

GSE SYSTEMS INC

Form 10-K

March 28, 2019

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d)
OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2018

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 001-14785

GSE Systems, Inc.

(Exact name of registrant as specified in its charter)

Delaware

52-1868008

(State of incorporation)

(I.R.S. Employer Identification Number)

1332 Londontown Blvd., Suite 200, Sykesville MD 21784

(Address of principal executive offices)

(Zip Code)

Registrant's telephone number, including area code: (410) 970-7800

SECURITIES REGISTERED PURSUANT TO SECTION 12(b) OF THE ACT:

Title of each class	Name of each exchange on which registered
Common Stock, \$.01 par value	Nasdaq

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 o No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes o 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 if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements

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incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. []

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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. (Check one):

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

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

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

The aggregate market value of Common Stock held by non-affiliates of the Registrant was \$60,662,030 on June 30, 2018, the last business day of the Registrant's most recently completed second fiscal quarter, based on the closing price of such stock on that date of \$3.25.

The number of shares outstanding of the registrant's Common Stock as of February 28, 2019 was 19,946,759 shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2019 Annual Meeting of Stockholders to be filed pursuant to Regulation 14A under the Securities Exchange Act of 1934, as amended, are incorporated by reference into Part III.

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CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS.

This report and the documents incorporated by reference herein contain “forward-looking” statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”) that are based on management’s assumptions, expectations and projections about us, and the industry within which we operate, and that have been made pursuant to the Private Securities Litigation Reform Act of 1995 reflecting our expectations regarding our future growth, results of operations, performance and business prospects and opportunities. Wherever possible, words such as “anticipate”, “believe”, “continue”, “estimate”, “intend”, “may”, “plan”, “potential”, “predict”, “expect”, “should”, “will” and similar expressions, or the negative of these terms or other comparable terminology, have been used to identify these forward-looking statements. These forward-looking statements may also use different phrases. These statements regarding our expectations reflect our current beliefs and are based on information currently available to us. Accordingly, these statements by their nature are subject to risks and uncertainties, including those listed under Item 1A Risk Factors, which could cause our actual growth, results, performance and business prospects and opportunities to differ from those expressed in, or implied by, these forward-looking statements. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. Except as otherwise required by federal securities law, we are not obligated to update or revise these forward looking statements to reflect new events or circumstances. We caution you that a variety of factors, including but not limited to the factors described below under Item 1A Risk Factors and the following, could cause our business conditions and results to differ materially from what is contained in forward-looking statements:

- changes in the rate of economic growth in the United States and other major international economies;
- changes in investment by the nuclear and fossil electric utility industry, the chemical and petrochemical industries, or the U.S. military;
- changes in the financial condition of our customers;
- changes in the regulatory environment;
- changes in project design or schedules;
- contract cancellations;
 - changes in our estimates of costs to complete projects;
- changes in trade, monetary and fiscal policies worldwide;
- currency fluctuations;
- war and/or terrorist attacks on facilities either owned by our customers or our company, or where equipment or services are or may be provided;
- initiation, prosecution, or outcomes of future litigation;
- protection and validity of our trademarks and other intellectual property rights;
- increasing competition by foreign and domestic companies;
- compliance with our debt covenants;
- recoverability of claims against our customers and others; and
- changes in estimates used in our critical accounting policies.

Other factors and assumptions not identified above were also involved in the formation of these forward-looking statements and the failure of such other assumptions to be realized, as well as other factors, may also cause actual results to differ materially from those projected. Most of these factors are difficult to predict accurately and are generally beyond our control. You should consider the areas of risk described above and in Item 1A Risk Factors in connection with any forward-looking statements that may be made by us. You should not place undue reliance on any forward-looking statements. New factors emerge from time to time, and it is not possible for us to predict which factors will arise.

We undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise. You are advised, however, to consult any additional disclosures we make in proxy statements, quarterly reports on Form 10-Q and current reports on Form 8-K filed with the SEC.

Company Information Available on the Internet

Our Internet address is www.gses.com. We make available free of charge through our Internet site our annual reports on Form 10-K; quarterly reports on Form 10-Q; current reports on Form 8-K; proxy statements, and any amendment to those reports filed or furnished pursuant to the Exchange Act as soon as reasonably practicable after such material is electronically filed with, or furnished to, the SEC.

PART I

ITEM 1. **BUSINESS.**

GSE Systems, Inc. (GSE Systems, GSE, the Company, we, us or our), a Nasdaq-listed company trading under the symbol GVP, is a leading provider of engineering, expert staffing, and simulation software to clients in the power and process industries. We provide customers with simulation, engineering and plant services that help clients reduce risks associated with operating their plants, increase revenue through improved plant and employee performance, and lower costs through improved operational efficiency. In addition, we provide professional services that systematically help clients fill key vacancies in the organization on a short-term basis, primarily in procedures, engineering, technical support, and training focused on regulatory compliance and certification in the nuclear power industry. Our operations also include interactive computer-based tutorials and simulation software for the refining, chemical, and petrochemical industries. We are one of the largest independent nuclear service companies in North America. We execute projects globally with approximately 402 employees, as of December 31, 2018, operating from offices in the U.S. and China, deployed at client sites. While most of our revenue comes from the nuclear power market, we also serve the fossil, refining, chemical, and petrochemical markets.

GSE Systems was formed on March 30, 1994, to consolidate the simulation and related businesses of General Physics International Engineering & Simulation, S3 Technologies, and EuroSim. The Company completed its Initial Public Offering in 1995.

On November 14, 2014, we acquired Hyperspring, LLC (Hyperspring). Hyperspring is a nuclear industry expert staffing firm that primarily provides highly skilled, high-value professionals to fill training and consulting positions on a contract basis for nuclear power plant operators and employs approximately 80 professionals. Hyperspring professionals provide training, operations and maintenance support including: generic fundamentals exams (GFES), accreditation training visit (ATV) preparation, senior reactor operator (SRO) certification, procedure development, work management, tagging/labeling, outage execution, planning/scheduling, corrective action, self-assessments and equipment reliability. Customers have included Entergy, TVA, PSEG Nuclear and First Energy.

On September 20, 2017, we acquired Absolute Consulting, Inc. (Absolute). Absolute is a provider of technical consulting and staffing solutions to the global nuclear power industry and employs approximately 131 professionals with expertise in procedure writing, engineering, technical support, project management, training, project controls, and corrective actions. Customers have included Entergy, Duke Energy, Vistra Energy and Southern Nuclear Operating Company.

On May 11, 2018, we acquired True North Consulting, LLC (True North). True North is a provider of engineering solutions to nuclear and fossil fuel power plants with an emphasis on regulatory-driven ASME code programs and employs approximately 59 professionals. Customers have included Exelon, Entergy, Southern Nuclear Operating Company, and EPRI.

On February 15, 2019, we acquired DP Engineering Ltd, Co, (DP Engineering). DP Engineering is a specialized provider of high-value engineering services and solutions to the nuclear power industry and employs approximately 110 full-time professionals. Founded in 1995 in Fort Worth, Texas, DP Engineering generates over 90% of its revenue from the nuclear power industry with core expertise in: mechanical design; civil/structural design; electrical, instrumentation and controls design; digital controls/cyber security; and fire protection. DP Engineering primarily works under master service agreements as the Engineer of Choice. Customers have included Entergy, Fluor, Talen Energy Services, and Vistra Energy.

As a result of the DP Engineering acquisition, we have added approximately 110 employees to the Company.

Operating Segments

We operate through two reportable business segments: Performance Improvement Solutions and Nuclear Industry Training and Consulting. Each segment focuses on delivering solutions to customers within our targeted markets - primarily the power and process industries. Marketing and communications, accounting, finance, legal, human resources, corporate development, information systems and other administrative services are organized at the corporate level. Business development and sales resources are generally aligned with each segment to support existing customer accounts and new customer development. The business units collaborate to facilitate cross-selling and the development of new solutions. The following is a description of our business segments:

·Performance Improvement Solutions (approximately 47% of revenue)

Our Performance Improvement Solutions ("Performance") segment primarily encompasses our power plant high-fidelity simulation solutions, engineering services for ASME programs, thermal performance optimization and plan design modifications, and interactive computer-based tutorials/simulation focused on the process industry. This segment includes various simulation products, engineering services, and operation training systems delivered across the industries we serve, primarily nuclear and fossil fuel power generation, as well as the process industries. Our simulation solutions include the following: (1) simulation software and services, including operator training systems, for the nuclear power industry, (2) simulation software and services, including operator training systems, for the fossil power industry, and (3) simulation software and services for the process industries used to teach fundamental industry processes and control systems to newly hired employees and for ongoing workforce development and training. GSE and its predecessors have been providing these services since 1976.

Our engineering solutions include the following: (1) in-service testing for engineering programs focused on ASME OM code including Appendix J, balance of plant programs, and thermal performance; (2) in-service inspection for specialty engineering including ASME Section XI; (3) software solutions; and (4) mechanical design, civil/structural design, electrical, instrumentation and controls design, digital controls/cyber security, and fire protection for nuclear power plant design modifications. Our True North and DP Engineering businesses typically work as either the engineer of choice or specialty engineer of choice for our clients under master services agreements. GSE and its predecessors have been providing these engineering solutions and services since 1995.

On May 11, 2018, we acquired True North, which is a provider of technical engineering solutions to nuclear and fossil fuel power plants with an emphasis on regulatory-driven ASME code programs. The acquisition of True North is expected to broaden our engineering services offering, expand our relationships with several of the largest nuclear energy providers in the United States, and add a highly specialized, complimentary talent pool to our employee base.

·Nuclear Industry Training and Consulting (approximately 53% of revenue)

Nuclear Industry Training and Consulting ("NITC") provides highly specialized, expert-professionals to the nuclear power industry. These employees work at our clients' facilities under client direction. Examples of these highly skilled positions are senior reactor operations instructors, procedure writers, project managers, work management specialists, planners and training material developers. This business is managed through the Hyperspring and Absolute subsidiaries. The business model, management focus, margins and other factors clearly separate the business line from the rest of the Company's product and service portfolio. GSE and its predecessors have been providing these training and consulting services since 1997.

Financial information is provided in Note 18 of the accompanying consolidated financial statements regarding our business segments and geographic operations and revenue.

Business Strategy, Industry Trends, Products and Services

Business Strategy

Our objective is to create a leading specialty engineering, expert staffing and technology delivery platform focused primarily on the nuclear power industry. We offer our differentiated suite of products and services to adjacent markets such as the fossil power and process industries where our offerings are a natural fit, delivering a clear and compelling value proposition to the market. Our primary growth strategy is twofold: (1) seek acquisitions to accelerate our overall growth in a manner that is complementary to our core business and (2) expand organically within our core markets by leveraging our market leadership position and drive increased usage and product adoption via new products and services. To accomplish this objective, we will pursue the following activities:

- Pursue roll-up acquisition strategy. We intend to complement our organic growth strategy through selective acquisitions including, but not limited to, the following: engineering; training, staffing and consulting service businesses for the power industry, with a particular focus on nuclear power; and software utilized in the power industry, both domestic and international. We are focusing our efforts on acquisitions that would enhance our existing portfolio of products and services, strengthen our relationships with our existing customers, and potentially expand our footprint to include new customers in our core served industries. We have made three acquisitions since 2017 and believe the opportunity exists to acquire more businesses that are complementary to ours, allowing us to accelerate our growth strategy.

In February 2019, we acquired DP Engineering, a specialized provider of high-value engineering services and solutions to the nuclear power industry. In May 2018, we acquired True North, a leading provider of specialty engineering solutions to the nuclear power industry and in September 2017, we acquired Absolute, a provider of technical consulting and staffing solutions to the global nuclear power industry. The acquisitions of Absolute, True North and DP Engineering are expected to strengthen the Company's global leadership in the nuclear services area. The acquisitions added new capabilities to the GSE solution offering and bring new highly complementary customers to GSE, while at the same time deepening GSE relationships with existing clients. These acquisitions, together with our earlier acquisition of Hyperspring in November 2014, are a significant proof point of the thesis that GSE is a compelling platform for consolidating a fragmented vendor ecosystem for nuclear power. We believe the acquisitions add significant scale and focus to the business, while positioning GSE as a "go to" provider of technical and consulting solutions to the power industry, in particular nuclear power.

- Expand our total addressable market. Our focus on growth means introducing product capabilities or new product and service categories that create value for our customers and therefore expand our total addressable market. Currently we are working on initiatives to expand our solution offerings in both of our business segments that may include, but not be limited to, the following: expanding our software product portfolio to include enhanced power and process simulation tools and systems that are complementary to our core offerings; delivering enhanced learning management systems/solutions; offering fully outsourced training solutions to our customers; adding work flow process improvement solutions; tailoring operational reporting and business intelligence solutions to address the unique need of our end user markets; and adding new services to broaden our market reach.

Initiatives such as these will broaden our scope and enable us to engage more deeply with the segments we serve and adjacent segments. We have delivered a compelling solution, the GSE GPWR™ Generic Pressurized Water Reactor simulation technology, proving that our modeling technology can be sold in generic form via traditional license terms and conditions to the nuclear industry ecosystem. We have both upgraded and expanded the EnVision™ library of simulation and eLearning tutorials for the process industries with specific new products for training clients in the upstream segment of the oil and gas industry including launching a new cloud-based training platform, EnVision™ Learning On-Demand, that significantly extends the capabilities of its industry leading EnVision™ tutorials and simulations. We continue to provide cutting edge training systems by adapting our technology to systems that meet the specific needs of customers such as U.S. government laboratories.

- Research and development (R&D). We invest in R&D to deliver unique solutions that add value to our end-user markets. We have delivered nuclear core and Balance-of-Plant modeling and visualization systems to the industry. To address the nuclear industry's need for more accurate simulation of both normal and accident scenarios, we provide our DesignEP® and RELAP5-HD® solutions. Our entire JADE™ suite of simulation software, including industry leading JTOPMERET® and JElectric™ software, provides the most accurate simulation of Balance-of-Plant and electrical systems available to the nuclear and fossil plant simulation market. The significant enhancements we have made to our SimExec® and OpenSim™ platforms enables customers to be more efficient in the daily operation of their simulators. We are bringing SimExec® and OpenSim™ together into a next generation unified environment that will add new capabilities as requested by clients and driven by market need.

We intend to continue to make pragmatic and measured investments in R&D that first and foremost are driven by the market and complement our growth strategy. Such investments in R&D may result in on-going enhancement of existing solutions as well as the creation of new solutions to serve our target markets, ensuring that we add greater value that is easier to use, at lower total cost of ownership than any alternative available to customers. GSE has pioneered a number of industry standards and intends to continue to be one of the most innovative companies in our

industry. During the years ended December 31, 2018 and 2017, we have made R&D investments totaling \$1.3 million and \$1.6 million, respectively.

- Strengthen and develop our talent while delivering high-quality solutions. Our experienced employees and management team are our most valuable resources. Attracting, training, and retaining top talent is critical to our success. To achieve our talent goals, we intend to remain focused on providing our employees with entrepreneurial opportunities to increase client contact within their areas of expertise and to expand and deepen our service offerings. We will also continue to provide our employees with training, personal and professional growth opportunities, performance-based incentives including opportunities for stock ownership, bonuses and competitive benefits as benchmarked to our industry and locations. We have developed a strong reputation for quality services based upon our industry-recognized depth of experience, ability to attract and retain quality professionals, and exceptional expertise across multiple service sectors. We have received numerous industry certificates and awards over the years for outstanding service.

4

Industry Trends

- Industry need to build and sustain a highly skilled workforce

We believe a critical ongoing challenge facing the industries we serve is access to, and continued development of, a highly trained and efficient workforce. This challenge manifests primarily in two ways: the increasing pace at which industry knowledge and experience are lost as a significant percentage of the existing experienced workforce reaches retirement age; and the fact that as new power plants come on-line, there is an increased demand for workers to staff and operate those plants.

In the United States, the energy industry is expected to lose a large percentage of its workforce within the next few years as baby boomers retire on the traditional schedule. For example, Power Engineering reported that the power sector needs more than 100,000 skilled workers within the next few years to replace retiring baby boomers. Electric, Light, and Power reported that 72% of energy employers currently struggle to find quality candidates and fill open positions. The National Electrical Contractors Association reported that 7,000 electricians join the field each year, while 10,000 retire. Finally, the Nuclear Energy Institute estimated that 39% of the nuclear workforce were eligible to retire in the next few years. As the nuclear industry expands and modernizes its fleet and strains to maintain the high standards of training for the existing workforce, existing plant simulator systems, which provide a critical environment for training services, are often operating 24 hours a day. With workers retiring and the need to backfill as well as expand the workforce for new units, certain operators are exploring the opportunity to de-bottleneck their existing simulator capabilities through the creation of dual reference simulators. Other workforce shortages and/or short-term spikes in demand for specialist skills that we offer similarly are positive developments for our business.

Globally, as more people increase their standard of living, their demand for power will increase, which in turn will require continuing construction of power plants to meet this surging demand. Developing a skilled labor force to operate these plants and keeping their skills current and their certifications in compliance with regulatory requirements is a key challenge facing the global power industry.

- Status of nuclear power in 2017/2018

The world's nuclear reactors performed well in 2017 (the most recent full year for which data is available). Global nuclear electricity output was 2506 terawatt-hour (TWh), an increase of 29 TWh compared to 2016. This marked the fifth successive year that nuclear output has increased, with generation 160 TWh higher than in 2012.

At the end of 2017 the global nuclear capacity of 448 operable reactors stood at 392 GWh, up 2 GWe on the end of 2016 total. Four new reactors were connected to the grid, with a combined capacity of 3373 MWe. Five reactors were shut down, with a combined capacity of 3025 MWe. Two of those reactors, Monju and Santa Maria de Garoña, had not generated for some years previously, however.

The number of reactors under construction at the end of 2017 was 59. The median average construction time for the four reactors grid connected in 2017 was 58 months. In addition to the four grid connections, there were four construction starts and two construction projects halted. Both 2015 and 2016 had more grid connections, with ten each, and there were more grid connections in 2018 than in 2017.

The capacity factor for the global fleet stood at 81%, maintaining the high availability of around 80% that has been maintained since 2000, up from the 60% average capacity factor at the start of the 1980s.

In Asia, construction started on the first nuclear power reactor to be built in Bangladesh. Nuclear generation was boosted by the return to service of the fifth Japanese reactor, with further restarts taking place in 2018. In South Korea, a public vote led to the resumption of construction of Shin-Kori 5. Construction was completed on the first unit at Barakah, in the United Arab Emirates (UAE).

In Canada, plans are progressing to support the development of small modular reactor (SMR) technology, as well as to ensure the continued operation of its existing Candu reactors.

In the US, construction was halted on the two VC Summer reactors, but agreement was reached on the completion of the two sister reactors at Vogtle plant. In some states, measures have been introduced to correct market distortions to support the continued operation of nuclear plants providing reliable and clean electricity.

Turkey has become the latest country to start a new build program. Construction on-site at Akkuyu formally started in December 2017, with construction of the first reactor starting in April 2018. Progress is underway, evidenced by the construction of more than 25 reactors scheduled to be completed in 2018 and 2019. New reactor projects are needed to maintain and accelerate global nuclear build so that nuclear generation can achieve the Harmony goal of supplying 25% of the world's global electricity by 2050.

A two-year budget deal signed by President Donald Trump on February 9, 2018, includes provisions that will benefit the development of nuclear power in the U.S. including the expansion of Vogtle, which is located near Waynesboro, GA. The Nuclear Energy Institute said that the legislation signed: (1) allows for new nuclear reactors placed in service after December 31, 2020, to qualify for the nuclear PTC; (2) permits the Secretary of Energy to allocate credits up to a 6,000-megawatt capacity limit for the first “new nuclear” reactors placed in service after December 31, 2020; and (3) allows public-entity project partners to transfer their credits to other project partners.

NEI said that the deadline change will ensure the two reactors being built at Vogtle will benefit from the PTC and that the 6,000-MW capacity limit indicates the PTC will also benefit NuScale Power LLC’s and its partners’ plans to build its first commercial power plant at the Idaho National Laboratory by 2026.

For the existing U.S. nuclear fleet, there is recognition that these plants are essential to meeting national goals of reducing carbon emissions, even as renewable energy sources are introduced. This recognition of the importance of nuclear power in providing zero-carbon baseload is demonstrated by the state of New York's Clean Energy Standard that values the emission-free energy of New York's nuclear fleet by granting a subsidy of 1.7¢/kWh. This subsidy helps ensure the state's existing nuclear plants remain economically viable in an era of low-cost natural gas, even competing with wind and solar power generation sources receiving a subsidy of 4.5¢/kWh.

In addition, the Illinois Legislature on December 2, 2016, passed the Future Energy Jobs Bill on December 2, 2016, a measure that ensures the continued operation of the Clinton and Quad Cities nuclear power plants in that state. In a statement, the Nuclear Energy Institute said the bill’s passage was a “remarkable moment” for the state and the nuclear industry. Gov. Bruce Rauner signed the bill into law on December 7, 2016. The Future Energy Jobs Bill provides Exelon and Commonwealth Edison with a \$235 million annual credit for the carbon-free energy produced by the Clinton and Quad Cities nuclear plants.

At the end of October 2017, Connecticut passed a bill that may help it keep its Millstone nuclear plant open. The bill permits state energy officials to change the rules for how Dominion Nuclear Connecticut sells electricity from Millstone. Millstone could sell up to 75% of its output in competition with the other zero-carbon sources of electricity under the bill. This is a significant recognition of the strategic value that nuclear power provides via zero-carbon baseload.

On May 22, 2018, New Jersey passed a bill establishing a Zero Emissions Certificate (ZEC) program to maintain New Jersey’s nuclear energy supply, which contributes close to 40 percent of the state’s electric capacity and is by far its largest source of carbon free energy. Plants seeking to participate in the program would be required, among other things, to demonstrate that they make a significant contribution to New Jersey air quality and are at risk of closure within three years. The four reactors operating in New Jersey are capable of generating over 4,100 megawatts (MW) of electricity. Three are located at the Salem-Hope Creek nuclear plant and are operated by a unit of Public Service Enterprise Group Inc., the state’s biggest power company.

The actions of New York, Illinois, Connecticut and New Jersey represent a trend that may continue as states such as Ohio and Pennsylvania consider legislation to recognize the value of zero-carbon power produced by nuclear plants in those states. This would echo the rollout of the Renewable Portfolio Standard across more than half of the states in the US to recognize the benefits of zero-carbon renewable power.

In regulated markets where the economy is growing, the nuclear fleet is profitable and expanding, with two reactors under construction in the southeast U.S. Longer term, the trends for nuclear power have promise as small-scale modular reactors (SMR's) advance in development and prototyping. A project is planned to build a NuScale Power SMR at Idaho National Labs. NuScale Power is a long-standing GSE customer. Tennessee Valley Authority submitted an application for an early site permit for two or more SMRs modules (up to 800 MWe, 2420 MWt) at the Clinch River Nuclear site on May 12, 2016. In January 2017 the Nuclear Regulatory Commission accepted and docketed the early site permit. U.S. Department of Energy recently released a draft plan to double America's nuclear power capacity by 2050. The plan, dubbed "Vision 2050", promotes expanding America's nuclear capacity through advanced reactor designs including small and medium-size reactors.

We believe GSE is well positioned to take full advantage of these strategic global and domestic trends by providing high fidelity simulation and training solutions to the global power and process industries.

Products and Services

- Performance Improvement Solutions

To assist our clients in creating world-class internal training and engineering improvement processes, we offer a set of integrated and scalable products and services that provide a structured program focused on continuous skills improvement for experienced employees to engineering services, including plant design verification and validation, ASME code compliance, and design plant modification work. We provide the right solutions to solve our clients' most pressing needs.

For workforce development and training, students and instructors alike must have a high degree of confidence that their power plant simulator truly reflects plant behavior across the entire range of operations. To earn this confidence, GSE's simulation solution starts with the most robust engineering approach possible. Using state-of-the-art modeling tools combined with our leading nuclear power modeling expertise, GSE provides simulation solutions that achieve unparalleled fidelity and accuracy. The solutions that GSE provides are also known for ease of use, resulting in increased productivity for end-users. For these reasons, GSE has delivered more nuclear power plant simulators than any other company in the world.

For virtual commissioning, designers of first-of-a-kind plants or existing plants need a highly accurate dynamic simulation platform to model a wide variety of design assumptions and concepts from control strategies to plant behavior to human factors. Because new builds and upgrades to existing plants result in deployment of new technology, often involving the integration of disparate technologies for the first time, a high-fidelity simulator enables designers to model the interaction between systems in advance of construction. With our combination of simulation technology and expert engineering, GSE was chosen to build first-of-a-kind simulators for the AP1000, PBMR, and small modular reactors such as those being built by NuScale.

Examples of the types of simulators we sell include, but are not limited to, the following:

Universal Training Simulators: These products complement our Self-Paced Training Tutorials by reinforcing what the student learned in the tutorial, putting it into practice on the Universal Simulator. The simulation models are high fidelity and engineering correct, but represent a typical plant or typical process, rather than the exact replication of a client's plant. We have delivered over 360 such simulation models to clients consisting of major oil companies and educational institutions.

Part-Task Training Simulators: Like our Universal Simulators, we provide other unique training solutions such as a generic nuclear plant simulator and VPanel® displays, which replicate control room hardware and simulator solutions specific to industry needs such as severe accident models to train on and aid in the understanding of events like the Fukushima Daiichi accident.

Plant-Specific Operator Training Simulators: These simulators exactly replicate the plant control room and plant operations. They provide the highest level of realism and training available, and allow users to practice their own plant-specific procedures. Clients can safely practice startup, shutdown, and other normal operations, as well as response to abnormal events we all hope they never have to experience in real life. Since our inception, we have delivered over 480 plant-specific simulators to clients in the nuclear power, fossil power and process industries worldwide.

- Nuclear Industry Training and Consulting

As our customers' experienced staff retire, access to experts that can help operate and train existing and new employees in how to operate their plants is essential to ensure safe ongoing plant operations. In addition, operating and training needs change over time and sometimes our clients require fixed priced discrete projects or specialized courses in contrast to straight staff augmentation. The industry needs operating personnel, including procedure writers, engineers, operators and instructors who can step in and use as well as update the client's operating methods, procedures, training material and more. Finding technical professionals and instructors, who know the subject, can perform the work or teach it to others and can adapt to the client's culture, is critical. GSE provides qualified professionals, instructors and turnkey projects/courses that work within the client's system and complement the operating or training methods they already have in place. Examples of our training program courses include senior reactor operator certification, generic fundamentals training, and simulation supervisor training. In addition, we also provide expert support through consulting or turnkey projects for procedure writing, technical engineers, project managers, training material upgrade and development, outage execution, planning and scheduling, corrective actions programs, and equipment reliability.

