

**Written Testimony of Frank Sheppard**  
**Parsons Salt Waste Processing Facility Deputy Project Manager**  
**Before the**  
**Subcommittee on Financial and Contracting Oversight**  
**United States Senate Homeland Security and Governmental Affairs Committee**  
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**INTRODUCTION**

Chairman McCaskill, Senator Johnson, and distinguished members of the Subcommittee, thank you for having me here today to discuss the subject of contract management by the Department of Energy (DOE). My name is Frank Sheppard. I represent Parsons and the Salt Waste Processing Facility (SWPF) currently being constructed at the Savannah River Site (SRS) near Aiken, SC. I am the Deputy Project Manager for SWPF and have been with Parsons since September of 2011.



SWPF is a large, complex, first-of-a-kind radioactive waste treatment facility. The mission of SWPF is to safely and efficiently segregate radioactive salt waste from the two tank farms into products suitable for processing at the Defense Waste Processing Facility and the Saltstone Processing Facility, both of which are currently in operation. The SWPF facility is the last component needed in the Liquid Waste System at the site and is on the critical path for completion of DOE's cleanup at SRS.

When operational, this facility will help eliminate the risk to the public and the environment by removing approximately 200 million curies<sup>1</sup> from 47 tanks and processing 100 million gallons of

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<sup>1</sup> A unit of radioactivity, equal to the amount of a radioactive isotope that decays at the rate of  $3.7 \times 10^{10}$  disintegrations per second. (Named after Marie and Pierre Curie)

radioactive waste. To convey how significant the facility design and construction is, let me briefly describe the size and quantity of materials involved:

- 145,000 square feet facility,
- ~40,000 cubic yards of concrete,
- ~8,000 tons of structural rebar and steel,
- ~130 miles of wire and cable,
- ~27 miles of piping, and
- ~3,700 valves.

The construction of the facility is currently over 72% complete and we recently finished enclosing the facility with completion of the roof in February 2013, just one week past our contractual target schedule milestone date.

## **DESIGN AND CONSTRUCTION**

In December 2000, then SRS Management and Operating (M&O) contractor, Westinghouse, estimated SWPF to cost between \$3.4-3.6B. In 2001, the DOE issued a Critical Decision-0 (CD-0) cost range of \$673M to \$2.6B. The SWPF contract was awarded to Parsons in 2002. Although there have been cost increases on this first-of-a-kind project for a number of reasons (including significant material upgrades to seismic and quality assurance requirements), the current Parsons contract value is \$1.74B, which is slightly above the median cost of the 2001 original CD-0 cost estimate range.

The Parsons contract encompasses design, construction, testing and commissioning of the facility, one year of operations and then 6 months of support if the operations are transferred or competed to another contractor. Our focus throughout the project has been on safety, quality, schedule, and cost. Parsons safety performance on SWPF is good and is improving. The construction recordable injury rates are roughly half the industry average. More importantly, the severity of the injuries is decreasing as reflected in worker's compensation costs.

Parsons believes that investing to continually improve safety is a core value and a fundamental principle of our business. Parsons takes on this task without a defined return on investment. From a contractual standpoint, Parsons receives no monetary incentive from DOE to improve safety.

SWPF is unique for DOE or National Nuclear Security Administration (NNSA) first-of-a-kind construction projects in that we have no major outstanding technical or regulatory issues in the design or construction of the facility. We are very proud of the fact that we have been able to consistently undergo reviews by DOE and others with no significant technical or design issues being identified. Additionally, the contract requires a throughput of approximately 6 million gallons per year and we are confident our design will result in the facility processing between 8 and 9 million gallons per year. Parsons has tested a Next Generation Solvent (NGS) with very positive results. We have proposed implementation of NGS to DOE. If implemented, we believe the facility has the potential to process 12 million gallons per year or possibly even more. This implementation could dramatically reduce the operational life of the facility, save significant life cycle costs for the Department and accelerate major risk reduction at SRS.

Unfortunately, additional requirements and more stringent standards, imposed after the initial contract award, have led to cost increases and schedule delays associated with the SWPF project.

- Change in Throughput Capacity. At CD-1 (November 2003), the contract required a throughput of only 3 million gallons per year. Subsequent to that, in a CD-1 Addendum (August 2004), DOE directed the capacity be increased to 6 million gallons per year. In addition, requirements for utilities, the waste transfer line, the Alpha Finishing Facility and a laboratory were added to the work scope.
- Change in Natural Phenomena Hazard (NPH) Category. At CD-1, the contract required a Performance Category 2 (PC-2) facility design. In January 2006, contract modification M026 directed Parsons to stop work on the PC-2 final design and immediately begin preparation of an Enhanced Preliminary Design in which the Central Processing Area and structures are designed to meet more stringent PC-3 requirements.
- Change in Quality Standard. At CD-1, the contract required compliance with International Organization for Standardization (ISO) 9001. Subsequently, in June 2009, contract modification M065 required the inclusion of Nuclear Quality Assurance (NQA) NQA-1-2004 as the primary quality standard. The ASME NQA-1 standard is more rigorous, and therefore, more costly to implement than the less stringent ISO 9001 program. ASME NQA-1 is a quality management system that is applied across the entire Project, including subcontractors and suppliers, on a graded approach. The overhead associated with establishing and maintaining an ASME NQA-1 compliant nuclear Quality Assurance (QA) program carries significant cost implications ranging

