GSA Professional Engineering Services

Schedule No.
GS-23F-0113L

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Products or Services

Overview

ARES Corporation, a small business, provides professional engineering services to government organizations (federal, state, and local), to large and small engineering companies, infrastructure companies, and commercial customers. ARES was founded in July 1992 dedicated to the application of applied research and engineering sciences. ARES has a history of providing clients with the most innovative and cost-effective solutions, state-of-the-art engineering, utilizing software and technology that is at the forefront of engineering practice. Over the last sixteen years ARES has grown to a company of over 500 employees, providing services to over 450 clients, and twenty offices located throughout the United States

ARES has acquired and integrated multi-disciplined engineering service to meet client needs. This allows the company to meet its primary objective of providing the highest quality engineering and scientific services to help our clients solve their most complex and difficult engineering problems. The engineering disciplines include: mechanical, electrical, chemical, civil, instrumentation & controls, nuclear, aerospace, environmental, physics, quality control, and reliability. Our experience and expertise recognizes that most problems needing to be solved require several engineering disciplines.

The expertise of the ARES founders and key managers represents an average base of over 20 years of varied and comprehensive engineering experience in many technical areas. ARES personnel have extensive design, analytical, startup, planning, process, and managerial experience. Key personnel have held positions as senior managers, officers, or Chief Engineers at large engineering and consulting firms. They are also active in Standard Committees and Working Groups of professional engineering societies such as the ASCE, ASME, and ACI

Small Business Accolades

Teaming with our customers, ARES consistently provides extremely high value-added products and services on time and within budget. This is exemplified by ARES receiving the US Small Business Administration (SBA) National Small Business Subcontractor for the Year (2001). According to the SBA, this award recognizes integrity, reliability, initiative and capability in meeting significant government requirements and complying with exacting standards of government subcontracting . Further, ARES has received the SBA 2005 DOE National Nuclear Security Administration, SBA 2005, 2004 and 2000 Administrator's Award for Excellence, 2003 Government Solutions Center-Pioneer Award, SBA 2001 Region IX Small Business Subcontractor Award (only one award is given for each of the 10 SBA regions), and received the United Space Alliance (corporation responsible for maintaining and launching the Space Shuttle) 1999 Small Business Award (out of 6,500 companies).

Scope and Pricing Related to the ARES PES Contract

Scope

The GSA PES contract covers all the primary engineering disciplines: Chemical Engineering, Civil Engineering, Electrical Engineering, and Mechanical Engineering. The Special Item Numbers (SINs) available within the contract are:

SIN	Item Title
871-1:	Strategic Planning for Technology Programs/ Activities
871-2:	Concept Development and Requirements Analysis
871-3:	System Design, Engineering and Integration
871-4:	Test and Evaluation
871-5:	Integrated Logistics Support
871-6:	Acquisition and Life Cycle Management

Pricing Information

ContractNumber: GS-23F-0113L
Contract Period: February 12, 2001 to February 11, 2011
Contractor Name: ARES Corporation
Address: 1440 Chapin Avenue, Suite 390 Burlingame CA 94010-4011
Phone Number: 401-7100
Fax Number: (650) 401-7101
Web site: www.arescorporation.com
Contact for contract administration: Stanley Lynch, Vice President
Business size: Small Business, Veteran-Owned
Prices Shown Herein are Net (discount deducted)
Supplement Number: 8
Date: 05/09/08
The Awarded Special Item Numbers (SINs) available within the contract are:

SIN	Item Title
871-1:	Strategic Planning for Technology Programs/ Activities
871-2:	Concept Development and Requirements Analysis
871-3:	System Design, Engineering and Integration
871-4:	Test and Evaluation
871-5:	Integrated Logistics Support
871-6:	Acquisition and Life Cycle Management

ARES has a DCAA approved accounting system and is audited annually by DCAA. The awarded GSA pricing is listed in the table below. Labor Category Descriptions are detailed in the following section.

Labor Category Description-Engineering	Labor Category	GSA Rates Per Hour
Engineering/Assistant/Administrative	1-1	$25.88
Engineering/Assistant/Administrative	1-2	$36.22
Engineering/Assistant/Administrative	1-3	$43.69
Technician-Draft/Administrative Specialist	2-1	$48.32
Technician-Draft/Administrative Specialist	2-2	$54.72
Engineer/Scientist	3-3	$66.84
Engineer/Scientist	3-4	$81.42
Sr. Designer	4-1	$76.37
Sr. Designer	4-2	$87.73
Sr. Designer	4-3	$98.10
Sr. Engineer	5-1	$89.78
Sr. Engineer	5-2	$101.90
Sr. Engineer	5-3	$117.93
Consultant	6-1	$121.33
Consultant	6-2	$125.42
Consultant	6-3	$142.41
Sr. Consultant	7-1	$159.28
Sr. Consultant	7-2	$187.13
Sr. Consultant	7-3	$187.13
Executive Management/Sr Subject Matter Expert	8-1	$204.59
Executive Management/Sr Subject Matter Expert	8-2	$218.00
Executive Management/Sr Subject Matter Expert	8-3	$235.00