We bring together the collection of skills we have amassed over more than 40 years beginning with its traditional roots in custom high-fidelity simulation and training solutions for the power industries, extended through the acquisition of specialized engineering capabilities, enhanced by the entry and intermediate level training solutions of EnVision and the extensive nuclear industry training and consulting services of Absolute and Hyperspring.

Customers and Locations

For more than 40 years, we have been developing next-generation, custom training simulation technologies. Since we built the first commercial full-scope nuclear power plant simulator in 1971, we have completed more than 1,100 installations in 50 countries.

In 2018, approximately 15% of our revenue was generated from end-users outside the United States and we have a concentration of revenue from two individual customers, which accounted for 14.3% and 26.9% of our consolidated revenue, respectively. A small representative list of our customer base includes: ABB Inc., American Electric Power, Bechtel Hanford National Laboratory, Duke Energy, EDF Energy (United Kingdom), Emerson Process Management, Exelon, PSEG Nuclear, Inc., Siemens AG (Germany), Southern Nuclear Operating Company, Inc., State Nuclear Power Automation System Engineering Company (China), Savannah River Nuclear Solutions, LLC, Tennessee Valley Authority, and Westinghouse Electric Co.

Hydrocarbon and chemical process customers include numerous large oil refineries and chemical plants such as BP (worldwide), Statoil ASA (Norway), Chevron, Emerson Process Management, Shell Oil Company (worldwide), and Total (Belgium).

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Marketing and Sales

We market our products and services through a network of direct sales staff, agents and representatives, and strategic alliance partners. Market-oriented business and customer account teams define and implement specific campaigns to pursue opportunities.

We continue to have a proactive public relations program, issuing non-financial press releases to announce product development and significant deliveries, as well as our presence at numerous industry trade shows and technical conferences. We are active on numerous social media platforms and strive to build a strong presence across all media that our clients use to find information about the Company. Our goal is to provide useful information at each stage of the client's journey with the Company.

The Company's ability to support its multi-facility, international, and multinational clients is facilitated by its network of offices and strategic partners in the U.S. and overseas. In addition to its office located in China, the Company's ability to conduct international business is enhanced by its multilingual and multicultural workforce. GSE has strategic relationships with system integrators and agents representing its interests in Bulgaria, Japan, Malaysia, Singapore, South Korea, Taiwan, Ukraine and various locations in the Gulf Coast Countries of the Middle East.

Competition

In the nuclear simulation market, we compete directly with firms primarily from Canada, France and the U.S., such as L-3 MAPPS Inc., a subsidiary of L-3 Communications (Canada), CORYS T.E.S.S (France) and Western Services Corporation. In the fossil simulation market, the Company competes with smaller companies in the U.S. and overseas. In the process industry our main competition comes from large digital control system/automation companies such as Honeywell and Schneider. In our engineering market, we compete with firms primarily from North America such as Enercon Services, Kinetrics, Sargent & Lundy, and AECOM.

The Nuclear Industry Training and Consulting business services include technical professional and training-related and services as well as staff augmentation solutions. The competition for these services includes but is not limited to the following: GP Strategies, The Westwind Group, Professional Training Technologies, and Western Technical Services. The competition for staff augmentation includes: Day & Zimmerman, Planet Forward, and The Westwind Group.

Competitive Advantages

Although there is competition in various industry niches, few companies in our space can combine our engineering, simulation and training expertise, especially for the nuclear power industry. Few of our competitors serve the broader performance improvement market and few work across the full spectrum of energy markets including nuclear and fossil power plus petrochemicals.

Proprietary Software Tools. We developed a library of proprietary software tools including auto-code generators and system models that substantially improve and expedite the design, production and integration, testing and modification of software and systems. These tools are used to automatically generate the computer code and systems models required for specific functions commonly used in simulation applications, thereby enabling the Company or its customers to develop high-fidelity, real-time software quickly, accurately and at lower costs. The Company also has an expertise integrating third-party engineering codes into the Company's simulation environment, thereby offering some of the most sophisticated technical solutions in the market. The Company has a substantial library of Process-Specific Simulation models and eLearning Modules aimed at the oil and gas, refining and specialty chemicals markets.

Industry Expertise. We are a leading innovator and developer of real-time simulation software with more than 40 years of experience producing high-fidelity, real-time simulators. As a result, the Company has acquired substantial applications expertise in the energy and process industries. As of December 31, 2018, the Company employed a highly educated and experienced multinational workforce of approximately 402 employees, including approximately 135 engineers and scientists in fields such as chemical, mechanical and electrical engineering, applied mathematics and computer sciences, and approximately 195 instructors and plant operations staff specialists. As a result of the DP Engineering acquisition, we have added approximately 110 employees to the Company.

Unique Combination of Talent. Few in our market space brings together the sophistication of simulation technology with the engineering expertise, training expertise and visualization expertise to provide the holistic people and plant performance improvement solutions as well as we do.

Reputation for Customer Satisfaction. As part of its ISO-9001:2015 Quality Program Certification, GSE measures customer satisfaction across numerous factors such as On-Time Delivery, Problem Solving, and Customer Communication. In each category measured we routinely exceed customer expectations.

Training Curricula. The Company has developed hundreds of detailed courses and simulator exercise material and specific industrial applications including oil and gas refining, gas-oil production, nuclear and combined cycle gas turbine power plant and desalination.

Our Nuclear Industry Training and Consulting business is mostly focused on training and operations support. Our trainers and consultants provide their services at customer facilities which allows us to interface with our customers directly in the course of doing business versus only periodically calling on customers. Our proximity gives us a significant competitive advantage in that we can immediately offer and implement solutions rather than contending with lengthy bid processes.

Intellectual Property.

The Company depends upon its intellectual property rights in its proprietary technology and information. GSE maintains a portfolio of trademarks (both registered and under common law), copyrights (both registered and unregistered), and licenses. While such trademarks, copyrights and licenses as a group are of material importance to the Company, it does not consider any one trademark, copyright, or license to be of such importance that the loss or expiration thereof would materially affect the Company. The Company relies upon a combination of trade secrets, copyright law, trademark law, contractual arrangements and technical means to protect its intellectual property rights. GSE distributes its software products under software license agreements that grant customers nonexclusive licenses for the use of its products. These are nontransferable. Use of the licensed software is restricted to designated computers at specified sites, unless the customer obtains a site license of its use of the software. Software and hardware security measures are also employed to prevent unauthorized use of the Company's software, and the licensed software is subject to terms and conditions prohibiting unauthorized reproduction of the software. The Company's perpetual licenses have an unlimited duration as long as they are adequately protected and the parties adhere to the material terms and conditions. The Company's other licenses and subscription agreements have specified durations and usage terms, and may expire or be revoked in certain circumstances.

The Company does not own any patents relevant to its business. The Company believes that all of the Company's trademarks (especially those that use the phrase "GSE Systems") are valid and will have an unlimited duration as long as they are adequately protected and sufficiently used.

GSE has numerous registered U.S. trademarks: GSE Systems®, JTOPMERET®, RELAP5-HD®, TOTALVISION®, VPanel® and SimExec®. Some of these trademarks have also been registered in foreign countries. The Company also claims trademark rights to DesignEP™, Java Application and Development Environment (JADE)™, OpenSim™, PSA-HD™, RACS™, SimSuite Pro™, SmartTutor™, THOR™, Xtreme I/S™, and others.

In addition, the Company maintains federal statutory copyright protection with respect to its software programs and products, has registered copyrights for some of the documentation and manuals related to these programs, and maintains trade secret protection on its software products and proprietary technologies and methodologies.

Despite these protections, the Company cannot be sure that it has protected or will be able to protect its intellectual property adequately, that the unauthorized disclosure or use of its intellectual property will be prevented, that others have not or will not develop similar technology independently, or, to the extent it owns any patents in the future, that others have not or will not be able to design around those patents. Furthermore, the laws of certain countries in which the Company's products are sold do not protect its products and intellectual property rights to the same extent as the laws of the United States.

Government Regulations

Our operations are directly and indirectly affected by political developments and both domestic and foreign governmental regulations. We cannot determine the extent to which changing political priorities, new legislation, new regulations or changes in existing laws or regulations may affect our future operations, positively or negatively.

Industries Served

The following chart illustrates the approximate percentage of the Company's 2018 and 2017 consolidated revenue by industries served:

	Years ended	
	December	
	31,	
	2018	2017
Nuclear power	91%	83%
Fossil fuel power	6%	9%
Process	3%	6%
Other	0%	2%
Total	100%	100%

Backlog

As of December 31, 2018, we had approximately \$70.6 million of total gross revenue backlog compared to \$71.4 million as of December 31, 2017. Most of our contract terms are less than 24 months. Our backlog includes only those amounts that have been funded and authorized and does not reflect the full amounts we may receive over the term of such contracts. Our backlog includes future expected revenue at contract rates, excluding contract renewals or extensions that are at the discretion of the client. We calculate backlog without regard to possible project reductions or expansions or potential cancellations unless and until we have reason to believe that such changes may occur.

Backlog is expressed in terms of gross revenue and, therefore, may include significant estimated amounts of third-party or pass-through costs to subcontractors and other parties. Because backlog is not a defined accounting term, our computation of backlog may not necessarily be comparable to that of our industry peers.

Employees

As of December 31, 2018, we had approximately 402 employees, which include approximately 191 in our Performance Improvement segment and 211 in our Nuclear Industry Training and Consulting segment. Excluding our Nuclear Industry Training and Consulting business, which consists primarily of contracted instructors, our employee attrition rate for 2018 among all staff was approximately 11%. To date, we have been able to locate and engage highly qualified employees as needed and we expect our growth efforts to be addressed through attracting top talent. As a result of the DP Engineering acquisition that closed on February 15, 2019, we have added approximately 110 employees to the Company.

ITEM 1A. RISK FACTORS.

The following are some of the factors that we believe could cause our actual results to differ materially from historical results and from the results contemplated by the forward-looking statements contained in this report and other public statements made by us. Additional risks and uncertainties not presently known to us, or that we currently see as immaterial, may also harm our business. Most of these risks are generally beyond our control. If any of the risks or uncertainties described below, or any such other or additional risks and uncertainties actually occurs, our business, results of operations and financial condition could be materially and adversely affected. The following information should be read in conjunction with Item 7 - Management's Discussion and Analysis of Financial Condition and Results of Operations and the consolidated financial statements and related notes under Item 8 - Financial Statements and Supplementary Data.

Our business is largely dependent on sales to the nuclear power industry. Any significant disruption in this industry would have a material adverse effect upon our revenue and profitability.

In 2018, 91% of our revenue was from customers in the nuclear power industry (83% in 2017). We expect to derive a significant portion of our revenue from customers in the nuclear power industry for the foreseeable future. Market demand for, and our ability to supply nuclear power plant simulators and related products and services is dependent on

the continued operation of nuclear power plants globally and, to a lesser extent, on the construction of new nuclear power plants. A wide range of factors affect the continued operation and construction of nuclear power plants, including the political, regulatory and legal environment in which they operate, the availability and cost of alternative means of power generation, the occurrence of future nuclear incidents, such as the one which occurred at the Fukushima Daiichi nuclear plant in 2011, and general economic conditions. Significant regulatory changes in the U.S. or abroad could materially affect demand for our products, the profitability of our service deliveries to nuclear power industry customers, and the overall efficacy of our current business model.

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Our sales to foreign customers expose us to risks associated with operating internationally.

Sales of products and services to end users outside the United States accounted for approximately 15% of the Company's consolidated revenue in 2018 and 19% of consolidated revenue in 2017. Consequently, our businesses are subject to a variety of risks that are specific to international operations, including the following:

- export laws and regulations that could erode our profit margins or restrict the export of some or all of our products;
- compliance with the U.S. Foreign Corrupt Practices Act and similar non-U.S. regulations such as the UK Bribery Act;
- the burden and cost of compliance with foreign laws, treaties and technical standards generally, as well as responding to changes in those requirements;
- contract award and funding delays;
- potential restrictions on transfers of funds;
- potential difficulties in accounts receivable collection;
- currency fluctuations, including costs and potentially limited availability of viable hedging options;
- import and export duties and value added or other taxes;
- transportation and communication delays and interruptions;
- differences in insurance availability and coverage in some jurisdictions;
- difficulties involving strategic alliances and managing foreign sales agents or representatives;
- uncertainties arising from foreign local business practices and cultural considerations; and
- potential military conflicts and political risks.

While we have and will continue to adopt measures to reduce the potential impact of losses resulting from the risks of our foreign business, we cannot ensure that such measures will be adequate. During the years ended December 31, 2018 and 2017, we did not have revenues greater than 10% from any individual foreign country.

Exports and sales to certain foreign countries, including the People's Republic of China, are subject to regulatory, political, and other risks.

The export and sale of our services and technology to certain foreign countries including China, are subject to U.S. export control regulations. Export control policy pertaining to China and other countries may be enforced through laws and regulations administered by the Department of Commerce and the Department of Energy, and jurisdiction with regard to the export and sale of our services and technology may be overlapping and unclear. Specific governmental authorizations may be required before we can export our services or technology to countries such as China, or collaborate with foreign entities or foreign individuals located in countries such as China. These restrictions include our own wholly-owned Chinese subsidiary and its employees. If export or other authorizations are required and not granted, or are significantly delayed, our international business plans pertaining to China and other countries could be materially affected. Further, our exports and sales to China and other countries with respect to which the United States may have shifting or negative diplomatic and trade relations, including sales made by or through our wholly-owned Chinese subsidiary, expose us to particular risks associated with the political and regulatory relationship between the U.S. and China and between the U.S. and such other countries.

In October 2018, the Department of Energy announced the tightening of certain export control restrictions with regard to the export of nuclear technology to China, including certain presumptive denials with regard to the export of identified nuclear technologies to China. Although we do not believe that these policy changes cover our technologies or services, additional restrictions pertaining to U.S. regulation and policy pertaining to international trade with China could adversely affect our business in China and the performance of our Chinese subsidiary.

Finally, violation of export control regulations, including those pertaining to China, could subject us to fines and other penalties, such as losing the ability to export for a period of years, which would limit our revenue growth opportunities and significantly hinder our attempts to expand our business internationally. Although we take steps to monitor and ensure our compliance with all applicable export laws and regulations, we are nevertheless exposed to political and regulatory risks that we may not be able to mitigate fully and that may have a material adverse effect upon our international business operations.

Our operations within China subject us to risks and uncertainties relating to the laws and regulations of China.

Our business and operations within China may be adversely affected by China's continuously evolving internal policies, laws and regulations, including those relating to nuclear technology, trade, taxation, import and export tariffs or restrictions, currency controls, cybersecurity and data protection, indigenous innovation and the promotion of a

domestic nuclear industry, and intellectual property rights and enforcement and protection of those rights. Enforcement of existing laws or agreements in China may be inconsistent. In addition, changes in the political environment, governmental policies, international trade policies and relations, or U.S. - China relations could result in revisions to laws or regulations or their interpretation and enforcement, exposure of our proprietary intellectual property to risk of loss, increased taxation, trade sanctions, the imposition of import duties or tariffs, restrictions on imports or exports, currency revaluations, or retaliatory actions by the Chinese government in response to U.S. actions, any or all of which could have an adverse effect on our business plans and operating results. Customer concentration in the U.S. nuclear power industry subjects us to risks and uncertainty, which we may not be able to mitigate through diversification.

The U.S. nuclear industry has significant customer concentration with a limited number of entities owning all of the 99 nuclear reactors currently operating in the United States. In 2018, we continued to experience high customer concentration with respect to each of our businesses. Indeed, one customer accounted for 26.9% of our total consolidated revenue for the year-ended December 31, 2018. We monitor our customer concentration and seek to diversify our customer base within this concentrated industry. In addition to pursuing diversification strategies and expanding relationships with targeted customers, we mitigate the associated customer concentration risk by developing meaningful relationships with each nuclear power plant, which are often separately responsible for vendor selection and individual procurement decisions.

While our acquisition activity has the potential to diversify our customer base through inorganic means, we have also found that some of the strongest commercial opportunities are within our existing customer base, as our existing relationships are a resource for introductions, due diligence, and business intelligence. Our recent acquisition of DP Engineering highlights these kinds of opportunities and challenges. Through the acquisition process, we benefited from insights obtained from our subsidiaries who work side-by-side with DP Engineering within our existing footprint. At the same time, DP Engineering has significant customer concentration within our existing customer base. As a result, our strategy with DP Engineering includes a focus on new customer acquisition and diversification. Our diversification strategy is intended to reduce our customer concentration risk. One of the risks associated with customer concentration was underscored by a recent event at a customer location following our acquisition of DP Engineering. After that event, the customer identified a prior plant modification by DP Engineering as meriting further analysis. As is customary in the industry, pursuant to an Engineer of Choice agreement, the customer issued DP Engineering a Notice of Suspension by email while a root cause analysis of the event proceeds. Because of DP Engineering's concentrated nature, this notice impacted a number of unrelated projects at other locations. Although more than 25% of the impacted projects have already been restarted at the request of the customer, this incident shows that high customer concentration can result in events at one location impacting projects at other locations. In this case, DP Engineering and GSE are working with the customer and outside vendors to assist in the causal analysis related to the event and anticipate further clarity once the analysis is complete in the coming weeks.

Our revenue, results of operations, and cash flows may suffer upon the loss of a significant customer.

For the years ended December 31, 2018 and 2017, the following customers have provided more than 10% of Nuclear Industry Training and Consulting segment's revenues:

	Years ended December 31, 2018 2017	
Customer A	48%	48%
Customer B	12%	16%

Hyperspring and Absolute, which together comprise our Nuclear Industry Training and Consulting segment, may lose a significant customer if any existing contract with such customer expires without extension, renewal, or negotiation or if it is terminated by the customer prior to expiration, to the extent such early termination is permitted by the contract. A number of Hyperspring's and Absolute's contracts typically are subject to expiration during each year, and either company may lose any of these contracts if the company is unable to extend, renew, or renegotiate the contracts. The loss of any significant customer would adversely affect our Nuclear Industry Training and Consulting segment's revenue, results of operations, and cash flows.

For the years ended December 31, 2018 and 2017, the following customer has provided more than 10% of Performance Improvement Solutions segment's revenues:

	Years ended December 31, 2018 2017	
Customer C	26%	31%

Customer A also provided 26.9% and 20.8% of our total consolidated revenue for the years ended December 31, 2018 and 2017, respectively. While the acquisition of DP Engineering increased our product and service offerings, we anticipate that it will further increase our customer concentration in our Performance Improvement Solutions segment. GSE Performance Solutions, Inc., GSE True North Consulting, LLC, DP Engineering and Envision, which together comprise our Performance Improvement Solutions segment, may lose a significant customer if any existing contract with such customer expires without extension, renewal, or negotiation or if it is terminated by the customer prior to expiration, to the extent such early termination is permitted by the contract. A majority of the contracts entered into by our Performance Improvement Solutions businesses are able to be terminated by our customer on relatively short notice without cause or further compensation. The loss of any significant customer would adversely affect our Performance Improvement Solutions segment's revenue, results of operations, and cash flows.

Our expense levels are based upon our expectations as to future revenue, and we may be unable to adjust spending to compensate for a revenue shortfall. Accordingly, any revenue shortfall would likely have a disproportionate effect on our operating results.

Our revenue was \$92.2 million and \$70.9 million for the years ended December 31, 2018 and 2017, respectively. We had operating income of \$1.4 million and \$0.2 million for the years ended December 31, 2018 and 2017, respectively. Our operating results have fluctuated in the past and may fluctuate significantly in the future as a result of a variety of factors, including purchasing patterns, timing of launch or release of new products and enhancements by us and our competitors, and fluctuating global economic conditions. Because our expense levels are based in part on our expectations as to future revenue and includes certain fixed, pre-negotiated, and prepaid costs, we may be unable to adjust spending in a timely manner to compensate for any revenue shortfall. Because of this lag in response time, such revenue shortfalls likely would have a disproportionate adverse effect on our operating results.

Our backlog is subject to unexpected adjustments and cancellations and may not be a reliable indicator of future revenues or earnings.

Backlog represents products or services that our customers have committed by contract or purchase order to purchase from us and that we have not yet delivered or recognized as revenue. Our backlog as of December 31, 2018 and 2017 was \$70.6 million and \$71.4 million, respectively. There can be no assurance that the revenues projected in our backlog will be realized or, if realized, will result in profits. Because of project cancellations or changes in project scope and schedule, we cannot predict with certainty whether or when backlog services will be performed, or products delivered. In addition, even where a project proceeds as scheduled, it is possible that contracted parties may default and fail to pay amounts owed to us. Our poor project performance could increase the cost associated with a project. Thus, delays, suspensions, cancellations, payment defaults, scope changes and poor project execution could materially reduce or eliminate the revenues and profits that we actually realize from projects in backlog. Reductions in our backlog due to cancellation or modification by a customer or for other reasons may adversely affect, potentially to a material extent, the revenues and earnings we actually receive from contracts and orders included in our backlog. Many, but not all, of the contracts in our backlog provide for cancellation fees in the event customers cancel projects. These cancellation fees usually provide for reimbursement of our out-of-pocket costs and payments, for work performed prior to cancellation including varying percentages of the profits we would have realized had the contract been completed. We usually have no contractual right to payment for all of the lost revenue or lost profits in the event of cancellation of the contracts and orders reflected in our backlog, however. Projects may remain in our backlog for extended periods of time. If we experience significant project terminations, suspensions, or scope adjustments to contracts reflected in our backlog, our financial condition, results of operations and cash flows may be adversely impacted.

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We are currently a party to multiple fixed price contracts and will continue to enter into similar contracts in the future. If we are not able to estimate accurately or control costs on such projects, the profitability of such projects could be reduced.

A significant portion of our revenue is attributable to contracts entered into on a fixed price basis, which enable us to benefit from cost savings, but expose us to the risk of cost overruns. If our initial estimates are incorrect regarding our costs of performance under these contracts, or if unanticipated circumstances arise, we could experience cost overruns that could result in reduced profits or even net losses on these contracts. Our financial condition is dependent upon our ability to maximize our earnings from our contracts. Lower earnings or losses caused by cost overruns could have a negative impact on our financial results.

Under our time and materials contracts, we are paid for labor at negotiated hourly billing rates and for certain expenses. Under cost-reimbursable contracts, which are subject to a contract ceiling amount, we are reimbursed for allowable costs and are paid a fee, which may be fixed, or performance based. In both cases, however, if our costs exceed the contract ceiling or are not allowable under the provisions of the contract or applicable regulations, we may not be able to obtain reimbursement for all such costs even under a time and materials or cost-reimbursable contract. Our inability to successfully estimate and manage costs on each of these contract types may materially and adversely affect our financial condition.

Our simulation business is dependent on product innovation and research and development, which costs are incurred prior to realization of revenue for new products and improvements.

We believe that our success will depend in large part on our ability to maintain and enhance our current product line, develop new products, maintain technological competitiveness and meet an expanding range of customer needs. Our product development activities are aimed at the development and expansion of our library of software modeling tools, the improvement of our display systems and workstation technologies, and the advancement and upgrading of our simulation technology. The life cycles for software modeling tools, graphical user interfaces, and simulation technology are variable and largely determined by competitive pressures and the evolution of software and standards that may be controlled by third parties. Consequently, we will need to continue to make significant investments in research and development to enhance and expand our capabilities in these areas and to maintain our competitive advantage. We cannot control, and we may be unable to predict accurately, the development and evolution of these competitive pressures and external software and standards. We may be unable to monetize our investment in research and development in a timely manner, or at all. Unexpected or excessive delays in realizing a return on these investments may have a material and adverse effect on our cash position, results of operations, and financial condition.

We use derivative instruments in the normal course of our business which could result in financial losses and exposure to other risks that negatively impact our net income (loss) and business operational efficiency.

We periodically enter into forward foreign exchange contracts to manage market risks associated with the fluctuations in foreign currency exchange rates on foreign-denominated trade receivables. We could recognize financial losses as a result of volatility in the market values of these contracts or if a derivative instrument counterparty fails to perform.

We attempt to minimize credit exposure by limiting counterparties to internationally recognized financial institutions, but even these counterparties are subject to default and contract risk and this risk is beyond our control. We also engage in interest rate hedging transactions in the ordinary courses of our business to mitigate the risk that amounts borrowed under our credit facility at floating interest rates may be affected by adverse rate movements. Depending on future business, market, and interest rate environments, however, these hedging transactions may not be effective to mitigate the financial impact of the risks for which they were put into place sufficiently to justify their expense.

Additionally, we may need or wish to avail ourselves of other forms of hedging or derivative instruments in the future depending on our business needs, and these other types of derivative instruments may be subject to the same and other risks and may not be available to us on a cost-effective or risk-controlled basis, if at all. The unavailability of viable and cost effective risk management, hedging, or similar instruments now or in the future could adversely impact our business operational efficiency or results.

We issue performance, advance payment, and bid bonds in the normal course of our business which could result in financial losses that negatively impact our net income (loss).

We may be required to issue performance, advance payment, and bid bonds to our customers and potential customers as a normal part of our business activities. Our customers may have the ability to draw upon these performance bonds

in the event we fail to cure a material breach of the contract within a specified period after receiving notice from the customer regarding the nature of the breach. For the year ended December 31, 2018, we did not issue any advance payment or performance bonds, but we may be required to do so in the future to secure contract awards.

We rely upon our intellectual property rights for the success of our business, but the steps we have taken to protect our intellectual property may be inadequate.

Although we believe that factors such as the technological and creative skills of our personnel, new product developments, frequent product enhancements and reliable product maintenance are important to establishing and maintaining a technological leadership position, our business depends, in part, on the strength of our intellectual property rights in our proprietary technology and information. We rely upon a combination of trade secret, copyright, and trademark law, contractual arrangements and technical means to protect our intellectual property rights. We enter into confidentiality agreements with our employees, consultants, joint venture and alliance partners, customers, and other third parties that are granted access to our proprietary information, and we limit access to and distribution of our proprietary information. There can be no assurance, however, that we have protected or will be able to protect our proprietary technology and information adequately, that the unauthorized disclosure or use of our proprietary information will be prevented, that others have not or will not develop similar technology or information independently, or, to the extent we own any patents in the future, that others have not or will not be able to design around those future patents. Furthermore, the laws of certain countries in which our products are sold do not protect our products and intellectual property rights to the same extent as the laws of the United States. Our inability to protect our intellectual property rights from infringement, dilution, or loss could make it more difficult for us to generate revenue from the offer, licensure, and sale of our products and services and could enable third parties to compete with us more effectively.

