GSE SYSTEMS INC
Form 10-K
March 11, 2010

Conformed

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549
FORM 10-K
(Mark One)
[X] ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d)
OF THE SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2009

OR

[ ] TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d)
OF THE SECURITIES EXCHANGE ACT OF 1934
For the transition period from to ____

Commission File Number 001-14785
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 Amex Stock Exchange

SECURITIES REGISTERED PURSUANT TO SECTION 12(g) OF THE ACT: NONE

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

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

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 [X] 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 [X] 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 or a smaller reporting company. See the definitions of “large accelerated filer”, “accelerated filer” and “smaller reporting company” in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer [ ]	Accelerated filer [X]	Non-accelerated filer [ ] (Do not check if a smaller reporting company)	Smaller reporting company [ ]

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

The aggregate market value of Common Stock held by non-affiliates of the Registrant was $103,059,776 on June 30, 2009, 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 $6.75.

The number of shares outstanding of the registrant’s Common Stock as of March 10, 2010 was 18,933,700 shares.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2010 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 2010 Annual Meeting of Shareholders.

GSE SYSTEMS, INC.
FORM 10-K
For the Year Ended December 31, 2009

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 and Section 21E of the Exchange Act that are based on management's assumptions, expectations and projections about us, and the industry within which we operate, that have been made pursuant to the Private Securities Litigation Reform Act of 1995 which reflect 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", " 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 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 and the U.S. military;
- changes in the financial condition of our customers;
- changes in 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 or where equipment or services are or may be provided;
- 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 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.

PART I

ITEMBUSINESS.
1.

GSE Systems, Inc. ("GSE Systems", "GSE", the "Company", "our", "we" or "us"), a Delaware corporation organized in M 1994, is a world leader in real-time, high fidelity simulation. The Company provides simulation and educational solutions and services to the nuclear and fossil electric utility industry and the chemical and petrochemical industries. In addition, the Company provides plant monitoring, signal analysis monitoring and optimization software primarily to the power industry. GSE is the parent company of GSE Power Systems, Inc., a Delaware corporation; GSE Power Systems, AB, a Swedish corporation; GSE Engineering Systems (Beijing) Co. Ltd., a Chinese limited liability company; GSE Systems Ltd., a British limited liability company; and has a 10% minority interest in Emirates Simulation Academy, LLC, a United Arab Emirates limited liability company.

The Company's annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and all amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act (15 U.S.C. 78m(a) or 78o(d) will be made available free of charge through the Investor Relations section of the Company's Internet website (http://www.gses.com) as soon as practicable after such material is electronically filed with, or furnished to, the SEC. In addition, the public may read and copy any materials we file with the SEC at the SEC's Public Reference Room at 100 F Street, NE, Washington, DC 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. The SEC maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC at http://www.sec.gov.

Recent Developments.

On September 4, 2009, the Company raised $15.0 million through the sale of 2.5 million shares of its common stock, $.01 par value per share. The shares were sold under a shelf registration statement which was declared effective by the Securities and Exchange Commission on August 21, 2009. On September 23, 2009, the Company raised an additional $2,250,000 when the Company's underwriter exercised an over-allotment option in full to purchase an additional 375,000 shares of the Company's common stock at the public offering price of $6.00 per share. The aggregate net proceeds received by the Company from the two transactions was approximately $15.9 million. The Company paid the underwriter a fee in the amount of 6% of the gross proceeds received by the Company from the offering ($1,035,000) and paid $339,000 in other transaction fees. The Company intends to use the net proceeds for general working capital purposes and to fund acquisitions and other strategic opportunities.

GSE is a 10% owner of the Emirates Simulation Academy LLC in the United Arab Emirates. Although ESA was formed in late 2005, it had its grand opening on January 14, 2009 and signed its first customer training contract on the same day. Despite ESA's promotional efforts, 2009 revenue totaled only AED 209,000 ($57,000), and they incurred a net loss of AED 22.6 million ($6.1 million). Per ESA's latest financial projections, ESA would not become profitable until 2016 and would not become cash positive until 2017.

At December 31, 2009, ESA had borrowed a total of AED 36.4 million ($9.9 million) from its credit facility with Union National Bank, including accrued interest payable. ESA was delinquent in paying both principal and interest (a total of AED 5.3 million or $1.5 million) and in January 2010, UNB drew upon the guarantees of the three partners to pay off the delinquency, withdrawing $145,000 from GSE's restricted cash account. In February 2010, GSE was notified that ESA had missed another loan payment and that 10% of the amount due ($24,000) would be withdrawn from the Company's restricted cash account.

At a meeting of ESA's three shareholders held at ESA on February 17, 2010, the shareholders reached agreement to siginificantly reduce costs and begin to explore options up to and including the selling of ESA.

Accordingly, based upon these events, the Company has determined that its remaining investment in ESA has been impaired and has established reserves for the trade receivable due from ESA at December 31, 2009 and the cash that GSE has on deposit with UNB as a partial guarantee for ESA's credit facility. Partially offsetting these charges is the reversal of the remaining deferred profit related to the Company's sale of five simulators to ESA in prior years and the remaining agent fee that was due upon payment of the final outstanding receivable. The charges recorded and the presentation in the statement of operations for the year ended December 31, 2009 are as follows:

(in thousands)	Year ended December 31, 2009
Trade receivable	$ 1,604
Accrued agent fee	(96)
Operating expense	1,508
Restricted cash- bank guarantee and accrued interest income	1,291
Investment in ESA	117
Deferred profit	(543)
Other expense, net	865
Total	$ 2,373

The nuclear power industry has been largely dormant for the last thirty years with few opportunities to provide new full scope simulators. The Company's nuclear simulation business has concentrated mainly on providing services to the installed base of nuclear simulators worldwide. These services are primarily related to upgrading antiquated simulation software and hardware systems, providing new and improved plant and system simulation models, and modifying the simulator to reflect changes in the physical plant. However, over the last several years, the nuclear power industry has experienced a dramatic change, and most energy experts believe the industry is on the verge of a "renaissance", driven by the gap between the energy that the world is projected to need versus the current capacity, the instability in the cost of oil, and growing environmental concerns over the usage of fossil fuels. According to the U.S. Energy Information Administration, U.S. energy consumption alone will increase somewhere between 1-2% per year, even if the American economy grows at a fairly modest rate. Government and industry sources and trade journals report that up to 252 new nuclear plants could be built worldwide over the next 20 years. In the U.S. alone, there are proposals for over twenty new reactors and the first 17 combined construction and operating licenses for these have been applied for. Each new plant will be required to have a full scope simulator ready for operator training and certification about two years prior to plant operation. In February 2010, President Obama announced that the federal government will provide $8.33 billion in loan guarantees for a pair of nuclear reactors to be built in Georgia at the Alvin W. Vogtle Electric Generating Plant by Georgia Power, a subsidiary of Southern Company. Georgia Power received an early site permit from the U.S. Nuclear Regulatory Commission for the two additional units in 2009 and preliminary site work has begun. Westinghouse Electric Company LLC ("Westinghouse") and its consortium team member The Shaw Group are under contract to provide two Westinghouse AP1000™ nuclear power plants at the Vogtle site.

