance or transfer, moratorium or similar laws affecting creditors’ rights generally and (ii) general principles of equity (regardless of whether such enforceability is considered in a proceeding at law or in equity);

(c) No consent, approval, authorization or order of, or filing, registration or qualification with, any court or governmental authority or third party is required in connection with the execution, delivery or performance of this Amendment by such Loan Party;

(d) The representations and warranties set forth in Article V of the Credit Agreement are true and correct as of the date hereof (except for those which expressly relate to an earlier date);

(e) After giving effect to this Amendment, no event has occurred and is continuing which constitutes a Default or an Event of Default;

(f) Intentionally omitted; and

(g) The Obligations are not reduced or modified by this Amendment and are not subject to any offsets, defenses or counterclaims.

4.4 Reaffirmation of Obligations. Each Loan Party hereby ratifies the Credit Agreement and each other Loan Document and acknowledges and reaffirms (a) that it is bound by all terms of the Credit Agreement and each other Loan Document applicable to it and (b) that it is responsible for the observance and full performance of its respective Obligations.

4.5 Loan Document. This Amendment shall constitute a Loan Document under the terms of the Credit Agreement.

4.6 Expenses. The Borrower agrees to pay all reasonable costs and expenses of the Administrative Agent in connection with the preparation, execution and delivery of this Amendment, including without limitation the reasonable fees and expenses of the Administrative Agent's legal counsel.

4.7 Further Assurances. The Loan Parties agree to promptly take such action, upon the request of the Administrative Agent, as is necessary to carry out the intent of this Amendment.

4.8 Entirety. This Amendment and the other Loan Documents embody the entire agreement among the parties hereto and supersede all prior agreements and understandings, oral or written, if any, relating to the subject matter hereof.

4.9 Counterparts; Telecopy. This Amendment may be executed in any number of counterparts, each of which when so executed and delivered shall be an original, but all of which shall constitute one and the same instrument. Delivery of an executed counterpart of a signature page of this Amendment or any other document required to be delivered hereunder, by fax transmission or e-mail transmission (e.g. "pdf" or "tif") shall be effective as delivery of a manually executed counterpart of this Agreement. Without limiting the foregoing, upon the request of any party, such fax transmission or e-mail transmission shall be promptly followed by such manually executed counterpart.

4.10 No Actions, Claims, Etc. As of the date hereof, each of the Loan Parties hereby acknowledges and confirms that it has no knowledge of any actions, causes of action, claims, demands, damages and liabilities of whatever kind or nature, in law or in equity, against the Administrative Agent, the Lenders, or the Administrative Agent's or the Lenders' respective officers, employees, representatives, agents, counsel or directors arising from any action by such Persons, or failure of such Persons to act under the Credit Agreement on or prior to the date hereof.

4.11 GOVERNING LAW. THIS AMENDMENT SHALL BE GOVERNED BY, AND SHALL BE CONSTRUED AND ENFORCED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK.

4.12 Successors and Assigns. This Amendment shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns.

4.13 General Release. In consideration of the Administrative Agent's willingness to enter into this Amendment, on behalf of the Lenders, each Loan Party hereby releases and forever discharges the Administrative Agent, the L/C Issuer, the Lenders and the Administrative Agent's, the L/C Issuer's and each Lender's respective predecessors, successors, assigns, officers, managers, directors, employees, agents, attorneys, representatives, and affiliates (hereinafter all of the above collectively referred to as the "Bank Group"), from any and all claims, counterclaims, demands, damages, debts, suits, liabilities, actions and causes of action of any nature whatsoever, including, without limitation, all claims, demands, and causes of action for contribution and indemnity, whether arising at law or in equity, whether known or unknown, whether liability be direct or indirect, liquidated or unliquidated, whether absolute or contingent, foreseen or unforeseen, and whether or not heretofore asserted, which any Loan Party may have or claim to have against any of the Bank Group in any way related to or connected with the Loan Documents and the transactions contemplated thereby.

4.14 Consent to Jurisdiction; Service of Process; Waiver of Jury Trial. The jurisdiction, service of process and waiver of jury trial provisions set forth in Sections 10.14 and 10.15 of the Credit Agreement are hereby incorporated by reference, *mutatis mutandis*.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF: the parties hereto have caused this Amendment to be duly executed as of the date first above written.