The industries in which we operate are highly competitive. This competition may prevent us from raising prices at the same pace at which our costs increase.

Our businesses operate in highly competitive environments with both domestic and foreign competitors, many of whom have substantially greater financial, marketing, and other resources than we do. The principal factors affecting competition in our industries include price, technological proficiency, ease of system configuration and use, product reliability, applications expertise, engineering support, local presence, personal relationships, and the relative financial stability of the competitor. We believe competition in the simulation fields may further intensify in the future as a result of advances in technology, consolidations and strategic alliances among competitors, increased costs required to develop new technology and the increasing importance of software content in systems and products. Because our business has a significant international component, changes in the value of the dollar could adversely affect our ability to compete internationally and could reduce our profitability on international business opportunities that we do win. Any of these competitive factors, or any combination of two or more factors, could make it more difficult for us to bid successfully on new projects, or to complete projects at profit margins that we consider reasonable. An inability or reduced ability to win new work would have a material adverse impact on our backlog and revenue, and an inability or reduced ability to secure reasonable profit margins on projects awarded to us would have a material adverse impact on our profitability and overall results of operations.

We may encounter difficulties in effectively integrating acquired businesses.

As part of our business strategy, we have acquired, and intend to acquire, companies with compatible or related products. These acquisitions will be accompanied by the risks commonly encountered in acquisitions of companies, which include, among other things:

- potential exposure to unknown liabilities of the acquired companies;
- higher than anticipated acquisition costs and expenses;
- depletion of cash and other company assets and resources in connection with the acquisition or integration;
- difficulty and expense of integrating the operations and personnel of the companies, especially if the acquired operations are geographically distant or culturally different;
- potential disruption of our ongoing business and diversion of management time and attention;
- failure to maximize our financial and strategic position by the successful incorporation of acquired technology;
- difficulties in adopting and maintaining uniform standards, controls, procedures, and policies;
- loss of key employees and customers as a result of changes in management; and
- possible dilution to our shareholders.

We may not be successful in overcoming these risks or any other problems encountered in connection with any of our acquisitions, and if we are not successful, our financial results may be materially impacted. We may be forced to modify our strategic objectives or seek alternative sources of growth.

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We are dependent on our management team, and the loss of or the inability to attract and retain one or more key employees or groups could harm our business and prevent us from implementing our business plan in a timely manner.

Our future success is substantially dependent on the continued services and continuing contributions of our executive officers and other key personnel. All of our recently acquired businesses, including Hyperspring, Absolute, True North, and DP Engineering, are particularly dependent on key personnel and their key strategic relationships. The loss of the services of any of our executive officers or other key personnel could harm our business. Our future success also depends on our ability to continue to attract, retain, and motivate highly skilled employees. If we are not able to attract and retain key skilled personnel, our business could be harmed and our revenue, profitability, and overall results of operations could be materially impacted.

A failure to attract and retain technical personnel could reduce our revenue and our operational effectiveness. There is a continuing demand for qualified technical personnel in the industries within which we operate. We believe that our future growth and success will depend upon our ability to attract, train and retain such personnel. Our design and development efforts, particularly within our Performance Improvement Solutions business segment, depend on hiring and retaining qualified technical personnel. An inability to attract or maintain a sufficient number of technical personnel could have a material adverse effect on our contract performance or on our ability to capitalize on market opportunities.

The nuclear power industry, our largest customer group, is associated with a number of hazards which could create significant liabilities.

Our business could expose us to third party claims with respect to product, environmental and other similar liabilities. Although we have sought protection from these potential liabilities through a variety of legal and contractual provisions as well as through liability insurance, the effectiveness of such protections has not been fully tested.

Certain of our products and services are used by the nuclear power industry primarily in operator training. Although our contracts for such products and services typically contain provisions designed to protect us from potential liabilities associated with such use, there can be no assurance that we would not be materially adversely affected by claims or actions which may potentially arise due to factors that may be outside of our direct control.

Cyber security incidents could disrupt business operations, result in the loss of critical and confidential information, and adversely impact our reputation and results of operations.

Global cyber security threats can range from uncoordinated individual attempts to gain unauthorized access to our information technology (IT) systems to sophisticated and targeted measures known as advanced persistent threats. While we employ comprehensive measures to prevent, detect, address and mitigate these threats (including access controls, data encryption, vulnerability assessments, continuous monitoring of our IT networks and systems, and maintenance of backup and protective systems), cyber security incidents, depending on their nature and scope, could potentially result in the misappropriation, destruction, corruption or unavailability of critical data and confidential or proprietary information (our own or that of third parties) and the disruption of business operations. The potential consequences of a material cyber security incident include reputational damage, litigation with third parties, civil or regulatory liability for loss of sensitive or protected information such as personal data, incident response costs, diminution in the value of our investment in research, development and engineering, loss of intellectual property, and increased cyber security protection and remediation costs, which in turn could adversely affect our competitiveness and results of operations.

Third-party claims that we allegedly infringe the intellectual property rights of others may be costly to defend or settle and could damage our business.

We cannot be certain that our software and services do not infringe issued patents, copyrights, trademarks or other intellectual property rights of third parties. We may be subject to legal proceedings and claims from time to time, including claims of alleged infringement of intellectual property rights of third parties by us or our licensees concerning their use of our software products and integration technologies and services. Third parties may bring claims of infringement directly against us, or because our software is integrated with our customers' networks and business processes, as well as other software applications against us, our customers, and our business partners or software suppliers, if the cause of the alleged infringement cannot easily be determined.

Claims of alleged infringement may have a material adverse effect on our business and may discourage potential customers from doing business with us on acceptable terms, if at all, even if the claims are ultimately adjudicated to

have no merit, dismissed, or settled. Defending against claims of infringement may be time-consuming and may result in substantial costs and diversion of resources, including our management's attention to our business. Furthermore, a party making an infringement claim could secure a judgment that requires us to pay substantial damages. A judgment could also include an injunction or other court order that could prevent us from selling our software or require that we re-engineer some or all of our products or modules. Claims of intellectual property infringement also might require us to enter costly royalty or license agreements. We may be unable to obtain royalty or license agreements on terms acceptable to us or at all. Our business, operating results and financial condition could be harmed significantly if any of these events were to occur, and the price of our common stock could be adversely affected. In addition, we have agreed, and may agree in the future, to indemnify certain of our customers against claims that our software infringes upon the intellectual property rights of others. Although we carry general liability insurance, our current insurance coverage may not apply to, and likely would not protect us entirely or at all from, liability that may be imposed under any of the types of claims described above.

We are subject to a wide variety of laws and regulations, and these may change.

Our businesses are subject to regulation by U.S. federal and state laws, and foreign laws, government regulations and policies, and other administrative requirements. Changes to laws or regulations may require us to modify our business objectives if existing practices become more restricted, subject to escalating costs, or prohibited outright. Particular risks include possible curtailment of our intended business activities or strategies as a result of changed or new regulatory risks arising from federal laws and regulations, such as laws and regulations regarding export of sensitive technologies or technical information or changed interpretations of existing laws and regulations. Our business and the industries in which we operate are also at times being reviewed or investigated by regulators, which could lead to enforcement actions, fines and penalties, or the assertion of private litigation claims and damages. Any significant change to laws, regulations, enforcement policies, or liability regimes, or other actions by government bodies having jurisdiction over our business, may have material adverse effects on our business and profitability. We have only limited ability to foresee, plan for, or influence changes to these requirements.

Provisions in our corporate documents and Delaware law could delay or prevent a change in control of our company, even if that change may be considered beneficial by some stockholders.

The existence of some provisions of our certificate of incorporation and bylaws and Delaware law could discourage, delay or prevent a change in control of our company that a stockholder may consider favorable. These include provisions:

- providing that our Board of Directors fixes the number of members of the board and fills all vacancies on the Board of Directors;
- providing for the division of our Board of Directors into three classes with staggered terms;
- limiting who may call special meetings of stockholders;
- prohibiting stockholder action by written consent, thereby requiring stockholder action to be taken at a meeting of the stockholders;
- establishing advance notice requirements for nominations of candidates for election to our Board of Directors or for proposing matters that can be acted on by stockholders at stockholder meetings;
- establishing supermajority vote requirements for certain amendments to our certificate of incorporation and bylaws;
- limiting the right of stockholders to remove directors; and
- authorizing the issuance of "blank check" preferred stock, which could be issued by our Board of Directors to increase the number of outstanding shares and thwart a takeover attempt.

In addition, we are subject to Section 203 of the Delaware General Corporation Law, which may have an anti-takeover effect with respect to transactions not approved in advance by our Board of Directors, including discouraging takeover attempts that might result in a premium over the market price for shares of our common stock.

We believe these provisions protect our stockholders from coercive or otherwise unfair takeover tactics by requiring potential acquirers to negotiate with our Board of Directors and by providing our Board of Directors with more time to assess any acquisition proposal and are not intended to make our company immune from takeovers. These provisions apply even if the offer may be considered beneficial by some stockholders, however, and could delay or prevent an acquisition that our Board of Directors determines is not in the best interests of our company and our stockholders.

A sustained decline in the price of our common stock or weaker than forecasted operating results could result in write-downs of goodwill and other intangible assets and capitalized software development costs.

In conjunction with business acquisitions, we record goodwill and other intangible assets and review their fair value for impairment annually as of December 31, or on an interim basis if impairment indicators are present, such as a significant reduction in our market capitalization, significant declines in operating performance or disruptions to the business that could reduce our future cash flow. On November 14, 2014, we recorded \$5.6 million of goodwill related to our acquisition of Hyperspring. On September 20, 2017, we recorded \$2.8 million of goodwill related to our acquisition of Absolute. On May 11, 2018, we recorded \$4.7 million of goodwill related to our acquisition of True North, LLC. We tested our goodwill at the reporting unit level as of December 31, 2018 and 2017, and there was no indication of impairment. We can provide no assurance that we will not have an impairment charge in future periods as the result of changing conditions. See Note 5 to our consolidated financial statements for information regarding our goodwill.

We capitalize certain computer software development costs and, accordingly, the capitalized costs are reported on our balance sheet. Capitalization of computer software development costs begins upon the establishment of technological feasibility. Capitalization ceases and amortization of capitalized costs begins when the software product is commercially available for general release to customers. Amortization of capitalized computer software development costs is included in cost of revenue and is determined using the straight-line method over the remaining estimated economic life of the product, typically three years. On an annual basis, and more frequently as conditions indicate, we assess the status of our development programs and the recoverability of the unamortized software development costs by estimating the net undiscounted cash flows expected to be generated by the sale of the product. If the undiscounted cash flows are not sufficient to recover the unamortized software costs, we will write-down these costs to their estimated fair value based on the future undiscounted cash flows. The excess of any unamortized computer software costs over the related net realizable value is written down and charged to operations.

Write-down of goodwill and capitalized software development costs in the current and future accounting periods may have an impact on the value of the company, results of operations, and price of our common stock.

Our ability to use our net operating loss (NOL) carryforward and certain other tax attributes may be limited.

Under Section 382 of the Internal Revenue Code of 1986, as amended, if a corporation undergoes an "ownership change," generally defined as a greater than 50% change (by value) in its equity ownership over a three-year period, the corporation's ability to use its pre-change NOL carryforwards, and other pre-change tax attributes (such as research tax credits) to offset its post-change income or tax liabilities may be limited. We may experience ownership changes in the future as a result of shifts in our stock ownership. As a result, if we earn net taxable income, our ability to use our pre-change NOL carryforwards to offset U.S. federal taxable income may be subject to limitations, which could potentially result in increased future tax liability to us.

ITEM 1B. UNRESOLVED STAFF COMMENTS.

None.

ITEM 2. PROPERTIES.

The Company is headquartered in a facility in Sykesville, Maryland (approximately 37,000 square feet). The lease for this facility expires on June 30, 2023. As of December 31, 2018, the Company subleased approximately 3,800 square feet of the facility with a sublease term ending June 30, 2023.

On November 28, 2017, the Company entered into an office lease agreement to lease approximately 5,039 rentable square feet of an office building located in Columbia, Maryland. The lease is for an initial six years and six months with two renewal periods of five years each. The Company has relocated part of the back-office employees to the new office in the first quarter of 2018.

In addition, the Company leases office space domestically in Huntsville, Alabama; Navarre, Florida; Montrose, Colorado and internationally in Beijing, China; Chennai, India (terminating in 2019); Nyköping, Sweden (terminating in 2019) and Stockton-On-Tees, England (terminated in 2018). The Company leases these facilities for terms ending between 2019 and 2023.

ITEM 3. LEGAL PROCEEDINGS.

The Company and its subsidiaries are from time to time involved in ordinary routine litigation incidental to the conduct of its business. The Company and its subsidiaries are not a party to, and its property is not the subject of, any material pending legal proceedings that, in the opinion of management, are likely to have a material adverse effect on the Company's business, financial condition or results of operations.

ITEM 4. MINE SAFETY DISCLOSURES.

Not applicable.

PART II

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

The Company's common stock is listed on the Nasdaq American Stock Exchange, where it trades under the symbol "GVP". The following table sets forth, for the periods indicated, the high and low sale prices for the Company's common stock reported by the Nasdaq Stock Exchange for each full quarterly period within the two most recent fiscal years:

2018

Quarter	High	Low
First	\$3.55	\$3.10
Second	\$3.40	\$3.10
Third	\$3.80	\$2.75
Fourth	\$3.50	\$2.00

2017

Quarter	High	Low
First	\$3.85	\$3.05
Second	\$3.75	\$2.85
Third	\$3.55	\$2.35
Fourth	\$3.60	\$3.10

On February 28, 2019, there were 19,946,759 shares of common stock outstanding. As of the latest record date, the Company had approximately 762 holders of record. The Company has never declared or paid a cash dividend on its common stock. The Company currently intends to retain future earnings to finance the growth and development of its business and, therefore, does not anticipate paying any cash dividends in the foreseeable future on its common stock. The Company believes factors such as quarterly fluctuations in results of operations and announcements of new products by the Company or by its competitors may cause the market price of the common stock to fluctuate, perhaps significantly. In addition, in recent years the stock market in general, and the shares of technology companies in particular, have experienced extreme price fluctuations. The Company's common stock has also experienced a relatively low trading volume, making it further susceptible to extreme price fluctuations. These factors may adversely affect the market price of the Company's common stock.

ITEM 6. SELECTED FINANCIAL DATA.

This information is not required for smaller reporting companies.

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

GSE is a leading provider of engineering, expert staffing, and simulation software to clients in the power and process industries. We provide customers with simulation, engineering and plant services that help clients reduce risks associated with operating their plants, increase revenue through improved plant and employee performance, and lower costs through improved operational efficiency. In addition, we provide professional services that systematically help clients fill key vacancies in the organization on a short-term basis, primarily in procedures, engineering, technical support, and training focused on regulatory compliance and certification in the nuclear power industry. Our operations also include interactive computer-based tutorials and simulation software for the refining, chemical, and petrochemical industries.

GSE Systems was formed on March 30, 1994, to consolidate the simulation and related businesses of General Physics International Engineering & Simulation, S3 Technologies, and EuroSim. We are pursuing a strategy that includes growth from development of our core business and acquisition of adjacent and complementary businesses. Our thesis is that GSE can be a compelling platform for consolidation of the fragmented vendor ecosystem for nuclear power. On September 20, 2017, the Company acquired Absolute Consulting, Inc., now a wholly-owned subsidiary of GSE Performance Solutions, Inc., for \$8.8 million. (subject to customary pre- and post-closing working capital adjustments) Absolute Consulting, Inc. is a provider of technical consulting and staffing solutions to the global nuclear power industry. This acquisition brings a natural adjacency to GSE, fits well with our growth strategy, and benefits our customers from expanded capabilities and offerings.

On May 11, 2018, GSE acquired True North Consulting, LLC, now a wholly-owned subsidiary of GSE Performance Solutions, Inc., for \$9.75 million (subject to customary pre- and post-closing working capital adjustments). True North is a provider of technical engineering solutions to nuclear and fossil fuel power plants with an emphasis on regulatory-driven ASME code programs. Located in Montrose, Colorado, True North is a well-regarded service provider to leading companies in the power industry. The acquisition of True North is expected to broaden our engineering services offering, expand our relationships with several of the largest nuclear energy providers in the United States, and add a highly specialized, complimentary talent pool to our employee base.

On February 15, 2019, GSE acquired DP Engineering for \$13.5 million (subject to customary pre- and post-closing working capital adjustments). The acquisition was completed through the drawdown of \$14.3 million (including transaction costs) of the term loan. DP Engineering is a provider of value-added technical engineering solutions and consulting services to nuclear power plants with an emphasis on preparation and implementation of design modifications during plant outages. Located in Fort Worth, Texas, DP Engineering is well-regarded as a leading service provider to the nuclear power industry, having been designated an "engineer of choice" by two large power generation companies. Following a recent event at a customer location, in accordance with its standard operating procedures and an Engineer of Choice Agreement, a customer of DP Engineering issued a Notice of Suspension to DP Engineering while a root cause analysis of the event proceeds. More than 25% of the impacted projects have already been restarted at the request of the customer. DP Engineering and GSE are working with the customer and outside vendors to assist in the causal analysis related to the event and anticipate further clarity once the analysis is complete. These acquisitions are a significant proof point of our consolidation thesis. We believe the acquisitions add significant scale and focus to the business, while positioning GSE as a "go to" provider of technical and consulting solutions to the power industry, in particular nuclear power.

We execute projects globally with approximately 402 employees operating from offices in the U.S., China, and at client sites. While the majority of revenue comes from the nuclear power market, we also serve the fossil, refining, chemical, and petrochemical markets. As a result of the DP Engineering acquisition, we have added approximately 110 employees to the Company.

Through our Hyperspring, Absolute, True North and DP Engineering subsidiaries, we provide highly skilled, high-value professionals to fill training and consulting positions on a contract basis for nuclear power plant operators.

Results of Operations.

The following table sets forth the results of operations for the periods presented expressed as a percentage of revenue. (\$ in thousands)

	Years ended December 31,			
	2018	%	2017	%
Revenue	\$92,249	100.0%	\$70,880	100.0%
Cost of revenue	69,119	74.9 %	52,336	73.8 %
Gross profit	23,130	25.1 %	18,544	26.2 %
Operating expenses				
Selling, general and administrative	17,469	18.9 %	15,469	21.8 %
Research and development	899	1.0 %	1,391	2.0 %
Restructuring charges	1,269	1.4 %	778	1.1 %
Depreciation	515	0.6 %	342	0.5 %
Amortization of definite-lived intangible assets	1,612	1.7 %	335	0.5 %
Total operating expenses	21,764	23.6 %	18,315	25.8 %
Operating income	1,366	1.5 %	229	0.3 %
Interest (expense) income, net	(268)	-0.3 %	80	0.1 %
(Loss) Gain on derivative instruments, net	(350)	-0.4 %	99	0.1 %
Other income (expense), net	29	0.0 %	(4)	0.0 %
Income before income taxes	777	0.8 %	404	0.6 %
Provision (benefit) for income taxes	1,131	1.2 %	(6,153)	-8.7 %
Net (loss) Income	\$(354)	-0.4 %	\$6,557	9.3 %

Comparison of the Years Ended December 31, 2018 to December 31, 2017.

Revenue. Revenue for the year ended December 31, 2018, totaled \$92.2 million, which was 30.1% greater than the \$70.9 million of revenue for the year ended December 31, 2017. The year over year increase in revenue was primarily driven by the respective increases in the two segments listed below:

(in thousands)	Year ended	
	December 31, 2018	2017
Revenue:		
Performance Improvement Solutions	\$42,954	\$39,899
Nuclear Industry Training and Consulting	49,295	30,981
Total revenue	\$92,249	\$70,880

Performance Improvement Solutions revenue increased 7.7% from \$39.9 million to \$43.0 million for the years ended December 31, 2017 and 2018, respectively. The increase in revenue for the year ended December 31, 2018 compared to the prior year was driven primarily by the acquisition of True North, which contributed \$8.0 million of revenue to the segment since the acquisition. This increase was partially offset by a decline of \$1.4 million in revenue from foreign subsidiaries, driven by the international restructuring effort, and \$3.4 million decrease from fossil and process industry. We recorded total Performance Improvement Solutions orders of \$42.6 million and \$16.9 million for the years ended December 31, 2018 and 2017, respectively.

For the year ended December 31, 2018, Nuclear Industry Training and Consulting revenue totaled \$49.3 million compared to revenue of \$31.0 million during the year ended December 31, 2017. The \$18.3 million increase was primarily attributable to the acquisition of Absolute in September 2017. Nuclear Industry Training and Consulting orders totaled \$45.4 million and \$38.1 million for the years ended December 31, 2018 and 2017, respectively.

At December 31, 2018, the Company's backlog was \$70.6 million: \$49.4 million for the Performance Improvement Solutions segment, \$8.3 million of which was attributable to True North and \$21.2 million for the Nuclear Industry Training and Consulting segment. At December 31, 2017, the Company's backlog was \$71.4 million: \$46.3 million for the Performance Improvement Solutions segment and \$25.1 million for the Nuclear Industry Training and Consulting segment. Nuclear Industry Training and Consulting segment's backlog decreased by \$3.9 million compared to December 31, 2017. The decrease in backlog is primarily due to 2017 backlog that was converted to revenues during 2018 and has only been partially replaced by new orders. Excluding True North, Performance Improvement Solutions segment's backlog decreased by \$5.2 million, primarily due to decreased orders from international restructuring on UK and Sweden of \$3.6 million in total, and \$1.3 million decreased orders on Asia.

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Gross profit. Gross profit was \$23.1 million, or 25.1%, for the year ended December 31, 2018 compared to \$18.5 million, or 26.2%, for the year ended December 31, 2017.

(\$ in thousands)	Years ended December 31,			
	2018	%	2017	%
Gross profit:				
Performance Improvement Solutions	\$16,457	38.3%	\$13,712	34.4%
Nuclear Industry Training and Consulting	6,673	13.5%	4,832	15.6%
Consolidated gross profit	\$23,130	25.1%	\$18,544	26.2%

As a percentage of revenue, the Performance Improvement Solutions segment's gross profit increased from \$13.7 million, or 34.4% for the year ended December 31, 2017 to \$16.5 million, or 38.3%, for the year ended December 31, 2018. The increase in gross profit percentage for Performance Improvement Solutions during 2018 was primarily driven by cost savings realized in 2018 on certain large projects.

For the years ended December 31, 2018 and 2017, the Nuclear Industry Training and Consulting segment had gross margin of 13.5% and 15.6%, respectively. The minor fluctuations in gross profit percentage for Nuclear Industry Training and Consulting for the periods presented were due to normal changes in the mix of projects with different margins.

Selling, general and administrative expenses. Selling, general and administrative (SG&A) expenses totaled \$17.5 million and \$15.5 million for the years ended December 31, 2018 and 2017, respectively. Fluctuations in the components of SG&A spending were as follows:

(\$ in thousands)	Years ended December 31,			
	2018	%	2017	%
Selling, general and administrative expenses:				
Corporate charges	\$12,826	73.4 %	\$10,428	67.4 %
Business development	3,478	19.9 %	3,560	23.0 %
Facility operation & maintenance (O&M)	866	5.0 %	908	5.9 %
Contingent consideration	-	0.0 %	446	2.9 %
Bad debt expense	294	1.7 %	118	0.8 %
Other	5	0.0 %	9	0.1 %
Total	\$17,469	100.0%	\$15,469	100.0%

Corporate charges increased \$2.4 million in 2018 compared to 2017. The increase was primarily due to higher labor cost of \$0.4 million, administrative expenses of \$1.5 million due to acquisitions of True North LLC and Absolute, \$0.3 million of severance expenses and \$0.2 million of additional professional fees.

Business development charges decreased \$0.1 million in 2018 compared to 2017. The minor fluctuations for the periods presented were due to normal changes in the operation.

Facility O&M expenses decreased \$42,000 for the year ended December 31, 2018 compared to the year ended December 31, 2017. The decrease in 2018 was mainly due to the winding down of international subsidiaries, and partially offset by the acquisition of True North and Absolute in United States.

Contingent consideration expense mainly reflected the fair value adjustments related to our November 2014 Hyperspring acquisition. The earnout period expired in November 2017, and the final payment was made in January 2018, and, therefore, no contingent consideration adjustment was recorded for the year ended December 31, 2018.

Bad debt expense. We recorded bad debt expense of \$294,000 and \$118,000 for the year ended December 31, 2018 and December 31, 2017, respectively. GSE reserved the bad debt allowance based on historical trends of past due accounts, write-offs, and specific identification and review of customer accounts.

Research and development. Research and development costs consist primarily of software engineering personnel and other related costs. Research and development costs, net of capitalized software, totaled \$0.9 million and \$1.4 million for the years ended December 31, 2018 and 2017, respectively.

Restructuring charges. Restructuring charges totaled \$1.3 million and \$0.8 million for the years ended December 31, 2018 and 2017, respectively. On December 27, 2017, the Board of GSE Systems, Inc. approved an international restructuring plan to streamline and optimize the Company's global operations. Under the restructuring plan, we expect

a total restructuring charge of \$2.2 million, excluding any tax impacts and cumulative translation adjustments. We recorded a severance expense of \$0.4 million, lease termination fee of \$0.7 million and other costs of \$0.2 million for the year December 31, 2018. We expect to record the remaining restructuring charges in 2019, primarily to reflect the office closure costs and the amounts to be transferred from cumulative translation adjustments and included in determining net income for the period. The increase in 2018 restructuring plan charges was primarily due to lease termination fee on the Company's restructuring activities during 2018.

Depreciation. Depreciation expense totaled \$515,000 and \$342,000 for the years ended December 31, 2018 and 2017, respectively. The increase was primarily due to \$110,000 of additional depreciation related to a full year of Absolute and the remainder of the increase is due to additional purchased software amortization and leasehold improvements in the Performance segment.

Amortization of definite-lived intangible assets. Amortization expense related to definite-lived intangible assets totaled \$1,612,000 and \$335,000 for the years ended December 31, 2018 and 2017, respectively. The increase in amortization expense was primarily due to True North's amortization of \$829,000 and Absolute's amortization of \$670,000. As we continue to pursue our strategy and acquire companies that are synergistic to ours, we will experience an increase in amortization expense.

Interest (expense) income, net. Interest expense (income) net, totaled \$268,000 for the year ended December 31, 2018. Interest income totaled \$80,000 for year ended December 31, 2017. The Company drew down a five-year term loan of \$10.3 million in May 2018 to finance the acquisition of True North, and has recorded interest expense of \$286,000 related to the term loan for the year ended December 31, 2018.