In 2005, the Company completed an agreement with Westinghouse to become their preferred vendor for the development of simulators for their AP1000 reactor design. As a result of this agreement, GSE is working closely with Westinghouse to cooperate in the development of simulators for the AP1000 design and assist Westinghouse in the verification and validation of the AP1000 Human Machine Interface. The Company's simulation models have been used to help Westinghouse successfully complete several phases of Human Machine Interface testing with U.S. regulators. In addition to the contract with Georgia Power, Westinghouse and its consortium partners have received definitive multi-million dollar contracts to provide four AP1000 nuclear power plants in China. The four plants are being constructed in pairs on China's eastern coast at Sanmen in Zhejiang province and Haiyang in Shandong province. In September 2007, Westinghouse authorized GSE to proceed on the Sanmen full scope AP1000 simulator project in China. The Sanmen plant is expected to begin commercial operations in late 2013. In April 2008, Westinghouse authorized GSE to proceed on a second full scope AP1000 simulator at the Haiyang site in China.

In July 2009, the Company announced the award of a multi-million dollar contract from Westinghouse to build an AP1000 nuclear power plant simulator based upon Westinghouse's design for domestic customers. This award covers an initial phase of work that will focus on building high fidelity simulation models for the AP1000 nuclear systems. These models will help Westinghouse demonstrate the plant design and control room human factors. The models that will be built in this current phase will be largely common to all future U.S.-based AP1000 plants and hence highly reusable from plant to plant. GSE anticipates future awards that will address the remaining plant systems. These future systems are expected to be different from plant to plant, and, therefore, the Company expects these contracts to be issued on a plant specific basis in the future. In addition to the Vogtle Plant, the Westinghouse consortium has been selected to provide no less than 12 additional AP1000s in the U.S. including four for which Engineering, Procurement and Construction contracts have been signed with the Westinghouse consortium. Providing a plant simulator at each site is included within the scope of work between the Westinghouse consortium and these U.S. customers.

In the first quarter 2009, the Company was awarded a contract valued at over $18 million to build a new nuclear power plant simulator for a two unit reactor plant in Slovakia. The contract includes approximately $12 million of hardware that the customer has requested be a part of the contract in addition to approximately $6 million related specifically to the simulator. Margins on the hardware portion of the contract are minimal, while margins on the more traditional simulation portions are consistent with those in the past. The utility customer in Slovakia is constructing

two new Russian designed VVER-440 nuclear reactors at the site that will incorporate Siemens / Areva control systems. Work on this contract commenced in the first quarter 2009 and is scheduled for completion by the end of 2011. GSE, in partnership with Siemens, built the first full scope simulator at the same site in 1997.

In the fourth quarter 2009, the Company completed a full scope simulator for the American Electric Power Donald C. Cook Nuclear Generating Station in Michigan. This project was unique as it was the first simulator of its kind to fully integrate both control rooms of a dual site plant and therefore set a new standard for nuclear facilities with more than one unit occupying the same site.

A new generation of small reactors also promises to make nuclear power more affordable. For example, NuScale Power, Inc. ("NuScale"), is commercializing, a modular, scalable 45 Megawatt Electric Light Water Reactor nuclear power plant. Each NuScale module has its own combined containment vessel and reactor system, and its own designated turbine-generator set. NuScale power plants are scalable, allowing for a single facility to have just one or up to 24 units. In November 2008, the Company was awarded a contract from NuScale to develop simulation models for its nuclear power plant which will be used in NuScale's design certification process, including design analysis, and control system strategy and plant procedure development. Eventually the simulation models will form the basis for a full scope operator training system to license the operators of these plants.

In 2009, the Company introduced its VPanel™ interactive visual training simulator. The advantage of the VPanel simulator is its scalability and ease of configuration for both team and individual training, plant specific or cross training. The VPanel allows customers to utilize their existing simulator load while bringing many full scope simulator capabilities directly into the classroom for a fraction of the cost. The Company's "Operator Jump Start" training program, which utilizes the VPanel simulator, helps customers screen and train new operator candidates. This training program is designed to provide essential knowledge and skills to potential nuclear plant operators and to determine if candidates have the ability to successfully complete the customer's own control operator training programs. The program includes instruction on fundamental sciences (including GFES), plant systems and operations.

Most U.S. nuclear electric utilities have applied for license extensions and/or power upgrades. These license extensions will lead to significant upgrades to the physical equipment and control room technology which will result in the need to modify or replace the existing plant control room simulators. The Company, having what it believes is the largest installed base of existing simulators, over 60% on a global basis, is well positioned to capture a large portion of this business, although no assurance can be given that it will be successful in doing so. The Company logged approximately $47.5 million, $26.5 million and $21.5 million in nuclear simulation orders in the years ended December 31, 2009, 2008 and 2007, respectively.

The Company also provides simulators to the fossil fueled power product industry. The Company logged approximately $5.6 million, $13.6 million, and $11.2 million of fossil fueled simulation orders for the years ended December 31, 2009, 2008 and 2007, respectively. The global recession and financial credit crisis along with confusing and sometimes conflicting federal, state, and local regulatory procedures have impacted this portion of our business. However, the transition from obsolete analog control systems to modern digital control systems and the new requirements for complex emission control systems continues to provide opportunities for the Company in this business. GSE's high-fidelity simulation models can be used to validate these control schemes and logic for new designs before the control systems are deployed to the field. GSE builds the plant models based upon design specifications supplied by its customers, and the models then drive the actual digital control systems in the factory. This testing can uncover numerous control system discrepancies. By correcting these problems at the factory versus in the field, GSE's customers can save millions in reduced down time and reduced commissioning time.