Labor Category Description-Risk Management	Labor Category	GSA Rates Per Hour
Risk Analyst I	1-1	$25.88
Risk Analyst I	1-2	$36.22
Risk Analyst I	1-3	$43.69
Risk Analyst II/Admin.Specialist	2-1	$48.32
Risk Analyst II/Admin.Specialist	2-2	$54.72
Risk Analyst III	3-3	$66.84
Risk Analyst III	3-4	$81.42
Risk Management Specialist I	4-1	$76.37
Risk Management Specialist I	4-2	$87.73
Risk Management Specialist I	4-3	$98.10
Risk Analyst IV	5-1	$89.78
Risk Analyst IV	5-2	$101.90
Risk Analyst IV	5-3	$117.93
Risk Management Specialist II	6-1	$121.33
Risk Management Specialist II	6-2	$125.42
Risk Management Specialist II	6-3	$142.41
Sr. Risk Management Specialist	7-1	$159.28
Sr. Risk Management Specialist	7-2	$187.13
Sr. Risk Management Specialist	7-3	$187.13
Executive Management/Sr Subject Matter Expert	8-1	$204.59
Executive Management/Sr Subject Matter Expert	8-2	$218.00
Executive Management/Sr Subject Matter Expert	8-3	$235.00

Maximum order: $750,000 Minimum order: $100.00 Geographic coverage (delivery area): Domestic and Overseas delivery Point(s) of production (city, county, and state or foreign country)

Albuquerque
Albuquerque Bernalillo County New Mexico
Arlington
Arlington Arlington County Virginia
Burlingame
Burlingame San Mateo County California
Cleveland
Cleveland Cuyahoga County Ohio
Denver
Littleton Arapahoe County Colorado
Dulles
Dulles Loudoun County Virginia
Houston, Armand Plaza/ Houston, Gemini
Houston Harris County Texas
Huntsville
Huntsville Madison County Alabama
Idaho Falls
Idaho Falls Bonneville County Idaho
Las Vegas
Las Vegas Clark County Nevada
Los Alamos
Los Alamos Los Alamos County New Mexico
Oakland
Oakland Alameda County California
Richland
Richland Benton County Washington
Santa Ana
Santa Ana Orange County California
Santa Fe
Santa Fe Santa Fe County New Mexico
Stratham

Stratham Rockingham County New Hampshire
Torrance
Torrance Los Angeles County California
Tullahoma
Tullahoma Coffee County Tennessee

Discount from list prices or statement of net price: To be negotiated at the task order level

Quantity discounts: 1% over $1,000,000

Prompt payment terms: Not Applicable

Government purchase cards accepted at or below the micro-purchase threshold: Yes

Government purchase cards accepted or not accepted above the micro-purchase threshold: No

Foreign items: Not Applicable

Time of delivery: To be negotiated at the task order level

Expedited delivery: Items available for expedited delivery are noted in this price list.

Overnight and 2-day delivery: Not Applicable

F.O.B. point(s): Not Applicable

Ordering address(es): ARES Corporation, 1440 Chapin Avenue, Suite 390, Burlingame, CA 94010-4011

Ordering procedures: For supplies and services, the ordering procedures, information on blanket purchase agreements (BPA s), and a sample BPA can be found at the GSA/FSS schedule homepage (fss. gsa.gov/schedules).

Payment address: ARES Corporation, 1440 Chapin Avenue, Suite 390, Burlingame, CA 94010-4011

Warranty provision: Not Applicable

Export packing charges: Not Applicable

Terms and conditions of Government purchase card acceptance (any thresholds above the micro-purchase level): Not Applicable

Terms and conditions of rental maintenance, and repair: Not Applicable

Terms and conditions of installation: Not Applicable

Terms and conditions of repair parts: Not Applicable

Terms and conditions for any other services: Not Applicable
List of service and distribution points: Not applicable

List of participating dealers: Not applicable

Preventative maintenance Not Applicable

Special attributes such as environmental attributes: Environmental benefits if applicable are incorporated into performance under the contract.

Section 508 compliance - Not applicable

Data Universal Number System (DUNS) number: 80-772-1980

Notification regarding registration in Central Contractor Registration (CCR) database: Registered October 27, 2004. Registration valid

to October 17, 2008.

Labor Category Descriptions
For each labor category offered, provide the following:
· Minimum/General Experience
· Functional Responsibility
· Minimum Education

