

Lessons Learned
Sodium Bearing Waste Treatment Project
Procurement of AL-6XN Piping

Lesson Learned Statement:

The Department must ensure that contractors adequately flow down quality assurance requirements to subcontractors and sub-tier subcontractors and vendors. Procurement of safety significant items requires concerted effort to ensure effective execution, including; a) precisely communicating requirements and expectations, b) conducting a vigorous evaluation of supplier technical and quality capabilities, and c) providing regular follow-up monitoring. Communication with a supplier must be predicated upon adequate requirements flow down in procurement documents as well as a circumspect confirmation of the suppliers' understanding of these requirements. Frequent, in-depth communication becomes paramount when working with suppliers that provide material and equipment to the Department and the private nuclear industry. Terminology differences and informal communications provide an easy avenue for misunderstanding between the supplier and the procuring organization.

Discussion of Activities:

The Idaho Operations Office, Idaho Cleanup Project, Sodium Bearing Waste Treatment Project (SBWT) is a part of the process to close the Idaho Nuclear Technology and Engineering Center (INTEC) Tank Farm. Three tanks in the INTEC Tank Farm are in use to provide interim storage for approximately 900,000 gallons of radioactive liquid waste. The bulk of this tank waste was generated from past waste management and decontamination activities at INTEC.

In 2007, the Sodium Bearing Waste Treatment Project via a contract between CH2MHill-Washington Group, LLC (CWI) and Premier Technology, Inc. (PTI) ordered AL-6XN (a special alloy-fully austenitic stainless steel) piping and components. These materials were procured for installation in the SBWT, and intended to serve a safety significant function in the SBWT facility. The piping was fabricated by rolling a flat plate of AL-6XN material and welding the seam.

On April 13, 2011, pipe fitters were conducting a piping change to one of the AL-6XN pipe spools to make a dimensional adjustment for fit-up. During this process, while conducting a dye penetrant test of a circumferential root weld, a small indication (lack of fusion) was found in the longitudinal piping weld. The indication is located approximately in the center of the pipe seam weld. During the investigation, the project determined that this pipe spool (and several other similar spools) was supplied as part of a contract between CWI to PTI. PTI subcontracted to Rolled Alloys to supply the pipe. Rolled Alloys (RA) subcontracted with Bristol Metals, LLC (Brismet) to fabricate the pipe from plate stock provided by RA. American Society for Testing Materials (ASTM) B675 and B775 are the standards that govern the fabrication and testing of this pipe. The ultrasonic examination (UT) testing of the pipe was performed but failed to identify this particular indication.

The flow down of QA requirements from PTI to RA required the use of NQA-1. However, RA was informed by PTI that this procurement was not ASME Section III and it was not communicated by PTI that this procurement was safety significant. RA executed the procurement as commercial grade and subsequently did not flow down the appropriate NQA-1 requirements to its suppliers.

Analysis:

The following causes were identified in the analysis:

- Failure to confirm that QA procurement requirements were clearly understood by suppliers and sub-suppliers.

Lesson learned- QA oversight at all levels (CWI and PTI) was deficient as each organization should have discovered that over 30 purchase orders for safety significant piping did not contain appropriate QA procurement requirements. Oversight during the execution of the purchase order should include both audit and shop inspection/surveillance for safety significant items.

- Through informal and inconcise communications (via email), RA asked PTI if the procurement was an American Society of Mechanical Engineers (ASME) Section III procurement. PTI responded that it was not an ASME Section III procurement. With this communication, RA proceeded as a commercial grade procurement. There was a failure to communicate that this NQA-1 procurement was for safety significant material. It is important that communications with suppliers include discussions regarding QA requirements and how they relate to ASME Section III requirements.

Lessons learned- Purchase orders, including change control, must be enforced as part of QA Program applications. E-mails between procurement organizations with respect to QA procurement requirements are not sufficient.

- Supplied pipe was UT tested in accordance with ASTM B675-02, Section 5 2, Class 2 piping. This documented fabrication testing did not detect the indication.

Lessons learned- SBWT contracted with third party to developed a UT technique that was used to confirm and size the indications.

General Recommendations:

1. Ensure your primes are flowing down sufficient quality requirements.
2. Ensure mechanism is in place to review the QA program and procurement requirements of your suppliers and their sub-tier contractors.
3. Ensure clear lines of communication are open and can be substantiated between primes and suppliers.