GSE's process industries simulation business customers include primarily oil and gas production facilities, oil refining plants, chemical plants and petro-chemical facilities. As in the power industry, there is increasing focus on regular, periodic and systematic training of plant operator personnel which may reduce the risk of operator errors and potentially catastrophic environment disasters and/or loss of life. The Company logged approximately $1.2 million, $1.2 million, and $3.4 million of process industry simulation orders for the years ended December 31, 2009, 2008 and 2007, respectively.

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The Company continues to develop its concept of integrating simulation with broader training programs and educational initiatives giving customers a turnkey alternative to traditional on-site operator and maintenance training. In the fourth quarter 2008, the Company was awarded a nuclear power plant operator training program contract with Georgia Power, a subsidiary of Southern Company, one of the largest U.S. nuclear utilities. The scope of the award included the development of course materials for a licensed operator preparation course which includes modules on nuclear plant fundamentals, introduction to nuclear plant systems, human performance principles and team building, and an introduction to integrated nuclear plant operations. The first 20-week class for new nuclear plant instructor and operator candidates was completed in December 2009. Two classes are scheduled for 2010.

Background.

GSE Systems was formed on March 30, 1994 to consolidate the simulation and related businesses of S3 Technologies, General Physics International Engineering & Simulation and EuroSim, each separately owned and operated by ManTech International Corporation, GP Strategies Corporation and Vattenfall AB, respectively.

In December 1997, the Company acquired 100% of the outstanding common stock of J.L. Ryan, Inc. (“Ryan”), a provider of engineering modifications and upgrade services to the power plant simulation market. The combination of the Company’s pre-existing technology with the technical staff of the acquired Ryan business positioned the Company to be more competitive for modifications and upgrade service projects within the nuclear simulation market.

In October 2002, GSE purchased the stock of ManTech Automation Systems (Beijing) Company Ltd, from ManTech International Corp. The Chinese company, which has sixteen employees, was renamed GSE Systems Engineering (Beijing) Company Ltd. This acquisition gave the Company a base in China to pursue and implement simulation projects in that emerging market.

In 2007, the Company formed a subsidiary, GSE Systems Ltd., in the United Kingdom. The British subsidiary was established to provide training solutions to the nuclear power industry.

Simulation Business.

I. Nuclear and Fossil Fuel Power Simulation.

Industry History

The real-time simulation industry grew from the need to train people on complex and potentially dangerous operations, without placing life or capital assets at risk. Real-time simulation has been used for the training of plant operators for the power industry, including both nuclear power plants and conventional fossil fuel power plants (i.e., coal, oil, and natural gas), since the early 1970s. Real-time simulation usage has traditionally centered on initial training of operators and follow-on training of operators in emergency conditions that can best be achieved through simulation replicating actual plant operations.

In the nuclear power industry, use of a simulator that accurately reflects the current actual plant design is mandated by the U.S. Nuclear Regulatory Commission ("NRC"). This mandate resulted from the investigation of the accident at the Three Mile Island nuclear plant in 1979, which was attributed, at least in part, to operator error. The NRC requires nuclear plant operators to earn their licenses through simulator testing. Each nuclear plant simulator must pass a certification program to ensure that the initial plant design and all subsequent changes made to the actual plant control room or plant operations are accurately reflected in the simulator. Plant operating licenses are tied to simulator certification.

Full scope power plant simulators are a physical representation of the entire plant control room. For older plants, the control panels are connected to an input/output (I/O) system, which converts analog electrical signals to digital signals understood by the simulation computer. For newer plants, the control rooms consist mainly of digital control systems and a series of computer screens used by the operator to control the plant. The simulation computer houses the mathematical models, which simulate the physical performance of the power plant's systems such as the reactor core, steam boiler, cooling water, steam turbine, electrical generator, plant system controls and electrical distribution systems. Partial scope simulators can be viewed as a subset of a full scope simulator. Instead of simulating the entire performance of the power plant, a partial scope simulator might represent one or two critical systems such as the steam turbine and/or electrical generator operation.

In the past, training simulators had to strike a delicate balance between providing an accurate engineering representation of the plant, while still operating in "real-time" in order to provide effective training. As computing power has increased, so too has the capacity of simulators to provide more accurate plant representations in real-time based upon simulation models developed from engineering design codes. The more sophisticated and accurate engineering codes allows customers to use the simulator to help validate plant design, control system strategies, control system displays, and develop plant operating procedures and training material.

Simulation also is used to validate proposed plant equipment changes and to confirm the results of such changes, prior to making the change in the plant, which can save time and money, as well as reduce the risk of unsafe designs, for the utility.

The importance of nuclear power to the U.S. energy supply is resulting in the extension of the useful lives of U.S. nuclear power plants. Any service life extension of a nuclear power plant is likely to require major upgrades to the plant's equipment and technology, including its simulator.

Fossil fuel plant simulators are not required by law or regulation, but are justified as a cost-effective approach to train operators on new digital control systems being implemented at many fossil fuel power plants. The size, complexity and price of a fossil plant simulator are much lower than for simulators used for nuclear plants. Fossil plant simulators have traditionally used lower fidelity (less sophisticated) mathematical models to provide an approximate representation of plant performance. The demand for highly accurate models did not exist in the early market for fossil simulators since the main use of the simulator was to train operators on the functionality of distributed control systems for plant start-up activities.

The deregulation of the power industry has forced utilities to view their assets differently. Power plants are profit centers, and gaining the maximum efficiency from the plant to become, or remain, competitive is a paramount issue. The mindset of the operator has shifted, as plant operators now must perform within narrower and narrower performance margins while still maintaining safe operations. GSE believes its fossil fuel plant customers are recognizing the benefits of high fidelity simulation models that provide highly accurate representations of plant operations to help plant operators and management determine optimal performance conditions.

Beyond traditional operator training uses, the Company sees a significant shift in the use of its simulators to test plant automation systems before they are deployed in the actual plant. Control strategies and equipment set points are validated on the simulator prior to plant start up to ensure the control schemes work properly and the expected plant performance is achieved. Performing these tests on a high fidelity simulator saves days or weeks in the plant start up, thereby reducing cost and ensuring quicker revenue generation by the utility.