PES Labor Category Descriptions Engineering – ARES Corporation

Grade	Level	Years of Experience	Position Description -- Engineering
8	3	20 Years with PhD	**Executive Management, Senior Subject Matter Expert:** An ARES Professional acknowledged at the industry level in a technical field or highly qualified specialized engineering/ technology/ scientific area and is an authority in the area's principles and practices. Applies experience, skills and/or expert knowledge to broad complex assignments. Recognized and respected as an "Industry Notable." Level 1: Provides project management over complex projects, Manages large number of offices & divisions, Signature authority for large contracts; Level 2: Develops solutions for extremely sophisticated, complex projects; Develops guidance at the Industry Level; Level 3: Authorizes multi-million dollar contracts, Develops and provides expert opinions at Industry level in area of expertise
	2	20 Years with Advanced Degree	
	1	15 Years with Degree HS Diploma & Industry certification	
7	3	15 Years with Advanced Degree 18 Years with Degree 25 Years Experience & HS Diploma	**Sr. Consultant:** An ARES professional with relevant engineering, research and consulting experience who is generally recognized as an expert in project execution and control in his or her area of technical expertise. Duties and responsibilities include development of engineering in his or her expertise area, client interface, conducting project meetings, project/task status reporting, task scheduling and cost control; preparation, review and approval of technical reports, and training. Recognized expert in project execution/ project controls methodology, including ability to independently analyze cost and schedule problems, identity root causes, and develop and implement corrective actions. Ability to lead an ARES Engineering group. Level 1: Performs sophisticated calculations or technical reports, manages groups of employees; Level 2: Prepares detailed cost control & job tracking for large, complex projects; checks & approves complex calculations and reports. Level 3: Authorizes contracts, Peer reviewer for projects, provides solutions to complex, unique, non-standard analysis; manage large groups of employees.
	2	12 Years with Advanced Degree 15 Years with Degree 22 Years Experience & HS Diploma	
	1	10 Years with Advanced Degree 12 Years with Degree 20 Years Experience & HS Diploma	
6	3	12 Years with Advanced Degree 14 Years with Degree 21 Years Experience & HS Diploma	**Consultant:** An ARES professional with relevant engineering, research, or consulting experience. A licensed Professional is desirable for those with an engineering degree. Duties and responsibilities include assistance with development of engineering documents in an area of expertise, client interface, conducting project meetings, project/task status reporting, task scheduling and control, preparation, review and approval of engineering research and technical reports, hiring recommendations, and training. Significant experience in developing and implementing cost and schedule solutions for troubled projects and/or baselining new programs/projects. Ability to assume a lead role for project-specific efforts. Level 1: Prepares engineering documentation, checking engineering calculations & reports prepared by others, perform more complex job tracking & reporting. Level 2: Provide direct interface with Clients, prepare draft proposals, develop task orders; Level 3: Manages other personnel, work with clients to execute projects correctly and lead task order changes, approve calculations and reports.
	2	8 Years with Advanced Degree 10 Years with Degree 17 Years Experience & HS Diploma	
	1	6 Years with Advanced Degree 8 Years with Degree or 15 Years Experience & HS Diploma	
5	3	6 Years with Advanced Degree 8 Years with Degree or 15 Years Experience & HS Diploma	**Sr. Engineer/ Sr. Scientist:** An ARES professional that has 3 years of supervisory experience in addition to the required professional experience. Duties and responsibilities include assistance with limited client interface, preparing for and attending project meetings and presentations, task status and scheduling/ tracking, preparation and review of engineering research and technical reports, and employee supervision. Cognizant of project controls functions and life-cycle management; may implement software changes and train others on products and project execution. Demonstrated capability to provide project controls support and analysis without day-to-day supervision. Experience with cost and schedule analysis. Level 1: Prepares documentation for client presentations, performs more difficult calculations and technical reports; Level 2: requires some supervision, can prepare job controls and life-cycle management reports & analysis; Level 3: Supervises other engineers/ scientists, reviews calculations and studies, train other personnel.
	2	4 Years with Advanced Degree 6 Years with Degree or 12 Years Experience & HS Diploma	
	1	2 Years with Advanced Degree 4 Years with Degree or 8 Years Experience & HS Diploma or PhD with No Experience	
4	3	8 Years with Degree or 15 Years Experience & HS Diploma	**Sr. Designer:** A designer or draftsperson experienced in the design of mechanical and electromechanically systems, machines or special facilities equipment. Duties and responsibilities include development of novel design solutions for unique and non-standard design challenges and design tasks to include Conceptual, Preliminary, Final, and Detail Design, fabrication liaison and design project estimation. Senior Designer may lead and organize the drafting activities for large projects. Level 1: Uses software to develop non-standard design challenges; Level 2: supervises other personnel, develops detailed concepts based on engineering drawings and calculations; Level 3: Manages other drafting personnel, develop unique designs and firm concept of constructability
	2	6 Years with Degree or 12 Years Experience & HS Diploma	
	1	3 Years with Degree or 6 Years Experience & HS Diploma	
3	2	0 Years with Advanced Degree 2 Years with Degree or 4 Years Experience & HS Diploma	**Engineer, Scientist:** An ARES professional with either engineering or other project-related experience. Duties and responsibilities include preparation of engineering and assistance with researching material for technical studies and reports. Able to build and status schedules and provide cost reports under the supervision of more-senior personnel. Collect information and support the development of cost estimates. Level 1: Performs rudimentary calculations or technical studies, assists in building cost & job tracking information; Level 2: Performs more complex calculation or technical studies, develops job & cost tracking documentation, provide research for complex analysis
	1	Entry Level & Degree	
2	2	2 Years with Degree or 4 Years Experience & HS Diploma	**Technician, Drafter:** An engineering or project controls assistant or support person that assists an engineer in data acquisition, both in the office and in the field, and/or assists in the production of calculations, designs, drawings, schedules, cost tracking, software programming and administration, and reports. Supervision is required. Level 1: Provides basic job tracking and cost reporting, prepares basic drawings; Level 2: Prepares sophisticated drawing, prepares more complex job tracking & analysis
	1	Entry Level HS Diploma or GRE	
2	2	2 Years with Degree or 4 Years Experience & HS Diploma	**Administrative Specialist:** May handle more complex office responsibilities such as conducting research, preparing statistical reports, training employees, and hiring and supervising other clerical staff. Level 1: Conduct research and preparing reports; Level 2: Hiring, training other administrative personnel, preparing more complex reports
	1	Entry Level HS Diploma or GRE	

1	3	Degree or 5 Years Experience & HS Diploma	**Engineering Assistant:** A student enrolled in an engineering curriculum supporting engineers including preparing routine engineering calculations, reviewing drawings, preparing take-offs using AutoCAD, MathCAD, Excel spreadsheets, and other routine programs. Level 1: Assist Engineers in finding information; Level 2: prepare basic calculation, knowledge in engineering software programs; Level 3: Use engineering software programs, prepare routine calculations
	2	2 Years & HS Diploma	
	1	Entry Level & HS Diploma	
1	3	Degree or 5 Years Experience	**Administrative**: A clerical person to assist an engineer or a technician in record keeping, time keeping, job control, cost control, and report and correspondence production. Level 1: Filing and Answer Phones; Level 2: Type basic letters, Take notes during meetings; Level 3: Provide administrative support for engineers/ scientists, administer job tracking
	2	2 Years Experience	
	1	Entry Level	

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For the purpose of classification requirements, a degreed ARES professional shall mean a professional with a Bachelor's or advanced degree in Engineering, Science (such as: Physics, Chemistry, Biology), Applied Mathematics, Construction Management, Economics, Business Administration, Accounting, or other equivalent. A "Degree" is a BS or BA and an "Advanced Degree" is an MS, MA, MBA, JD, Ph.D.

