GSE SYSTEMS INC
Form 10-K
March 16, 2018
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, 2017

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	NYSE American

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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		(Do not check if a smaller reporting 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 o No

The aggregate market value of Common Stock held by non-affiliates of the Registrant was $56,765,904 on June 30, 2017, 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 $3.10.

The number of shares outstanding of the registrant's Common Stock as of February 28, 2018 was 19,425,905 shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2018 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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*to be incorporated by reference from the Proxy Statement for the registrant's 2018 Annual Meeting of Shareholders.

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 NYSE American company trading under the symbol GVP, is a world leader in real-time high-fidelity simulation and provides a wide range of simulation, consulting, training, and engineering solutions to the global 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, through our wholly-owned subsidiary GSE Performance Solutions, Inc.

We execute projects globally with approximately 388 employees operating from offices in the U.S. and 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.

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 is a nuclear industry training and consulting firm that primarily provides highly skilled, high-value professionals to fill training and consulting positions on a contract basis for nuclear power plant operators. 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 include TVA, Entergy, Southern Company, PSEG Nuclear LLC and NRG Energy Inc.

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 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.

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, 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 following is a description of our business segments:

·Performance Improvement Solutions (approximately 56% of revenue)

Our Performance Improvement Solutions segment primarily encompasses our power plant high-fidelity simulation solutions 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.

·Nuclear Industry Training and Consulting (approximately 44% of revenue)

Nuclear Industry Training and Consulting provides highly specialized and skilled nuclear operations instructors, procedure writers, technical engineers, and other consultants 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 Hyperspring and the newly acquired Absolute subsidiaries. The business model, management focus, margins and other factors clearly separate this business line from the rest of the Company's product and service portfolio. GSE and its predecessors have been providing these services since 1997.

Financial information is provided in Note 17 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 provide a powerful technology-enabled engineering and training/consulting services platform focused primarily on the nuclear power industry. We offer our differentiated suite of products and services to adjacent markets such as fossil power and the process industries where our offerings are a natural fit with a clear and compelling value proposition for 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, 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: technical engineering; training, staffing and consulting service businesses focused on the power industry particular nuclear; value added components for nuclear power plants; 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 several acquisitions since 2011 and believe the opportunity exists to acquire businesses that are complementary to ours, allowing us to accelerate our growth strategy.

In January 2011, we acquired a software company called EnVision Systems Inc., which provided interactive multi-media tutorials and simulation models, primarily to the process industries. We have integrated the technology assets from this acquisition and expanded the firm's application to other industries, and we intend to repeat this successful process. In 2014, we acquired Hyperspring, which enabled GSE to offer highly skilled nuclear operations and consulting personnel with unique know-how to our client base which is nuclear power plants. This deepened our relationship with existing clients and won business for us at new client sites in the nuclear industry. This acquisition has proven to be synergistic, enabling cross selling domestically, and in 2015, the expansion of these offerings to international customers for the first time. In September 2017, we acquired Absolute, a provider of technical consulting and staffing solutions to the global nuclear power industry, located in Navarre, Florida. The acquisition of Absolute is expected to strengthen the Company's global leadership in nuclear training and consulting solutions. The acquisition adds new capabilities to the GSE solution offering, and brings new highly complementary customers to GSE while deepening GSE relationships with existing clients. The acquisition of Absolute is a significant proof point of the thesis that GSE is a compelling platform for consolidating a fragmented vendor ecosystem for nuclear power. The acquisition adds significant scale and focus to the business, while positioning GSE as a "go to" provider of 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 our business segments which may include, but not be limited to, the following: expanding our software product portfolio to the industries we serve with 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. We have delivered a compelling solution, the GSE GPWR™ Generic Pressurized Water Reactor simulation technology, proving that our modeling technology can be sold 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 to 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 are complementary to advancing 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, in an easier to use fashion, at lower cost of ownership than any alternative available to customers. GSE has pioneered a number of industry standards over our lifetime and will continue to be one of the most innovative companies in our industry. During the years ended December 31, 2017 and 2016, we have made R&D investments totaling $1.6 million, respectively.

Strengthen and develop our talent. 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 our business within 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.

Continue to deliver industry-recognized high-quality services. 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 expertise across multiple service sectors. We have received industry certificates and awards including being recognized for outstanding work on projects by Bechtel's Nuclear, Security & Environmental global business unit (NS&E) at the Bechtel Supply Chain Recognition awards in April 2016. In addition, we have a recognized high-value brand as one of the most respected providers of software and services to the nuclear industry, as evidenced by our marquee client base and significant market wins over the past years. A recently conducted survey of clients with projects underway and/or just delivered validates our brand with a Net Promoter Score of +72, a compelling score for an industrial technology and services company.

