

Seaport-e

SeaPort Enhanced (SeaPort-e) Multiple Award Contract (MAC).

Contract Number: N00178-15-D-8383

Contract Period of Performance: April 2, 2015 – April 1, 2019

Engineering, Technical, and Programmatic Support Services in support of Naval Surface Warfare Center

Radiation Safety & Control Services, Inc.

DBA RSCS, Inc.

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Business Size:

Small Business



Company Overview

RSCS, Inc. is a small business in Stratham, NH that was established in 1989 and offers expertise in all aspects of radiation safety and radiation measurement applications. Our company specializes in operations and decommissioning services for government radiological facilities, as well as industrial, medical, and nuclear power plant facilities. Our base operations also include health physics consulting, emergency planning, and specialized radiological characterization and measurements.



Functional Areas Supported

- 3.1. Research and Development Support
- 3.2. Engineering, System Engineering and Process Engineering Support
- 3.3. Modeling, Simulation, Stimulation, and Analysis Support
- 3.6. Software Engineering, Development, Programming, and Network Support
- 3.15. Measurement Facilities, Range, and Instrumentation Support
- 3.18. Training Support
- 3.21. Functional and Administrative Support

Contract Awards

Contract:	Award Date	Contracting Officer
N00178-15-D-8383	4/2/2015	Garry W. Byram Seaport-e PCO NSWC Dahlgren Division 17632 Dahlgren Road, Suite 157 Dahlgren, VA 222448-5110 540-653-7087 SEAPORT_EPCO@navy.mil

Service Descriptions

Research & Development Support

RSCS has provided the NSWC with radiation detection products, systems and instrumentation development services since 2007.

RSCS developed a criticality radiation detection system in response to a request for proposal from the US military. This research and development for this system included monte-carlo simulation calculations, detector design and fabrication, software/firmware development and system testing at the White Sands Missile Range. The system was demonstrated to meet all technical requirements by the US military.

In addition, our team researched, designed, developed and manufactured radiation simulation instrumentation for the US Navy's Radiac instrumentation. As part of this research and development effort, RSCS applied for and received a US patent for one of the detection simulation platforms that includes the use of ultrasound technology. This technology was incorporated into the final production equipment delivered to the US Navy under contract.



We have been awarded several research contracts from the Electric Power Research Institute (EPRI) in the areas of decommissioning robotics technology, groundwater monitoring technology and soil vapor extraction methods. These projects resulted in the creation of published EPRI reports.

Engineering, System Engineering, and Process Engineering Support

At RSCS, our core business focus is in implementing safety engineering controls for sites with radiological and hazmat contaminants. In addition, we have extensive experience in characterizing radiologically contaminated and activated materials and components including items for re-use and waste. Our company routinely performs pre-decommissioning modeling and characterization studies, oversees demolition and decommissioning, segregates and packages waste, and characterizes the radiation profile of waste storage areas. A proven industry specialist, RSCS has contributed to guidance documents published by EPRI and ANI and have had our methodologies recognized by INPO as "best practices".

We have the expertise and models to characterize radiological waste media



that is typically hard to quantify, including: water, soil, oils, sludge and resins. We also have expertise in characterizing large components and media encountered during demolition and decommissioning projects (or power uprate construction sites) including concrete, piping, scaffolding, turbines, reactor vessels and other large mechanical components. We routinely perform surveys in challenging environments, characterizing landscapes, scrap and soil piles, spent fuel ponds, underground aquifers, discharge canals, stacks, ISFSIs and waste disposal buildings. We can vet the



characterization methodology employed at sites against NRC Branch Technical Position on Waste Averaging and Encapsulation to provide for cost-effective ways to consolidate and solidify higher level and transuranic waste to ensure disposal options for our clients.

Our staff employs cutting edge technologies to model and characterize waste, including in-situ gamma spectroscopy detectors, state-of-the-art environmental neutron detection systems, tritium monitors, and other routine and specialty survey instruments. Minimum detectable activities (MDAs) for these detection systems are carefully assessed and used to meet site specific waste disposal criteria, environmental requirements and Derived Concentration Guideline Levels for decommissioning. We develop systematic sampling survey work plans that integrate MARRSIM and MARSAME statistical sampling methods with state of the art in-situ processes to provide efficient processes to screen large volumes of waste and segregate radioactive materials. We provide extra value to our clients by effectively reducing the volumetric waste and providing potential revenue streams as free release materials can be recycled and reclaimed.