The following will be considered in place of the minimum education and experience:
· unique education, specialized experience, skills, knowledge, training or certification;
· military training and/or experience;
· quality of experience;
· national recognition; or
· exceptional grade point average. Related experience may be substituted for education as noted for each labor category.

Grade	Level	Years of Experience	Position Description – Risk Management
8	3	20 Years with PhD	**Executive Management, Senior Subject Matter Expert:** An ARES Professional acknowledged at the industry level in a technical field or highly qualified specialized risk engineering/ technology/ scientific area and is an authority in the area's principles and practices. Applies experience, skills and/or expert knowledge to broad complex assignments. Recognized and respected as an "Industry Notable." Level 1: Provides project management over complex projects, Manages large number of offices & divisions, Signature authority for large contracts; Level 2: Develops solutions for extremely sophisticated, complex projects, Develops guidance at the Industry Level; Level 3: Authorizes multi-million dollar contracts, Develops and provides expert opinions at Industry level in area of expertise multi-million dollar contracts, Develops and provides expert opinions at Industry level in area of expertise
	2	20 Years with Advanced Degree	
	1	15 Years with Degree HS Diploma & Industry Certification	
7	3	15 Years with Advanced Degree 18 Years with Degree 25 Years Experience & HS Diploma	**Sr. Risk Management Specialist:** An ARES professional with relevant, risk analysis, risk management, and consulting experience who is generally recognized as an expert in project execution and control in his or her area of technical expertise. Duties and responsibilities include risk documents in his or her expertise area, client interface, conducting project meetings, project/task status reporting, task scheduling and cost control; preparation, review and approval of technical reports, and training. Recognized expert in project execution/project controls methodology, including ability to independently analyze cost and schedule problems, identity root causes, and develop and implement corrective actions. Ability to lead an ARES Risk group. Level 1: Performs sophisticated calculations or technical reports, manages groups of employees; Level 2: Prepares detailed risk analysis, cost control & job tracking for large, complex projects; checks & approves complex calculations and reports. Level 3: Authorizes contracts, Peer reviewer for projects, provides solutions to complex, unique, non-standard analysis; manage large groups of employees.
	2	12 Years with Advanced Degree 15 Years with Degree 22 Years Experience & HS Diploma	
	1	10 Years with Advanced Degree 12 Years with Degree 20 Years Experience & HS Diploma	
6	3	12 Years with Advanced Degree 14 Years with Degree 21 Years Experience & HS Diploma	**Risk Management Specialist II:** An ARES professional with relevant risk analysis, risk management, or consulting experience. Duties and responsibilities include client interface, conducting project meetings, project/task status reporting, task scheduling and control, preparation, review and approval of risk studies and technical reports, hiring recommendations, and training. Significant experience in developing and implementing cost and schedule solutions for troubled projects and/or baselining new programs/projects. Ability to assume a lead role for project-specific efforts. Level 1: Prepares risk analysis documentation, checking calculations & reports prepared by others, perform more complex job tracking & reporting. Level 2: Provides direct interface with Clients, prepare draft proposals, develop task orders; Level 3: Manages other personnel, work with clients to execute projects correctly and lead task order changes, approve calculations and reports.
	2	8 Years with Advanced Degree 10 Years with Degree 17 Years Experience & HS Diploma	
	1	6 Years with Advanced Degree 8 Years with Degree or 15 Years Experience & HS Diploma	
5	3	6 Years with Advanced Degree 8 Years with Degree or 15 Years Experience & HS Diploma	**Risk Analyst IV:** An ARES professional that has 3 years of supervisory experience in addition to the required professional experience in risk analysis techniques. Duties and responsibilities include limited client interface, preparing for and attending project meetings and presentations, task status and scheduling/ tracking, preparation and review of risk related documents, research, risk studies and technical reports, and employee supervision. Cognizant of project controls functions and life-cycle management; may implement software changes and train others on products and project execution. Demonstrated capability to provide project controls support and analysis without day-to-day supervision. Experience with cost and schedule analysis. Level 1: Prepares documentation for client presentations, performs more difficult studies & calculations and technical reports; Level 2: requires some supervision, can prepare job controls and life-cycle management reports & risk analysis; Level 3: Supervises other risk management personnel, reviews calculations and studies, train other personnel
	2	4 Years with Advanced Degree 6 Years with Degree or 12 Years Experience	
	1	2 Years with Advanced Degree 4 Years with Degree 8 Years Experience & HS Diploma or PhD with No Experience	
	3	8 Years with Degree 15 Years Experience & HS Diploma	**Risk Management Specialist I:** Experienced in risk analysis and risk management techniques, and qualified to check other personnel's