(Loss) Gain on derivative instruments, net. The Company periodically enters into forward foreign exchange contracts to manage market risks associated with the fluctuations in foreign currency exchange rates on foreign-denominated trade receivables. The Company had not designated the contracts as hedges and recognized a loss on the change in the estimated fair value of the contracts of \$150,000 for the year ended December 31, 2018, and a gain of \$73,000 for the year ended December 31, 2017.

The foreign currency denominated trade receivables, unbilled receivables, billings in excess of revenue earned and subcontractor accruals that are related to the outstanding foreign exchange contracts are remeasured at the end of each period into the functional currency using the current exchange rate at the end of the period. The gain or loss resulting from such remeasurement is also included in gain (loss) on derivative instruments net in the consolidated statements of operations. For the years ended December 31, 2018 and 2017, the Company incurred (loss) gain of \$(97,000) and \$26,000, respectively, from the remeasurement of such assets and liabilities.

Other income (expense), net. The Company recognized \$29,000 of other expense, net and \$4,000 of other income, net for the years ended December 31, 2018 and 2017, respectively.

Provision for Income Taxes. The Company files tax returns in the United States federal jurisdiction and in several state and foreign jurisdictions. Because of the net operating loss carryforwards, the Company is subject to U.S. federal and state income tax examinations for tax years 2000, and forward, and is subject to foreign tax examinations by tax authorities for the years 2010 and forward. Open tax years related to state and foreign jurisdictions remain subject to examination but are not considered material to our financial position, results of operations or cash flows.

The Company's tax expense in 2018 was \$1.1 million, representing an annual effective tax rate of 145.6%, and consisted of \$0.5 million of current tax provision and \$0.6 million of deferred taxes. The Company's tax expense (benefit) in 2017 was \$(6.2) million, representing an annual effective rate of (1,523.0)% and consisted of \$0.5 million of current tax provision and \$(6.7) million of deferred taxes.

The significant change of \$6.1 million in deferred tax expense (benefits) was primarily driven by the prior year release of \$9.4 million of valuation allowance against the deferred tax assets related to the U.S. entities which was partially offset by a decrease of \$2.5 million for deferred taxes, primarily due to the remeasurement of deferred tax assets using a tax rate decreased from 34% to 21%.

The difference between the effective rate and statutory rate primarily resulted from permanent differences, the write-off of the stock option deferred tax asset due to expirations, accruals related to uncertain tax positions for certain foreign tax contingencies and revenue recognition, and return to provision true-ups. Please see Note 13, Income Taxes for additional information.

Critical Accounting Policies and Estimates.

In preparing the Company's consolidated financial statements, management makes several estimates and assumptions that affect the Company's reported amounts of assets, liabilities, revenues and expenses. Those accounting estimates that have the most significant impact on the Company's operating results and place the most significant demands on management's judgment are discussed below. For all of these policies, management cautions that future events rarely develop exactly as forecast, and the best estimates may require adjustment.

Revenue Recognition. The Company derives its revenue through three broad revenue streams: 1) System Design and Build (SDB), 2) Software, and 3) Training and Consulting services. We recognize revenue from SDB and software contracts mainly through the Performance Improvement Solutions segment and the training and consulting service contracts through both the Performance Improvement Solutions segment and Nuclear Industry Training and Consulting segment.

The SDB contracts are typically fixed-price and consist of initial design, engineering, assembly and installation of training simulators which include hardware, software, labor, and post contract support (PCS) on the software. We generally have two main performance obligations for an SDB contract: the training simulator build and PCS. The training simulator build performance obligation generally includes hardware, software, and labor. The transaction price under the SDB contracts is allocated to each performance obligation based on its standalone selling price. We recognize the training simulator build revenue over the construction and installation period using the cost-to-cost input method as our performance creates or enhances assets with no alternative use to the Company, and we have an enforceable right to payment for performance completed to date. Cost-to-cost input method best measures the progress toward complete satisfaction of the performance obligation. PCS revenue is recognized ratably over the service period, as PCS is deemed as a stand-ready obligation.

In applying the cost-to-cost input method, we use the actual costs incurred to date relative to the total estimated costs to measure the work progress toward the completion of the performance obligation and recognize revenue accordingly. Estimated contract costs are reviewed and revised periodically as the work progresses, and the cumulative effect of any change in estimates is recognized in the period in which the change is identified. Estimated losses are recognized in the period such losses are identified. Uncertainties inherent in the performance of contracts include labor availability and productivity, material costs, change order scope and pricing, software modification and customer acceptance issues. The reliability of these cost estimates is critical to the Company's revenue recognition as a significant change in the estimates can cause the Company's revenue and related margins to change significantly from the amounts estimated in the early stages of the project.

The SDB contracts generally provide a one-year base warranty on the systems. The base warranty will not be accounted for as a separate performance obligation under the contract because it does not provide the customer with a service in addition to the assurance that the completed project complies with agreed-upon specifications. Warranties extended beyond our typical one-year period will be evaluated on a case by case basis to determine if it provides more than just assurance that the product operates as intended, which requires carve-out as a separate performance obligation.

Revenue from the sale of perpetual standalone and term software licenses, which do not require significant modification or customization, is recognized upon its delivery to the customer. Revenue from the sale of subscription-based standalone software licenses, which do not require significant modification or customization, is recognized ratably over the term of such licenses following delivery to the customer. Delivery is considered to have occurred when the customer receives a copy of the software and is able to use and benefit from the software.

A software license sale contract with multiple deliverables typically includes the following elements: license, installation and training services and PCS. The total transaction price of a software license sale contract is typically fixed, and is allocated to the identified performance obligations based on their relative standalone selling prices. Revenue is recognized as the performance obligations are satisfied. Specifically, license revenue is recognized when the software license is delivered to the customer; installation and training revenue is recognized when the installation and training is completed without regard to a detailed evaluation of the point in time criteria due to the short-term nature of the installation and training services (one to two days on average); and PCS revenue is recognized ratably over the service period, as PCS is deemed as a stand-ready obligation.

The contracts within the training and consulting services revenue stream are either time and materials (T&M) based or fixed-price based. Under a typical T&M contract, the Company is compensated based on the number of hours of

approved time provided by temporary workers and the bill rates which are fixed per type of work, as well as approved expenses incurred. The customers are billed on a regular basis, such as weekly, biweekly or monthly. In accordance with Accounting Standards Codification (ASC) 606-10-55-18, we elected to apply the "right to invoice" practical expedient, under which we recognize revenue in the amount to which we have the right to invoice. The invoice amount represents the number of hours of approved time worked by each temporary worker multiplied by the bill rate for the type of work, as well as approved expenses incurred. Under a typical fixed-price contract, we recognize the revenue using the completed contract method as we are not able to reasonably estimate costs to complete and contracts typically have a term of less than one month.

For contracts with multiple performance obligations, we allocate the contract price to each performance obligation based on its relative standalone selling price. We generally determine standalone selling prices based on the prices charged to customers.

Impairment of Intangible Assets, including Goodwill. We review goodwill for impairment annually as of December 31 and whenever events or changes in circumstances indicate the carrying value of an asset may not be recoverable. We test goodwill at the reporting unit level. A reporting unit is an operating segment, or one level below an operating segment, as defined by U.S. GAAP. As of December 31, 2018, the Company's \$13.2 million goodwill balance was related to the acquisitions of Hyperspring in November 2014, Absolute in September 2017 and True North, LLC in May 2018.

Accounting Standards Update (ASU) 2011-08, Intangibles — Goodwill and Other (Topic 350): Testing Goodwill for Impairment (ASU 2011-08) permits an entity to first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount as a basis for determining whether it is necessary to perform the two-step goodwill impairment test. An entity is not required to perform step one of the goodwill impairment test for a reporting unit if it is more likely than not that its fair value is greater than its carrying amount (Step 0). If the Step 0 test indicates the fair value of a reporting unit is less than its carrying value, then additional impairment testing is required in accordance with the provisions of ASC 350, Intangibles — Goodwill and Other.

If it is determined that it is more likely than not that the fair value of a reporting unit is less than its carrying amount, a two-step impairment test is required. In the first step, we compare the fair value of each reporting unit to its carrying value. If the fair value of the reporting unit exceeds the carrying value of the net assets assigned to that unit, goodwill is not impaired and we are not required to perform further testing. If the carrying value of the net assets assigned to the reporting unit exceeds the fair value of the reporting unit, then we must perform the second step of the impairment test in order to determine the implied fair value of the reporting unit's goodwill. The implied fair value of goodwill is determined by allocating the fair value of the reporting unit's assets and liabilities in a manner similar to a purchase price allocation, with any residual fair value allocated to goodwill. If the carrying value of a reporting unit's goodwill exceeds its implied fair value, then we record an impairment loss equal to the difference.

At December 31, 2018, we performed a qualitative step 0 analysis and have concluded that the estimated fair values of each of our reporting units as of December 31, 2018, is more likely than not, greater than their respective carrying values. At December 31, 2017, we performed a qualitative step 0 goodwill impairment test and concluded that the fair values of each of our reporting units exceeded their respective carrying values.

Determining the fair value of a reporting unit is judgmental in nature and involves the use of significant estimates and assumptions. These estimates and assumptions include revenue growth rates and operating margins used to calculate projected future cash flows, risk-adjusted discount rates, future economic and market conditions and determination of appropriate market comparables. We base our fair value estimates on assumptions we believe to be reasonable but that are unpredictable and inherently uncertain. Actual future results may differ from those estimates. In addition, we make certain judgments and assumptions in allocating shared assets and liabilities to determine the carrying values for each of our reporting units. The timing and frequency of our goodwill impairment tests are based on an ongoing assessment of events and circumstances that would indicate a possible impairment. We will continue to monitor our goodwill and intangible assets for impairment and conduct formal tests when impairment indicators are present.

Capitalization of Computer Software Development Costs. In accordance with U.S. GAAP, the Company capitalizes computer software development costs incurred after technological feasibility has been established, but prior to the release of the software product for sale to customers. Once the product is available to be sold, the Company amortizes the costs, on a straight line method, over the estimated useful life of the product, which is typically three years. As of December 31, 2018, the Company has net capitalized software development costs of \$0.6 million. On an annual basis, and more frequently as conditions indicate, the Company assesses the recovery of the unamortized software development costs by estimating the net undiscounted cash flows expected to be generated by the sale of the product. If the undiscounted cash flows are not sufficient to recover the unamortized software costs, the Company will write-down the investment to its estimated fair value based on future discounted cash flows. The excess of any unamortized computer software costs over the related net realizable value is written down and charged to operations. Significant changes in the sales projections could result in an impairment with respect to the capitalized software that is reported on the Company's consolidated balance sheets.

Valuation of Contingent Consideration for Business Acquisitions. Acquisitions may include contingent consideration payments based on future financial measures of an acquired company. Contingent consideration is required to be recognized at fair value as of the acquisition date. We estimate the fair value of these liabilities based on financial projections of the acquired companies and estimated probabilities of achievement. We believe our estimates and assumptions are reasonable; however, there is significant judgment involved. At each reporting date, the contingent consideration obligation will be revalued to estimated fair value and changes in fair value subsequent to the acquisition will be reflected in income or expense in the consolidated statements of operations, and could cause a material impact to our operating results. Changes in the fair value of contingent consideration obligations may result from changes in discount periods and rates, changes in the timing and amount of revenue and/or earnings estimates and changes in probability assumptions with respect to the likelihood of achieving the various earn-out criteria.

Deferred Income Tax Valuation Allowance. Deferred income taxes arise from temporary differences between the tax basis of assets and liabilities and their reported amounts in the consolidated financial statements. Management makes a regular assessment of the realizability of the Company's deferred tax assets. In making this assessment, management considers whether it is more likely than not that some or all of the deferred tax assets will not be realized. The ultimate realization of deferred tax assets is dependent upon the generation of future taxable income during the periods in which those temporary differences become deductible. Management considers the scheduled reversal of deferred tax liabilities and projected future taxable income of the Company in making this assessment. A valuation allowance is recorded to reduce the total deferred income tax asset to its realizable value. Based on the assessment the Company's management performed as of December 31, 2018, we conclude that critical pieces of positive evidence supporting the realization of deferred tax assets exist including the strength of three year cumulative positive earnings, reversal of existing deferred temporary differences and future taxable income for the U.S. entities. As a result, the Company has determined that a valuation allowance in the U.S. is not appropriate at this time. A portion of the deferred tax asset is attributable to a capital loss that expired as of December 31, 2018. The Company could not support the realization of this DTA, therefore, a valuation allowance has historically existed. The Company was not able to generate sources of capital income and, therefore the expiration and write-off of the capital loss deferred tax asset also generated the release of the valuation allowance existing at December 31, 2017 in the amount of \$0.4 million.

The Company performed this same assessment of its foreign deferred tax assets. It determined that it does not have sufficient objectively verifiable positive evidence to substantiate the realization of the deferred tax assets for India, U.K. Swedish and Chinese deferred tax assets at December 31, 2018, accordingly, a full valuation allowance of \$0.75 million has been established on these deferred tax assets, predominantly comprised of net operating losses.

Liquidity and Capital Resources.

As of December 31, 2018, GSE had cash, cash equivalents and restricted cash of \$12.1 million compared to \$20.1 million at December 31, 2017.

Cash (used in) provided by operating activities. For the years ended December 31, 2018 and 2017, net cash (used in) provided by operating activities totaled \$(3.5) million and \$7.3 million, respectively. The year over year decrease in cash provided by operating activities was largely driven by:

A \$11.7 million decrease in net inflows from changes in net working capital primarily due to significantly increased billing in the last quarter of 2018 and a higher accounts receivable balance as of December 31, 2018.

A \$3.2 million increase in operating expenses (excluding non-cash operating expenses) mainly driven by higher administrative cost due to recent acquisitions.

The decrease was partially offset by a \$4.6 million increase in gross profit, primarily driven by increased revenues contributed from both business segments.

Net cash used in investing activities. For the year ended December 31, 2018, net cash used in investing activities was \$10.6 million compared to net cash of \$9.4 million used in investing activities in the prior year. The increase in cash outflow in 2018 was primarily due to the acquisition of True North, which resulted in a cash outflow of \$9.6 million. For fiscal year 2017, the net cash outflow of \$9.4 million was primarily due to acquisition of Absolute.

Net cash provided by (used in) financing activities. For the years ended December 31, 2018 and 2017, net cash provided by (used in) financing activities totaled \$6.5 million and \$(1.1) million, respectively. The increase in the cash provided from financing activities is largely driven by the proceeds from issuance of a term loan of \$10.2 million, net of discount and issuance costs, a decrease of \$0.4 million in the Company's withholding RSUs in order to pay employees' payroll withholding taxes on vested RSUs, partially offset by a \$0.1 million decrease in proceeds received from stock option exercises, and \$1.3 million decrease in contingent consideration payments to the former Hyperspring owners in 2018.

Debt

Citizen's Bank

The Company entered into a three-year, \$5 million revolving line of credit facility (RLOC) with Citizens Bank, National Association (the Bank) on December 29, 2016, to fund general working capital needs. On May 11, 2018, GSE and Performance Solutions (collectively, the Borrower) entered into an Amended and Restated Credit and Security Agreement (the Credit Agreement) with the Bank, amending and restating the Company's existing Credit and Security Agreement with the Bank, which included a \$5 million asset-based revolving credit facility between the Borrower and the Bank, to now include (a) a \$5 million revolving credit facility not subject to a borrowing base, including a letter of credit sub-facility, and (b) a \$25 million delayed draw term loan facility available to be drawn upon for up to 18 months and to finance certain permitted acquisitions by the Borrower. The credit facilities mature in five years and bear interest at LIBOR plus a margin that varies depending on the overall leverage ratio of the Borrower and its subsidiaries. Revolving loans are interest-only with principal due at maturity, while term loans require monthly payments of principal and interest based on an amortization schedule. The Borrower's obligations under the Credit Agreement are guaranteed by GSE's wholly-owned subsidiaries Hyperspring, Absolute, and True North and by any future material domestic subsidiaries (collectively, the Guarantors). The credit facilities are secured by liens on all assets of the Borrower and the Guarantors. The Company drew down \$10.3 million on the delayed draw term loan facility for the acquisition of True North, of which \$0.5 million was repaid to the bank on the same day. At December 31, 2018, the Company was in compliance with its financial covenants.

We intend to continue using the RLOC for short-term working capital needs and the issuance of letters of credit in connection with business operations. Letter of credit issuance fees range between 1.25% and 2% depending on the Company's overall leverage ratio, and the Company pays an unused RLOC fee quarterly based on the average daily unused balance.

At December 31, 2018, there were no outstanding borrowings under the RLOC and five letters of credit totaling \$2.3 million were outstanding. At December 31, 2017, there were no outstanding borrowings on the RLOC and three letters of credit was approximately \$0.8 million outstanding.

Branch Banking and Trust Bank (BB&T)

At December 31, 2018 and December 31, 2017, the cash collateral account with BB&T totaled \$0.0 million and \$1.0 million, respectively. The balances were classified as restricted cash on the consolidated balance sheets.

2019 Liquidity Outlook

At December 31, 2018, the Company's cash, cash equivalents and restricted cash totaled \$12.1 million.

As discussed above, the Company has a \$5.0 million RLOC with Citizen's Bank to fund general working capital needs, including acquisitions. At December 31, 2018, the amount available under this RLOC, after consideration of the borrowing base, letters of credit and working capital advances was approximately \$2.7 million. This credit facility provides the Company with additional flexibility to pursue its strategic initiatives and continue to expand the business. The Company entered 2019 with \$70.6 million of backlog; \$54.2 million of which is expected to convert to revenue in 2019. The Company anticipates that its normal operations will generate sufficient liquidity and working capital to fund its consolidated operations during the next twelve months without additional financing.

As discussed in MD&A, on December 27, 2017, the board of GSE Systems, Inc. approved an international restructuring plan to streamline and optimize the Company's global operations. GSE is in the process of consolidating its engineering services and R&D activities to Maryland and cease an unprofitable non-core business in the U.K. As a result, the Company will be closing its offices in Nyköping, Sweden; Chennai, India; and Stockton-on-Tees, UK. These actions are designed to improve Company productivity by eliminating duplicate employee functions and increasing GSE's focus on its core business, improving efficiency and maintaining the full range of engineering capabilities while reducing costs and organizational complexity. Under the restructuring plan, the Company expects a \$0.2 million cash outflow in 2019, which primarily includes severance expense, facility closing costs, and other restructuring costs.

Foreign Exchange.

A portion of the Company's international sales revenue has been and may be received in a currency other than the currency in which the expenses relating to such revenue are paid. Accordingly, the Company periodically enters into forward foreign exchange contracts to manage the market risks associated with the fluctuations in foreign currency exchange rates.

Off-balance Sheet Obligations.

The Company has no off-balance sheet obligations as of December 31, 2018, except for its operating lease commitments and outstanding letters of credit and surety bonds.

Other Matters.

Management believes inflation has not had a material impact on the Company's operations.

EBITDA and Adjusted EBITDA Reconciliation (in thousands)

References to “EBITDA” mean net (loss) income, before taking into account interest expense (income), provision for income taxes, depreciation and amortization. References to Adjusted EBITDA exclude the impact of gain from the change in fair value of contingent consideration, restructuring charges, stock-based compensation expense, impact of the change in fair value of derivative instruments, acquisition-related expense, and bad debt expense due to customer bankruptcy. EBITDA and Adjusted EBITDA are not measures of financial performance under generally accepted accounting principles (GAAP). Management believes EBITDA and Adjusted EBITDA, in addition to operating profit, net income and other GAAP measures, are useful to investors to evaluate the Company’s results because it excludes certain items that are not directly related to the Company’s core operating performance that may, or could, have a disproportionate positive or negative impact on our results for any particular period. Investors should recognize that EBITDA and Adjusted EBITDA might not be comparable to similarly-titled measures of other companies. This measure should be considered in addition to, and not as a substitute for or superior to, any measure of performance prepared in accordance with GAAP. A reconciliation of non-GAAP EBITDA and Adjusted EBITDA to the most directly comparable GAAP measure in accordance with SEC Regulation G follows:

	Three Months Ended December 31,		Twelve Months Ended December 31,	
	2018	2017	2018	2017
Net (loss) Income	\$679	\$6,601	\$(354)	\$6,557
Interest expense (income), net	115	(20)	268	(80)
Provision (benefit) for income taxes	1,007	(6,552)	1,131	(6,153)
Depreciation and amortization	776	392	2,634	1,146
EBITDA	2,577	421	3,679	1,470
Gain from the change in fair value of contingent consideration	-	10	-	446
Restructuring charges	92	733	1,269	778
Stock-based compensation expense	(9)	599	1,526	2,472
Impact of the change in fair value of derivative instruments	44	127	350	(99)
Acquisition-related expense	49	-	540	473
Bad debt expense due to customer bankruptcy	20	-	85	122
Adjusted EBITDA	\$2,773	\$1,890	\$7,449	\$5,662

Adjusted Net Income and Adjusted EPS Reconciliation (in thousands, except per share amounts)

References to Adjusted net income exclude the impact of gain from the change in fair value of contingent consideration, restructuring charges, stock-based compensation expense, impact of the change in fair value of derivative instruments, acquisition-related expense, amortization of intangible assets related to acquisitions, bad debt expense due to customer bankruptcy, one-time tax reform impact and release of valuation allowance. Adjusted Net Income and adjusted earnings per share (adjusted EPS) are not measures of financial performance under generally accepted accounting principles (GAAP). Management believes adjusted net income and adjusted EPS, in addition to other GAAP measures, are useful to investors to evaluate the Company's results because they exclude certain items that are not directly related to the Company's core operating performance and non-cash items that may, or could, have a disproportionate positive or negative impact on our results for any particular period. These measures should be considered in addition to, and not as a substitute for or superior to, any measure of performance prepared in accordance with GAAP. A reconciliation of non-GAAP adjusted net income and adjusted EPS to GAAP net income, the most directly comparable GAAP financial measure, is as follows:

	Three Months ended December 31,		Twelve Months ended December 31,		
	2018 (unaudited)	2017 (unaudited)	2018 audited	2017 audited	
Net (loss) Income	\$679	\$6,601	\$(354	) \$6,557
Gain from the change in fair value of contingent consideration	-	10	-	446	
Restructuring charges	92	733	1,269	778	
Stock-based compensation expense	(9	) 599	1,526	2,472
Impact of the change in fair value of derivative instruments	44	127	350	(99)
Acquisition-related expense	49	-	540	473	
Amortization of intangible assets related to acquisitions	518	187	1,612	335	
Bad debt expense due to customer bankruptcy	20	-	85	122	
Tax reform impact	-	2,497	-	2,497	
Release of valuation allowance	(339) (10,555) (339) (10,555)
Adjusted net income	\$1,054	\$199	\$4,689	\$3,026	
Diluted earnings (loss) per common share	\$0.03	\$0.33	\$(0.02	) \$0.33
Adjusted earnings per common share – Diluted	\$0.05	\$0.01	\$0.24	\$0.15	
Weighted average shares outstanding – Diluted	20,100,489	19,790,696	19,922,151	19,605,427	

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

Not required of a smaller reporting company.

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ITEM 8. FINANCIAL STATEMENTS AND
SUPPLEMENTARY DATA.

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Report of Independent Registered Public Accounting Firm

Shareholders and Board of Directors

GSE Systems, Inc.

Sykesville, Maryland

Opinion on the Consolidated Financial Statements

We have audited the accompanying consolidated balance sheets of GSE Systems, Inc. (the “Company”) and subsidiaries as of December 31, 2018 and 2017, the related consolidated statements of operations, comprehensive (loss) income, stockholders’ equity, and cash flows for each of the two years in the period ended December 31, 2018, and the related notes (collectively referred to as the “consolidated financial statements”). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company and subsidiaries at December 31, 2018 and 2017, and the results of their operations and their cash flows for each of the two years in the period ended December 31, 2018, in conformity with accounting principles generally accepted in the United States of America.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company’s management. Our responsibility is to express an opinion on the Company’s consolidated financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (“PCAOB”) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. As part of our audits we are required to obtain an understanding of internal control over financial reporting but not for the purpose of expressing an opinion on the effectiveness of the Company’s internal control over financial reporting. Accordingly, we express no such opinion. 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/ BDO USA, LLP

We have served as the Company's auditor since 2014.

