

EFCOG Best Practice #99

06/05/2011

Best Practice Title: Waste Incidental to Reprocessing (WIR) Citation Determination

Facility: Hanford, Office of River Protection, Savannah River Site, South Carolina, West Valley Demonstration Project

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Brief Description of Best Practice:

As a result of its nuclear materials production missions, Hanford, SRS, and West Valley generated large quantities of HLW. This waste resulted from spent nuclear fuel reprocessing, that is, dissolution of spent reactor fuel and nuclear targets and chemical processing to recover the valuable isotopes. During management and processing of HLW, a variety of tools, equipment, and materials come into contact with the waste in some fashion. Through this incidental contact, these items become contaminated to varying extent with radionuclides in the HLW. The waste incidental to reprocessing process in DOE Manual 435.1-1 was established to determine whether such equipment and material can be managed as LLW or TRU waste instead of HLW.

These three DOE Facilities developed a comprehensive risk based *Waste Incidental to Reprocessing (WIR) Citation Determination* procedure that establishes an efficient process for making additional determinations by the citation process that other materials and equipment contaminated by HLW from site spent nuclear fuel reprocessing are not HLW.

Why the best practice was used:

The SRS had been operating to a WIR Citation Determination procedure that was out dated and cumbersome to use. Updating the procedure with a sound technical basis and an efficient process saved time and money in making WIR citation determination. West Valley was without an efficient WIR Citation Determination as well.

What are the benefits of the best practice?

The benefits include: providing employees with a procedure that is easy to use; a solid technical and regulatory basis for making citation determinations; saves time and money; and approved by the DOE.

What problems/issues were associated with the best practice?

The WIR process is a highly sensitive area at SRS and within the DOE Complex. Since SRS had an existing WIR procedure, it was somewhat difficult to get management priority to revise the procedure. In addition, two major contractors had to approve the procedure that has different contract arrangements, responsibilities and priorities.

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How the success of the best practice was measured:

Success of the WIR process is measured by the fact that waste that had been in storage at SRS for years has been properly disposed. In addition, the procedure was used at the West Valley Demonstration Project to develop a similar procedure for their site.

Description of process experience using the best practice:

Consideration was given to waste incidental to reprocessing procedures used at the other DOE sites that manage HLW. Only one site (Hanford) had updated its procedure to reflect the lessons learned in implementation of the DOE Manual 435.1-1 requirements and the DOE Guide 435.1-1 guidance.

In 2008, the DOE Office of River Protection issued an integrating procedure for waste incidental

To reprocessing determinations (Hanford 2008). This procedure identified a broad category of materials under the citation process that routinely meet the criteria for disposal as non-HLW. It used the evaluation process to demonstrate the technical basis for use of the citation process for these materials.

In 2001, SRS prepared waste incidental to reprocessing evaluations for two types of equipment wetted by HLW in underground waste tanks. One evaluation involved three slurry pumps used in Tank 40 (WSRC 2001a). The other involved a telescoping transfer jet used in Tank 41 (WSRC 2001b).

Both evaluations were approved by DOE-SR (DOE 2001) were use as part of the basis for the SRS citation determination process procedure. In April, 2010, DOE approved the SRS Citation Determination and it was implemented to dispose of over 100 items of equipment, pipes, and pumps that were in legacy storage.

In May, 2011, West Valley approved their WIR Citation Procedure allowing for disposal of the balance of its equipment.

Criteria at SRS and other sites that manage HLW make it clear that most secondary waste streams were not produced in reprocessing of spent nuclear fuel, are not highly radioactive (i.e., will meet waste acceptance criteria for disposal as LLW of TRU waste), and do not require long-term geologic isolation and are therefore not HLW.

ISM Core Function 2: Analysis the Hazard