4			work in the same area. May administer management programs and techniques to interface with personnel. Demonstrate the ability to build and status schedules as well as track and report costs to a high level of proficiency. Also able to support cost and schedule analysis efforts. Level 1: Uses software to develop non-standard analysis challenges; Level 2: supervises other personnel, develops detailed concepts based on relative risks and calculations; Level 3: Manages other personnel, develops unique analysis and job control assessments
	2	6 Years with Degree 12 Years Experience & HS Diploma	
	1	3 Years with Degree 6 Years Experience & HS Diploma	
3	2	0 Years with Advanced Degree 2 Years with Degree or 4 Years Experience & HS Diploma	**Risk Analyst III:** An ARES professional with either risk analysis/ risk management or other project-related experience. Duties and responsibilities include assistance with preparing presentation material, preparation of risk calculations, and assistance with researching material for technical studies and reports. Able to build and status schedules and provide cost reports under the supervision of more-senior personnel. Collect information and support the development of cost estimates. Level 1: Performs rudimentary calculations or technical studies, assists in building cost & job tracking information; Level 2: Performs more complex calculation or technical studies, develops job & cost tracking documentation, provide research for complex analysis
	1	Entry Level & Degree	
2	2	2 Years with Degree or 4 Years Experience & HS Diploma	**Risk Analyst II:** A risk analysis/ risk management project controls assistant or support person that assists an in data acquisition, both in the office and in the field, and/or assists in the production of calculations, designs, drawings, schedules, cost tracking, software programming and administration, and reports. Supervision is required. Level 1: Provides basic data acquisition, prepares basic analysis; Level 2: Prepares sophisticated calculations, prepares more complex job tracking & analysis and software programming
	1	Entry Level HS Diploma or GRE	
2	2	2 Years with Degree or 4 Years Experience & HS Diploma	**Administrative Specialist:** May handle more complex office responsibilities such as conducting research, preparing statistical reports, training employees, and hiring and supervising other clerical staff. Level 1: Conduct research and preparing reports; Level 2: Hiring, training other administrative personnel, preparing more complex reports
	1	Entry Level	
1	3	Degree or 5 Years Experience & HS Diploma	**Risk Analyst I**: A junior-level person to assist a risk engineer/ risk manager or a technician in record keeping, time keeping, job control, cost control, and report and correspondence production. Level 1: Assist risk engineers in finding information; Level 2: prepare basic calculation, knowledge in risk management software programs; Level 3: Use risk management software programs, prepare routine calculations
	2	2 Years & HS Diploma	
	1	Entry Level & HS Diploma	
1	3	Degree or 5 Years Experience	**Administrative**: A clerical person to assist an risk analyst or engineer or a technician in record keeping, time keeping, job control, cost control, and report and correspondence production. Level 1: Filing and Answer Phones; Level 2: Type basic letters, Take notes during meetings; Level 3: Provide administrative support for engineers/ scientists, administer job tracking
	2	2 Years Experience	
	1	Entry Level	

For the purpose of classification requirements, a degreed ARES professional shall mean a professional with a Bachelor's or advanced degree in Engineering, Science (such as: Physics, Chemistry, Biology), Applied Mathematics, Construction Management, Economics, Business Administration, Accounting, or other equivalent. A "Degree" is a BS or BA and an "Advanced Degree" is an MS, MA, MBA, JD, Ph.D.

The following will be considered in place of the minimum education and experience:
· unique education, specialized experience, skills, knowledge, training or certification;
· military training and/or experience;
· quality of experience;
· national recognition; or
· exceptional grade point average.

Related experience may be substituted for education as noted for each labor category.

PES Expertise and Experience

The table below provides a brief list of PES functions and representative Engineering Services and Products:

Strategic Planning and Concept Development;	***Test and Evaluation***:
Functions & Requirements, Acquisition strategy, Value engineering, Facilitation sessions, Cost-benefit analysis, Mission statements, Project/ management reviews, Programmatic risk evaluations, Weighing technology & financial & schedule risk analyses, Project validation	ASME qualification of tanks and piping, Project startup plans and procedures, Independent/ third party reviews, Testing special/ unique components, Quality assurance programs and procedures, Probabilistic Risk Assessments, Safety/ quality/ mission assurance
System Design, Engineering, & Integration;	***Logistics Support and Acquisitions/ Life Cycle***:
Process design, Piping and Instrument Drawings, Facility layout design, Seismic analysis, Waste tank failure analysis, Nuclear engineering and radiological analysis, Fluid system design, Specialty equipment design, Thermal-hydraulic analyses, Cost estimates, Specifications	Reliability, availability, maintainability; Risk management & assessments, Safety analyses, Graded approach to management, Software development, Statistical analysis, Project controls, Ergonomic evaluations, Failure modes and effects analyses, Cost estimates

Experience by SIN

The following describes some of ARES experience related to the various SIN designators:

871-1: Strategic Planning for Technology Programs/ Activities

An engineering study was performed to evaluate and recommend an optimal design approach for a cooling tower. An alternative evaluation for replacement of one cooling tower was first conducted to determine if the loads from this tower should be combined with the replacement for another cooling tower. This alternative analysis utilized a multi-attribute decision analysis approach considering Environmental and Safety Impacts, Design and Construction Costs, Outage Impacts, Operations and Maintenance Considerations, and Flexibility.

There were alternatives available to satisfy the needs ranging from multiple smaller towers to elimination of various loads and heat removal by other means. The mechanical engineering effort included preparing reliability analyses for existing and potential systems, evaluating the flexibility of the potential systems, establishing outage schedules to tie in the potential systems and arriving at an appropriate optimum solution.

A thermal analysis was conducted to determine the heat load for the cooling tower, taking in to account the need for flexibility in the operation of the facility. A hydraulic analysis was also performed to provide preliminary assessment of the size of the tower s primary supply pumps and piping. Multiple flow analysis programs were utilized (Fathom, pipe flow, etc) as well as multiple stress analysis calculations to assure the selected solution was technically able to meet the rigorous criteria.