Industry Future

The Company sees a renaissance in nuclear power generation both domestically and internationally that will provide significant opportunities for expansion of the Company's business. In 2002, the U.S Department of Energy initiated the Nuclear Power 2010 ("NP 2010") program, a government-industry, 50-50 cost-shared initiative that had two main goals: removing the technical, regulatory and institutional barriers to building new nuclear power plants in the U.S. and securing industry decisions to construct and operate those plants. Per the DOE's office of Nuclear Energy, NP 2010 program has worked to 1) demonstrate untested regulatory processes, 2) identify sites for new nuclear power plants, 3) develop and bring to market advanced, standardized nuclear plant technologies, and 4) evaluate the business case for building new nuclear power plants. In February 2010, President Obama announced that the Department of Energy will provide $8.33 billion in loan guarantees for a pair of nuclear reactors to be built in Georgia at the Alvin W. Vogtle Electric Generating Plant by Georgia Power, a subsidiary of Southern Company. Georgia Power received an early site permit from the U.S. NRC for the two additional units in 2009 and preliminary site work has begun. Westinghouse Electric Company LLC ("Westinghouse") and its consortium team member The Shaw Group are under contract to provide two Westinghouse AP1000™ nuclear power plants at the Vogtle site. The new units are expected to begin commercial operation in 2016 and 2017. In addition to the Vogtle plant, the Westinghouse consortium has signed Engineering, Procurement and Construction contracts with Progress Energy Florida, a subsidiary of Progress Energy, to provide two AP1000 nuclear power units at Progress's Levy County, Florida site and with South Carolina Electric & Gas Company, principal subsidiary of SCANA Corporation, and Santee Cooper to provide two AP1000 nuclear power units at the V.C. Summer Nuclear Station in Jenkinsville, S.C.

Internationally, there are currently over 50 nuclear reactors under construction in 13 countries. Per the World Nuclear Association ("WNA"), China has 11 nuclear power reactors in commercial operation, 20 under construction and another 27 units are planned, with construction due to start within three years. China's aim is to have a sixfold increase in nuclear capacity or more by 2020. In Russia, six large reactors are under active construction, seven further reactors are then planned to replace some existing plants, and by 2016 ten new reactors should be operating. Further reactors are planned to add new capacity by 2020. New plants are on the drawing board or under construction in Argentina, Canada, Bulgaria, Finland, France, Japan, India, Pakistan, Romania, Slovakia and South Korea.

Beyond new construction, numerous U.S. utilities are extending the useful life of their current assets. These license extension processes in the nuclear industry will result in significant changes in plant equipment and control room technology. Based upon U.S. NRC regulations, each training simulator is required to reflect all changes that are made in the actual plant, thus when changes in plant equipment and control room technology are made, the nuclear power plants must either upgrade existing simulators or purchase brand new simulators.

The second phenomena affecting the industry is the aging of the nuclear and fossil plant operator workforce which will result in the need for simulation to train the next generation of plant operators. Per the U.S. Bureau of Labor Statistics' Current Population Survey, 2008, 53% of the utilities industry workforce was age 45 or older in 2008; 15.9% was over age 55. Thus, the industry is faced with an aging workforce at the same time new capacity is needed, thereby placing significant pressure on the industry to find and train the next generation of operations and maintenance personnel. In their employment outlook for the utilities industry, the Bureau of Labor Statistics states "Because on-the-job training is very intensive in many utilities industry occupations, preparing a new workforce will be one of the industry's highest priorities during the next decade".

Therefore, the Company believes that these trends, if they come to fruition in whole or even in part, represent a market opportunity for its real-time simulation, plant optimization, asset management and condition monitoring products and services.

GSE's Solution

The Company's Power Simulation business is a leader in the development, marketing and support of high fidelity, real-time, dynamic simulation software for the electric utility industry. The Company has built or modified about 65 of the approximately 75 full-scope simulators serving about 103 operating nuclear power plants in the United States. Outside the United States, GSE has built or modified about 73 of the approximately 167 full-scope simulators serving approximately 329 operating nuclear power plants.

The Company has developed integrated training solutions which combine the power of the Company's simulation technology with training content to provide turn-key training for the power and process industries. These training centers will help industry bridge the gap between college and university level training and real world experience through simulation.

In addition to operator training, the Company's simulation products and services permit plant owners and operators to simulate the effects of changes in plant configuration and performance conditions to optimize plant operation. These features allow the Company's customers to understand the cost implications of replacing a piece of equipment, installing new technology or holding out-of-service assets. GSE has also developed a suite of tools based on sophisticated signal analysis and simulation techniques to help its customers manage their assets by determining equipment degradation before it severely impacts plant performance.

The Company has also focused on upgrading older technology used in power plants to new technology upgrades for plant process computers and safety parameter display systems. As nuclear plants in the U.S. continue to age, the Company will seek more business in this upgrade market.

GSE provides both turn-key solutions, including simulated hardware and proprietary software, to match a specific plant, and discrete simulation technology for specific uses throughout a plant. Its substantial investment in simulation technology has led to the development of proprietary software tools. These tools significantly reduce the cost and time to implement simulation solutions and support long-term maintenance. The Company's high fidelity, real-time simulation technology for power plant fluid, logic and control, electrical systems and associated real-time support software, JADE, is available for use primarily on UNIX, Linux and Windows computer platforms. The Company's Xtreme tools were designed for the Windows environment. Both technologies were specifically designed to provide user friendly graphic interfaces to the Company's high fidelity simulator.

In addition to the simulator market, the Company offers products aimed at improving performance of existing plants by reducing the number of unplanned outages due to equipment failure. Using advanced signal analysis techniques, the Company's tools can predict when certain plant equipment needs to be replaced. Replacement of critical equipment prior to failure permits effective planning and efficient use of maintenance time during scheduled off-line periods.