McLean, Virginia

March 27, 2019

PART I - FINANCIAL INFORMATION

Item 1. Financial Statements

GSE SYSTEMS, INC. AND SUBSIDIARIES

CONSOLIDATED BALANCE SHEETS

(in thousands, except share data)

	December 31,	
	2018	2017
ASSETS		
Current assets:		
Cash and cash equivalents	\$12,123	\$19,111
Restricted cash	-	960
Contract receivables, net	21,077	13,997
Prepaid expenses and other current assets	1,800	2,795
Total current assets	35,000	36,863
Equipment, software and leasehold improvements	5,293	4,782
Accumulated depreciation	(4,228)	(3,719)
Equipment, software and leasehold improvements, net	1,065	1,063
Software development costs, net	615	690
Goodwill	13,170	8,431
Intangible assets, net	6,080	2,604
Deferred tax assets	5,461	6,494
Other assets	49	37
Total assets	\$61,440	\$56,182
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Current portion of long-term debt, net of debt issuance costs and original issue discount	\$1,902	\$-
Accounts payable	1,307	1,251
Accrued expenses	2,646	2,276
Accrued compensation	3,649	2,866
Billings in excess of revenue earned	10,609	14,543
Accrued warranty	981	1,433
Current contingent consideration	-	1,701
Income taxes payable	1,176	1,113
Other current liabilities	60	69
Total current liabilities	22,330	25,252
Long-term debt, less current portion, net of debt issuance costs and original issue discount	6,610	-
Other liabilities	1,371	1,258
Total liabilities	30,311	26,510
Commitments and contingencies (FN16)		
Stockholders' equity:		
Preferred stock \$.01 par value; 2,000,000 shares authorized; no shares issued and outstanding	-	-
Common stock \$.01 par value; 60,000,000 shares authorized, 21,485,445 shares issued, 19,886,534 shares outstanding as of December 31, 2018; 30,000,000 shares authorized,	214	210

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21,024,395 shares issued, 19,425,484 shares outstanding as of December 31, 2017

Additional paid-in capital	78,118	76,802
Accumulated deficit	(42,569)	(42,870)
Accumulated other comprehensive loss	(1,635)	(1,471)
Treasury stock at cost, 1,598,911 shares	(2,999)	(2,999)
Total stockholders' equity	\$31,129	\$29,672
Total liabilities and stockholders' equity	\$61,440	\$56,182

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

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GSE SYSTEMS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF OPERATIONS
(in thousands, except per share data)

	Years ended December 31,		
	2018	2017	
Revenue	\$92,249	\$70,880	
Cost of revenue	69,119	52,336	
Gross profit	23,130	18,544	
Operating expenses			
Selling, general and administrative	17,469	15,469	
Research and development	899	1,391	
Restructuring charges	1,269	778	
Depreciation	515	342	
Amortization of definite-lived intangible assets	1,612	335	
Total operating expenses	21,764	18,315	
Operating income	1,366	229	
Interest (expense) income, net	(268	) 80
(Loss) Gain on derivative instruments, net	(350	) 99
Other income (expense), net	29	(4)
Income before income taxes	777	404	
Provision (benefit) for income taxes	1,131	(6,153)
Net (loss) Income	\$(354	) \$6,557
Basic (loss) earnings per common share	\$(0.02	) \$0.34
Diluted (loss) earnings per common share	\$(0.02	) \$0.33
Weighted average shares outstanding - Basic	19,704,999	19,259,966	
Weighted average shares outstanding - Diluted	19,704,999	19,605,427	

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

GSE SYSTEMS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF COMPREHENSIVE (LOSS) INCOME
(in thousands)

	Years ended December 31,	
	2018	2017
Net (loss) Income	\$(354)	\$6,557
Foreign currency translation adjustment	(164)	306
Comprehensive (loss) Income	\$(518)	\$6,863

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

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GSE SYSTEMS, INC, AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CHANGES IN STOCKHOLDERS' EQUITY
(in thousands)

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Treasury Stock		Total
	Shares	Amount				Shares	Amount	
Balance, January 1, 2017	20,434	\$ 204	\$ 75,120	\$ (49,427)	\$ (1,777)	(1,599)	\$(2,999)	\$21,121
Cumulative effect of new accounting principle	-	-	-	-	-	-	-	-
Stock-based compensation expense	-	-	2,398	-	-	-	-	2,398
Common stock issued for options exercised	182	2	207	-	-	-	-	209
Common stock issued for RSUs vested	409	4	(4)	-	-	-	-	-
Shares withheld to pay taxes	-	-	(919)	-	-	-	-	(919)
Foreign currency translation adjustment	-	-	-	-	306	-	-	306
Net income	-	-	-	6,557	-	-	-	6,557
Balance, December 31, 2017	21,024	\$ 210	\$ 76,802	\$ (42,870)	\$ (1,471)	(1,599)	\$(2,999)	\$29,672
Cumulative effect of adopting ASC 606	-	-	-	655	-	-	-	655
Stock-based compensation expense	-	-	1,668	-	-	-	-	1,668
Common stock issued for options exercised	220	2	134	-	-	-	-	136
Common stock issued for RSUs vested	241	2	(2)	-	-	-	-	-
Shares withheld to pay taxes	-	-	(484)	-	-	-	-	(484)
Foreign currency translation adjustment	-	-	-	-	(164)	-	-	(164)
Net loss	-	-	-	(354)	-	-	-	(354)
Balance, December 31, 2018	21,485	\$ 214	\$ 78,118	\$ (42,569)	\$ (1,635)	(1,599)	\$(2,999)	\$31,129

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

GSE SYSTEMS, INC. AND SUBSIDIARIES
CONSOLIDATED STATEMENTS OF CASH FLOWS
(in thousands)

	Years ended December 31,	
	2018	2017
Cash flows from operating activities:		
Net (loss) Income	\$(354)	\$6,557
Adjustments to reconcile net (loss) income to net cash (used in) provided by operating activities:		
Write-off of long-lived assets to be disposed of	-	222
Accrued severance costs	-	465
Depreciation	515	342
Amortization of definite-lived intangible assets	1,612	335
Amortization of capitalized software development costs	507	469
Stock-based compensation expense	1,526	2,472
Bad debt expense	294	118
Loss (gain) on derivative instruments, net	350	(99)
Deferred income taxes	644	(6,678)
Loss on sale of equipment, software, and leasehold improvements	-	2
Changes in assets and liabilities:		
Contract receivables, net	(5,656)	10,006
Prepaid expenses and other assets	856	1,020
Accounts payable, accrued compensation and accrued expenses	(838)	(1,904)
Billings in excess of revenue earned	(2,984)	(6,897)
Accrued warranty	(322)	462
Other liabilities	367	370
Net cash (used in) provided by operating activities	(3,483)	7,262
Cash flows from investing activities:		
Capital expenditures	(513)	(112)
Capitalized software development costs	(432)	(177)
Acquisition of Absolute Consulting, net of cash acquired	-	(9,066)
Acquisition of True North Consulting, net of cash acquired	(9,609)	-
Net cash used in investing activities	(10,554)	(9,355)
Cash flows from financing activities:		
Proceeds from issuance of long-term debt, net of debt issuance costs and original issue discount	10,154	-
Repayment of long-term debt	(1,642)	-
Proceeds from issuance of common stock on the exercise of stock options	136	209
Shares withheld to pay taxes	(484)	(919)
Contingent consideration payments to former Hyperspring, LLC owners	(1,701)	(404)
Net cash provided by (used in) financing activities	6,463	(1,114)
Effect of exchange rate changes on cash	(374)	391
Net decrease in cash and cash equivalents	(7,948)	(2,816)
Cash, cash equivalents and restricted cash at beginning of year	20,071	22,887
Cash, cash equivalents and restricted cash at end of year	\$12,123	\$20,071

The accompanying notes are an integral part of these consolidated financial statements.
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GSE SYSTEMS, INC. AND SUBSIDIARIES
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
December 31, 2018 and 2017

1. Summary of Significant Accounting Policies

Principles of consolidation

The accompanying consolidated financial statements include the accounts of GSE Systems, Inc. and its wholly-owned subsidiaries (collectively the Company). All intercompany balances and transactions have been eliminated in consolidation.

Accounting estimates

The preparation of the consolidated financial statements in conformity with generally accepted accounting principles in the United States of America (U.S. GAAP) requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenue and expenses during the reporting period. On an ongoing basis, the Company evaluates the estimates used, including, but not limited to those related to revenue recognition on long-term contracts, allowance for doubtful accounts, product warranties, valuation of goodwill and intangible assets acquired, impairment of long-lived assets to be disposed of, valuation of contingent consideration issued in business acquisitions, valuation of stock based compensation awards and the recoverability of deferred tax assets. Actual results could differ from these estimates.

Business combinations

Business combinations are accounted for in accordance with ASC 805, Business Combinations, using the acquisition method. Under the acquisition method, the identifiable assets acquired, liabilities assumed and any non-controlling interest in the acquiree are recognized at fair value on the acquisition date, which is the date on which control is transferred to the Company. Any excess purchase price is recorded as goodwill. Transaction costs associated with business combinations are expensed as incurred.

Revenues and the results of operations of the acquired business are included in the accompanying consolidated statements of operations commencing on the date of acquisition.

Acquisitions may include contingent consideration payments based on future financial measures of an acquired company. Under ASC 805, contingent consideration is required to be recognized at fair value as of the acquisition date. We estimate the fair value of these liabilities based on financial projections of the acquired companies and estimated probabilities of achievement. At each reporting date, the contingent consideration obligation is revalued to estimated fair value, and changes in fair value subsequent to the acquisition are reflected in income or expense in the consolidated statements of operations, and could cause a material impact to our operating results. Changes in the fair value of contingent consideration obligations may result from changes in discount periods and rates, changes in the timing and amount of revenue and/or earnings estimates, and changes in probability assumptions with respect to the likelihood of achieving the various earn-out criteria.

Revenue recognition

The Company derives its revenue through three broad revenue streams: 1) System Design and Build (SDB), 2) Software, and 3) Training and Consulting services. We recognize revenue from SDB and software contracts mainly through the Performance Improvement Solutions segment and the training and consulting service contracts through both the Performance Improvement Solutions segment and Nuclear Industry Training and Consulting segment. The SDB contracts are typically fixed-price and consist of initial design, engineering, assembly and installation of training simulators which include hardware, software, labor, and post contract support (PCS) on the software. We

generally have two main performance obligations for an SDB contract: the training simulator build and PCS. The training simulator build performance obligation generally includes hardware, software, and labor. The transaction price under the SDB contracts is allocated to each performance obligation based on its standalone selling price. We recognize the training simulator build revenue over the construction and installation period using the cost-to-cost input method as our performance creates or enhances assets with no alternative use to the Company, and we have an enforceable right to payment for performance completed to date. Cost-to-cost input method best measures the progress toward complete satisfaction of the performance obligation. PCS revenue is recognized ratably over the service period, as PCS is deemed a stand-ready obligation.

In applying the cost-to-cost input method, we use the actual costs incurred to date relative to the total estimated costs to measure the work progress toward the completion of the performance obligation and recognize revenue accordingly. Estimated contract costs are reviewed and revised periodically as the work progresses, and the cumulative effect of any change in estimates is recognized in the period in which the change is identified. Estimated losses are recognized in the period such losses are identified. Uncertainties inherent in the performance of contracts include labor availability and productivity, material costs, change order scope and pricing, software modification and customer acceptance issues. The reliability of these cost estimates is critical to the Company's revenue recognition as a significant change in the estimates can cause the Company's revenue and related margins to change significantly from the amounts estimated in the early stages of the project.

The SDB contracts generally provide a one-year base warranty on the systems. The base warranty will not be accounted for as a separate performance obligation under the contract because it does not provide the customer with a service in addition to the assurance that the completed project complies with agreed-upon specifications. Warranties extended beyond our typical one-year period will be evaluated on a case by case basis to determine if it provides more than just assurance that the product operates as intended, which requires carve-out as a separate performance obligation.

Revenue from the sale of perpetual standalone and term software licenses, which do not require significant modification or customization, is recognized upon its delivery to the customer. Revenue from the sale of subscription-based standalone software licenses, which do not require significant modification or customization, is recognized ratably over the term of such licenses following delivery to the customer. Delivery is considered to have occurred when the customer receives a copy of the software and is able to use and benefit from the software.

A software license sale contract with multiple deliverables typically includes the following elements: license, installation and training services, and PCS. The total transaction price of a software license sale contract is typically fixed, and is allocated to the identified performance obligations based on their relative standalone selling prices. Revenue is recognized as the performance obligations are satisfied. Specifically, license revenue is recognized when the software license is delivered to the customer; installation and training revenue is recognized when the installation and training is completed without regard to a detailed evaluation of the point in time criteria due to the short-term nature of the installation and training services (one to two days on average); and PCS revenue is recognized ratably over the service period, as PCS is deemed as a stand-ready obligation.

The contracts within the training and consulting services revenue stream are either time and materials (T&M) based or fixed-price based. Under a typical T&M contract, the Company is compensated based on the number of hours of approved time provided by temporary workers and the bill rates which are fixed by type of work, as well as approved expenses incurred. The customers are billed on a regular basis, such as weekly, biweekly or monthly. In accordance with ASC 606-10-55-18, Revenue from contracts with customers, we elected to apply the "right to invoice" practical expedient, under which we recognize revenue in the amount to which we have the right to invoice. The invoice amount represents the number of hours of approved time worked by each temporary worker multiplied by the bill rate for the type of work, as well as approved expenses incurred. Under a typical fixed-price contract, we recognize the revenue using the completed contract method as we are not able to reasonably estimate costs to complete and contracts typically have a term of less than 1 month.

For contracts with multiple performance obligations, we allocate the contract price to each performance obligation based on its relative standalone selling price. We generally determine standalone selling prices based on the prices charged to customers.

Cash and cash equivalents

Cash and cash equivalents represent cash and highly liquid investments including money market accounts with maturities of three months or less at the date of purchase.

Restricted cash

Restricted cash consists of the cash collateralization of outstanding letters of credit used for various advance payment, bid, surety and performance bonds. BB&T Bank has complete and unconditional control over the restricted money market accounts. As of December 31, 2018 and 2017, the cash collateral account totaled \$0.0 million and \$1.0 million, respectively, and was classified as restricted cash on the consolidated balance sheets. As of December 31, 2018, all BB&T accounts have been closed.

Contract receivables, net

Contract receivables include recoverable costs and accrued profit not billed which represents revenue recognized in excess of amounts billed. Billings in excess of costs and estimated earnings on uncompleted contracts in the accompanying consolidated balance sheets represent advanced billings to clients on contracts in advance of work performed. Generally, such amounts will be earned and recognized over the next twelve months. Billed receivables are recorded at invoiced amounts. The allowance for doubtful accounts is based on historical trends of past due accounts, write-offs, specific identification and review of customer accounts.

Equipment, software and leasehold improvements, net

Equipment and purchased software are recorded at cost and depreciated using the straight-line method with estimated useful lives ranging from three to ten years. Leasehold improvements are amortized over the life of the lease or the estimated useful life, whichever is shorter, using the straight-line method. Upon sale or retirement, the cost and related depreciation are eliminated from the respective accounts and any resulting gain or loss is included in operations. Maintenance and repairs are charged to expense as incurred.

Software development costs

Certain computer software development costs, including direct labor cost, are capitalized in the accompanying consolidated balance sheets. Capitalization of computer software development costs begins upon the establishment of technological feasibility. Capitalization ceases and amortization of capitalized costs begins when the software product is commercially available for general release to customers. Amortization of capitalized computer software development costs is included in cost of revenue and is determined using the straight-line method over the remaining estimated economic life of the product, typically three years. On an annual basis, or more frequently as conditions indicate, the Company assesses the recovery of the unamortized software development costs by estimating the net undiscounted cash flows expected to be generated by the sale of the product. If the undiscounted cash flows are not sufficient to recover the unamortized software costs the Company will write-down the carrying amount of such asset to its estimated fair value based on the future discounted cash flows. The excess of any unamortized computer software costs over the related fair value is written down and charged to operations.

Development expenditures

Development expenditures incurred to meet customer specifications under contracts are charged to contract costs. Company sponsored development expenditures are either charged to operations as incurred and are included in research and development expenses or are capitalized as software development costs. See Note 9, Software development costs. The amounts incurred for Company sponsored development activities relating to the development

of new products and services or the improvement of existing products and services, were approximately \$1.3 million and \$1.6 million for the years ended December 31, 2018 and 2017, respectively. Of this amount, the Company capitalized approximately \$0.4 million and \$0.2 million for the years ended December 31, 2018 and 2017, respectively.

Impairment of long-lived assets

Long-lived assets, such as equipment, purchased software, capitalized software development costs, and intangible assets subject to amortization, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability of assets to be held and used is measured by a comparison of the carrying amount of an asset to estimated undiscounted future cash flows expected to be generated by the asset. If the carrying amount of an asset exceeds its estimated undiscounted future cash flows, an impairment charge is recognized at the amount by which the carrying amount of the asset exceeds its fair value. Assets to be disposed of would be separately presented in the consolidated balance sheets and reported at the lower of the carrying amount or fair value less costs to sell, and would no longer be depreciated.

On December 27, 2017, the Board of the Company approved an international restructuring plan to streamline and optimize the Company's global operations. As a result, the Company will be closing its offices in Nyköping, Sweden; Chennai, India; and Stockton-on-Tees, UK. The Company's management conducted an impairment review of the assets to be disposed of under the plan. Based upon this review, we recorded an impairment loss of \$0.2 million representing the net book value of the equipment and intangible assets subject to amortization under the respective offices as of December 31, 2017. See Note 4, Restructuring Expenses.

Goodwill and intangible assets

The Company's intangible assets include amounts recognized in connection with business acquisitions, including customer relationships, trade names, non-compete agreements and alliance agreements. Intangible assets are initially valued at fair value using generally accepted valuation methods appropriate for the type of intangible asset.

Amortization is recognized on a straight-line basis over the estimated useful life of the intangible assets, except for contract backlog and contractual customer relations, which are recognized in proportion to the related project revenue streams. Intangible assets with definite lives are reviewed for impairment if indicators of impairment arise. The Company does not have any intangible assets with indefinite useful lives.

Goodwill represents the excess of costs over fair value of assets of businesses acquired. The Company reviews goodwill for impairment annually as of December 31 and whenever events or changes in circumstances indicate the carrying value of goodwill may not be recoverable in accordance with ASU 2011-08, Intangibles - Goodwill and Other (Topic 350): Testing Goodwill for Impairment. The Company tests goodwill at the reporting unit level. ASU 2011-08 permits an entity to first assess qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit is less than its carrying amount as a basis for determining whether it is necessary to perform the two-step goodwill impairment test. Under ASU 2011-08, an entity is not required to perform step one of the goodwill impairment test for a reporting unit if it is more likely than not that its fair value is greater than its carrying amount. For the annual goodwill impairment test as of December 31, 2018, the Company performed a qualitative step zero goodwill impairment test and concluded that it was more likely than not fair values of each of the reporting units exceeded their respective carrying values. No goodwill impairment was recorded during 2018 or 2017.

Foreign currency translation

The United States Dollar (USD) is the functional currency of GSE and our subsidiaries operating in the United States. Our subsidiaries' financial statements are maintained in their functional currencies. The functional currency of each of our foreign subsidiaries is the currency of the economic environment in which the subsidiary primarily does business. Our foreign subsidiaries' financial statements are translated into USD using the exchange rates applicable to the dates of the financial statements. Assets and liabilities are translated into USD using the period-end spot foreign exchange rates. Income and expenses are translated at the average exchange rate for the year. Equity accounts are translated at

historical exchange rates. The effects of these translation adjustments are cumulative translation adjustments, which are reported as a component of accumulated other comprehensive income (loss) included in the consolidated statements of changes in stockholders' equity.

For any business transaction that is in a currency different from the entity's functional currency, we record a gain or loss based on the difference between the exchange rate at the transaction date and the exchange rate at the transaction settlement date (or rate at period end, if unsettled) to foreign currency realized gain (loss) account, net gain (loss) on derivative instruments in the consolidated statements of operations.

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Accrued warranty

For contracts that contain a warranty provision, the Company provides an accrual for estimated future warranty costs based on historical experience and projected claims. The Company's contracts may contain warranty provisions ranging from one to five years. The current portion of the accrued warranty is presented separately on the consolidated balance sheets within current liabilities whereas the noncurrent portion is included in other liabilities.

The activity in the accrued warranty accounts is as follows:

(in thousands)	As of and for the years ended December 31,	
	2018	2017
Beginning balance	\$1,953	\$1,478
Current year provision	(107)	707
Current year claims	(215)	(245)
Currency adjustment	(10)	13
Ending balance	\$1,621	\$1,953

Income taxes

Income taxes are provided under the asset and liability method. Under this method, deferred income taxes are determined based on the differences between the consolidated financial statements and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. Valuation allowances are established, when necessary, to reduce deferred tax assets to the amounts expected to be realized. A provision is made for the Company's current liability for federal, state and foreign income taxes and the change in the Company's deferred income tax assets and liabilities.

We establish accruals for uncertain tax positions taken or expected to be taken in a tax return when it is not more likely than not (i.e., a likelihood of more than fifty percent) that the position would be sustained upon examination by tax authorities that have full knowledge of all relevant information. A recognized tax position is then measured at the largest amount of benefit that is greater than fifty percent likely of being realized upon ultimate settlement. Favorable or unfavorable adjustment of the accrual for any particular issue would be recognized as an increase or decrease to income tax expense in the period of a change in facts and circumstances. Interest and penalties related to income taxes are accounted for as income tax expense.

Stock-based compensation

Share-based compensation expense is based on the grant-date fair value estimated in accordance with the provisions of ASC 718, Compensation-Stock Compensation. Compensation expense related to share based awards is recognized on a pro rata straight-line basis based on the value of share awards that are scheduled to vest during the requisite service period.

Earnings per share

Basic earnings per share is based on the weighted average number of outstanding common shares for the period. Diluted earnings per share adjusts the weighted average shares outstanding for the potential dilution that could occur if outstanding vested stock options were exercised. Basic and diluted earnings per share is based on the weighted average number of outstanding shares for the period.

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The number of common shares and common share equivalents used in the determination of basic and diluted (loss) earnings per share were as follows:

(in thousands, except for per share data)	Years ended December 31,	
	2018	2017
Numerator:		
Net (loss) income attributed to common stockholders	\$(354	) \$6,557
Denominator:		
Weighted-average shares outstanding for basic earnings per share	19,704,999	19,259,966
Effect of dilutive securities:		
Employee stock options and warrants	-	345,461
Adjusted weighted-average shares outstanding and assumed conversions for diluted earnings per share	19,704,999	19,605,427
Shares related to dilutive securities excluded because inclusion would be anti-dilutive	217,152	374,833

Conversion of certain outstanding stock options was not assumed for the years ended December 31, 2018 and 2017 because the impact would have been anti-dilutive.

Significant customers and concentration of credit risk

For the year ended December 31, 2018, we have a concentration of revenue from two individual customers, which accounted for 14.3% and 26.9% of our consolidated revenue, respectively. For the year ended December 31, 2017, we have a concentration of revenue from two customers, which accounted for 18.2% and 20.8% of our consolidated revenue, respectively. These customers are part of Performance and both Performance and NITC segments, respectively. No other individual customer accounted for more than 10% of our consolidated revenue in 2018 or 2017. As of December 31, 2018, we have one customer that accounted for 16.8% of the Company's consolidated contract receivables. As of December 31, 2017, the Company had one customer that accounted for 26.7% of the Company's consolidated contract receivables.

Fair values of financial instruments

The carrying amounts of current assets and current liabilities reported in the consolidated balance sheets approximate fair value due to their short term duration.

Derivative instruments

The Company utilizes forward foreign currency exchange contracts to manage market risks associated with the fluctuations in foreign currency exchange rates. It is the Company's policy to use such derivative financial instruments to protect against market risk arising in the normal course of business in order to reduce the impact of these exposures. The Company minimizes credit exposure by limiting counterparties to nationally recognized financial institutions.

Reclassifications and Immaterial Correction of an Error in Previously Issued Financial Statements

Certain prior year amounts have been reclassified to conform with the current year presentation. The Company reclassified the cash payments made to settle the contingent liability from acquisition in excess of the amount recognized at the acquisition date to operating activities from financing activities due to the adoption of ASU 2016-15. Subsequent to the filing of the Company's Annual Report on Form 10-K for the year ended December 31, 2017, the Company determined that in connection with the adoption of ASU 2016-09, Compensation – Stock Compensation: Topic 718: Improvements to Employee Share Based Payment Accounting, it had improperly recorded the release of \$1.2 million of deferred tax asset valuation directly as an adjustment to its accumulated deficit account. The Company corrected this error by recording the \$1.2 million deferred tax asset valuation release as additional income tax benefit in its provision for income tax for the year ended December 31, 2017. The misstatement had no impact on ending accumulated deficit balance at December 31, 2017 or any net impact on the Company's Consolidated Statements of Cash Flows.

Management evaluated the effect of the adjustment on the Company's financial statements under the provision of ASC 250: Accounting Changes and Error Corrections and Staff Accounting Bulletin No. 108: Considering the Effects of Prior Year Misstatements When Quantifying Misstatements in Current Year Financial Statements and concluded that it was immaterial to the current year and prior years' annual and quarterly financial statements.

The following are the impacted line items from the Company's consolidated financial statements illustrating the effect of these revisions, in thousands (other than earnings per common share).

Consolidated Statement of Operations

	Twelve months ended December 31, 2017		
	As reported	Adjustment	As revised
Benefit for income taxes	\$ (4,980)	\$ (1,173)	\$ (6,153)
Net Income	5,384	1,173	6,557
Basic earnings per common share	\$0.28	\$ 0.06	\$0.34
Diluted earnings per common share	0.27	0.06	0.33

Consolidated Statements of Changes in Stockholders' Equity

	Twelve months ended December 31, 2017		
	As reported	Adjustment	As revised
Cumulative effect of new accounting principle	\$1,173	\$ (1,173)	\$-
Net Income	5,384	1,173	6,557

Additionally, the Company identified a \$0.7 million classification error between deferred tax asset and deferred tax liability at December 31, 2017 due to improper netting of deferred taxes by jurisdiction. Accordingly, in our Form 10-Q for Q2 2018, we reclassified \$0.7 million of deferred tax liabilities, which was included in other liabilities to deferred tax assets in our December 31, 2017 consolidated balance sheet.

Consolidated Balance Sheets

	Balance at December 31, 2017		
	As reported	Adjustment	As revised
Deferred tax assets	\$7,167	\$ (673)	\$6,494
Total assets	56,855	(673)	56,182

Other liabilities	1,931	673	1,258
Total liabilities	\$27,183	\$ 673	\$26,510

Accounting pronouncements recently adopted

In May 2014, the Financial Accounting Standards Board (FASB) issued ASU No. 2014-09, Revenue from Contracts with Customers, which provides guidance for revenue recognition. Subsequently, the FASB issued a series of updates to the revenue recognition guidance in ASC 606, Revenue from Contracts with Customers (ASC 606). Under ASC 606, revenue is recognized when a customer obtains control of promised goods or services and is recognized at an amount that reflects the consideration expected to be received in exchange for such goods or services. In addition, the new accounting standard requires disclosure of the nature, amount, timing, and uncertainty of revenue and cash flows arising from contracts with customers. ASU 2014-09 is effective for the fiscal year ended December 31, 2018 and interim periods therein.

We adopted ASU 2014-09 and all the related updates (collectively, the new revenue standard) on January 1, 2018 using the modified retrospective transition method. The new revenue standard was applicable to (1) all new contracts entered into after January 1, 2018 and (ii) all existing contracts for which all (or substantially all) of the revenue has not been recognized under legacy revenue guidance. We recognized the cumulative effect of initially applying the new revenue standard as an increase of \$0.7 million to the opening balance of accumulated deficit. The comparative information has not been restated and continues to be reported under the accounting standards in effect for those periods.

This adoption primarily affected our software license sales with multiple deliverables, which typically include the following elements: license, installation and training services and PCS. Under the legacy revenue recognition standard, due to the lack of vendor specific objective evidence (VSOE), revenue was recognized ratably over the PCS period. Under the new revenue standard, the total transaction price is allocated to the identified performance obligations based on their relative standalone selling prices, and revenue is recognized as the performance obligations are satisfied.