RSCS has also established a reputation for performing complex neutron characterizations in support of ANI Bulletin 11-02 "Neutron Monitoring" at operating reactors and ISFSIs. We have characterized the neutron dose profiles inside containments of operating nuclear power plants and at ISFISI sites for dozens of power plants throughout the US, employing Tissue Equivalent Proportional Counters, Bonner Spheres, He-3 detectors, and other methods to accurately characterize neutron radiation fields. We also review neutron activation



data, to make comparative calculations to observed dose rates to provide more accurate correction factors for personnel dosimetry and dose measurements.

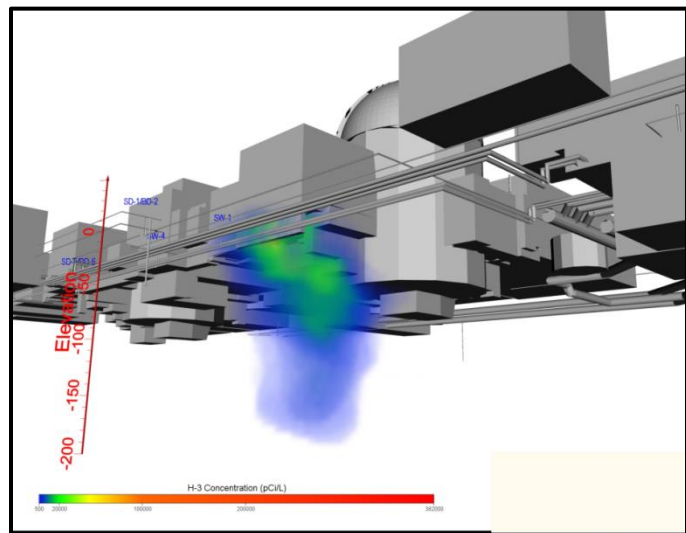
The combined benefit of our expertise in radiological waste characterization is our ability to handle all waste aspects of a decommissioning project. We can support our clients in developing strategies, logistics, schedule and cost for the segmentation, removal, transportation and disposal of various waste forms and media. We can determine the activation and surface contamination source term estimates, perform preliminary waste classification calculations, and provide options and strategies for compliance with NRC regulations and waste disposal criteria. We also offer dose rate modeling expertise, and can provide for all radiological controls and project management at decommissioning sites.

Simulation Modeling

RSCS staff includes Health Physics professionals and engineers who are well versed in developing modeling and simulation systems.

RSCS Health Physicists have extensive history in the development of rigorous methodology to support mathematical and physical models of real-world systems or phenomena. RSCS frequently relies on Monte-Carlo techniques, in which large tabular probability tables are repeatedly consulted in conjunction with random number sampling, in order to solve the Boltzmann equation for radiation transport. Similarly, RSCS has developed computer scripting frameworks (in C, VBA, Perl, and Python) and standalone computer programs to:

- Process large data sets emergent from the aforementioned Boltzmann solutions
- Provide combinatorial analysis of potential radiation shielding configurations
- Simulate multi-step real-world processes (irradiation, activation, decay)
- Standardize and control site-wide sampling for groundwater flow modeling



The results of these structured analyses provide the basis for a multitude of high level decisions such as:

- Architectural and contracting design during medical PET cyclotron vault construction
- Personnel shielding design at Nuclear Power Plants following site modifications (Extended Power Uprates, BioWall Shielding Alterations, etc.)
- Groundwater monitoring well positioning to conservatively bound potential effluent flow through site boundaries
- Detector manufacturing, specifically the geometry and design of detector active areas to increase detection efficiency

RSCS Engineering staff has extensive electronics and product development experience. Our engineering professionals design and manufacture radiation detection simulation instrumentation using well established design and built processes. We design required circuitry, lay out supporting electronics using schematic capture and layout tools, design mechanical housings and assemblies, and develop code for embedded micro-controllers using C programming languages. We have established manufacturing processes and procedures that are used to build production lots that include robust quality control measures.