Expand international operations in selected markets. We believe there are additional opportunities for us to market our software and services to international customers, and to do so in a cost-effective manner. For example, we believe partnerships with Value Added Resellers (VAR) could significantly expand our sales pipeline for the EnVision™ software suite. In 2016, we entered into a reseller agreement with an entity in the Middle East that has an established track record of success selling simulation and workforce development solutions to the process industries throughout the region. Such VARs may yield positive results for our pursuit of international nuclear opportunities globally (see industry trends below). We may explore the creation of appropriate joint ventures to target nuclear new-build and maintenance programs in key regions.

Industry Trends

Industry need for building and sustaining 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 more 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 reports the power sector will need more than 100,000 skilled workers by the end of 2018 to replace retiring baby boomers. Electric, Light, and Power reports 72% of energy employers currently struggle to find quality candidates, and fill open positions. The National Electrical Contractors Association reports 7,000 electricians join the field each year, while 10,000 retire. Finally, the Nuclear Energy Institute estimates that 39% of the nuclear workforce will be eligible to retire in 2018. As the nuclear industry expands its fleet and strains to maintain the high standards of training 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 spike in demand for specialist skills that we offer similarly are positive development for our business.

According to the US Energy & Employment Report released in January 2017, the employment in the traditional energy and energy efficiency sectors increased by 55% in 2016, adding 300,000 net new jobs. The Nuclear Energy Institute projects 20,000 new position will be needed in the nuclear industry over the next 5 years.

Globally, as more people increase their standard of living, their demand for power will increase, which in turn will require the on-going 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.

Growing global power demand and the increasing emphasis on nuclear power

On September 28, 2017, United States Secretary of Energy, Rick Perry, directed the nation's Federal Energy Regulatory Commission (FERC) to improve the resilience of the national electrical grid by creating rules recognizing the critical value generated by nuclear power plants, among other things. The Notice of Proposed Rulemaking stated that FERC must order grid operators to increase how they value "reliability and resilience attributes" in energy generation. All licensed nuclear power plants and a significant portion of existing coal plants can meet those requirements today.

While this request to FERC was unanimously rejected by the commissioners in January 2018, they did say they shared Secretary Perry's stated goals of grid resiliency, and directed regional transmission operators to provide information to help FERC examine the matter further. The operators have 60 days to submit new materials. At that time, the agency can issue another order. While disappointing that the request by Secretary Perry was rejected, it is the first time in quite some time that there is federal recognition of the need for support of the nuclear fleet in the US.

At the time of Secretary Perry's request to FERC, he announced a separate action to support and accelerate the development of new nuclear plants with conditional commitments of up to $3.7 billion in loan guarantees to the owners of the Vogtle nuclear power plant in Georgia. Secretary Perry stated, "I believe the future of nuclear energy in the United States is bright and look forward to expanding American leadership in innovative nuclear technologies." "Advanced nuclear energy projects like Vogtle are the kind of important energy infrastructure projects that support a

reliable and resilient grid, promote economic growth, and strengthen our energy and national security".

In December 2017, Georgia's Public Service Commission voted unanimously to allow continued construction of two nuclear reactors at Georgia Power's embattled Plant Vogtle. Commission chair Stan Wise said the decision came down to the importance of fuel diversity and the long term benefits the project would have on Georgians. Georgia utility regulators on Thursday conditioned their approval of the Vogtle nuclear project with the caveat that Congress approves roughly $800 million worth of tax credits.

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 Plant Vogtle, which is located near Waynesboro, Ga. The Nuclear Energy Institute said that the legislation signed by Trump: (1) allows for new nuclear reactors placed in service after Dec. 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 Dec. 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.

The U.S. Energy Information Administration's latest International Energy Outlook 2017 projects that world energy consumption will grow by 28% between 2015 and 2040. Most of this growth is expected to come from countries that are not in the Organization for Economic Cooperation and Development (OECD), and especially in countries where demand is driven by strong economic growth, particularly in Asia. Non-OECD Asia (which includes China and India) accounts for more than 60% of the world's total increase in energy consumption from 2015 through 2040. At the same time, countries globally are pledging to reduce greenhouse gas emissions despite this growth in demand for power. These trends are increasingly favorable to nuclear power. The United Kingdom illustrates this trend, with an energy policy that places a much greater reliance on nuclear power and relies on plans for a new nuclear fleet, while slashing subsidies for solar energy and seeking to phase out coal fired power plants. With plans to build at least three new nuclear plants, the UK plans to add 16GWe of new nuclear capacity operating by 2030 according to World Nuclear Association.

Today there are some 440 nuclear power reactors operating in 30 countries plus Taiwan, with a combined capacity of over 390 GWe. In 2014 these provided over 11% of the world's electricity. There are currently 50 nuclear plants under construction in 13 countries, including 20 in China, seven in Russia, six in India and four in the United Arab Emirates according to the Nuclear Energy Institute. Two reactors are currently under construction in the U.S. at Southern Nuclear's Vogtle, Georgia site. Per the World Nuclear Association, there are 160 reactors in 23 countries in specific phases of planning that will be operating by 2030 and over 300 more are proposed. This pace of construction is surpassing the peak construction velocity of the 1970s and 1980s as countries around the world recognize the importance of lowering carbon emissions from power generation.