Select line items which were adjusted upon adoption were as follows (in thousands):

Statement of Operations

	Twelve months ended December 31, 2018		
	As Reported	Balance without adoption of ASC 606	Effect of Change
Revenue	\$92,249	\$ 92,723	\$ (474)
Gross profit	23,130	23,604	(474)
Provision for income taxes	1,131	1,257	126
Net loss	(354)	(6)	(348)
Basic loss per common share	(0.02)	-	
Diluted loss per common share	(0.02)	-	

Balance Sheet

	Balance at December 31, 2018		
	As Reported	Balance without adoption of ASC	Effect of Change

		606	
Contract receivables, net	\$21,077	\$21,077	\$ -
Deferred tax assets	5,461	5,576	(115)
Billings in excess of revenue earned	10,609	11,088	(479)
Accumulated deficit	(42,569)	(42,933)	364

In August 2016, the FASB issued ASU No. 2016-15, Classification of Certain Cash Receipts and Cash Payments. The new guidance addresses eight specific cash flow issues and applies to all entities that are required to present a statement of cash flows. ASU 2016-15 was effective for fiscal reporting periods beginning after December 15, 2017, including interim reporting periods within those fiscal years. We adopted ASU 2016-15 on January 1, 2018, on a retrospective basis. Upon the adoption of ASU 2016-15, cash payments made to settle a contingent consideration liability from an acquisition in excess of the amount recognized at the acquisition date are classified as operating activities, which were previously presented as financing activities. The comparative statement of cash flows has been restated to include only the payments made to settle the contingent liability related to the original amount recognized at the acquisition date in the financing activities; previously, the payment of \$0.4 million related to fair value adjustment and interest accretion of the contingent liability was included in financing activities. Upon the adoption of ASU 2016-15, it was reclassified as an operating activity.

In November 2016, the FASB issued ASU No. 2016-18, Restricted Cash. The new guidance applies to all entities that have restricted cash or restricted cash equivalents and are required to present a statement of cash flows. This update is intended to reduce diversity in cash flow presentation of restricted cash and restricted cash equivalents and requires entities to include all cash and cash equivalents, both restricted and unrestricted, in the beginning-of-period and end-of-period totals presented on the statement of cash flows. We adopted ASU 2016-18 effective January 1, 2018, on a retrospective basis. As the result of the adoption of ASU 2016-18, we restated the statement of cash flows for the comparative period to include both restricted and unrestricted cash in the beginning-of-period and end-of-period totals, and eliminated the transfers between restricted and unrestricted cash in the statement of cash flows.

In January 2017, the FASB issued ASU No. 2017-01, Business Combinations: Clarifying the definition of a Business, which amends the definition of a business. ASU 2017-01 was effective for acquisitions commencing on or after December 15, 2017, with early adoption permitted. We adopted ASU 2017-01 effective January 1, 2018. ASU 2017-01 is applied prospectively to acquisitions commencing on or after the effective date.

Accounting pronouncements not yet adopted

In February 2016, the FASB issued ASU No. 2016-02, Leases. The new standard establishes a right-of-use (ROU) model that requires a lessee to record a ROU asset and a lease liability on the balance sheet for all leases with terms longer than 12 months. Leases will be classified as either finance or operating, with classification affecting the pattern of expense recognition in the income statement. The new standard is effective for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years. A modified retrospective transition approach is required for lessees with capital and operating leases existing at, or entered into after, the beginning of the earliest comparative period presented in the consolidated financial statements, with certain practical expedients available. The Company anticipates adoption of the standard will result in the recognition of incremental right of use assets and corresponding lease liabilities to its balance sheet upon adoption of the new standard in the range of \$2.5 million to \$3.5 million resulting from the recognition of office leases, currently accounted for as operating leases. The adoption will also result in an increase of \$0.2 million to \$0.4 million to the opening balance of accumulated deficit as of January 1, 2019. Beginning in 2019, the Company expects changes to its disclosed lease recognition policies and practices, as well as to other related financial statement disclosures due to the adoption of this standard. The Company is finalizing its adoption of the new standard, including an evaluation of the potential impact on internal controls, and will report finalized impacts in the Company's first quarter 2019 Form 10-Q filing.

In June 2016, the FASB issued ASU 2016-13, Financial Instruments – Credit Losses, which introduces new guidance for credit losses on instruments within its scope. The new guidance introduces an approach based on expected losses to estimate credit losses on certain types of financial instruments, including, but not limited to, trade and other

receivables, held-to-maturity debt securities, loans and net investments in leases. The new guidance also modifies the impairment model for available-for-sale debt securities and requires the entities to determine whether all or a portion of the unrealized loss on an available-for-sale debt security is a credit loss. The standard also indicates that entities may not use the length of time a security has been in an unrealized loss position as a factor in concluding whether a credit loss exists. The ASU is effective for public companies for fiscal years beginning after December 15, 2019, and interim periods within those fiscal years. Early adoption is permitted for all entities for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years. The Company is currently evaluating the effects, if any, that the adoption of this guidance will have on the Company's consolidated financial position, results of operations and cash flows.

In January 2017, the FASB issued ASU No. 2017-04, Simplifying the Test for Goodwill Impairment. ASU 2017-04 simplifies the accounting for goodwill impairment by eliminating Step 2 of the current goodwill impairment test, which required a hypothetical purchase price allocation. Goodwill impairment will now be the amount by which the reporting unit's carrying value exceeds its fair value, limited to the carrying value of the goodwill. ASU 2017-04 is effective for financial statements issued for fiscal years, and interim periods beginning after December 15, 2019. We are currently evaluating the potential impact of the adoption of ASU 2017-04 on our consolidated financial statements.

2. Acquisitions

True North

On May 11, 2018, GSE, through Performance Solutions, entered into a membership interest purchase agreement with Donald R. Horn, Jenny C. Horn, and True North Consulting LLC (the True North Purchase Agreement) to purchase 100% of the membership interests in True North Consulting LLC (True North) for \$9.75 million. The purchase price was subject to customary pre- and post-closing working capital adjustments, resulting in total consideration of \$9.9 million. The True North Purchase Agreement contains customary representations, warranties, covenants, and indemnification provisions subject to certain limitations. An escrow of \$1.5 million was funded from the cash paid to the sellers of True North at the closing and is available to GSE to promote retention of key personnel and satisfy indemnification claims for 18 months after the closing. After the indemnification period or if no claims are paid out, any remaining cash reverts to the seller. The acquisition of True North was completed on an all-cash transaction basis. In connection with the acquisition, we drew down a \$10.3 million term loan to finance the transaction (including the transaction costs). See Note 11. Debt, for further information on the loan.

True North is a provider of technical engineering solutions to nuclear and fossil fuel power plants with an emphasis on regulatory-driven ASME code programs. Located in Montrose, Colorado, True North is a well-regarded service provider to leading companies in the power industry. The acquisition of True North is expected to broaden our engineering services offering, expand our relationships with several of the largest nuclear energy providers in the United States, and add a highly specialized, complimentary talent pool to our employee base.

The following table summarizes the consideration paid to acquire True North and the preliminary fair value of the assets acquired and liabilities assumed at the date of the transaction. Due to the recent completion of the acquisition, the Company recorded the assets acquired and liabilities assumed at their preliminary estimated fair value. As of December 31, 2018, the Company had not finalized the determination of the fair value allocated to various assets and liabilities, including, but not limited to, contract receivables, prepaid expenses and other current assets, intangible assets, accounts payable, accrued expenses, accrued compensation and the residual amount allocated to goodwill. The following amounts except for cash are all reflected in the consolidated statement of cash flows within the "Acquisition of True North Consulting, net of cash acquired" line caption.

(in thousands)

Total purchase price	\$9,915
Purchase price allocation:	
Cash	306
Contract receivables	1,870
Prepaid expenses and other current assets	8
Property, and equipment, net	1
Intangible assets	5,088
Accounts payable, accrued expenses	(1,744)
Accrued compensation	(353)
Total identifiable net assets	5,176
Goodwill	4,739
Net assets acquired	\$9,915

The fair value of the assets acquired includes gross trade receivables of \$1.9 million, of which the Company expects to collect in full. GSE did not acquire any other class of receivable as a result of the acquisition of True North.

True North contributed revenue of \$8.0 million to GSE for the period from May 11, 2018 to December 31, 2018.

The goodwill is primarily attributable to broader engineering service offering to new and existing customers, the workforce of the acquired business and the significant synergies expected to arise after the acquisition of True North.

The total amount of goodwill is expected to be tax deductible. All of the \$4.7 million of goodwill was assigned to our

Performance Improvement Solutions segment. As discussed above, the goodwill amount is provisional pending receipt of the final valuations of various assets and liabilities.

The Company identified other intangible assets of \$5.1 million, including customer contracts and relationships, tradename, non-compete agreements, and alliance agreements, with amortization periods of four to fifteen years. The fair value of the intangible assets is provisional pending receipt of the final valuations for these assets.

The following table summarizes the fair value of intangible assets acquired at the date of acquisition and the related weighted average amortization period:

Intangible Assets	Weighted Average Amortization Period (in years)	Fair Value (in thousands)
Customer relationships	15	\$ 3,758
Tradename	10	582
Alliance agreements	5	527
Non-compete agreements	4	221
Total		\$ 5,088

Absolute

On September 20, 2017, GSE, through its wholly-owned subsidiary Performance Solutions, acquired 100% of the capital stock of Absolute Consulting (Absolute) for \$8.8 million pursuant to the Stock Purchase Agreement by and among Performance Solutions and the sellers of Absolute. The purchase price was subject to a customary working capital adjustment resulting in total consideration of \$9.5 million. An indemnification escrow of \$1.0 million was funded from the cash paid to the sellers and is available to GSE and Performance Solutions to satisfy indemnification claims until September 20, 2019. The acquisition of Absolute was completed on an all-cash transaction basis.

Absolute is a provider of technical consulting and staffing solutions to the global nuclear power industry. Located in Navarre, Florida, Absolute has established long-term relationships with blue-chip customers primarily in the nuclear power industry. The acquisition of Absolute is expected to strengthen the Company's global leadership in nuclear training and consulting solutions, add new capacities to our technical consulting and staffing solutions offerings and bring highly complementary customers, while deepening relationships with existing clients.

The following table summarizes the consideration paid to acquire Absolute and the fair value of the assets acquired and liabilities assumed at the date of the transaction. The following amounts except for Cash are all reflected in the consolidated statement of cash flow within the "Acquisition of Absolute Consulting, net of cash acquired" line caption.

(in thousands)

Total purchase price	\$9,521
Purchase price allocation:	
Cash	\$455
Contract receivables	5,121
Prepaid expenses and other current assets	68
Property, and equipment, net	184
Intangible assets	2,569
Accounts payable, accrued expenses, and other liabilities	(78)
Accrued compensation	(1,617)
Total identifiable net assets	6,702
Goodwill	2,819
Net assets acquired	\$9,521

The goodwill is primarily attributable to the additional capacities to offer broader solutions to new and existing customers and the expected enhanced cost and growth synergies as a result of the acquisition. The total amount of goodwill that is expected to be tax deductible is \$2.8 million. All of the \$2.8 million of goodwill was assigned to our Nuclear Industry Training and Consulting segment.

The fair value of the assets acquired includes gross trade receivables of \$5.1 million, of which the Company has collected in full subsequent to the acquisition. GSE did not acquire any other class of receivable as a result of the acquisition of Absolute.

The Company identified \$2.6 million of other intangible assets, including customer relationships and trademarks/names with amortization periods of three to ten years. The following table summarizes the fair value of intangibles assets acquired at the date of acquisition and the related weighted average amortization period:

Intangible Assets	Weighted Average Amortization	Fair Value
-------------------	-------------------------------------	------------

	Period	(in
	(in years)	thousands)
Customer relationships	10	\$ 1,856
Trademarks/Names	3	713
Total		\$ 2,569

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Unaudited Pro Forma Financial Information

The following unaudited pro forma summary presents consolidated information for GSE, True North and Absolute as if the business combination had occurred on January 1, 2017. The unaudited pro forma financial information was prepared based on historical financial information.

These pro forma amounts have been calculated after applying GSE's accounting policies and adjusting the results of True North and Absolute to reflect the additional depreciation and amortization that would have been charged assuming the fair value adjustments to fixed assets and intangible assets had been applied from January 1, 2017, with the consequential tax effects. In 2018, GSE has incurred \$0.5 million of acquisition-related costs. These expenses are included in general and administrative expense on GSE's consolidated statements of operations and are reflected in pro forma earnings for the year ended December 31, 2017, in the table below. The pro forma financial information is not intended to reflect the actual results of operations that would have occurred if the acquisition had been completed on January 1, 2017, nor is it intended to be an indication of future operating results.

(in thousands)	(unaudited) Twelve Months Ended December 31,	
	2018	2017
Revenue	\$95,419	\$110,274
Net (Loss) Income	(1,717)	5,524
Basic (loss) earnings per common share	\$(0.09)	\$0.29
Diluted (loss) earnings per common share	\$(0.09)	\$0.28

3. Revenue

We generate revenue primarily through three broad revenue streams: 1) SDB, 2) Software, and 3) Training and Consulting Services. We recognize revenue from SDB and software contracts mainly through the Performance Improvement Solutions segment and the training and consulting service contracts through both the Performance Improvement Solutions segment and Nuclear Industry Training and Consulting segment.

The following table represents a disaggregation of revenue by type of goods or services for the years ended December 31, 2018 and 2017, along with the reportable segment for each category:
(in thousands)

	Twelve Months Ended December 31,	
	2018	2017 ⁽¹⁾
Performance Improvement Solutions segment		
System Design and Build	\$25,948	\$29,217
Software	2,883	3,409
Training and Consulting Services	14,123	7,273
Nuclear Industry Training and Consulting segment		
Training and Consulting Services	49,295	30,981
Total revenue	\$92,249	\$70,880

⁽¹⁾ Prior period amounts have not been adjusted under the modified retrospective transition method for the adoption of ASC 606.

SDB contracts are typically fixed-priced, and we receive payments based on a billing schedule as established in our contracts. The transaction price for software contracts is generally fixed. Fees for software are normally due in advance of or shortly after delivery of the software. Fees for PCS are normally paid in advance of the service period. For Training and Consulting Services, the customers are generally billed on a regular basis, such as weekly, biweekly or monthly, for services provided. Contract liability, which we classify as billing in excess of revenue earned, relates to payments received in advance of performance under the contract. Contract liabilities are recognized as revenue as performance obligations are satisfied.

The following table reflects the balance of contract liabilities and the revenue recognized in the reporting period that was included in the contract liabilities from contracts with customers:

(in thousands)

	December 31, 2018	December 31, 2017
Billings in excess of revenue earned (BIE)	\$ 10,609	\$ 14,543
Revenue recognized in the period from amounts included in BIE at the beginning of the period	\$ 11,275	-

For an SDB contract, we generally have two main performance obligations: the training simulator build and PCS. The training simulator build generally includes hardware, software, and labor. We recognize the training simulator build revenue over the construction and installation period using the cost-to-cost input method. In applying the cost-to-cost input method, we use the actual costs incurred to date relative to the total estimated costs to measure the work progress toward the completion of the performance obligation and recognize revenue accordingly. Estimated contract costs are reviewed and revised periodically as the work progresses, and the cumulative effect of any change in

estimates is recognized in the period in which the change is identified. Estimated losses are recognized in the period such losses are identified. Uncertainties inherent in the performance of contracts include labor availability and productivity, material costs, change order scope and pricing, software modification and customer acceptance issues. The reliability of these cost estimates is critical to the Company's revenue recognition as a significant change in the estimates can cause the Company's revenue and related margins to change significantly from the amounts estimated in the early stages of the project.

For the year ended December 31, 2018, the Company recognized revenue of \$2.0 million related to performance obligations satisfied in previous periods.

As of December 31, 2018, the aggregate amount of transaction price allocated to the remaining performance obligations of SDB, software and fixed-price training and consulting services contracts is \$41.6 million. The Company will recognize the revenue as the performance obligations are satisfied, which is expected to occur over the next twelve months.

Part of the training and consulting services contracts are T&M based. Under a typical T&M contract, the Company is compensated based on the number of hours of approved time provided by temporary workers and the bill rates, which are fixed by type of work, as well as approved expenses incurred. As part of our adoption of ASU 2014-09, we have elected to use the optional exemption under ASC 606-10-50-14(b) Revenue from contracts with customers, pursuant to which we have excluded disclosures of transaction prices allocated to remaining performance obligations under such contracts and when we expect to recognize the revenue.

4. Restructuring expenses

On December 27, 2017, the Board of the Company approved an international restructuring plan to streamline and optimize the Company's global operations. Beginning in December 2017, GSE has been in the process of consolidating its engineering services and R&D activities to Maryland and ceasing an unprofitable non-core business in the United Kingdom (UK). As a result, the Company closed its offices in Nyköping, Sweden; Chennai, India; and Stockton-on-Tees, UK. These actions are designed to improve Company productivity by eliminating duplicate employee functions, increasing GSE's focus on its core business, improving efficiency and maintaining the full range of engineering capabilities while reducing costs and organizational complexity.

GSE eliminated approximately 40 positions due to these changes, primarily in Europe and India, and will undertake other cost-savings measures. The restructuring plan is expected to be completed by the first quarter of 2019. As a result of these efforts, as shown in the table below, GSE expects to record a restructuring charge of approximately \$2.2 million in total, primarily related to workforce reductions, contracts termination costs and asset write-offs due to the exit activities. We recorded a restructuring charge of \$1.3 million for the year ended December 31, 2018, and we expect to record the remaining charges, primarily reflecting the office closure costs, in the first quarter of 2019. In addition to the restructuring costs in the table below, the Company has an estimated \$1.6 million of cumulative translation adjustments that will be charged against net income (loss) and an estimated \$1.0 million of tax benefits that will be realized upon liquidation of these foreign entities. GSE expects to recognize the remaining restructuring costs, currency translation adjustments and tax benefits by the first quarter of 2019.

The following tables summarize the restructuring costs and restructuring liabilities at December 31, 2018. The amounts to be transferred from cumulative translation adjustments and included in determining net loss for the period, in which the liquidation of these foreign entities are completed (2019), are not included in the table below.

	Total			
	Expected Termination Costs	Termination Costs for the Year	Accumulated Termination Costs	Expected Termination Costs Remaining
(in thousands)				
Employee termination benefits	\$ 820	\$ 355	\$ 820	\$ -
Lease termination costs	700	700	700	-
Assets write-offs	222	-	222	-
Other restructuring costs	419	214	260	159
Total	\$ 2,161	\$ 1,269	2,002	\$ 159

Restructuring Liabilities

	Employee Termination Benefits	Lease Termination Costs	Other Restructuring Costs	Total
(in thousands)				
Balance as of January 1, 2018	\$ 465	\$ -	\$ -	\$465
Accruals	341	668	214	1,223
Payments	(737)	(635)	(214)	(1,586)
Currency translation adjustments	(17)	1	-	(16)
Balance as of December 31, 2018	\$ 52	\$ 34	\$ -	\$86

The restructuring costs related to our Performance Improvement Solutions segment were included in the consolidated statement of operations within the "Restructuring charges" line caption. The accrued employee termination benefits of \$52,000 were reflected in the "Accrued compensation" line in the consolidated balance sheets. \$1.6 million of restructuring payments have been made as of December 31, 2018. There was no restructuring payment made for the year ended December 31, 2017.

5. Goodwill and Intangible Assets

Goodwill

The Company reviews goodwill for impairment annually as of December 31 and whenever events or changes in circumstances indicate the carrying value of an asset may not be recoverable. The Company tests goodwill at the reporting unit level. A reporting unit is an operating segment, or one level below an operating segment, as defined by U.S. GAAP. After the acquisition of Hyperspring on November 14, 2014, the Company determined that it had two reporting units, which are the same as our two operating segments: (i) Performance Improvement Solutions; and (ii) Nuclear Industry Training and Consulting (which includes Hyperspring and Absolute). As of December 31, 2018 and 2017, goodwill of \$13.2 million and \$8.4 million, respectively, related to the acquisitions of Hyperspring, Absolute and True North Consulting. No impairment of goodwill was recorded in 2018 or 2017.

The change in the net carrying amount of goodwill from January 1, 2017 through December 31, 2018 was comprised of the following items:

(in thousands)

	Performance Improvement Solutions	Nuclear Industry Training and Consulting	Total
Net book value at January 1, 2017	\$ -	\$ 5,612	\$5,612
Acquisition	-	2,819	2,819
Dispositions	-	-	-
Goodwill impairment loss	-	-	-
Net book value at December 31, 2017	\$ -	\$ 8,431	\$8,431
Acquisition	4,739	-	4,739
Dispositions	-	-	-
Goodwill impairment loss	-	-	-
Net book value at December 31, 2018	\$ 4,739	\$ 8,431	\$13,170

Intangible Assets Subject to Amortization

As discussed in Note 2, Acquisitions, we recognized finite-lived intangible assets of \$5.1 million upon acquisition of True North on May 11, 2018 and \$2.6 million upon acquisition of Absolute on September 17, 2017, including customer contracts and relationships, trademarks, non-compete agreements, and alliance agreements, with amortization periods of four to fifteen years. Amortization is recognized on a straight-line basis over the estimated useful life of the intangible assets. The fair value of the intangible assets is provisional pending receipt of the final valuations for these assets.

The following table shows the gross carrying amount and accumulated amortization of definite-lived intangible assets:

(in thousands)

As of December 31, 2018		
Gross	Accumulated	Net
Carrying Amount	Amortization	

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Amortized intangible assets:

Customer relationships	\$6,831	\$ (2,375) \$4,456
Trade names	1,295	(318) 977
Developed technology	471	(471) -
Non-contractual customer relationships	433	(433) -
Noncompete agreement	221	(35	) 186
Alliance agreement	527	(66	) 461
Others	167	(167) -
Total	\$9,945	\$ (3,865	) \$6,080

(in thousands)

As of December 31, 2017

Gross

Carrying Accumulated

Amount Amortization Net

Amortized intangible assets:

Customer relationships	\$3,074	\$ (1,218	) \$1,856
Trade names	713	(33	) 680
Developed technology	471	(412	) 59
Non-contractual customer relationships	433	(426) 7
Others	167	(165) 2
Total	\$4,858	\$ (2,254) \$2,604

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Amortization expense related to definite-lived intangible assets totaled \$1.6 million and \$0.3 million for the years ended December 31, 2018 and 2017, respectively. The following table shows the estimated amortization expense of the definite-lived intangible assets for the next five years:

(in thousands)

Years ended December 31:

2019	\$1,654
2020	1,332
2021	903
2022	674
2023	455
Thereafter	1,062
	\$6,080

6. Contract Receivables

Contract receivables represent the Company's unconditional rights to considerations due from a broad base of both domestic and international customers. All contract receivables are considered to be collectible within twelve months.

Recoverable costs and accrued profit not billed represent costs incurred and associated profit accrued on contracts that will become billable upon future milestones or completion of contracts. The components of contract receivables are as follows:

(in thousands)	December 31,	
	2018	2017
Billed receivables	\$15,998	\$8,154
Unbilled receivables	5,506	5,980
Allowance for doubtful accounts	(427)	(137)
Total contract receivables, net	\$21,077	\$13,997

Management reviews collectability of receivables periodically and records an allowance for doubtful accounts to reduce our receivables to their net realizable value when it is probable that the Company will not be able to collect all amounts due according to the contractual terms of the receivable. The allowance for doubtful accounts is based on historical trends of past due accounts, write-offs, and specific identification and review of customer accounts. During the years ended December 31, 2018 and 2017, the Company recorded allowances for doubtful accounts of \$294,000 and \$118,000, respectively.

During January 2019, the Company invoiced \$4.1 million of the unbilled amounts related to the balance at December 31, 2018.

As of December 31, 2018, the Company had one customer that accounted for 16.8% of its consolidated contract receivables. As of December 31, 2017, the Company had one customer that accounted for 26.7% of its consolidated contract receivables.

The activity in the allowance for doubtful accounts is as follows:

(in thousands)	As of and for the Years ended December 31, 2018 2017
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Beginning balance	\$137	\$17
Current year provision	294	118
Current year write-offs	-	-
Currency adjustment	(4)	2
Ending balance	\$427	\$137

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7. Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets consist of the following:

(in thousands)	December 31,	
	2018	2017
Inventory	\$ 139	\$ 755
Income tax receivable	310	418
Prepaid expenses	556	549
Other current assets	795	1,073
Total	\$ 1,800	\$ 2,795

Inventory composed of raw material, is being purchased to support the construction of three major nuclear simulation projects related to a significant contract that was executed during the first quarter of 2016. Inventory is recorded at the lower of cost or net realizable value in accordance with ASC 330, Inventory. Cost is determined using specific identification.

Other current assets primarily include value-added tax receivables and cash deposited in a Swedish tax account. Prepaid expenses primarily include prepayment for insurance.

8. Equipment, Software and Leasehold Improvements

Equipment, software and leasehold improvements, net consist of the following:

(in thousands)	December 31,	
	2018	2017
Computer equipment	\$ 2,178	\$ 2,101
Software	1,682	1,598
Leasehold improvements	619	454
Furniture and fixtures	814	629
	5,293	4,782
Accumulated depreciation	(4,228)	(3,719)
Equipment, software and leasehold improvements, net	\$ 1,065	\$ 1,063

Depreciation expense was \$0.5 million and \$0.3 million for the years ended December 31, 2018 and 2017, respectively.

As discussed in Note 4, Restructuring Expenses, on December 27, 2017, the board of the Company approved an international restructuring plan to streamline and optimize the Company's global operations. As a result, the Company will be closing its offices in Nyköping, Sweden; Chennai, India; and Stockton-on-Tees, UK, accordingly, the Company's management conducted an impairment test of the assets to be disposed of under the plan.

The fixed assets under the respective offices primarily included computers, office equipment and furniture, software and leasehold improvements. As a result of this test, the Company concluded that these assets were no longer recoverable. Accordingly, we recorded a \$0.1 million write-off of the fixed assets which represented the net book value of the respective assets for the year ended December 31, 2017. There was no fixed-asset write-off for the year ended December 31, 2018.

9. Software Development Costs

Software development costs, net consist of the following:

(in thousands)	December 31,	
	2018	2017

Beginning balance	\$690	\$982
Additions	432	177
Amortization	(507)	(469)
Ending balance	\$615	\$690

Software development costs capitalized were \$0.4 million and \$0.2 million for the years ended December 31, 2018 and 2017, respectively. Amortization of capitalized software development costs were \$507,000 and \$469,000 for the years ended December 31, 2018 and 2017, respectively, and were included in cost of revenue in the consolidated statements of operations.

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10. Fair Value of Financial Instruments

ASC 820, Fair Value Measurement (ASC 820) defines fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principle or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. ASC 820 also establishes a fair value hierarchy which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value.

The levels of the fair value hierarchy established by ASC 820 are:

Level 1: inputs are quoted prices, unadjusted, in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date.

Level 2: inputs are other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly. A Level 2 input must be observable for substantially the full term of the asset or liability. The Monte Carlo model was used to calculate the fair value of level 2 instruments. The inputs used are current stock price, expected term, risk-free rate, number of trials, volatility and interest rates.

Level 3: inputs are unobservable and reflect the reporting entity's own assumptions about the assumptions that market participants would use in pricing the asset or liability. The contingent consideration was based on EBITDA.