We have developed a line of radiation detection training instruments that respond to simulated radiation sources. We have provided wirelessly controlled simulation gear to the US Navy since 2008 that are completely lifelike representations of the SAIC Multifunction Radiac (MFR) meter and supporting probes that are deployed fleet wide. The systems are based upon IEE 802.11 and 802.15.4 wireless protocols to allow trainers to control the output of the radiation levels displayed on the MFR in real time using a hand held controller. Included in the MFR contamination probe designs are our patented proximity detection modules that automatically detect the distance of the probe from a hard surface to adjust the contamination level detected for simulated beta or alpha radiation based on the distance of the probe from the surface (US Patent 8794973). In addition, we have developed simulation equipment that relies upon two way ranging (TWR) technology that automatically measures the distance of a meter to a simulated "live" radiation source, and adjusts the radiation level reported on the meter in real time as the meter's proximity to the source changes. This provides additional flexibility for training scenarios in which direct observation of a student by the trainer is impractical, or that include multiple students surveying an area simultaneously.

More than 1000 of these systems have been deployed throughout the NAVSEA fleet. Using our in-house calibration

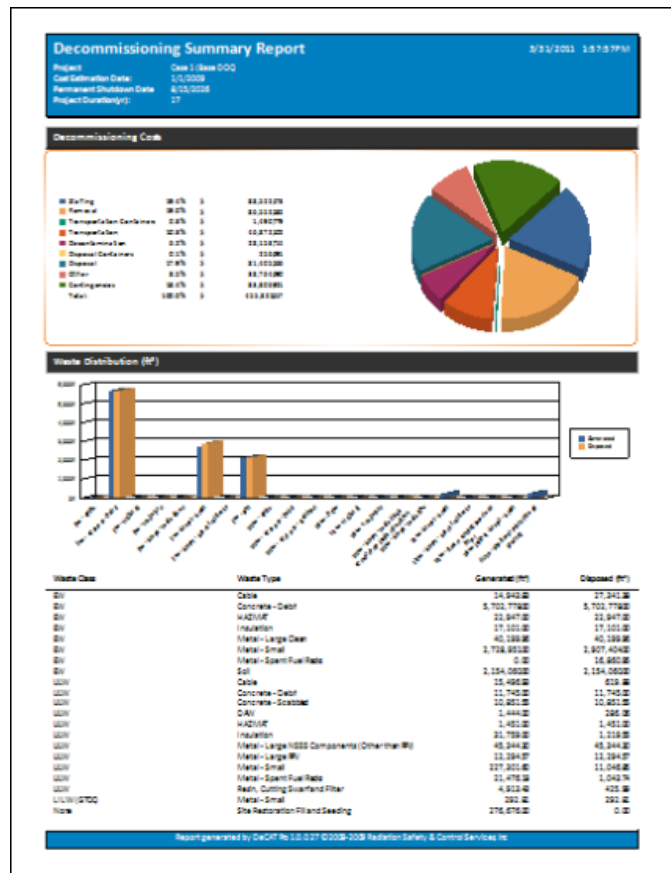


range, staff characterized the exact performance of all models simulated in order to program lifelike response time, response variability and over range performance parameters into the simulation systems. These systems provide the most lifelike simulation experience available to students learning to use radiation detection equipment, without exposing them to dangerous radioactive materials.

Software Engineering, Development, Programming, and Network Support

We have the capability to provide engineering and scientific technical support for software development and support across a range of functional areas. This includes developed software for complex technical applications under a QA program that provides controls and documentation of development through verification and validation. As examples, we developed and implemented the following software platforms:

DeCAT-Pro is a software application written against an SQL data base which provides a functional tool to perform fully documented decommissioning cost estimates, primarily designed for commercial nuclear power plants but applicable to the decommissioning of any complex facility or system. Inputs to DeCAT-Pro include detailed facility inventories of systems and components, manpower allocations, and work sequencing and the resulting outputs provide detailed cost project cost estimates presented in a variety of available formats. A powerful aspect of DeCAT-Pro is the ability to easily vary decommissioning scenario parameters to evaluate the cost implications of implementing those scenarios.