Products of the Power Simulation business include:

- Java Applications & Development Environment (JADE™), a Java-based application that provides a window into the simulation instructor station and takes advantage of the web capabilities of Java, allowing customers to access the simulator and run simulation scenarios from anywhere they have access to the web. JADE includes the following software modeling tools:
  - JFlow™, a modeling tool that generates dynamic models for flow and pressure networks.
  - JControl™, a modeling tool that generates control logic models from logic diagrams.
  - JLogic™, a modeling tool that generates control logic models from schematic diagrams.
  - JElectric™, a modeling tool that generates electric system models from schematic and one-line diagrams.
  - JTopmeret™, a modeling tool that generates two phase network dynamic models.
  - JDesigner™, a JADE based intuitive graphic editor for all JADE tools.
  - JStation™, a JADE based web-enabled Instructor Station.

- Xtreme Tools™, a suite of software modeling tools developed under the Microsoft Windows environment. It includes:
  - Xtreme Flow™, a modeling tool that generates dynamic models for flow and pressure networks.
  - Xtreme Control™, a modeling tool that generates control logic models from logic diagrams.
  - Xtreme Logic™, a modeling tool that generates control logic models from schematic diagrams.
- Xtreme Electric™, a modeling tool that generates electric system models from schematic and one-line diagrams.

- RELAP5 R/T HD™, a real-time version of the safety analysis code RELAP5 developed by the Idaho National Laboratory. The Company's HD (High Definition) version of RELAP5 R/T enables the engineers to understand and control all of the internal functions of RELAP5, making this solution unique in the market.

- SimExec® and OpenSim®, real-time simulation executive systems that control all real-time simulation activities and allow for an off-line software development environment in parallel with the training environment. OpenSim is targeted for users of Microsoft Windows operating systems, while SimExec is targeted for users of Microsoft Windows, UNIX and Linux operating systems.

- SmartTutor®, complementary software for instructor stations. It provides new capabilities to help improve training methodologies and productivity. Using Microsoft Smart Tag technology, SmartTutor allows the control of the simulator software directly from Microsoft Office products. The user can run training scenarios directly from a Microsoft Word document, or he can plot and show transients live within a Microsoft PowerPoint slide.

- Xtreme I/S™, a Microsoft Windows based Instructor Station that allows the use of Microsoft Word and PowerPoint to control the real-time simulation environment. Xtreme I/S is a user-friendly tool for classroom training and electronic report generation. It provides real-time plant performance directly from the simulator during classroom training, which drastically increases learning efficiency.

- Pegasus Surveillance and Diagnosis System™, a software package for semi-automatic plant surveillance and diagnostics, incorporates sophisticated signal processing and simulation techniques to help operators evaluate the condition and performance of plant components. Pegasus permits plant management to identify degraded performance and replace components before they fail.

- SIMON™, a computer workstation system used for monitoring stability of boiling water reactor plants. SIMON assists the operator in determining potential instability events, enabling corrective action to be taken to prevent unnecessary plant shutdowns.

- VPanel™, an interactive visual training solution. For customers that already have a full scope ANS 3.5 Certified simulator, the VPanel provides a second hardware platform that will run the ASN 3.5 Simulator software model at a fraction of the cost of building a second full scope simulator. The VPanel Simulator provides the same fidelity of operation as their existing simulator but the VPanel offers portability and versatility at a very affordable price. All of the features and functions of the full scope ANS 3.5 Simulator are duplicated in the VPanel simulator but the VPanel can be used in a classroom setting or as a second simulator to alleviate many of the time pressures our customers are experiencing with their current simulators. For nations considering entry into the nuclear power industry the VPanel is the ideal tool to help build a base of experienced nuclear workers either at a university or industrial training facility. Since the VPanel uses a software load from an ANS 3.5 Certified simulator it will accurately reflect the operations and response of an operating nuclear power plant. The VPanel provides nations entering the nuclear power industry with realistic hands on experience of the operation of a nuclear facility long before they begin construction on their facilities.

The Simulation business also provides consulting and engineering services to help users plan, design, implement, and manage/support simulation and control systems. Services include application engineering, project management, training, site services, maintenance contracts and repair.

Strategy

The goal of the Power Simulation business is to expand its business on three fronts:

- Continue serving its traditional customer base.
- Combine its simulation capability with training content to provide totally integrated training solutions.
- Expand the use of high fidelity simulation beyond training to help validate plant design.

Traditional Simulation Market. Nuclear power currently accounts for about 20% of the total electrical output in the United States and this percentage will likely remain the same even as total capacity increases. Any new nuclear power plants will likely be of the advanced reactor designs created by Westinghouse, General Electric and Areva. These new designs require new simulators and training programs, as they are different from the nuclear power plant designs currently in operation. In addition to new power plants, existing nuclear power plants will likely be required to remain on-line for a longer period than originally expected. In order to stay in operation, many plants will require life extension modifications. Since all existing U.S. nuclear power plants went on-line before 1979, their designs and technology can also benefit from the substantial advances in plant design and technology developed over the past 30 years. For example, several of the Company's U.S. utility customers have been replacing their existing hard panel control rooms with modern distributed control systems (DCS) as are common in fossil fuel plants and which have been implemented in Europe for several years. Significant changes to control room instrumentation and overall control strategy from hard panel to DCS generally require modification or replacement of the plant simulator. With the largest installed base of nuclear plant simulators in the world, the Company believes it is uniquely positioned to serve this market segment with new simulation products and services. GSE has received several projects in the last few years for implementing digital turbine control systems in U.S. plants.

As plants extend their useful life, many plan to "up-rate" the existing capacity to increase electrical yield. By changing the capacity of certain equipment in a plant, the utility can gain upwards of a 10%-15% increase in output. Again, any such changes must be reflected in the control room simulator, and operators must be trained on the new equipment before implementation.

In addition to the United States markets, several emerging regions of the world are expanding their electrical capacity with both nuclear and fossil fuel power plants. This is particularly the case in China and India.

Classroom Simulation. In recent years the Company has upgraded numerous training simulators to utilize standard PC technology. As an extension of the PC-based simulator technology, the Company has developed tools which will allow the training simulator to be used in a classroom setting, replacing the actual control room panels with "soft-panel" graphics.

Increased training requirements and demands for performance improvement have resulted in simulator training time becoming scarce. By providing the actual training simulator models in a classroom setting, the value of the simulator is increased by allowing more personnel the training advantages of interactive, dynamic real-time simulation.