from internal staffing and training to higher costs from suppliers with ASME NQA-1 programs. For example, the cost of a piece of equipment can be five to ten times higher than an identical piece of equipment manufactured to a less rigorous standard. The cost of the qualification documentation the supplier must provide with the “certificate of conformance” is substantial. This same QA program implementation cost burden is realized again on the construction site through extensive documentation, inspections, layers of oversight, and testing. The competition and retention of the required personnel with the proper education, experience, qualifications, and certifications is also key factor in the cost of implementing an ASME NQA-1 program. The standard requires use of experienced/certified inspection and nondestructive testing personnel, qualified welders, designers, engineers, and quality assurance personnel to name a few.

- Nuclear Supply Chain Atrophy. The diminished ability of most nuclear qualified vendors and suppliers to effectively meet NQA-1-2004 standards on a consistent basis has caused significant cost growth and schedule delays on SWPF as well as many other DOE/NNSA nuclear facility construction projects. The most significant delay on the SWPF project was related to the manufacturing and delivery of our 10 large American Society of Mechanical Engineers (ASME) processing vessels. After initially awarding one subcontract, it became apparent the vendor could not provide the quality necessary for the large vessels. That contract was terminated and a subsequent subcontract was competed. Although the subcontractor was incentivized to deliver the vessels in July 2011, the 10 large ASME vessels were finally delivered to SWPF in June and July 2012. This is not an isolated issue affecting just nuclear vessel manufacturers. The limited number of qualified vendors and suppliers available for this specialized project persists with respect to items, such as pipes, bulk material and valves.

Throughout the contractually directed changes and management of the supply chain, Parsons has consistently worked to mitigate any schedule and cost impacts while maintaining the high degree of safety and quality necessary on a DOE project. Given the extensive delay in delivery of the large vessels, Parsons effectively built the facility around the area of the vessels and then safely placed the vessels into the facility. This approach required significant innovation and changes in the construction approach to mitigate even more schedule delays and cost impacts.

We recently signed contract modification 116 with DOE on June 17<sup>th</sup> that includes all of the additional costs associated with the challenges and impacts I spoke to earlier. This modification establishes a cost

cap-type contract for the completion of construction by December 2016. Parsons has assumed significant liability with this type of contract and cost cap, but we are committed to deliver construction complete on or ahead of schedule and at or below the target cost.

#### **DOE PROCESS TO EVALUATE PERFORMANCE**

The Department of Energy uses an evaluation system called the Contractor Performance Assessment Reporting System (CPARS). The system is a standard system that allows for the evaluation of contractors based on five Performance Elements and 32 sub-elements. The five ratings are *Outstanding*, *Above Average*, *Satisfactory*, *Marginal*, and *Unsatisfactory*. Based on our records, DOE has completed only two CPARS evaluations on the SWPF contract.

The first CPARS evaluation was completed in September 2010, with construction 25% complete. Parsons received an overall rating of *Satisfactory*, with all of the sub-elements rated at either *Above Average* or *Satisfactory*.

The second CPARS evaluation was conducted in January 2013, with construction 60% complete. Parsons received an overall rating of *Marginal*, although we received 7 *Outstanding*, 7 *Above Average*, 7 *Satisfactory*, 7 *Marginal* and 2 *Unsatisfactory* sub-element ratings (2 were not applicable).

The DOE stated in the evaluation remarks that due to the impact of the cost overrun and schedule delays caused by late delivery of the ASME vessels, these elements were weighted more heavily in the overall rating. Parsons appealed and provided documented evidence (attached) to DOE in response to each of the objectionable ratings, specifically that we were maintaining overall schedule objectives, but the overall rating of *Marginal* was upheld by DOE in the final determination.

#### **USE OF DESIGN-BUILD MODEL AT SWPF**

It is our opinion that although there have been cost increases on this particular project, the design-build contract model has worked successfully to date for SWPF. Due to the nature of our design for SWPF, using extensive sloped piping systems and designed to operate at essentially ambient temperature and pressure, it is crucial to maintain the technical and engineering expertise from design throughout construction and into the commissioning and operations phases. This is critical to maintain the pedigree of technical documentation required by NQA-1 and required to successfully complete the DOE Operational Readiness Review.

## **CONCLUSION**

As I stated earlier, we have no outstanding technical or regulatory issues to resolve at SWPF. Parsons and DOE have agreed to a path forward to complete construction no later than December 2016. We are working with DOE to negotiate the path forward for the remainder of the Commissioning, One Year of Operations and 6-months support (if necessary). We will continue to propose new and innovative concepts to DOE that can potentially reduce overall life cycle costs. We are confident we will deliver a facility that will successfully complete start-up, will operate in a safe environment for the workers, will outperform the contractual capacity requirements, and will provide significant risk reduction for the Savannah River Site.

Thank you for the opportunity to speak with you today. I am happy to answer any questions you may have.