For the existing nuclear U.S. fleet, there is recognition that these plants are essential to meeting goals of reducing carbon emissions, even as renewable energy sources are introduced. This recognition of the importance of nuclear 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 and in so doing providing an emissions-free 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 with wind and solar 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. The actions of New York, Illinois and Connecticut starts a trend which may continue as states such as Ohio, Pennsylvania, and New Jersey consider legislation to recognize the value of zero carbon power produced by nuclear plants in those states.

This would be similar to how the Renewable Portfolio Standard was rolled out across more than half 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. There is a project 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 has 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 which provide a structured program focused on continuous skills improvement for experienced employees to engineering services, which include plant design verification and validation. 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 achieve this, 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 by 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 new technology being deployed, often involving the integration of disparate technologies for the first time, a high-fidelity simulator allows designers to see the interaction between systems for the very first time. 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 the 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 the 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 provide an exact replication of the plant control room and plant operations. They provide the highest level of realism and training and allow users to practice their own plant-specific procedures. Clients can safely practice startup, shutdown, 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 both 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 2017, approximately 19% of our revenue was generated from end-users outside the United States. 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, Korean Electric Power Company (Korea), PSEG Nuclear, Inc., Shangdong Nuclear Power Co. Ltd. (China), Siemens AG (Germany), Southern Nuclear Operating Company, Inc., State Nuclear Power Automation System Engineering Company (China), Savannah River Nuclear Solutions, LLC, Tennessee Valley Authority, US Department of Energy, 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).

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 more non-financial press releases aimed at product development and delivery, as well as our role in numerous industry trade shows and technical conferences. We are active across numerous social media platforms to build a stronger presence across all media our clients use to find information about the Company, and providing useful information for each stage of the client's journey with the Company.

The Company's ability to support its multi-facility, international and/or multinational clients is facilitated by its network of offices and strategic partners in the U.S. and overseas. In addition to the 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, Mexico, Singapore, South America, 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 the main competition comes from large Digital Control System/Automation companies such as Honeywell and Schneider.

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

While 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. None of our competitors serve the broader performance improvement market and few work across the broader energy markets of 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 facilitate 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 in being able to integrate 3rd party engineering codes into the Company's simulation environment, thereby being able to offer 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 market.

Industry Expertise. We are a leading innovator and developer of real-time 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. The Company employs a highly educated and experienced multinational workforce of approximately 430 employees, including approximately 84 engineers and scientists in fields such as chemical, mechanical and electrical engineering, applied mathematics and computer sciences, and approximately 226 instructors and plant operations staff specialists.

Unique Combination of Talent. Nobody 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-9000 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 the customer facilities which allow us to interface with our customers directly in the course of doing business versus having to periodically call on customers. Our proximity allows us a significant competitive advantage in that we can immediately offer solutions and therefore bypass 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 unregistered), 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, and

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, which 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 does not own any patents. 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. The Company's licenses are perpetual in nature and will have an unlimited duration as long as they are adequately protected and the parties adhere to the material terms and conditions.

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™, and Xtreme I/S™.

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.

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 2017 and 2016 consolidated revenue by industries served:

	Years ended December 31,	
	2017	2016
Nuclear power	83%	73%
Fossil fuel power	9%	17%
Process	6%	6%
Other	2%	4%
Total	100%	100%

Backlog. As of December 31, 2017, we had approximately $71.4 million of total gross revenue backlog compared to $73.2 million as of December 31, 2016. Most of our contract terms are less than 24 months. With respect to our backlog, it 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 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, 2017, we had approximately 430 employees, which include approximately 181 in our Performance Improvement segment and 249 in our Nuclear Industry Training and Consulting segment. This also includes approximately 100 licensed engineers and other advanced degreed professionals. Excluding our Nuclear Industry Training and Consulting business, which consists primarily of contracted instructors, our employee attrition rate for 2017 among all staff was approximately 10%. 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.

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 disruption in this industry would have a material adverse effect upon our revenue and profitability.

In 2017, 83% of our revenue was from customers in the nuclear power industry (73% in 2016). We expect to derive a significant portion of our revenue from customers in the nuclear power industry for the foreseeable future. Our ability to supply nuclear power plant simulators and related products and services is dependent on the continued operation of nuclear power plants 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 and regulatory environment, 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. In addition, demand for our products and services may be affected by changes in the legal and regulatory environment within which the global nuclear power industry operates. Regulatory changes 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.

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 19% of the Company's consolidated revenue in 2017 and 33% of consolidated revenue in 2016. 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 exports;
- 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 regulations;
- 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;
- difficulties involving strategic alliances and managing foreign sales agents or representatives;
- uncertainties arising from foreign local business practices and cultural considerations; and