Design concepts were then developed that considered design and construction lessons learned on another recent cooling tower project, existing facility infrastructure, disposition of tower waste water, water distribution, water treatment, instrumentation and controls, and site civil/structural considerations. Design concept development included modeling, field walkdowns, selected potholding, and sampling for things such as asbestos and lead. In addition to the design concepts developed, an outline specification was prepared and a separate evaluation and recommendation for a continuous water cleaning system was prepared.

The specification consisted of detailed requirements for construction/procurement consolidated into the CSI (Construction Specification Institute) format, and served as the governing technical basis for the remainder of the mechanical work on the project. The drawings were also prepared to support the modeling and analysis.

The optimal site for the cooling tower was determined based on existing infrastructure and needed space. Preliminary sizing of the support building and chemical storage areas was also conducted. An assessment of required seismic performance of the facility was conducted along with a review of the structural calculations for a similar cooling tower previously installed at the site.

The primary civil activities included preliminary calculation and drawing development for the design of the cooling tower and the various support facilities. These drawings and calculations (along with the specification) served the civil portion of this work also included performing site walkdowns to determine soil and structure characteristics, evaluating slope of lines, backfill availability, dust/erosion control (both during construction and after start up) and establishment of a preliminary layout for the roads, access ways, parking areas, etc. The availability to tie into an existing outfall without violating the operating permit was also evaluated.

871-2: Concept Development and Requirements Analysis

Prepared a Conceptual Design for a waste feed delivery system related to the upgrades to tank farms for retrieval and delivery of radioactive waste to the private vitrification contractor facility. The Double-Shell Tanks (DSTs), 1.16M gallon underground storage tanks, that store radioactive liquid waste required modifications and additions of a number of mechanical systems as determined by the project definition criteria.

Several of the systems to be upgraded required piping and pumping systems that required engineering analysis to assure proper sizing. These systems are described as follows: (1) The diluent and flush system was designed to condition the waste by injecting a sodium hydroxide diluent into the transfer pump in-take, or directly into the DST; (2) The DST mixer pump system was designed to slurry solids that are contained in the 1.16M gallon DSTs; (3) The transfer pump system is used to deliver the required quantities of waste feed to transfer piping systems for transport to the vitrification facility while maintaining the critical velocity to prevent the settling of solids; (4) The transfer piping system is a double contained pipe with continuous leak detection cable run in the annulus; (5) Remotely replaceable valve jumpers were designed for routing the waste to the proper location; and (6) The ventilation exhaust system on four of the DSTs was upgraded to comply with codes and standards and meet reliability requirements.

Preliminary layout drawings were developed for the mechanical systems with supporting preliminary scoping calculations. The diluent and flushing systems were sized which required the need for heat transfer calculations as the diluent temperature was required to be the same as the waste temperature. Net positive suction head available was determined for the mixing and transfer pumps. Mixer pump jet forces were calculated for all in-tank components to assure that they could withstand the impingement forces. In addition, shielding calculations were performed where necessary to assure exposure of operators to ionizing radiation was kept within allowable levels.

One-line electrical diagrams were developed to supply motive power to the mixer pumps, transfer pumps, HVAC, and control systems as required. Load calculations resulted in the need for additional 1,500 kVA and 1,000 kVA transformers in several locations. Preliminary voltage drop calculations were performed for the transfer and mixing pumps. Switchboards, variable frequency drives, transfer switches, cables and miscellaneous panels were specified as required in the outline specification.

A complete suite of electrical calculations and drawings was required. Calculations included wire sizing, switchboard sizing, short circuit and ground fault calculations, Drawings prepared included one lines (13.8kv & 480v), raceway layouts, connection panel-board schedules, and equipment details.

Valve jumper pits were designed to provide proper radiation shielding as well as provide structural support to jumper wall nozzles. The cover blocks for the pits were those very massive and seismic interactions were considered. Butler type buildings were designed for use as instrumentation and control enclosures where needed. Civil engineering requirements were specified in the outline specification.

A complete suite of structural calculations and drawings was required. Calculations included concrete loading, rebar tension, structural and compaction, testing, drawings, and compaction requirements. Drawings included site layout, compaction details, equipment anchor details, and miscellaneous structural details

An outline specification was prepared for all civil, electrical, mechanical and piping systems. The specification consisted of detailed requirements for construction/procurement consolidated into the CSI

(Construction Specification Institute Format), and served as the governing technical basis for the remainder of the mechanical work on the project.

ARES has used simulation techniques to predict how a system will behave by using a computer model to numerically evaluate and/or estimate desired characteristics of the system. The system model is used to gain some understanding of how the real-world system would behave under a variety of situations. This valuable aid enabled a large site to determine that radioactive waste storage capacity was sufficient over the next 20 years, thereby saving money on the installation of new storage tanks. Simulations are useful in dynamic systems where bottlenecks can occur in flow steams (physical flows, paperwork, etc.) at various points in time. Even if exact values for system parameters (flow rate, storage volumes, etc.) are not known, a system can be simulated using distributions representing best available data and produce an answer based on probabilities.

ARES performed value engineering services to a school district to review the cost bases for major improvements by systematically and objectively looking at the process, services, design, and construction requirements.

871-3: System Design, Engineering and Integration

A Radioactive Liquid Waste (RLW) Treatment Facility collects liquid waste from a number of other facilities. The radioactive liquid waste (RLW) system design included temporary 30,000 gallon underground storage tanks, piping systems for collecting and transporting the waste, and a facility with associated equipment for treatment of the waste prior to discharging the effluent to an evaporative basin.