ADMS 2.0 is an SQL data base software application that provides an analytical data management system to process large volumes of sample data, both radiological and non-radiological, to meet regulatory requirements and support investigations of air, soil and groundwater contaminants. ADMS 2.0 provides a powerful tool to implement complex environmental monitoring programs, often in support of site remediation and site closure processes. ADMS 2.0 provides detailed reports and data tracking capabilities to support all facets of the process from sample collection, chain of custody, sample analysis and data reporting.

RSM (Radiation Safety Manager) is an SQL data base software application that assists users to manage all regulatory aspects of a radiation protection program including license limits,

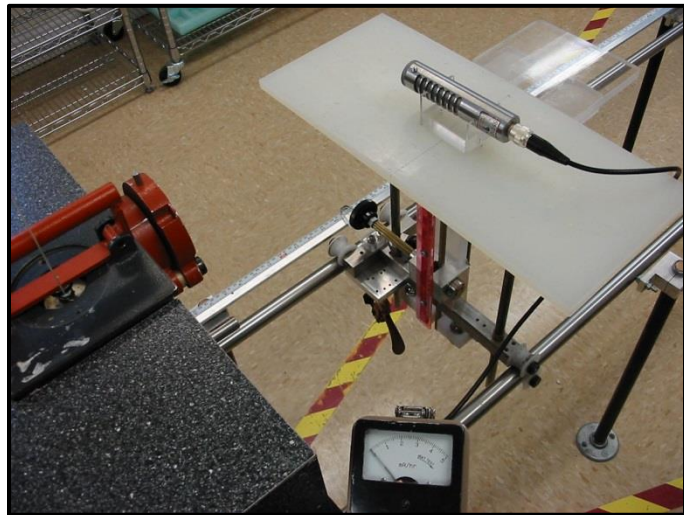
surveillance scheduling, personnel exposure records, training requirements and calibration requirements. This application includes many standard reports.

We have also developed embedded hardware and software solution for both simulated and real radiation detection systems. Examples of these include:

- Developed and maintained embedded software (“C”) for various AVR and ARM based modules.
- Designed hardware and software for custom PC peripherals including 802.15.4 to USB and 802.11 to 802.15.4.
- Modified COTS hardware and software (Matlab) products.

Measurement Facilities, Range, and Instrumentation Support

RSCS has operated an instrument calibration laboratory, licensed by the State of NH (#381R) to perform radiological calibrations and other services, since 1992. The instrument calibration laboratory is accredited to ISO/IEC 17025 as a tertiary lab by the Health Physics Society Laboratory Program (<http://www.hps.org/labs/>). The laboratory is owned and operated by health physicists certified by the American Board of Health Physics. Calibrations are performed in compliance with ANSI/NCSL Z540-1, ANSI323A and MIL STD 45662A. Our Management Systems Controls are consistent with ISO 9002 standards.



The instrument calibration laboratory is licensed to calibrate survey meters and dosimeters ranging from uR/hr to 10,000 R/hr using our Cs-137 range and box calibrators, and neutron survey meters and dosimeters ranging from 4 mrem/h to 20 mrem/h (ICRP 60) using our AmBe neutron calibrator. The laboratory also calibrates contamination monitoring equipment and provides detection efficiencies for most radioisotopes used in industrial, medical, and research applications.

Additionally, the instrument calibration laboratory offers instrument repair and support services for both portable and installed radiation monitoring equipment. Our highly trained service technicians have experience repairing all major manufacturers’ radiation instruments. RSCS is an authorized service center for MGPI, Rotem and RADOS, and routinely repairs instruments manufactured by Ludlum Instruments, Thermo, Canberra, Victoreen, NDS, SAIC, and other manufacturers.

The laboratory's well established and robust chain of custody and calibration process controls provide for more than 10,000 instrument calibrations annually. Customers' instruments are received, logged, and tracked throughout the calibration process using a proprietary database that captures all customer calibration requirements for their instrument, including preferred scale (exposure or contamination), biases, efficiencies, calibration intervals and other parameters. In addition, this database provides ready access to client specifics for shipping, billing and other administrative requests. At each step throughout the calibration process, technicians and Quality Control personnel review and verify that client expectations have been met. This has ensured a consistently high level of customer satisfaction and retention.