The Company pioneered the technology to run a simulator on a PC several years ago. However, the technology remains complex, which prevented wide deployment of the simulator in classrooms. The Company has developed unique software which allows simulator-based training lessons to be easily developed and deployed in a classroom setting.

Simulation Beyond Training. In addition to operator training, the Company's simulation products can meet this increased need for efficiency by assisting plant operators in understanding the cost implications of replacing equipment, installing new technology and maintaining out-of-service assets. In order to exploit this potential, the Company has increased the fidelity of its simulation products and is marketing its services to increase the fidelity of simulators that are already in operation.

As computing power and networking technologies improve, several of the Company's customers have started to migrate simulation technology from the training organization to the engineering organization. The same full scope simulation software that drives the simulated control room panels in a simulator can be used with graphical representations of the panels so engineers can test design changes and see how the balance of the plant will react to such changes. GSE has developed a Java-based application to allow customers easier access to, and use of, the simulation capabilities across the organization through network communication.

Optimize Existing Engineering Resources. GSE's Power domestic service organization focuses on simulator upgrades and retrofits. In addition to domestic resources, GSE has developed a network of trained engineers in Russia, Ukraine, Czech Republic, Bulgaria, and China. These foreign resources provide low cost engineering and software development capabilities and are readily available to supplement the United States engineering staff as necessary.

Strategic Alliances

Power's strategic alliances have enabled the Company to penetrate regions outside the United States by combining the Company's technological expertise with the regional presence and knowledge of local market participants. These strategic alliances have also permitted the reduction of research and development and marketing costs by sharing such costs with other companies.

In recent years, a significant amount of the Company's international business has come from contracts in Eastern Europe, including the republics of the former Soviet Union, and the Pacific Rim. In order to acquire and perform these contracts, the Company entered into strategic alliances with various entities including: All Russian Research Institute for Nuclear Power Plant Operation (Russia); Kurchatov Institute (Russia); Risk Engineering Ltd. (Bulgaria); Samsung Electronics (Korea); Toyo Engineering Corporation (Japan); and Westinghouse Electric Company LLC (U.S.).

Competition

The Power Simulation business encounters intense competition. In the nuclear simulation market, GSE competes directly with larger firms primarily from Canada and Germany, such as MAPPS Inc., a subsidiary of L-3 Communications, CORYS T.E.S.S and Western Services Corp. The fossil simulation market is represented by smaller companies in the U.S. and overseas. Several of the Company's competitors have greater capital and other resources than it has, including, among other advantages, more personnel and greater marketing, financial, technical and research and development capabilities. Customer purchasing decisions are generally based upon price, the quality of the technology, experience in related projects, and the financial stability of the supplier.

Customers

The Power Simulation business has provided approximately 200 simulation systems to an installed base of over 75 customers worldwide. In 2009, approximately 65% of the Company's revenue was generated from end users outside the United States. Customers include, among others, ABB Inc., American Electric Power, Bernische Kraftwerke AG (Switzerland), British Energy Generation Ltd. (UK), Comisión Federal De Electricidad (Mexico), Concern Titan-2 (Russia), Emerson Process Management, Georgia Power, Kärnkraftsäkerhet och Utbildning AB (Sweden), Kraftwerks–Simulator-Gesellschaft mbH (Germany), Nuclear Engineering Ltd. (Japan), PSEG Nuclear, Inc., Slovenské elektrárne, a.s. (Slovakia), and Westinghouse Electric Co.

The following Power Simulation customers have provided more than 10% of the Company's consolidated revenue for the indicated periods:

	Years ended December 31,		
	2009	2008	2007
Slovenské elektrárne, a.s.	13.5%	0.0%	0.0%
Emerson Process Management	12.1%	16.2%	7.9%
Titan-2 Concern	10.7%	0%	0%
American Electric Power	6.8%	10.5%	0.5%
Emirates Simulation Academy LLC	0.0%	4.2%	31.1%

Sales and Marketing

The Company markets its Power Simulation products and services through a network of direct sales staff, agents and representatives, systems integrators and strategic alliance partners. Market-oriented business and customer development teams define and implement specific campaigns to pursue opportunities in the power marketplace.

The Company's ability to support its multi-facility, international and/or multinational Power Simulation clients is facilitated by its network of offices and strategic partners in the U.S. and overseas. Power Simulation offices are maintained in Maryland and Georgia, and outside the U.S., in Sweden and China. In addition to the offices located overseas, the Company's ability to conduct international business is enhanced by its multilingual and multicultural work force. GSE has strategic relationships with systems integrators and agents representing its interests in the Czech Republic, Bulgaria, Japan, Mexico, People's Republic of China, South Africa, Spain, South Korea, Taiwan, Ukraine and the United Kingdom.

II. Process Industries Simulation.

Industry

Throughout the process industries there is continuing competitive pressure, reduction of technical resources, and an aging workforce which is forcing process manufacturers to turn to advanced technologies for real-time optimization, training, and advanced process control. Operational efficiency is vital for companies to remain competitive where many of the manufacturing industries operate on very thin margins. There are only one or two advanced technology companies that offer services fully across this spectrum, and GSE offers dynamic real-time simulation capabilities for operator training and plant design validation and verification into this segment.

GSE's Solution

The SimSuite Pro™ product was developed by GSE specifically for dynamic real-time simulation for operator training and validating the plant design logic and control. The GSE culture and expertise is one of customized project execution and delivery. This marketplace places a high value on experience, both company-wide and for the individuals on the project teams, so GSE promotes its long history in training simulators, while also seeking new applications. The SimSuite Pro package continues to be enhanced with features applicable not just to the execution of professional training techniques and design validation, but also to the recording and validating of process operator performance for potential certification.

Strategy

GSE is uniquely positioned in the process simulation market to provide total training solutions which combine the development of the plant simulator with the training infrastructure and course material to enable the customer to truly benefit from the simulator investment. The core concepts of process simulation make the technology a basis for other potential process improvement activities, such as Advanced Process Control and Process Optimization, which is where some of the major GSE competition has more business focus than for operator training. GSE will continue to emphasize its operator training focus and strengths, as well as the application of the process simulator for change management, where changes in the process, control strategy, or operating procedures can be evaluated in real time before they are applied to the actual process units. On-stream time is an important economic factor, and there is recognizable value in avoiding the risk of unplanned process disturbances from invalidated changes.