Mechanical engineering was responsible for the design and specification of the storage tanks, piping systems for collecting and transporting the waste, layout of treatment equipment, and other mechanical equipment. Support systems under the cognizance of mechanical engineering include building HVAC systems.

Among The analyses performed by mechanical engineering were: (1) Evaporative rate calculations to determine the size of the basin and seasonal variability to determine the depth required; (2) Calculations to determine the number of spray nozzles needed to increase the average annual evaporation rate by a factor of 1.5; (3) A calculation to size the weir between the evaporative ponds; (4) Calculations for the treatment facility heat-load and air flow; (5) An RLW transfer pump hydraulic analysis: (5) A calculation for sizing the spray pump; (6) Calculations for heat loads and required air flow within the temporary storage tank vault and the RLW treatment facility; and (6) a calculation for determining the hydraulic requirements for the RLW transfer pump.

One-line electrical and electrical site plan diagrams were developed to supply motive power to the transfer pumps, HVAC, and control systems as required. Load calculations resulted in the need for a new 50 kVA transformer. Switchboards, transfer switches, a motor control center, cables and miscellaneous panels were specified as required in the construction specification.

The control system was designed for simple hands on operation of the system with review and oversight of process parameters from a central location. Instrumentation for monitoring process parameters such as flow, temperature, pressure and density were used to provide information to the operator to operate the system.

Civil and Structural engineering was responsible for the preparation of a number of drawings of the RLW project including: (1) A grading and drainage plan: (2) A utility plan; (3) A facility foundation plan; (4) A facility floor framing and low roof framing plan; (5) A facility high roof framing plan and building section; (6) sections and details; (7) Building elevations; (8) A floor plan and schedule, and; (9) Evaporation basin plan, sections, and details.

The construction specification contained the following information prepared by Civil and Structural Engineering: (1) Sitework; (2) Concrete; (3) Masonry; (4) Metals; (5) Wood and Plastic; (6) Thermal and Moisture Protection; (7) Doors and Windows, and (8) Finishes.

871-4: Test and Evaluation

ARES prepared and performed an Acceptance Test Procedures (ATP) for a cooling tower replacement project that provided cooling for laser accelerator components. Work performed during the ATP included preparing the test plan, implementing test plan, and issue resolution. Requirements in the test plan called for validating design adequacy, operations, and the verification of construction to the design. Physical tests of the cooling tower and ancillary subsystems performed. Systems tested included multiple hydraulic, thermal, HVAC, and chemical water treatment systems. Test engineering tasks included recording, analyzing, and validating data during testing. In the event of unsatisfactory results, resolutions were devised and implemented, and systems retested. Procedures and test sequences followed safety and quality assurance requirements of the customer.

Preparation of the test procedures included reviewing all vendor submittals for compliance with the specifications, preparing detailed point-by-point pre checks, and marking up all drawings and specifications for as building purposes. Close out of punch list items through follow on testing was also required.

871-5: Integrated Logistics Support

A failure modes and effects analysis of the MCO Handling Machine (MHM) was conducted for the mechanical systems using the guidelines of MIL STD-1629A. In addition, a quantitative analysis of the reliability of the system was prepared. Mechanical engineering identified mechanical nodes, determined their failure modes, their consequences, and mitigating features of the system design. Failure rate data was determined from generic and component specific reference sources as available.

Recommendations were made to improve the reliability of specific components as well as the overall system. Maintainability recommendations were also made to improve the overall availability of the system. Mechanical systems and components included turret drive gears, turret and trolley locking pins, seal ring jacking screws, fail safe MCOgrapple, crane hoist, shielding material, helium purge equipment and tubing, and gears and bearings associated with system drive motors. Electrical systems and components included the control system, system drive motors, control system sensors and relays, control programming logic, power control systems. The reactivity of the spent fuel was examined to determine time frames where systems could be returned to service with no adverse consequences. This aided in identifying spare parts that should be carried locally.

871-6: Acquisition and Life Cycle Management

ARES provided design authority support for a fuel retrieval subproject. This support included responsibility for all technical aspects of the design, procurement, installation, and testing of the system. Responsibilities included, but were not limited to the following activities:

Reviewed and approved all procurement and fabrication specifications for first of a kind equipment

Reviewed and approved vendor design drawings, calculations, fabrication plans, QA plans, welding procedures, factory acceptance test procedures, maintenance and operation manuals, and other submittals as appropriate

Witnessed factory acceptance testing of equipment

Reviewed, approved, and also prepared test procedures for installed equipment

Responsible for establishing and maintaining configuration control of installed systems and their supporting documentation

Prepared and/or reviewed and approved other project supporting documents such as the functions and requirements document, safety analysis report, criticality safety evaluation report, and reliability and maintainability analyses.

Resolved issues during final operational testing and turnover of system to operations

Experience by Primary Engineering Discipline

The following is a brief synopsis of ARES expertise as it relates to the four primary engineering disciplines:

Chemical Engineering

ARES verified the safety and long-term storage using a limited process validation/MCO monitoring program by conducting an evaluation of available statistical sampling methodologies and how they might be used in this application.

Utilizing previous work performed on the determination of the reactive fuel surface area, a probability density function (PDF) that represented the most likely value and uncertainty associated with this value was prepared. This PDF was deduced from available information relative to the current condition of the elements and using a Monte Carlo convolution technique. Statistical sampling methods were then used to infer the condition of remaining MCO based on the successful processing of a number of MCOs. Successful processing was determined by the monitoring of pressure and temperature conditions in the processed MCO.