Technical Training Support

The RSCS training staff includes professionals experienced in a wide range of disciplines dealing with radiation and radiation protection. RSCS staff includes many professional and technical experts in various fields including Regulatory Compliance, Engineering, Operational Health Physics, Radiation Protection, Final Status Survey, Remediation, and Decommissioning.

RSCS training course development follows principles and practices developed by the Institute of Nuclear Power Operations (INPO). The INPO standards include a Systematic Approach to Training, where all training material is driven by the specific functions to be performed by the trainees. Terminal and Enabling Objectives are developed to ensure all training material is focused on specific knowledge and performance requirements.



RSCS provides several open-enrollment classes for our clients including the following:

- 40-hour Radiation Safety Officer Training Class
- 24-hour Advanced Radiation Safety Officer Training Class
- 40-hour Principles of Radiochemistry, Separation, and Analysis

The American Academy of Health Physics (AAHP) has granted the RSO and ARSO courses 16 Continuing Education (CE) credits each, and the Principles of Radiochemistry 32 CE credits. The American Society of Radiological Technologists (ARST) has approved the RSO course for 40 "Category A" CE credits, and the ARSO course for 24 "Category A" CE credits. The American Board of Industrial Hygiene (ABIH) will award 4.5 Industrial CM points for the 5 day RSO course, and 3 for the ARSO course.

RSCS also provides custom classes for specific clients. An example of specific classes conducted by RSCS is shown below:



- 40-hour Radiation Safety for Technicians, presented at the Patrick Air Force Base
- 40-hour Radiation Safety Training For First Responders, presented to the NY Department of Homeland Security
- 40-hour Radiological Instrumentation Principals and Calibrations, presented to the Constellation Energy Group
- 40-hour Internal and External Dosimetry, presented to the Constellation Energy Group
- 40-hour Calibration of Radiation Detection Instruments, provided to the Dresden Nuclear Power Plant
- 8-hour Radiation Safety for First Responders, presented to the Department of Homeland Security, Commercial Equipment Direct Assistance Program
- 24-hour Internal Dosimetry Training presented to American Nuclear Insurers
- 8-hour Final Status Survey and Dose Modeling class presented to the Yankee Rowe Nuclear Power Plant
- 8 hour Transportation of Radioactive Materials presented to multiple industry clients
- 24 hour Radiological Instrument Training presented to the Rhode Island Emergency Management Agency
- 24 hour Fundamental of Radiological Protection to the Rhode Island Emergency Management Agency

RSCS includes the use of training simulators to provide a hands-on training tool to reinforce concepts in radiation safety, survey methods, and contamination control without the use of actual radioactive material. RSCS has developed a customized line of radiation safety simulators for the Navy, based on the widely used Multi-Function Radiac (MFR) survey instrument.

Clerical and Administrative Support

RSCS has provided clerical and administrative support for several large projects, including a decommissioning project at the Connecticut Yankee Nuclear Power Plant and the management of the Independent Spent Fuel Storage Installations for 3Yankees (Connecticut Yankee, Maine Yankee, and Yankee Rowe). Our clerical and administrative staff is proficient in methods that are cost-effective and practice excellent attention to detail that is necessary for seamless operation of offices and support functions.

RSCS administrative support personnel are knowledgeable in the use of common computer applications such as Microsoft Word, Excel, and Powerpoint. Custom applications have been used at client facilities with appropriate training.

We are also proficient with using common document control policies, including preparation and administration of Standard Operating Procedures and other controlled documents.

Quality Assurance

RSCS has developed a comprehensive Quality Management System that ensures all quality-related activities are carried out with proper attention to detail.

Due to the diversity of products and services offered by Radiation Safety & Control Services, our Quality Management System is based on several standards as references. RSCS's production and service operations and administration are consistent with the

requirements set forth in ISO 9001:2000 and applicable requirements of 10CFR50 Appendix B, and our instrument calibration laboratory is accredited to ISO/IEC 17025.