An emerging energy market is developing for Integrated Gasification Combined Cycle ("IGCC") power plants. These new plants produce electricity more efficiently than traditional power plants by first converting existing refinery waste materials into synthetic gas that is used to power a gas turbine. The gas is then burned to create steam to turn a steam turbine. The unique nature of these plants requires expertise both in chemical process simulation and power simulation. GSE is one of the few simulator companies in the world with expertise in both areas.

Customers

Hydrocarbon and chemical process customers include numerous large oil refineries and chemical plants such as Statoil ASA (Norway), Bayernoil (Germany), Emerson Process Management, Saudi Basic Industries Corporation (Saudi Arabia), Sinopec Ningbo Engineering Company (China), and Savannah River Nuclear Solutions, LLC.

Competition

GSE's process simulation competitors are a varied group. There are major corporations offering a wide range of products and services that include operator training simulators. There are also companies focused on Process Technology and manufacturing enhancement, such as Invensys and Honeywell who are Distributed Control System ("DCS") distributors to the refining industry and provide operator simulation as part of their DCS offering. There is a collection of companies with specific industry niches that enables them to compete in operator training simulation, such as Invensys and RSI Simcon. There are also the smaller training companies that compete at the lower cost levels of Computer Based Training ("CBT") or simple simulations close to CBT.

The GSE focus on dynamic simulation for training and design validation is a business strength, and its vendor independence, with the ability to integrate to different vendor's process control systems, is also a value which is appreciated by customers. GSE can be seen as a best-of-breed type of supplier because it is not tied to a major control system, nor is it providing simulation software for engineering and business management with high annual license fees.

Sales and Marketing

The Company will market its Process Simulation technologies through a combination of techniques including its existing direct sales channel, sales agents, and strategic alliance partners.

Competitive Advantages.

The Company believes that it is in a strong position to compete in the Simulation markets based upon the following strengths:

- Technical and Applications Expertise. GSE is a leading innovator and developer of real-time software with more than 38 years of experience producing high fidelity real-time simulators. As a result, the Company has acquired substantial applications expertise in the energy and industrial process industries. The Company employs a highly educated and experienced multinational workforce of 201 employees, including approximately 152 engineers and scientists. Approximately 49% of these engineers and scientists have advanced science and technical degrees in fields such as chemical, mechanical and electrical engineering, applied mathematics and computer sciences.

- Proprietary Software Tools. GSE has 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 it or its customers to develop high fidelity real-time software quickly, accurately and at lower costs.

- Open System Architecture. GSE's software products and tools are executed on standard operating systems with third-party off-the-shelf hardware. The hardware and operating system independence of its software enhances the value of its products by permitting customers to acquire less expensive hardware and operating systems. The Company's products work in the increasingly popular Microsoft operating environment, allowing full utilization and integration of numerous off-the-shelf products for improved performance.

- Training Curricula. The Company has developed detailed course material in nuclear power plant fundamental sciences and specific industrial applications.

- International Strengths. Approximately 65% of the Company's 2009 revenue was derived from international sales of its products and services. GSE has a multinational sales force with offices located in Beijing, China, and Nyköping, Sweden and agents, representatives and partners in 20 other countries. To capitalize on international opportunities and penetrate foreign markets, the Company has established strategic alliances and partnerships with several foreign entities and universities.

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 eleven registered U.S. trademarks: RETACT®, GSE Systems®, THOR®, OpenSim®, SmartTutor®, SimSuite Pro®, ESmart®, GAARDS®, Openexec®, REMITS-Real-Time Emergency Management Interactive Training System® and SimExec®. Some of these trademarks have also been registered in foreign countries. The Company also claims trademark rights to BRUS™, GCONTROL+™, GFLOW+™, GLOGIC+™, GPower+™, Java Applica and Development Enviroment (JADE)™, PEGASUS Plant Surveillance and Diagnosis System™, RACS™, Sens Base™ SIMON™, SimSuite Power™, V-Panel ™, Vista PIN™, 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.

Industries Served.

The following chart illustrates the approximate percentage of the Company's 2009, 2008, and 2007 consolidated revenue by industries served:

	2009	2008	2007
Nuclear power industry	73%	54%	45%
Fossil fuel power industry	21%	31%	20%
Process industry	4%	9%	4%
Training and education industry	2%	6%	31%
Total	100%	100%	100%

Contract Backlog.

The Company does not reflect an order in backlog until it has received a contract that specifies the terms and milestone delivery dates. As of December 31, 2009, the Company's aggregate contract backlog totaled approximately $53.9 million of which approximately $29.5 million or 55% is expected to be converted to revenue by December 31, 2010. As of December 31, 2008, the Company's aggregate contract backlog totaled approximately $38.1 million.

Employees.

As of December 31, 2009, the Company had 201 employees as compared to 178 employees at December 31, 2008.

ITEM 1A. RISK FACTORS.

The following discussion of risk factors contains "forward-looking statements," as discussed on pages 3 and 4 of this Annual Report on Form 10-K. These risk factors may be important to understanding any statement in this Annual Report on Form 10-K or elsewhere. The Company believes that the following risk factors may cause the market price for its 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. 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.

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We routinely encounter and address risks, some of which may cause our future results to be different, sometimes materially, than we presently anticipate. Discussion about important operational risks that we encounter can be found in Item 1, Business and Item 7, Management's Discussion and Analysis of Financial Condition and Results of Operations. We have described certain important strategic risks below. Our reactions as well as our competitors' reactions to material future developments may affect our future results.

The Company's global growth is subject to a number of economic and political risks.

The Company conducts its operations in North America, Europe, Asia and the Middle East. Global economic developments affect businesses such as GSE, and the Company's operations are subject to the effects of global competition. The Company's global business is affected by local economic environments, including inflation, recession and currency volatility. Political changes, some of which may be disruptive, can interfere with the Company's supply chain, its customers and all of its activities in a particular location. While some of these risks can be hedged using derivatives or other financial instruments and some are insurable, such attempts to mitigate these risks are costly and not always successful. The current global recession has not yet had a material impact on the Company's business. The Company's backlog as of December 31, 2009 totaled $53.9 million, a 41.5% increase over the Company's backlog at December 31, 2008. The Company has seen no significant delays or cancellations to the projects it is currently working on and is unaware of any significant delays or cancellations to projects that the Company expects to secure in 2010. However, as the recession continues, we may see an impact on the Company's operations.