Rheological data on the waste slurries was researched for design of mixer and transfer pump systems. Preliminary scoping calculations were performed on the diluent and flush system to size temporary holding tanks for required bulk chemicals and to determine the heat of dilution for mixing the concentrated bulk chemicals with water. An analysis of existing tank exhaust stack monitoring equipment versus current regulatory requirements was conducted

and recommendations were made for upgrading the current system to cost effectively meet requirements. Drawings prepared included P&ID, flow diagrams and corrosion protection details.

Mass and energy balances were performed early in the project. Environmental regulatory requirements were then reviewed to determine appropriate treatment requirements and technologies. Further negotiations were carried out later with the regulatory agencies that determined treatment was unlikely to be required. Provisions for later addition of a treatment skid (ion exchange) were left in the design as a contingency.

Civil Engineering

A failure modes and effects analysis of a complex handling machine was conducted for the structural systems using the guidelines of MILSTD-1629A. In addition, a quantitative analysis of the reliability of the system was prepared. Civil engineering identified structural nodes, determined their failure modes, their consequences, and mitigating features of the system design. Structural calculations and analyses were reviewed to determine design margins and assign appropriate failures rates. Failure rate data was determined from generic and component specific reference sources as available. Recommendations were made to improve the reliability of specific components as well as the overall system. Maintainability recommendations were also made to improve the overall availability of the system.

Developed and used fluid-structure finite element models to ensure that the engineering and code design requirements were adequate. Prepared design, engineering, and fabrication drawings and specifications for neutron optics for very high precision specialty equipment.

Prepared pressure vessel detailed design and engineering documents for blast-loaded structures.

Performed linear and non-linear analyses on numerous plant structures and components including seismic, soil-structure interaction, fluid-structure interaction, collapse load evaluation, and thermal hydraulic loads. The ARES integrated modeling approach, applied to complex structural evaluations handled numerous loads and effects in a single model, minimizing data-transfer errors and reducing modeling and analysis efforts.

Prepared design, engineering, and fabrication drawings, documents, specifications for lifting fixtures for high-risk lifts of radioactive material storage containers.

Electrical Engineering

The control system for the upgrades interfaced with a tank farm wide supervisory control and data acquisition system. Instrumentation for monitoring process parameters such as flow, temperature, pressure and density were used to for control inputs for mixer and transfer pumps. Programmable Logic Controllers (PLCs), process instruments, Human/Machine Interfaces, and other control system equipment were specified in the outline specification.

Emergency power supply upgrades for community college administrative facilities. New power feeds, transformers, panels, and code violation corrections.

I&C design of a production facility including HVAC control system, new PLC s, loop diagrams, test procedures, and maintenance documentation.

Diesel generator system design for a production facility, including startup sequencing, controls, transfer switching, and test and operating procedures.

Power supply to new cooling tower including new 4160v feeders, new transformers, control systems, and 480/120v distribution systems.

Mechanical Engineering

Prepared a mission analysis for a project providing long-distance underground transfer system for high level radioactive waste.

Performed independent management assessments and special studies, and an independent third-party code and requirement compliance verification on a $50 million cross-site transfer system project.

Prepared various life cycle management documents related to a complex laser upgrade project providing definition/ project management (i.e. Project Management Plan, Quality Assurance Program Plan, Risk Management Plan, etc.).

Designed special, one-of-a-kind vacuum enclosure thimble requiring precision hardware with a 0.020 in. tolerance over 12 feet, a transparent beam window in a radiation environment to meet a tight budget and schedule. This effort included defining the functions and requirements, using state of the art analytical tools, preparing the fabrication specifications, then providing the fabrication oversight integrating multiple hardware vendors and machine shops, performed the test and inspections, and oversaw the installation and checkout.

Prepared a Functions and Operational Requirements document (engineering plan) for the nuclear ventilation system serving neutron spallation targets and adjacent experimental facilities. Prepared and implemented test and evaluation plans assessing system design and function for deficiencies. Recommended near-term and long-term corrective actions. Assisted in the implementation of near-term actions.

Performed a technical risk assessment a weapon disassembly and conversion facility. This was a qualitative assess of a facility process design. The assessment included building unique and specialized risk ranking scales for various attributes

then evaluating each sub-process against the ranking scales.

Business Related References

The ARES website for more information regarding our wide-range of expertise and experience is www.arescorporation.com

DUNS number: 80-772-1980

Federal Taxpayer Identification Number: TIN 94-3161428

Ordering and Sales Locations

The following lists the ARES office locations that can provide PES expertise.

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Arlington
201 12th Street,
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Arlington, VA 22202
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Fax: 703-271-7766

Burlingame
Corporation
1440 Chapin Avenue
Suite390
Burlingame, CA 94010
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Fax: 650-401-7101

Cleveland
22800 Cedar Point Road
Cleveland, Ohio 44142
Phone: 440-962-3022
Fax: 440-962-3098

Denver
7901 Southpark Plaza Drive
Suite 206
Littleton, CO 80120
Phone: 303-225-0540
Fax: 303-225-0541

Dulles Office
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Sterling, VA 20166
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Fax: 703-707-2046

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16441 Space Center Blvd.
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Phone: 713-933-6800
Fax: 281-488-4970
Houston, Gemini

1331 Gemini
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ARES offers our clients a broad array of professional services that span a multitude of task and technologies. We couple skilled professionals, proven methods, and state-of-the-art technologies to form innovative and effective solutions to our clients' most complex issues. Our industry-renowned specialists have an average experience of 20 years of experience.

We invite you to visit the ARES website for more information regarding our wide-range of expertise and experience: www.arescorporation.com.