The Company considers the recorded value of certain of its financial assets and liabilities, which consist primarily of cash equivalents, accounts receivable and accounts payable, to approximate the fair value of the respective assets and liabilities at December 31, 2018 and 2017 based upon the short-term nature of the assets and liabilities.

The Company had \$1.0 million and \$2.3 million deposited in unrestricted money market accounts on December 31, 2018 and 2017, respectively.

As of December 31, 2018, the Company had five standby letters of credit totaling \$2.3 million which represent performance bonds on three contracts.

The following table presents assets and liabilities measured at fair value at December 31, 2018:

(in thousands)	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
Money market funds	\$ 824	\$ -	\$ -	\$824
Foreign exchange contracts	-	43	-	43
Total assets	\$ 824	\$ 43	\$ -	\$867
Liability awards	-	(118)	-	(118)
Interest rate swap contract	-	(103)	-	(103)
Total liabilities	\$ -	\$ (221)	\$ -	\$(221)

The following table presents assets and liabilities measured at fair value at December 31, 2017:

Quoted Prices	Significant Unobservable
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(in thousands)	in Active Markets for Identical Assets (Level 1)	Other Observable Inputs (Level 2)	Inputs (Level 3)	Total
Money market funds	\$ 3,240	\$ -	\$ -	\$3,240
Foreign exchange contracts	-	201	-	201
Total assets	\$ 3,240	\$ 201	\$ -	\$3,441
Liability awards	\$ -	\$ (242 )	) \$ -	\$(242)
Contingent consideration liability	-	-	(1,701 )	) (1,701)
Total liabilities	\$ -	\$ (242 )	) \$ (1,701 )	) \$(1,943)

During the years ended December 31, 2018 and 2017, the Company did not have any transfers into or out of Level 3.

The following table provides a roll-forward of the fair value of the contingent consideration categorized as Level 3 for the year ended December 31, 2018:

(in thousands)

Balance, January 1, 2018	\$1,701
Payments made on contingent liabilities	(1,701)
Change in fair value	-
Balance, December 31, 2018	\$-

The Company made the last payment of the contingent consideration in January 2018.

11. Debt

Citizen's Bank

The Company entered into a three-year, \$5.0 million revolving line of credit facility (RLOC) with Citizen's Bank on December 29, 2016, to fund general working capital needs, including acquisitions. Working capital advances bear interest of one-month LIBOR plus 2.25% per annum and letter of credit fees are 1.25% per annum. The RLOC will mature on December 29, 2019. The Company is not required to maintain a restricted cash collateral account at Citizen's Bank for outstanding letters of credit and working capital advances. The credit facility agreement is subject to standard financial covenants and reporting requirements.

The maximum availability under the RLOC is subject to a borrowing base equal to 80% of eligible accounts receivable, and is reduced for any issued and outstanding letters of credit and working capital advances. At December 31, 2018, there were no outstanding borrowings on the RLOC and five letters of credit totaling \$2.3 million. The amount available at December 31, 2018, after consideration of the borrowing base, letters of credit and working capital advances was approximately \$2.7 million. At December 31, 2017, there were no outstanding borrowings on the RLOC and three letters of credit totaling \$0.8 million.

On May 11, 2018, GSE and Performance Solutions (collectively, the Borrower) entered into an Amended and Restated Credit and Security Agreement (the Credit Agreement) with the Bank, amending and restating the Company's existing Credit and Security Agreement with the Bank, which included a \$5 million asset-based revolving credit facility between the Borrower and the Bank, to now include (a) a \$5 million revolving credit facility not subject to a borrowing base, including a letter of credit sub-facility, and (b) a \$25 million delayed draw term loan facility available to be drawn upon for up to 18 months and to finance certain permitted acquisitions by the Borrower. The credit facilities mature in five years and bear interest at LIBOR plus a margin that varies depending on the overall leverage ratio of the Borrower and its subsidiaries. Revolving loans are interest-only with principal due at maturity, while term loans require monthly payments of principal and interest based on an amortization schedule.

The Borrower's obligations under the Credit Agreement are guaranteed by GSE's wholly-owned subsidiaries Hyperspring, Absolute, and True North and by any future material domestic subsidiaries (collectively, the Guarantors). The credit facilities are secured by liens on all assets of the Borrower and the Guarantors. The credit facility agreement is subject to standard financial covenants and reporting requirements. At December 31, 2018, the Company was in compliance with its financial covenants.

Term Loan

As discussed in Note 2, Acquisitions, we acquired True North on May 11, 2018 for total consideration of approximately \$9.9 million in cash. We drew down \$10.3 million to finance the acquisition of True North, \$0.5 million of which was repaid to the Bank on the same day. The loan bears interest at the adjusted one-month LIBOR plus a margin ranging between 2% and 2.75% depending on the overall leverage ratio of the Company and matures in five years on May 11, 2023. We also incurred \$70,000 debt issuance costs and \$75,000 loan origination fees related to the Credit Agreement. Debt issuance costs and loan origination fees are reported as a direct deduction from the carrying amount of the loan and are amortized over the term of the loan using the effective interest method.

At December 31, 2018, the outstanding long-term debt under the delayed draw term loan facility was as follows:

Long-term debt, net of discount	\$8,512
Less: current portion of long-term debt	1,902
Long-term debt, less current portion	\$6,610

The Credit Agreement contains customary covenants and restrictions typical for a financing of this type that, among other things, require the Borrower to satisfy certain financial covenants and restrict the Borrower's and Guarantors'

ability to incur additional debt, pay dividends and make distributions, make certain investments and acquisitions, repurchase its stock and prepay certain indebtedness, create liens, enter into agreements with affiliates, modify the nature of its business, enter into sale-leaseback transactions, transfer and sell material assets and merge or consolidate. Non-compliance with one or more of the covenants and restrictions after any applicable grace period could result in the obligations under the Credit Agreement becoming immediately due and payable and termination of the credit facilities. In addition to non-compliance with covenants and restrictions, the Credit Agreement also contains other customary events of default. If an event of default under the Credit Agreement occurs and is continuing, then the Bank may declare the obligations under the Credit Agreement to be immediately due and payable and may terminate the credit facilities. At December 31, 2018, the Company was in compliance with its financial covenants.

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12. Derivative Instruments

In the normal course of business, our operations are exposed to fluctuations in foreign currency values and interest rate changes. We may seek to control a portion of these risks through a risk management program that includes the use of derivative instruments.

Foreign Currency Risk Management

The Company utilizes forward foreign currency exchange contracts to manage market risks associated with the fluctuations in foreign currency exchange rates and minimize credit exposure by limiting counterparties to nationally recognized financial institutions.

As of December 31, 2018, the Company had foreign exchange contracts outstanding of approximately 3.2 million Euro, which will be valid through 2020. At December 31, 2017, the Company had contracts outstanding of approximately 162.5 million Japanese Yen, 24,000 Euro, and 0.2 million Australian Dollars at fixed rates. The contracts outstanding at December 31, 2017 have expired on various dates from January through December 2018.

Interest Rate Risk Management

As discussed in Note 11, Debt, the Company entered into a new term loan to finance the acquisition of True North in May. The loan bears interest at adjusted one-month LIBOR plus a margin ranging between 2% and 2.75% depending on the overall leverage ratio of the Company. As part of our overall risk management policies, in June 2018, the Company entered into a pay-fixed, receive-floating interest rate swap contract with a notional amount of \$9.0 million to reduce the impact associated with interest rate fluctuations. The notional value amortizes monthly in equal amounts based on the five-year principal repayment terms. The terms of the swap require the Company to pay interest on the basis of a fixed rate of 3.02%, and GSE will receive interest on the basis of one-month USD-LIBOR-BBA-Bloomberg.

The Company reports all derivatives at fair value. These contracts are recognized as either assets or liabilities, depending upon the derivative's fair value. The estimated net fair values of the derivative contracts on the consolidated balance sheets are as follows:

	December 31,	
(in thousands)	2018	2017
Asset derivatives		
Prepaid expenses and other current assets	\$43	\$201
	43	201
Liability derivatives		
Other liabilities	(103)	-
	(103)	-
Net fair value	\$(60)	\$201

The Company has not designated the derivative contracts as hedges. The changes in the fair value of the derivative contracts are included in (loss) gain on derivative instruments, net, in the consolidated statements of operations.

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The foreign currency denominated contract receivables, billings in excess of revenue earned, and subcontractor accruals that are related to the outstanding foreign exchange contracts are remeasured at the end of each period into the functional currency using the current exchange rate at the end of the period. The gain or loss resulting from such remeasurement is also included in (loss) gain on derivative instruments, net, in the consolidated statements of operations.

For the years ended December 31, 2018 and 2017, the Company recognized a net (loss) gain on its derivative instruments as outlined below:

(in thousands)	Years ended December 31,	
	2018	2017
Foreign exchange contracts- change in fair value	\$(150)	\$ 73
Interest rate swap - change in fair value	(103)	-
Remeasurement of related contract receivables and billings in excess of revenue earned	(97)	26
	\$(350)	\$ 99

13. Income Taxes

The consolidated income before income taxes, by domestic and foreign sources, is as follows:

(in thousands)	Years ended	
	December 31,	
	2018	2017
Domestic	\$2,512	\$1,580
Foreign	(1,735)	(1,176)
Total	\$777	\$404

The provision (benefit) for income taxes is as follows:

(in thousands)	Years ended	
	December 31,	
	2018	2017
Current:		
Federal	\$(6)	\$459
State	259	47
Foreign	234	19
Subtotal	487	525
Deferred:		
Federal	600	(5,867)
State	67	(942)
Foreign	(23)	131
Subtotal	644	(6,678)
Total	\$1,131	\$(6,153)

The effective income tax rate for the years ended December 31, 2018 and 2017 differed from the statutory federal income tax rate as presented below:

	Effective Tax Rate	
	Percentage (%)	
	Years ended	
	December 31,	
	2018	2017
Statutory federal income tax rate	21.0%	34.0%
State income taxes, net of federal tax benefit	30.1%	(184.7)%
Effect of foreign operations	(2.1)%	55.4%
Change in valuation allowance	(43.6)%	(2,332.0)%
Meals and Entertainment	10.0%	37.9%
Stock based compensation	(6.9)%	(81.7)%
162(m) Limit on compensation	0.0%	52.2%
Subpart F Income	0.0%	3.0%
Other permanent differences	0.4%	0.2%
Uncertain Tax Positions	46.3%	338.1%
Change in tax rate	(2.8)%	618.1%
Worthless stock deduction	0.0%	(257.0)%
Expired stock options	50.7%	30.2%
Change in APB 23	(4.4)%	46.0%

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Prior year reconciling items	(2.4)%	117.3%
Expiration of capital Loss	49.3%	0.0%
Effective tax rate	145.6%	(1,523.0)%

The difference between the effective rate and statutory rate in 2018 primarily resulted from permanent differences, the write-off of the stock option deferred tax asset due to expirations, accruals related to uncertain tax positions for certain foreign tax contingencies and revenue recognition, expiration of capital loss, and return to provision true-ups. The Tax Cuts and Jobs Act (the Act) was enacted in the US on December 22, 2017. The Act reduced the US federal corporate income tax rate from 34% to 21%. In 2017, we recorded provisional amounts for certain enactment-date effects of the Act by applying the guidance in SAB 118 because we had not yet completed our enactment-date accounting for these effects. In 2018, the Company concluded its' analysis under SAB 118 and determined that the changes to 2017 enactment-date provisional amounts increased the effective tax rate in 2018 by 1.77%.

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Deferred income taxes arise from temporary differences between the tax bases of assets and liabilities and their reported amounts in the consolidated financial statements. A summary of the tax effect of the significant components of the deferred income tax assets and liabilities is as follows:

(in thousands)	As of December	
	31, 2018	2017
Deferred tax assets:		
Net operating loss carryforwards	\$4,074	\$5,009
Capital loss carryforwards	-	383
Accruals	760	487
Reserves	479	514
Alternative minimum tax credit carryforwards	213	299
Stock-based compensation expense	563	1,002
Intangibles	674	433
Undistributed earnings of foreign subsidiary	-	-
Other	324	135
Total deferred tax asset	7,087	8,262
Valuation allowance	(756)	(1,095)
Total deferred tax asset less valuation allowance	6,331	7,167
Deferred tax liabilities:		
Undistributed earnings of foreign subsidiary	(103)	(149)
Software development costs	(163)	(188)
Fixed Assets	(44)	(91)
Indefinite-lived intangibles	(525)	(337)
Other	(138)	(45)
Total deferred tax liability	(973)	(810)
Net deferred tax asset	\$5,358	\$6,357

Deferred tax liabilities are included in "Other liabilities" on the consolidated balance sheet.

In assessing the realizability of deferred tax assets, management considers whether it is more likely than not that some or all of the deferred tax assets will not be realized. The Company's ability to realize its deferred tax assets depends primarily upon the preponderance of positive evidence that could be demonstrated by three year cumulative positive earnings, reversal of existing deferred temporary differences, and generation of sufficient future taxable income to allow for the utilization of deductible temporary differences.

As of each reporting date, the Company's management considers new evidence, both positive and negative, that could impact management's view with regard to future realization of deferred tax assets to estimate if sufficient future taxable income will be generated to use the existing deferred tax assets. This analysis is performed on a jurisdiction by jurisdiction basis. The Company provides forward forecasting which is incorporated into the scheduling analysis to support realization of the deferred tax assets.

Based on the assessment the Company's management performed as of December 31, 2018, we conclude that critical pieces of positive evidence supporting the realization of deferred tax assets exist including the strength of three year cumulative positive earnings, reversal of existing deferred temporary differences and future taxable income for the U.S. entities. As a result, the Company has determined that a valuation allowance in the U.S. is not appropriate at this time. A portion of the deferred tax assets is attributable to a capital loss that expired unutilized as of December 31, 2018 because the Company could not support the realization of this DTA, therefore, a valuation allowance has historically existed. The Company was not able to generate sources of capital income and, therefore the expiration and

write-off of the capital loss deferred tax asset also generated the release of the valuation allowance existing at December 31, 2017 in the amount of \$0.4 million.

The Company currently does not have sufficient positive objectively verifiable evidence to substantiate the recovery of the deferred tax assets for India, U.K, Swedish and Chinese deferred tax assets at December 31, 2018, accordingly, a full valuation allowance of \$0.75 million has been established on these deferred tax assets, predominantly comprised of net operating losses.

At December 31, 2018, the Company's largest consolidated deferred tax asset was \$5.1 million, excluding the impact of uncertain tax provisions. It primarily relates to a U.S. net operating loss carryforward of \$4.4 million, which expires in various amounts between 2020 and 2037. The amount of U.S. loss carryforward which can be used by the Company each year is limited due to changes in the Company's ownership which occurred in 2003. However, the Company does not anticipate that any of the loss carryforward will expire unutilized.

On December 22, 2017, the United States enacted tax reform legislation known as the H.R.1, commonly referred to as the "Tax Cuts and Jobs Act" (the Act), resulting in significant modifications to existing law.

The Company follows the guidance in SEC Staff Accounting Bulletin 118 (SAB 118), which provides additional clarification regarding the application of ASC 740 in situations where the Company does not have the necessary information available, prepared, or analyzed in reasonable detail to complete the accounting for certain income tax effects of the Act for the reporting period in which the Act was enacted. SAB 118 provides for a measurement period beginning in the reporting period that includes the Act's enactment date and ending when the Company has obtained, prepared, and analyzed the information needed in order to complete the accounting requirements, but in no circumstances should the measurement period extend beyond one year from the enactment date.

The Company has completed the accounting for the income tax effects of the Act. There were no material changes from what was reported as of December 31, 2017. The Company recognizes the tax on GILTI as a period cost in the period the tax is incurred. Under this policy, we have not provided deferred taxes related to temporary differences that upon their reversal will affect the amount of income subject to GILTI in the period. For the twelve months ended December 31, 2018, there is no GILTI inclusion.

As of December 31, 2018 and 2017, the Company's consolidated cash and cash equivalents totaled \$12.1 million and \$19.1 million, respectively, including cash and cash equivalents held at non-U.S. entities totaling \$4.7 million and \$5.4 million, respectively. The non-U.S. entities include operating subsidiaries located in China, United Kingdom, Sweden and India. Of these, the Company does not assert permanent reinvestment in the UK, Sweden or India. Accordingly, the Company analyzed the cumulative earnings and profits and determined no US deferred liability exists given aggregated accumulated deficits. A deferred tax liability in the amount of \$0.1 million has been recorded for India with respect to the undistributed earnings related to India's application of a Dividend Distributions Tax. Undistributed earnings in China are considered indefinitely reinvested as of December 31, 2018, to fund the Company's ongoing international operations. If China were to repatriate the funds it would not incur any tax due to an accumulated earnings and profits deficit.

The Company has made an entity classification (CTB) election to treat GSE UK as a disregarded entity effective January 1, 2018. Therefore, as of January 1, 2018, GSE UK is treated as a branch of the US for tax purposes.

Accordingly, GSE UK's 2018 activity has been included in the US Company's income tax provision.

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Uncertain Tax Positions

Foreign Uncertain Tax Positions

During 2018 and 2017, the Company recorded tax liabilities for certain foreign tax contingencies. The Company recorded these uncertain tax positions in other current liabilities on the consolidated balance sheets.

During 2017, the Company recorded a tax liability for an uncertain tax position related to the worthless stock deduction on the liquidation of GSE UK. The uncertain tax position is recorded as a component of current and deferred liability.

During 2018, the Company recorded a tax liability for an uncertain tax position related to revenue recognition in the US. The uncertain tax position is recorded as a component of current and deferred liability.

We believe that it is reasonably possible that a decrease of up to \$133,907 in unrecognized tax benefits related to federal and state tax exposures may be necessary within the next 12 months due to the intention of the Company to file an accounting method change related to revenue recognition for tax purposes.

The following table outlines the Company's uncertain tax liabilities, including accrued interest and penalties for each jurisdiction:

(in thousands)	China		Ukraine		South Korea		U.S.		Total
	Tax	Interest and Penalties	Tax	Interest and Penalties	Tax	Interest and Penalties	Tax	Interest and Penalties	
Balance, January 1, 2017	\$202	\$ 209	\$89	\$ 28	\$129	\$ 8	\$-	-	\$665
Increases	14	53	11	-	212	37	833	-	1,160
Decreases	-	-	-	-	-	-	-	-	-
Balance, December 31, 2017	\$216	\$ 262	\$100	\$ 28	\$341	\$ 45	\$833	\$ -	\$1,825
Increases	-	23	-	44	120	66	163	4	420
Decreases	12	-	18	-	-	-	-	-	30
Balance, December 31, 2018	\$204	\$ 285	\$82	\$ 72	\$461	\$ 111	\$996	\$ 4	\$2,215

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14. Capital Stock

The Company's Board of Directors has authorized 62,000,000 total shares of stock (30,000,000 of additional common shares authorized on June 12, 2018) of which 60,000,000 are designated as common stock and 2,000,000 are designated as preferred stock. The Board of Directors has the authority to establish one or more classes of preferred stock and to determine, within any class of preferred stock, the preferences, rights and other terms of such class. As of December 31, 2018, the Company has reserved 3,615,546 shares of common stock for issuance; 55,000 are reserved for shares upon exercise of outstanding stock options and 1,571,525 are reserved for shares upon vesting of restricted stock units. The Company has 2,247,848 shares available for future grants under the Company's 1995 Long-Term Incentive Plan.

15. Stock-Based Compensation

Long-term incentive plan

During 1995, the Company established the 1995 Long-Term Incentive Stock Option Plan (the Plan), which permits the granting of stock options (including incentive stock options and nonqualified stock options) stock appreciation rights, restricted or unrestricted stock awards, phantom stock, performance awards or any combination of these to employees, directors or consultants. The Plan expires on April 21, 2026; the total number of shares that could be issued under the Plan is 7,500,000. As of December 31, 2018, 4,174,981 shares have been issued under the Plan, 55,000 stock options and 1,571,525 restricted stock units (RSUs) were outstanding under the Plan, while 2,247,848 shares remain for future grants under the Plan.

The Company recognizes compensation expense on a pro rata straight-line basis over the requisite service period for stock-based compensation awards with both graded and cliff vesting terms. The Company recognizes the cumulative effect of a change in the number of awards expected to vest in compensation expense in the period of change. The Company has not capitalized any portion of its stock-based compensation. The Company's forfeiture rate is based on actuals.

During the years ended December 31, 2018 and 2017, the Company recognized \$1.5 million and \$2.5 million, respectively, of stock-based compensation expense under the fair value method. Accordingly, the Company recognized associated deferred income tax benefits of \$53,000 and \$330,000, respectively, during the years ended December 31, 2018 and 2017. During the years ended December 31, 2018 and 2017, there were approximately \$(142,000) and \$74,000 of stock-based compensation expense related to the change in fair value of cash-settled RSUs, which the Company accounts for as a liability.

Stock options

Options to purchase shares of the Company's common stock under the Plan expire in either seven or ten years from the date of grant and become exercisable in three, five, or seven installments with a certain percentage of options vesting on the first anniversary of the grant date and additional options vesting on each of the subsequent anniversaries of the grant date, subject to acceleration under certain circumstances.

Information with respect to stock option activity as of and for the year ended December 31, 2018 is as follows:

	Number of Shares	Weighted Average Exercise Price	Aggregate Intrinsic Value (in thousands)	Weighted Average Remaining Contractual Life (Years)
Options outstanding at January 1, 2018	1,046,833	\$ 3.33		
Options granted	-	-		

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Options exercised	(486,500)	1.88		
Options forfeited	(505,333)	4.89		
Options outstanding at December 31, 2018	55,000	1.87	\$ 17	2.08
Options expected to vest	-	-	\$ -	-
Options exercisable at December 31, 2018	55,000	\$ -	\$ -	-

Information with respect to stock option activity as of and for the year ended December 31, 2017 is as follows:

	Number of Shares	Weighted Average Exercise Price	Aggregate Intrinsic Value (in thousands)	Weighted Average Remaining Contractual Life (Years)
Options outstanding at January 1, 2017	1,556,833	\$ 3.15		
Options granted	-	-		
Options exercised	(320,000)	2.05		
Options forfeited	(190,000)	4.01		
Options outstanding at December 31, 2017	1,046,833	3.33	\$ 928	1.28
Options expected to vest	24,000	1.90	\$ 33	4.72
Options exercisable at December 31, 2017	1,022,833	\$ 3.36	\$ 895	1.20

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A summary of the status of the Company's nonvested options as of and for the year ended December 31, 2018 is presented below.

	Number of Shares	Weighted Average Fair Value
Nonvested options at January 1, 2018	24,000	\$ 0.97
Options granted	-	-
Options forfeited	-	-
Options vested during the period	(24,000)	0.97
Nonvested options at December 31, 2018	-	\$ -

A summary of the status of the Company's nonvested options as of and for the year ended December 31, 2017 is presented below.

	Number of Shares	Weighted Average Fair Value
Nonvested options at January 1, 2017	72,000	\$ 0.97
Options granted	-	-
Options forfeited	-	-
Options vested during the period	(48,000)	0.97
Nonvested options at December 31, 2017	24,000	\$ 0.97

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The Company did not grant stock options during the years ended December 31, 2018, and 2017.

The Company received cash for the exercise price associated with stock options exercised of \$136,000 and \$209,000 during the years ended December 31, 2018 and 2017, respectively. The total intrinsic value realized by participants on stock options exercised was \$701,318 and \$364,974 during the years ended December 31, 2018 and 2017, respectively.

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Restricted Stock Units

During the years ended December 31, 2018 and 2017, the Company issued RSUs to employees which vest upon the achievement of specific market-based or time-based measures. The fair value for RSU's is calculated based on the stock price on the grant date and expensed ratably over the requisite service period, which ranges between one and five years. The following table summarizes the information about vested and unvested restricted stock units for the years ended December 31, 2018 and 2017.

	Number of Shares	Weighted Average Fair Value
Nonvested RSUs at January 1, 2018	1,634,663	\$ 1.96
RSUs granted	428,526	3.23
RSUs forfeited	(140,997)	2.47
RSUs vested	(350,667)	3.30
Nonvested RSUs at December 31, 2018	1,571,525	\$ 1.96
Nonvested RSUs at January 1, 2017	1,688,480	\$ 1.45
RSUs granted	644,677	3.24
RSUs forfeited	(5,500)	3.40
RSUs vested	(692,994)	1.89
Nonvested RSUs at December 31, 2017	1,634,663	\$ 1.96

As of December 31, 2018, the Company had \$0.8 million of unrecognized compensation expense related to the RSUs expected to be recognized on a pro-rata straight line basis over a weighted average remaining service period of approximately 1.16 years.

16. Commitments and Contingencies

Leases

The Company is obligated under certain noncancelable operating leases for office facilities and equipment. Future minimum lease payments under noncancelable operating leases as of December 31, 2018 are as follows:

(in thousands)	Gross Future Minimum Lease Payments
2019	\$ 922
2020	785
2021	796
2022	771
2023	451
Thereafter	106

Total \$ 3,831

Total rent expense under operating leases for the years ended December 31, 2018 and 2017, was approximately \$0.9 million and \$ 0.8 million, respectively. The office facility leases contain renewal options.

Standby letters of credit, bank guarantees, surety bonds and performance bonds

As discussed in Note 11, Debt, as of December 31, 2018, the Company had no letters of credit with BB&T bank. The Company had five letters of credit with Citizen's Bank totaling \$2.3 million. The Company was contingently liable for these letters of credit.

Contingencies

Various actions and proceedings are presently pending to which the Company is a party. In the opinion of management, the aggregate liabilities, if any, arising from such actions are not expected to have a material adverse effect on the financial position, results of operations or cash flows of the Company. Legal defense costs are expensed as incurred.

17. Employee Benefits

The Company has a qualified defined contribution plan that covers all U.S. employees under Section 401(k) of the Internal Revenue Code. Under this plan, the Company's stipulated basic contribution matches a portion of the participants' contributions based upon a defined schedule for GSE Performance Improvement Solutions employees. The Company's contributions to the plan were approximately \$309,000 and \$305,000 for the years ended December 31, 2018 and 2017, respectively.

18. Segment Information

The Company has two reportable business segments.

The Performance Improvement Solutions segment provides simulation, training and engineering products and services delivered across the breadth of industries we serve. Solutions include simulation for both training and engineering applications. Example engineering services include, but are not limited to, plant design verification and validation, thermal performance evaluation and optimization programs, and engineering programs for plants for ASME code and ASME Section XI. The Company provides these services across all market segments. Example training applications include turnkey and custom training services. Contract terms are typically less than two years.

The Nuclear Industry Training and Consulting segment provides specialized workforce solutions primarily to the nuclear industry, working at clients' facilities. This business is managed through our Hyperspring and Absolute subsidiaries. The business model, management focus, margins and other factors clearly separate this business line from the rest of the GSE product and service portfolio.