BORROWER:

MISTRAS GROUP, INC., as Borrower

By: _____
Edward J. Prajzner
Senior Vice President, Chief Financial
Officer and Treasurer

GUARANTORS:

QUALITY SERVICES LABORATORIES, INC., a Delaware corporation

By: _____
Edward J. Prajzner
Vice President and Treasurer

MISTRAS INTERNATIONAL HOLDINGS INC., a Delaware corporation

By: _____
Edward J. Prajzner
Vice President and Treasurer

WEST PENN NON-DESTRUCTIVE TESTING, LLC, a Pennsylvania limited liability
company

By: _____
Edward J. Prajzner
Vice President and Treasurer

BANK OF AMERICA, N.A., as Administrative Agent

By: _____
Name:
Title:

[SIGNATURES CONTINUE ON THE FOLLOWING PAGE]

SIGNATURE PAGE TO FIRST AMENDMENT TO FIFTH AMENDED AND RESTATED CREDIT AGREEMENT

BANK OF AMERICA, N.A., as a Lender and as the
L/C Issuer

By: _____
Name:
Title:

[SIGNATURES CONTINUE ON THE FOLLOWING PAGE]

SIGNATURE PAGE TO FIRST AMENDMENT TO FIFTH AMENDED AND RESTATED CREDIT AGREEMENT

JPMORGAN CHASE BANK, N.A., as a Lender

By: _____
Name:
Title:

[SIGNATURES CONTINUE ON THE FOLLOWING PAGE]

SIGNATURE PAGE TO FIRST AMENDMENT TO FIFTH AMENDED AND RESTATED CREDIT AGREEMENT

KEYBANK NATIONAL ASSOCIATION, as a Lender

By: _____
Name:
Title:

[SIGNATURES CONTINUE ON THE FOLLOWING PAGE]

SIGNATURE PAGE TO FIRST AMENDMENT TO FIFTH AMENDED AND RESTATED CREDIT AGREEMENT

WELLS FARGO BANK, NATIONAL ASSOCIATION, as a Lender

By: _____
Name:
Title:

[SIGNATURES CONTINUE ON THE FOLLOWING PAGE]

SIGNATURE PAGE TO FIRST AMENDMENT TO FIFTH AMENDED AND RESTATED CREDIT AGREEMENT

TD BANK, NATIONAL ASSOCIATION, as a Lender

By: _____
Name:
Title:

[END OF SIGNATURE PAGES]

SIGNATURE PAGE TO FIRST AMENDMENT TO FIFTH AMENDED AND RESTATED CREDIT AGREEMENT

The following is a list of subsidiaries of the registrant. The list omits some subsidiaries which, in the aggregate, would not constitute a significant subsidiary.

Name	Jurisdiction of Organization
Aetos Group, Inc.	Delaware
Assistances Controles Technologies	France
CISMIS Springfield Corp.	Delaware
Conam Inspection and Engineering Services, Inc.	Delaware
Controles Industriels de L'entang	France
GMA Aeronautica S.L.U.	Germany
GMA Engineering GmbH	Germany
GMA Holding B.V.	The Netherlands
GMA Werkstoffprufung GmbH	Germany
Mistras Arizona Inspection Services Inc.	Delaware
Mistras Canada, Inc.	Canada
Mistras Engineering Services Inc.	New Jersey
Mistras GMA Holdings GmbH	Germany
Mistras Group B.V.	The Netherlands
Mistras Group BVBA	Belgium
Mistras Group GmbH	Germany
Mistras Group Hellas A.B.E.E.	Greece
Mistras Group Limited	England and Wales
Mistras Group SAS	France
Mistras Group South America Ltda	Brazil
Mistras International Holdings Inc.	Delaware
Mistras Services Inc.	Canada
Mistras Quebec Holdings Inc.	Canada
Mistras Ropeworks Training Corp.	Delaware
Mistras Western Canada Holdings Inc.	Canada
MWC Management Inc.	Canada
NDT do Brasil Ltd.	Brazil
Onstream Holdings, Inc.	Canada
Onstream Pipeline Inspection Services Inc.	Canada
Onstream Pipeline Inspection USA Inc.	Nevada
Physical Acoustics India Private Ltd.	India
Physical Acoustics South America LTDA	Brazil
Quality Services Laboratories, Inc. (1)	Delaware
QSL NDT Inc.	Delaware
QSL Quebec Inc.	Canada
R.A.C. Group Inc.	Canada
Rope Access Calgary, Inc.	Canada
West Penn Non-Destructive Testing, LLC	Pennsylvania

(1) Also does business under the names QSL and QSL Plus.