The Company's expense levels are based upon its expectations as to future revenue, so it may be unable to adjust spending to compensate for a revenue shortfall. Accordingly, any revenue shortfall would likely have a disproportionate effect on the Company's operating results.

The Company's revenue was $40.1 million, $29.0 million, and $31.9 million for the years ended December 31, 2009, 2008 and 2007, respectively. The Company's operating income (loss) was $563,000, $(12,000), and $2.2 million for the years ended December 31, 2009, 2008, and 2007, respectively. The Company's 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 new products and enhancements by the Company and its competitors, and fluctuating global economic conditions. Since the Company's expense levels are based in part on its expectations as to future revenue and includes certain fixed costs, the Company may be unable to adjust spending in a timely manner to compensate for any revenue shortfall and such revenue shortfalls would likely have a disproportionate adverse effect on operating results.

Risk of International Sales and Operations.

Sales of products and services to end users outside the United States accounted for approximately 65% of the Company's consolidated revenue in 2009, 63% of consolidated revenue in 2008, and 71% of consolidated revenue in 2007. The Company anticipates that international sales and services will continue to account for a significant portion of its revenue in the foreseeable future. As a result, the Company may be subject to certain risks, including risks associated with the application and imposition of protective legislation and regulations relating to import or export (including export of high technology products) or otherwise resulting from trade or foreign policy and risks associated with exchange rate fluctuations. Additional risks include potentially adverse tax consequences, tariffs, quotas and other barriers, potential difficulties involving the Company's strategic alliances and managing foreign sales agents or representatives and potential difficulties in accounts receivable collection. The Company currently sells products and provides services to customers in emerging market economies. The following emerging markets have provided more than 10% of the Company's revenue for the indicated period:

	Years ended December 31,		
	2009	2008	2007
Slovenské elektrárne, a.s.	13.5%	0.0%	0.0%
Emerson Process Management	12.1%	16.2%	7.9%
Titan-2 Concern	10.7%	0%	0%
American Electric Power	6.8%	10.5%	0.5%
Emirates Simulation Academy LLC	0.0%	4.2%	31.1%

The Company has taken steps designed to reduce the additional risks associated with doing business in these countries, but the Company believes that such risks may still exist and include, among others, general political and economic instability, lack of currency convertibility, as well as uncertainty with respect to the efficacy of applicable legal systems. There can be no assurance that these and other factors will not have a material adverse effect on the Company's business, financial condition or results of operations.

The Company's business is largely dependent on sales to the nuclear power industry. Any disruption in this industry would have a material adverse effect upon the Company's revenue.

In 2009, 73% of GSE's revenue was from customers in the nuclear power industry (54% in 2008 and 45% in 2007). The Company expects to derive a significant portion of its revenue from customers in the nuclear power industry for the foreseeable future. The Company's 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, and general economic conditions.

The Company's line of credit agreement imposes operating and financial restrictions on the Company which may prevent it from capitalizing on business opportunities.

GSE's line of credit agreements with Bank of America (BOA) impose operating and financial restrictions. These restrictions affect, and in certain cases limit, among other things, the Company's ability to:

- incur additional indebtedness and liens;
- make investments and acquisitions;
- consolidate, merge or sell all or substantially all of its assets.

There can be no assurance that these restrictions will not adversely affect the Company's ability to finance its future operations or capital needs or to engage in other business activities that may be in the interest of stockholders. At December 31, 2009, the Company was in default on two of its financial covenants. The financial covenant calculations at December 31, 2009 are shown below:

	Covenant	As of Dec. 31, 2009
Tangible net worth	Must Exceed $15.0 million	$33.5 million
Debt service coverage ratio	Must Exceed 1.25 : 1.00	(1,582) : 1.00
Funded debt to EBITDA ratio	Not to Exceed 2.50 : 1.00	2.74 : 1.00

At December 31, 2009 and throughout all of 2009, the Company had no outstanding borrowings against its lines of credit. Accordingly, we did not incur any bank interest expense in 2009. However, the Company did incur approximately $1,000 of interest expense related to late payments to vendors. This, in conjunction with the Company's net loss for the year ended December 31, 2009, has resulted in a negative debt service coverage ratio. For the funded debt to EBITDA ratio calculation, the amount of outstanding letters of credit and bank guarantees that are not cash collateralized are included as funded debt. The Company has received a written waiver from BOA and is in the process of negotiating a revision to the financial covenants for 2010. The Company's available borrowing base under the two lines of credit was $6.0 million at December 31, 2009, of which $2.4 million had been utilized to collateralize three standby letters of credit.

The Company is dependent on product innovation and research and development, which costs are incurred prior to revenue for new products and improvements.

The Company believes that its success will depend in large part on its ability to maintain and enhance its current product line, develop new products, maintain technological competitiveness and meet an expanding range of customer needs. The Company's product development activities are aimed at the development and expansion of its library of software modeling tools, the improvement of its display systems and workstation technologies, and the advancement and upgrading of its simulation technology. The life cycles for software modeling tools, graphical user interfaces, and simulation technology are variable and largely determined by competitive pressures. Consequently, the Company will need to continue to make significant investments in research and development to enhance and expand its capabilities in these areas and to maintain its competitive advantage.

The Company relies upon its intellectual property rights for the success of its business; however, the steps it has taken to protect its intellectual property may be inadequate.

Although the Company believes that factors such as the technological and creative skills of its personnel, new product developments, frequent product enhancements and reliable product maintenance are important to establishing and maintaining a technological leadership position, the Company's business depends, in part, on its intellectual property rights in its proprietary technology and information. The Company relies upon a combination of trade secret, copyright, and trademark law, contractual arrangements and technical means to protect its intellectual property rights. The Company enters into confidentiality agreements with its employees, consultants, joint venture and alliance partners, customers and other third parties that are granted access to its proprietary information, and limits access to and distribution of its proprietary information. There can be no assurance, however, that the Company has protected or will be able to protect its proprietary technology and information adequately, that the unauthorized disclosure or use of the Company's proprietary information will be prevented, that others have not or will not develop similar technology or information independently, or, to the extent the Company owns 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 the Company's products are sold do not protect the Company's products and intellectual property rights to the same extent as the laws of the United States.

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