Our Quality System documentation is comprised of the following three distinct levels that integrate the policies, procedures, and working documents:

- Level 1: The Quality Management System. The top-tier document that details the corporate quality policy and structure of the Company and provides guidance for all sub-tier documents.
- Level 2: Standard Operating and Administrative Procedures (SOPs and SAPs). The actual process for, and controls applied to, all activities concerned with the attainment of a quality assured product or service.
- Level 3: Other documents including Technical Support Documents, Drawings, Instructions, and Policy Manuals. These lower tier documents provide support to Level 2 documents, as well as provide guidance for non-critical company operations.

The Quality Management System is a dynamic document, undergoing periodic review and improvement, with the aim of not only ensuring our products and services continue to meet our customers' needs, but that our QMS continues to conform to referenced standards.

RSCS's Quality Policy is to provide products and services that fully satisfy customer and regulatory requirements. To this end, RSCS commits at all levels to ensuring that customer requirements are determined and met, with the aim of enhancing customer satisfaction.

RSCS retains a staff of competent, high integrity personnel with applicable theoretical and practical backgrounds for their assigned tasks. They are provided a comfortable work environment which includes the resources needed to realize quality products and services. RSCS has established Qualification Guides for several key positions to ensure that personnel are afforded the necessary knowledge and skills required to support the safe and effective activities for the business and customer needs.

When planning for product realization, RSCS determines the quality objectives and requirements for the product, through detailed contract review and by maintaining open customer communications. Thorough planning includes identifying required processes, documentation, inspection and testing.



The procurement process is documented and controlled to ensure that product non-conformances are kept below threshold levels. Suppliers are selected based on their similar commitments to quality, and are audited for continued conformance to their quality programs. Purchased product for end use in a quality assembly is identified and tracked to ensure traceability in the event of a discovered flaw or inconsistency. Final product storage and handling is controlled to protect the product integrity.

Processes affecting the quality of items and services are controlled by procedures, instructions, drawings, checklists, process control documents, computer software, and/or other appropriate methods. Special processes (ex. welding, heat treating, etc.) that could affect the quality of items or services are performed only by qualified personnel using qualified written procedures, and in accordance with applicable standards.

In the event that RSCS subcontracts products and/or services, subcontractors are selected with similar business philosophies and commitments to quality improvement and customer satisfaction.

Adequate procedures have been developed for processes affecting quality, and these processes are performed, as applicable, in conformance with published national or international standards. M&TE devices are properly controlled, calibrated, and adjusted at specified intervals, in accordance to manufacturer's specifications, to maintain its accuracy within the necessary limits.

Inspection and testing are performed on both purchased and manufactured items, as applicable, to verify compliance with acceptance criteria. Procedures provide for identifying nonconforming items and for identifying, documenting, and controlling unverified items to permit recall and replacement in the event of a nonconformance to specified requirements.

With regards to the calibration laboratory, measurement traceability is maintained for all standards used. This traceability provides for an unbroken chain of certifications to a National Institute of Standards and Technology (NIST) standard. Measurement & Test Equipment used for calibrations or repairs are calibrated at least annually, with calibrations also traceable to NIST.

Conditions adverse to the quality of items and services are identified, documented, analyzed, and corrected in accordance with established procedures. For significant conditions adverse to quality, these procedures provide for identification; assignment of responsibility for corrective action; documentation of the cause and corrective action taken; implementation, evaluation, and verification of corrective action to prevent recurrence; and reporting to the appropriate levels of management and/or customer as required.

Quality data is analyzed for trends in items, services, processes, and systems that may require action to eliminate causes of potential conditions adverse to quality. Customer complaints are likewise handled as conditions adverse to quality. RSCS has procedures that define how the complaint is investigated and, when applicable, the corrective actions implemented.

The need for corrective action is identified through sources such as non-conformances, failures, malfunctions, audits, inspections, surveillance, and customer complaints. Provisions



are contained in the Corrective Action Program to ensure that corrective actions are reviewed and not inadvertently nullified by subsequent actions.

Finally, to ensure the Quality Management System is functioning as designed, internal audits of activities affecting the quality of items and services are scheduled, planned, and conducted in accordance with established procedures and at regular intervals.