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Board of Directors
Mistras Group, Inc.:

We consent to the incorporation by reference in the registration statement (Nos. 333-164688 and 333-217047) on Form S-8 of Mistras Group, Inc. of our reports dated March 27, 2020, with respect to the consolidated balance sheets of Mistras Group, Inc. and subsidiaries (the Company) as of December 31, 2019 and 2018, the related consolidated statements of income (loss), comprehensive income (loss), equity, and cash flows for each of the years in the three-year period ended December 31, 2019, and the related notes (collectively, the consolidated financial statements), and the effectiveness of internal control over financial reporting as of December 31, 2019, which reports appear in the December 31, 2019 annual report on Form 10-K of Mistras Group, Inc.

Our report dated March 27, 2020, on the effectiveness of internal control over financial reporting as of December 31, 2019, expresses our opinion that the Company did not maintain effective internal control over financial reporting as of December 31, 2019 because of the effect of material weaknesses on the achievement of the objectives of the control criteria and contains an explanatory paragraph that states material weaknesses have been identified and included in management's assessment related to risk assessment not sufficiently considering changes in business processes and not having a sufficient complement of trained resources with knowledge of financial reporting processes and internal control related to accounting for income taxes. As a consequence, process level controls over the completeness, existence, accuracy, valuation and presentation of the income tax provision, including deferred tax assets and liabilities and valuation allowance, were not effective.

Our report dated March 27, 2020, on the effectiveness of internal control over financial reporting as of December 31, 2019, also includes an explanatory paragraph indicating that management excluded from its assessment of the effectiveness of the Company's internal control over financial reporting as of December 31, 2019, New Century Software, LLC's internal control over financial reporting associated with total assets of 0.2% and total revenues of 0.3% included in the consolidated financial statements of the Company as of and for the year ended December 31, 2019. Our audit of internal control over financial reporting of the Company also excluded an evaluation of the internal control over financial reporting of New Century Software, LLC.

/s/ KPMG LLP

Short Hills, New Jersey
March 27, 2020

**CERTIFICATION PURSUANT TO RULE 13A-14(a) OR 15D-14(a) OF THE SECURITIES
EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE
SARBANES-OXLEY ACT OF 2002**

I, Dennis Bertolotti, certify that:

1. I have reviewed this Annual Report on Form 10-K of Mistras Group, Inc.;
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 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.

March 27, 2020

By: /s/ DENNIS BERLOTTI

Dennis Bertolotti

President, Chief Executive Officer and Director
(Principal Executive Officer)

**CERTIFICATION PURSUANT TO RULE 13A-14(a) OR 15D-14(a) OF THE SECURITIES
EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE
SARBANES-OXLEY ACT OF 2002**

I, Edward J. Prajzner, certify that:

1. I have reviewed this Annual Report on Form 10-K of Mistras Group, Inc.;
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 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.

March 27, 2020

By: /s/ EDWARD J. PRAJZNER

Edward J. Prajzner

Executive Vice President, Chief Financial Officer and Treasurer
(Principal Financial and Accounting Officer)

**CERTIFICATION BY PRINCIPAL EXECUTIVE OFFICER
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 on Form 10-K of Mistras Group, Inc. (the Company) for the year ended December 31, 2019, I, Dennis Bertolotti, President and Chief Executive Officer, hereby certify pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, to the best of my knowledge and belief, that:

(1) such Annual Report on Form 10-K for the year ended December 31, 2019, fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) the information contained in such Annual Report on Form 10-K for the year ended December 31, 2019, fairly presents, in all material respects, the financial condition and results of operations of the Company.

The foregoing certification is being furnished solely to accompany such Annual Report on Form 10-K for the year ended December 31, 2019, pursuant to 18 U.S.C. § 1350, and is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and is not to be incorporated by reference into any filing of the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

Date: March 27, 2020

/s/ DENNIS BERTOLOTTI

Dennis Bertolotti

President, Chief Executive Officer and Director
(Principal Executive Officer)

**CERTIFICATION BY PRINCIPAL EXECUTIVE OFFICER
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 accompanying Annual Report on Form 10-K of Mistras Group, Inc. (the Company) for the year ended December 31, 2019, I, Edward J. Prajzner, Principal Financial and Accounting Officer, hereby certify pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, to the best of my knowledge and belief, that:

(1) such Annual Report on Form 10-K for the year ended December 31, 2019, fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) the information contained in such Annual Report on Form 10-K for the year ended December 31, 2019, fairly presents, in all material respects, the financial condition and results of operations of the Company.

The foregoing certification is being furnished solely to accompany such Annual Report on Form 10-K for the year ended December 31, 2019, pursuant to 18 U.S.C. § 1350, and is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and is not to be incorporated by reference into any filing of the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

Date: March 27, 2020

/s/ EDWARD J. PRAJZNER

Edward J. Prajzner

Executive Vice President, Chief Financial Officer, and Treasurer
(Principal Financial and Accounting Officer)