On May 11, 2018, GSE, through Performance Solutions acquired True North. True North is a provider of technical engineering solutions to nuclear and fossil fuel power plants with an emphasis on regulatory-driven ASME code programs. The acquisition of True North is expected to broaden our engineering services offering, expand our relationships with several of the largest nuclear energy providers in the United States, and add a highly specialized, complimentary talent pool to our employee base. For reporting purposes, True North is included in our Performance Improvement Solutions segment due to similarities in services provided including technical engineering solutions to the nuclear and fossil fuel power sector.

In September 20, 2017, the Company acquired Absolute. Absolute is a provider of technical consulting and staffing solutions to the global nuclear power industry and employs approximately 160 professionals with expertise in procedures writing, engineering, technical support, project management, training, project controls, and corrective actions. This acquisition brings a natural adjacency to GSE, fits well with our growth strategy, and benefits our customers from expanded capabilities and offerings. For reporting purposes, Absolute was aggregated with Hyperspring into our Nuclear Industry Training and Consulting segment due to similarities in services provided including training and staff augmentation to the nuclear energy sector. In addition, both entities report to the same management team and share support staff such as sales, recruiting and business development. As such, 100% of the goodwill acquired was allocated to the Nuclear Industry Training and Consulting segment.

The following table sets forth the revenue and operating results attributable to each reportable segment and includes a reconciliation of segment revenue to consolidated revenue and operating results to consolidated income before income tax expense (benefit). Inter-segment revenue is eliminated in consolidation and is not significant.

(in thousands)	Years ended	
	December 31, 2018	2017
Revenue:		
Performance Improvement Solutions	\$42,954	\$39,899
Nuclear Industry Training and Consulting	49,295	30,981
	\$92,249	\$70,880
Depreciation:		
Performance Improvement Solutions	\$385	\$321
Nuclear Industry Training and Consulting	130	21
	\$515	\$342
Amortization of definite-lived intangible assets:		
Performance Improvement Solutions	\$898	\$246
Nuclear Industry Training and Consulting	714	89
	\$1,612	\$335

Operating income		
Performance Improvement Solutions	\$2,640	\$(3,191)
Nuclear Industry Training and Consulting	(1,274)	3,420
Operating income	\$1,366	\$229
Interest (expense) income, net	(268)	80
(Loss) Gain on derivative instruments, net	(350)	99
Other income (expense), net	29	(4)
Income before income taxes	\$777	\$404

Additional information relating to segments is as follows:

(in thousands)	December 31,	
	2018	2017
Performance Improvement Solutions	\$40,353	\$33,434
Nuclear Industry Training and Consulting	21,087	22,748
Intercompany receivable elimination	-	-
Total assets	\$61,440	\$56,182

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For the years ended December 31, 2018 and 2017, 91% and 83%, respectively, of the Company's consolidated revenue was from customers in the nuclear power industry. The Company designs, develops and delivers business and technology solutions to the energy industry worldwide. Revenue, operating income (loss) and total assets for the Company's United States, European, and Asian subsidiaries as of and for the years ended December 31, 2018 and 2017 are as follows:

(in thousands)	Year ended December 31, 2018				
	United States	Europe	Asia	Eliminations	Consolidated
Revenue	\$88,979	\$2,150	\$1,120	\$ -	\$ 92,249
Transfers between geographic locations	2,046	-	199	(2,245)	-
Total revenue	\$91,025	\$2,150	\$1,319	\$(2,245)	\$ 92,249
Operating income (loss)	\$2,902	\$(1,116)	\$(420)	\$ -	\$ 1,366
Total assets, at December 31	\$171,206	\$3,893	\$3,592	\$(117,251)	\$ 61,440

(in thousands)	Year ended December 31, 2017				
	United States	Europe	Asia	Eliminations	Consolidated
Revenue	\$66,249	\$3,196	\$1,435	\$ -	\$ 70,880
Transfers between geographic locations	1,953	-	668	(2,621)	-
Total revenue	\$68,202	\$3,196	\$2,103	\$(2,621)	\$ 70,880
Operating income (loss)	\$1,930	\$(1,585)	\$(116)	\$ -	\$ 229
Total assets, at December 31	\$148,717	\$5,057	\$4,313	\$(101,905)	\$ 56,182

Revenues by geographic location above are attributed to the contracting entity. Therefore, revenues from a foreign customer that contracted directly with our U.S. entity are included in revenues from the United States. In Europe, total revenues attributable to our U.K. and Sweden subsidiaries was \$0.2 million and \$1.9 million for the year ended December 31, 2018. All revenues in Asia were attributable to our Chinese subsidiary.

Alternatively, revenues from customers domiciled in foreign countries were approximately 15% and 16%, of the Company's consolidated 2018 and 2017 revenue, respectively. Revenues from foreign countries where our customers reside were all individually less than 10% of the Company's consolidated revenues during 2018 and 2017.

19. Supplemental Disclosure of Cash Flow Information

	December 31, 2018	December 31, 2017
Cash and cash equivalents	\$ 12,123	\$ 19,111
Restricted cash	-	960
Cash, cash equivalents, and restricted cash	\$ 12,123	\$ 20,071

(in thousands)	Year ended December 31,	
	2018	2017
Cash paid:		
Interest	\$278	\$-
Income taxes	\$187	\$155

20. Subsequent Events

On February 15, 2019, through its wholly-owned subsidiary Performance Solutions, the Company entered into a membership interest purchase agreement with Steven L. Pellerin, Christopher A. Davenport, and DP Engineering (The “DP Engineering Purchase Agreement”), to purchase 100% of the membership interests in DP Engineering for \$13.5 million. The purchase price is subject to customary pre- and post-closing working capital adjustments plus an additional earn-out amount not to exceed \$5.0 million, potentially payable in 2020 and 2021 depending on DP Engineering’s satisfaction of certain targets for Adjusted EBITDA in calendar years 2019 and 2020, respectively. The acquisition was completed through the drawdown of \$14.3 million (including transaction costs) of the term loan. An escrow of approximately \$1.7 million was funded at the closing and is available to GSE and Performance Solutions to satisfy indemnification claims for 18 months after the closing.

DP Engineering is a provider of value-added technical engineering solutions and consulting services to nuclear power plants with an emphasis on preparation and implementation of design modifications during plant outages. Located in Fort Worth, Texas, DP Engineering is well-regarded as a leading service provider to the nuclear power industry, having been designated an “engineer of choice” by two large power generation companies. The Company's allocation of the purchase price remains incomplete and the net assets are subject to adjustments within the measurement period, which is not to exceed one year from the acquisition date.

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

None.

ITEM 9A. CONTROLS AND PROCEDURES.

(a) Evaluation of Disclosure Controls and Procedures

The Company maintains disclosure controls and procedures that are designed to ensure that information required to be disclosed by it in its reports filed or submitted pursuant to the Securities Exchange Act of 1934, as amended (the Exchange Act), is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's rules and forms and that information required to be disclosed by the Company in its Exchange Act reports is accumulated and communicated to management, including the Company's Chief Executive Officer (CEO), who is its principal executive officer, and Chief Financial Officer (CFO), who is its principal financial officer, to allow timely decisions regarding required disclosure. Based on an evaluation of our disclosure controls and procedures as of December 31, 2018, our CEO and CFO concluded that, as of such date, our disclosure controls and procedures were effective.

On May 11, 2018, the Company completed the acquisition of True North, LLC (True North). True North constitutes 23.7% of total assets of the Company at December 31, 2018, and 8.6% of the Company's consolidated revenue for the year ended December 31, 2018. As permitted by SEC guidance for newly acquired businesses, because it was not possible to complete an effective assessment of the acquired company's controls by year-end, the Company's management has excluded True North from its evaluation of disclosure controls and procedures and management's report on internal control over financial reporting and changes therein below from the date of such acquisition through December 31, 2018. Our management is in the process of reviewing the operations of True North and implementing GSE's internal control structure over the acquired operations.

(b) Management's Annual Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting, as such term is defined in Exchange Act Rule 13a-15(f). Our internal control over financial reporting is a process designed by, or under the supervision of, our CEO and CFO, 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.

Management, including our CEO and CFO, assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2018. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control-Integrated Framework (2013). Based on management's assessment, management has concluded that the Company's internal control over financial reporting was effective as of December 31, 2018.

(c) Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting identified in connection with the evaluation required by Rule 13a-15(d) and 15d-15(d) of the Exchange Act that occurred during the quarter ended December 31, 2018 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION.

On February 25, 2019, the Board of Directors approved the adoption of the form of indemnification agreement filed as Exhibit 10.38 to this Form 10-K. The Company will enter into substantially identical indemnification agreements with each of its current and future directors. The indemnification agreements require the Company to indemnify the

directors and to advance expenses on behalf of such directors and officers to the fullest extent permitted by applicable law and establish the procedures by which a director or officer may request and receive indemnification. The agreements are in addition to other rights to which a director or officer may be entitled under the Company's certificate of incorporation, by-laws and applicable law.

The foregoing summary description of the indemnification agreements is not intended to be completed and is qualified in its entirety by the complete text of the form indemnification agreement filed as Exhibit 10.38 to the Form 10-K and incorporated herein by reference.

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE.

The information required by this item, including items 401, 405, 406 and 407 of Regulation S-K, is incorporated by reference to the section captioned "Directors and Executive Officers" in the definitive Proxy Statement for the Company's 2019 Annual Meeting of Shareholders and incorporated herein by reference or will be provided in an amendment to this Annual Report on Form 10-K.

The Company has adopted a Conduct of Business Policy that applies to its directors, officers, and employees, including its principal executive officer, and principal financial officer. The Conduct of Business Policy is available on the Company's website at www.gses.com. In addition, the Company has adopted a Code of Ethics for its principal executive officer and senior financial officers which is also available on the Company's website. The Company will post on its website information about any amendment to, or waiver from, any provision of the Code of Ethics that applies to its principal executive officer, principal financial officer, or principal accounting officer.

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ITEM 11. EXECUTIVE
COMPENSATION.

The information required by this item will either be set forth under the “Executive Compensation” section in the definitive Proxy Statement for the 2019 Annual Meeting of Shareholders and incorporated herein by reference or will be provided in an amendment to this Annual Report on Form 10-K.

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

The information required by this item will be either set forth under the sections captioned “Voting Securities and Principal Holders Thereof,” and “Executive Compensation” in the definitive Proxy Statement for the 2019 Annual Meeting of Shareholders and incorporated herein by reference or will be provided in an amendment to this Annual Report on Form 10-K.

The following table sets forth the equity compensation plan information for the year ended December 31, 2018:

Plan Category		Number of Securities to be Issued Upon Exercise of Outstanding Options, Warrants and Rights (a)	Weighted Average Exercise Price of Outstanding Options, Warrants and Rights (b)	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column (a)) (c)
Equity compensation plans approved by security holders	Options	55,000	\$ 1.87	
RSUs		1,316,525	\$ 1.96	
		1,371,525	\$ 1.96	2,247,848
Equity compensation plans not approved by security holders		--	\$ --	--
Total		1,371,525	\$ 1.96	2,247,848

Table above excludes 255,000 RSUs granted under the Company's 1995 Long-Term Incentive Plan that are settled in cash instead of shares.

For a description of the material terms of our stock-based compensation plans, see Note 15 to the consolidated financial statements in Item 8 of this report.

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

The information required by this item will be either set forth under the “Directors and Executive Officers” section in the definitive Proxy Statement for the 2019 Annual Meeting of Shareholders and incorporated herein by reference or will be provided in an amendment to this Annual Report on Form 10-K.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES.

The information required by this item will be either set forth under the “Audit Committee Pre-Approval of Audit and Non-Audit Services” section in the definitive Proxy Statement for the 2019 Annual Meeting of Shareholders and incorporated herein by reference or will be provided in an amendment to this Annual Report on Form 10-K.

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES.

(a) (1) List of Financial Statements

The following financial statements are included in Item 8:

GSE Systems, Inc. and Subsidiaries

Report of Independent Registered Public Accounting Firm

Consolidated Balance Sheets as of December 31, 2018 and 2017

Consolidated Statements of Operations for the years ended December 31, 2018 and 2017

Consolidated Statements of Comprehensive (Loss) Income for the years ended December 31, 2018 and 2017

Consolidated Statements of Changes in Stockholders' Equity for the years ended December 31, 2018 and 2017

Consolidated Statements of Cash Flows for the years ended December 31, 2018 and 2017

Notes to Consolidated Financial Statements

(a) (2) List of Schedules

All other schedules to the consolidated financial statements are omitted as the required information is presented in the consolidated financial statements or related notes.

(a) (3) List of Exhibits

The Exhibits which are filed with this report or which are incorporated by reference are set forth in the Exhibit index hereto.

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ITEM 16. FORM 10-K SUMMARY.

None.

Exhibit Description of Exhibits

2. Plan of acquisition, reorganization, arrangement, liquidation, or succession

2.1 Membership Interests Purchase Agreement, dated as of November 14, 2014, by and between Dale Jennings, Paul Abbott, Shawn McKeever and Mickey Ellis and GSE Performance Solutions, Inc. Incorporated herein by reference to Exhibit 2.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on November 17, 2014.

2.2 Amendment to Membership Interests Purchase Agreement, dated as of May 13, 2015. Incorporated herein by reference to Exhibit 10.2 of GSE Systems, Inc. Form 10-Q filed with the Securities and Exchange Commission on May 14, 2015.

2.3 Stock Purchase Agreement, dated as of September 20, 2017, by and among GSE Systems, Inc., through its wholly owned subsidiary GSE Performance Solutions, Inc., Richard and Cynthia Linton (and certain trusts owned thereby) and Absolute Consulting, Inc. Incorporated herein by reference to Exhibit 2.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on September 20, 2017.

2.4 Membership Interest Purchase Agreement, dated as of May 11, 2018, between True North Consulting LLC, Donald R. Horn, Jenny C. Horn, GSE Performance Solutions, Inc., and Donald R. Horn in his capacity as Seller Representative. Incorporated herein by reference to Exhibit 2.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on May 14, 2018.

2.5 Membership Interest Purchase Agreement, dated as of February 15, 2019, between DP Engineering Co. Ltd., Steven L. Pellerin, Christopher A. Davenport, GSE Performance Solutions, Inc., and Steven L. Pellerin in his capacity as Seller Representative. Incorporated herein by reference to Exhibit 2.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on February 19, 2019.

3. Articles of Incorporation and Bylaws

3.1 Restatement of Certificate of Incorporation dated November 14, 2016. Incorporated herein by reference to Exhibit 3.1 of GSE Systems, Inc. Form 10-Q filed with the Securities and Exchange Commission on November 14, 2016.

3.2 Certificate of the Elimination of the Series A Cumulative Convertible Preferred Stock dated November 14, 2016. Incorporated herein by reference to Exhibit 3.2 of GSE Systems, Inc. Form 10-Q filed with the Securities and Exchange Commission on November 14, 2016.

3.3 Amendment to the Certificate of Incorporation of GSE Systems, Inc. Incorporated herein by reference to Exhibit 3.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on June 15, 2018.

3.4

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Third Amended and Restated Bylaws of GSE Systems, Inc. Incorporated herein by reference to Exhibit 3.2 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on September 16, 2016.

3.5 First Amendment to the Third Amended and Restated Bylaws of GSE Systems, Inc. Incorporated herein by reference to Exhibit 3.2 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on June 15, 2018.

10. Material Contracts

10.1 Office Lease Agreement between 1332 Londontown, LLC and GSE Systems, Inc. (dated as of February 27, 2008). Incorporated herein by reference to Exhibit 10.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on March 11, 2008.

10.2 Amendment of Lease to Office Lease Agreement, dated May 28, 2008. Incorporated herein by reference to Exhibit 10.20 of GSE Systems, Inc. Form 10-K filed with the Securities and Exchange Commission on March 19, 2015.

10.3 Second Amendment of Lease to Office Lease Agreement, dated July 22, 2010. Incorporated herein by reference to Exhibit 10.21 of GSE Systems, Inc. Form 10-K filed with the Securities and Exchange Commission on March 19, 2015.

10.4 Third Amendment of Lease to Office Lease Agreement, dated May 15, 2012. Incorporated herein by reference to Exhibit 10.22 of GSE Systems, Inc. Form 10-K filed with the Securities and Exchange Commission on March 19, 2015.

10.5 Fourth Amendment of Lease to Office Lease Agreement, dated April 15, 2014. Incorporated herein by reference to Exhibit 10.1 of GSE Systems, Inc. Form 10-Q filed with the Securities and Exchange Commission on May 15, 2014.

10.6 GSE Systems, Inc. 1995 Long-Term Incentive Plan, amended and restated, dated as of March 6, 2014. Incorporated herein by reference to Exhibit A of GSE Systems, Inc. Form DEF 14A filed with the Securities and Exchange Commission on April 29, 2014. *

10.7 Form of Option Agreement Under the GSE Systems, Inc. 1995 Long-Term Incentive Plan. Incorporated herein by reference to GSE Systems, Inc. Form 10-K filed with the Securities and Exchange Commission on March 31, 1997. *

10.8 Form of Restricted Share Unit Agreement pursuant to the GSE Systems, Inc. 1995 Long-Term Incentive Plan, as amended and restated, dated as of April 22, 2016. Incorporated herein by reference to Exhibit 10.2 of GSE Systems, Inc. Form 10-Q filed with the Securities and Exchange Commission on November 14, 2016.*

10.9 Form of Amendment to Restricted Share Unit Agreement, dated July 1, 2016. Incorporated herein by reference to Exhibit 99.8 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on July 1, 2016. *

10.10 Employment Agreement, dated July 1, 2016, between GSE Systems, Inc. and Emmett A. Pepe. Incorporated herein by reference to Exhibit 99.2 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on July 5, 2016. *

10.11

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Amendment to Employment Agreement between Emmett Pepe and GSE Systems, Inc. dated as of June 12, 2017. Incorporated herein by reference to Exhibit 99.4 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on June 16, 2017.*

10.12 Amendment No. 2 to Employment Agreement between GSE Systems, Inc. and Emmett Pepe, dated as of January 11, 2019. Incorporated herein by reference to Exhibit 99.3 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on January 11, 2019.*

10.13 Employment Agreement between Christopher D. Sorrells and GSE Systems, Inc. dated as of August 15, 2016. Incorporated herein by reference to Exhibit 10.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on August 19, 2016. *

10.14 Amendment to Employment Agreement between Christopher D. Sorrells and GSE Systems, Inc. dated as of June 12, 2017. Incorporated herein by reference to Exhibit 99.2 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on June 16, 2017.*

10.15 Amendment No. 2 to Employment Agreement between GSE Systems, Inc. and Christopher D. Sorrells, dated as of January 11, 2019. Incorporated herein by reference to Exhibit 99.2 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on January 11, 2019.*

10.16 Employment Agreement between Bahram Meyssami and GSE Systems, Inc. dated as of December 1, 2015. Incorporated herein by reference to Exhibit 10.1 of GSE Systems, Inc. Form 10-Q filed with the Securities and Exchange Commission on May 15, 2017.*

10.17 Amendment to Employment Agreement between Bahram Meyssami and GSE Systems, Inc. dated as of June 12, 2017. Incorporated herein by reference to Exhibit 99.3 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on June 16, 2017.*

10.18 Employment Agreement between Kyle J. Loudermilk and GSE Systems, Inc., dated as of July 1, 2015. Incorporated herein by reference to Exhibit 10.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on July 31, 2015. *

10.19 Amendment to Employment Agreement between Kyle J. Loudermilk and GSE Systems, Inc., dated as of June 12, 2017. Incorporated herein by reference to Exhibit 99.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on July 1, 2016.*

10.20 Amendment No. 2 to Employment Agreement between Kyle Loudermilk and GSE Systems, Inc. dated as of June 12, 2017. Incorporated herein by reference to Exhibit 99.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on June 16, 2017.*

10.21 Amendment No. 3 to Employment Agreement, dated January 11, 2019, between GSE Systems, Inc. and Kyle J. Loudermilk. Incorporated herein by reference to Exhibit 99.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on January 11, 2019.*

10.22 Restricted Share Unit Agreement between Kyle J. Loudermilk and GSE Systems, Inc., dated as of July 1, 2015. Incorporated herein by reference to Exhibit 10.2 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on July 31, 2015.*

10.23 Amendment to Restricted Share Unit Agreement between Kyle J. Loudermilk and GSE Systems, Inc., dated as of July 1, 2016. Incorporated herein by reference to Exhibit 99.2 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on July 1, 2016.*

10.24 Restricted Share Unit Agreement (Cash Award) between Kyle J. Loudermilk and GSE Systems, Inc., dated as of July 1, 2016. Incorporated herein by reference to Exhibit 99.3 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on July 1, 2016.*

10.25 Restricted Share Unit Agreement (Common Stock Award) between Kyle J. Loudermilk and GSE Systems, Inc., dated as of July 1, 2016. Incorporated herein by reference to Exhibit 99.4 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on July 1, 2016.*

10.26 Restricted Share Unit Agreement between Emmett A. Pepe and GSE Systems, Inc., dated as of July 1, 2016. Incorporated herein by reference to Exhibit 99.3 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on July 5, 2016.*

10.27 Restricted Share Unit Agreement between Christopher D. Sorrells and GSE Systems, Inc., dated as of August 15, 2016. Incorporated herein by reference to Exhibit 10.2 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on August 19, 2016.*

10.28 Restricted Share Unit Agreement between Christopher D. Sorrells and GSE Systems, Inc., dated as of August 15, 2016. Incorporated herein by reference to Exhibit 10.3 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on August 19, 2016.*

10.29 Restricted Share Unit Agreement (Cash Award) between Christopher D. Sorrells and GSE Systems, Inc., dated as of August 15, 2016. Incorporated herein by reference to Exhibit 10.4 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on August 19, 2016.*

10.30 Restricted Share Unit Agreement between Bahram Meyssami and GSE Systems, Inc. dated as of December 1, 2015. Incorporated herein by reference to Exhibit 10.2 of GSE Systems, Inc. Form 10-Q filed with the Securities and Exchange Commission on May 15, 2017.*

10.31 Amendment to Restricted Share Unit Agreement between Bahram Meyssami and GSE Systems, Inc. dated as of July 1, 2016. Incorporated herein by reference to Exhibit 10.3 of GSE Systems, Inc. Form 10-Q filed with the Securities and Exchange Commission on May 15, 2017.*

10.32 Credit and Security Agreement, by and between Citizens Bank, National Association, GSE Systems, Inc. and GSE Performance Solutions, Inc., dated December 29, 2016. Incorporated herein by reference to Exhibit 99.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on January 4, 2017.

10.33 Amended and Restated Credit and Security Agreement, dated as of May 11, 2018, by and among Citizens Bank, National Association, as Bank, and GSE Systems, Inc. and GSE Performance Solutions, Inc., as Borrower. Incorporated herein by reference to Exhibit 99.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on May 14, 2018.

10.34 Amendment and Reaffirmation Agreement, dated February 22, 2017, and effective as of December 29, 2016. Incorporated herein by reference to Exhibit 10.36 of GSE Systems, Inc. Form 10-K filed with the Securities and Exchange Commission on March 28, 2017.

10.35 Second Amendment and Reaffirmation Agreement dated as of May 25, 2018. Filed herewith.

10.36 Third Amendment and Reaffirmation Agreement dated as of February 15, 2019, by and among GSE Systems, Inc. and GSE Performance Solutions, Inc., as Borrowers, GSE True North Consulting, LLC, Hyperspring, LLC, Absolute Consulting, Inc. and DP Engineering Ltd. Co., as Guarantors, and Citizens Bank, National

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Association, as Bank. Incorporated herein by reference to Exhibit 99.1 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on February 19, 2019.

10.37 Sixth Comprehensive Amendment to Financing Documents, dated as of December 29, 2016, by and between BB&T, as Bank, and GSE Systems, Inc. and GSE Performance Solutions, Inc., as Borrower. Incorporated herein by reference to Exhibit 99.2 of GSE Systems, Inc. Form 8-K filed with the Securities and Exchange Commission on January 4, 2017.

10.38 Form of Indemnification Agreement. Filed herewith.

14 Code of Ethics

14.1 Code of Ethics for the Principal Executive Officer and Senior Financial Officers. Previously filed in connection with the GSE Systems, Inc. Form 10-K filed with the Securities and Exchange Commission on March 31, 2006 and incorporated herein by reference.

21 Subsidiaries.

21.1 List of Subsidiaries of Registrant at December 31, 2018, filed herewith.

23 Consent of Independent Registered Public Accounting Firm

23.1 Consent of BDO USA, LLP, filed herewith.

24 Power of Attorney

24.1 Power of Attorney for Directors' and Officers' Signatures on SEC Form 10-K, filed herewith.

31 Certifications

31.1 Certification of Chief Executive Officer of the Company pursuant to Securities and Exchange Act Rule 13d-14(a)/15(d-14(a), as adopted pursuant to Section 302 and 404 of the Sarbanes-Oxley Act of 2002, filed herewith.

31.2 Certification of Chief Financial Officer of the Company pursuant to Securities and Exchange Act Rule 13d-14(a)/15(d-14(a), as adopted pursuant to Section 302 and 404 of the Sarbanes-Oxley Act of 2002, filed herewith.

32 Section 1350 Certifications

32.1 Certification of Chief Executive Officer and Chief Financial Officer of the Company pursuant to 18 U.S.C. Section 1350 as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, file herewith.

* Management contracts or compensatory plans required to be filed as exhibits pursuant to Item 15(b) of this report.

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SIGNATURES

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

GSE Systems, Inc.
By: /s/ Kyle J. Loudermilk
Kyle J. Loudermilk
Chief Executive Officer

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

Date: March 27, 2019 /s/ KYLE J. LOUDERMILK
Kyle J. Loudermilk, Chief Executive Officer
(Principal Executive Officer)

Date: March 27, 2019 /s/ EMMETT A. PEPE
Emmett A. Pepe, Chief Financial Officer
(Principal Financial and Accounting Officer)

Date: March 27, 2019 /s/ CHRIS SORRELLS
Chris Sorrells, Chief Operating Officer

Date: March 27, 2019 (John D. Fuller, Chairman of the Board) By: /s/ EMMETT A. PEPE
(Jim Stanker, Chairman of the Audit Committee) Emmett A. Pepe
(Suresh Sundaram, Director) Attorney-in-Fact
(J. Barnie Beasley, Director)

A Power of Attorney, dated March 27, 2019 authorizing Emmett A. Pepe to sign this Annual Report on Form 10-K for the fiscal year ended December 31, 2018 on behalf of certain of the directors of the Registrant is filed as Exhibit 24.1 to this Annual Report.