

Best Practice: NNSS-01

Facility: Nevada National Security Site (NNSS)

Best Practice Title: Dual Independent Verification of Waste Packages

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Brief Description of Best Practice:

The NNSS Prime Contractor – Mission Support & Test Services (MSTS) uses visual inspection to identify the presence of prohibited items in waste units during handling and packaging. During waste inspection for final packaging, the assessment team observed the MSTS Waste Generator Services (WGS) inspector identifying multiple prohibited items in a waste unit (i.e., bags or containers of LLW) and appropriately setting the waste unit aside for further disposition. The waste stream non-compliance was subsequently entered into the MSTS issues management system (caWeb), and MSTS conducted a thorough critique and identified actions to prevent recurrence.

WGS maintains a waste stream data package for all waste streams that captures the acceptable knowledge for waste characterization, provides documentation that aligns the waste stream with the approved profile, and supports traceability of the waste from origination to disposal. WGS maintains positive control of all waste packages from initial loading to final closure. When waste loading activities are not occurring, procedures require the waste package to be secured with a tamper-indicating device to prevent the introduction of prohibited items or other waste constituents inconsistent with the approved waste profile.

Why the Best Practice was used?

Visual inspection of all waste prior to or during the waste packaging process by trained and qualified Waste Inspectors is an established part of the MSTS waste packaging process. This independent inspection reduces the likelihood for a non-compliant waste package by implementing a diverse defensive control strategy, so that if one layer of defense turns out to be inadequate, another layer of defense will prevent a non-compliance.

Visual inspection by qualified Waste Inspectors of all waste prior to final packaging has resulted in the following improvements to the waste handling process:

- Reduces the potential for having to repackage waste that was packaged by on-site generators who are not familiar with waste acceptance criteria packaging requirements.
- Reduces the likelihood for a non-compliant waste package being offered for disposal by implementing a diverse defensive control strategy, so that if one layer of defense turns out to be inadequate (e.g., waste packaged in waste-units by the generator), another layer of defense will prevent a non-

compliance (e.g., all waste, including waste-units packaged by the field generator, is visually inspected by separate qualified personnel)

What are the benefits of the Best Practice?

Various engineering and administrative controls are implemented by MSTs throughout the radioactive waste management process to ensure that waste shipped to a disposal site meets all waste acceptance criteria and that no prohibited items are accidentally introduced into waste streams.

The generator is the point of origin of any waste stream. As waste progresses through the management process, it can be accumulated and stored at various locations. Along the way, the waste is characterized and verified to be appropriate for the approved waste stream. Prior to final packaging, all waste is inspected by a trained and qualified Waste Inspector to ensure there are no prohibited items and that the waste is compliant with disposal acceptance criteria and is consistent with the results of characterization. Once finally packaged, the waste is certified to have met all requirements and is shipped to its final disposal site.

What problems/issues were associated with the Best Practice?

Visual inspection of waste prior to packaging has always been part of the NNS prime contractor's waste characterization, handling, packaging, and certification process. The primary challenge is to ensure on-site waste generators understand that trained and qualified Waste Inspectors must be present to visually inspect all waste prior to final packaging. This has been accomplished through a combination of procedural compliance, reviews of work planning documents by waste management personnel, and controlling and issuing waste packages.

How the success of the Best Practice was measured:

While there have been instances where waste-units have had to be segregated and repackaged due to the presence of non-compliant waste (e.g., prohibited items identified during the visual inspection by Waste Inspectors), there has been no need to repackage final waste packages prior to final certification nor have there been non-compliant waste packages offered for disposal since visual inspection of all waste by a qualified Waste Inspector became a procedural requirement.

Description of process experience using the Best Practice:

Implementing the visual inspection and verification for all waste prior to final packaging, as part of the waste packaging planning process, reduces the likelihood of a non-compliant waste package. In addition, ensuring that the inspection and verification is performed by trained and qualified waste inspectors helps to ensure that if one layer of defense turns out to be inadequate, another layer of defense will prevent a non-compliance.