

**Waste Certification Review Program at the Savannah River  
Site (U)**

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**WASTE CERTIFICATION REVIEW PROGRAM  
AT THE SAVANNAH RIVER SITE (U)**

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## **ABSTRACT**

After approving the waste certification programs for 45 generators of low-level radioactive and mixed waste, Westinghouse Savannah River Company (WSRC) moved forward to implement a performance-based approach for assuring that approved waste generators maintain their waste certification programs. WSRC implemented the Waste Certification Review Program, which is comprised of two sitewide programs, waste generator self-assessments and Facility Evaluation Board reviews, integrated with the WSRC Solid Waste Management Department Waste Verification Program Evaluations. The waste generator self-assessments ensure compliance with waste certification requirements, and Facility Evaluation Board reviews provide independent oversight of generators' waste certification programs. Waste verification evaluations by the TSD facilities serve as the foundation of the program by confirming that waste contents and generator performance continue to meet waste acceptance criteria (WSRC 1994) prior to shipment to treatment, storage, and disposal facilities.

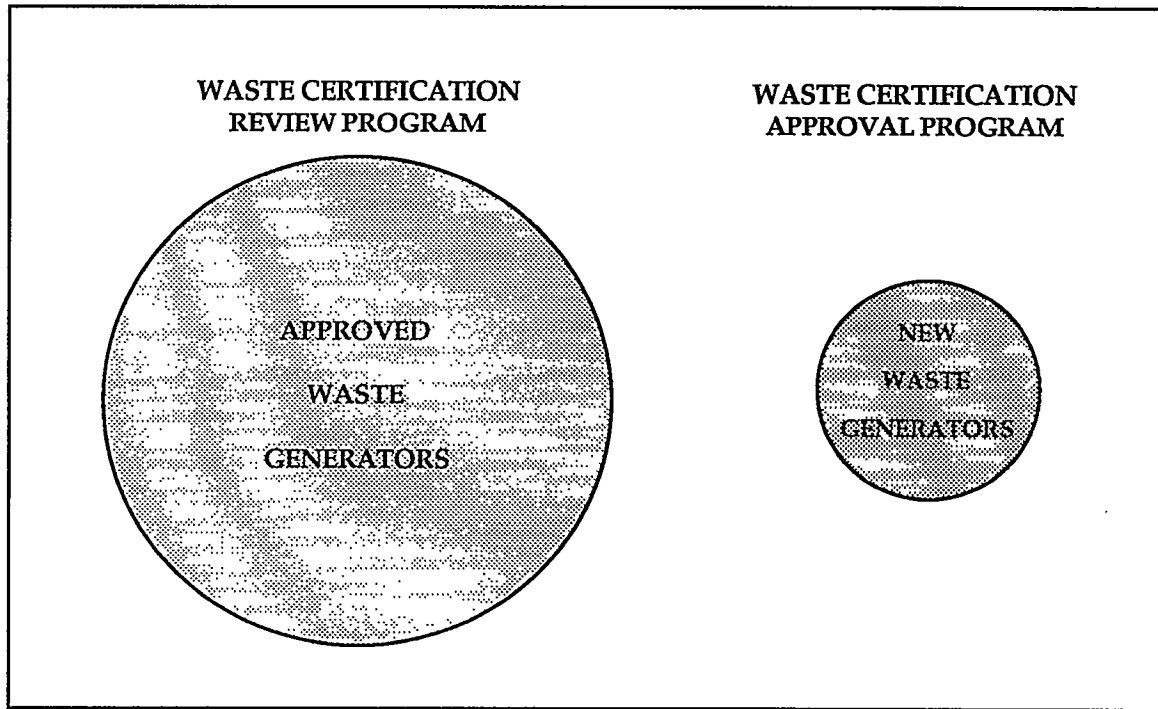
Construction of the Savannah River Site (SRS) was started by the U.S. Government in 1950. The site covers approximately 300 square miles located along the Savannah River near Aiken, South Carolina. It is operated by the U.S. Department of Energy (DOE). Operations are conducted by managing and operating contractors, including the Westinghouse Savannah River Company (WSRC). Historically, the primary purpose of the SRS was to produce special nuclear materials, primarily plutonium and tritium. In general, low-level radioactive and mixed waste is generated through activities in operations.

Presently, 47 SRS facilities generate low-level radioactive and mixed waste. The policies, guidelines, and requirements for managing these wastes are determined by DOE and are reflected in DOE Order 5820.2A (U.S. DOE 1988). In response to the DOE Order, WSRC implemented a waste certification assessment program to ensure generators comply with all applicable federal, state, and local regulations. By February 1995, WSRC had completed waste certification assessments to approve certification programs for the 45 facilities at SRS.

## **TRANSITION TO A WASTE CERTIFICATION REVIEW PROGRAM**

The WSRC Solid Waste Management Department (SWMD) is now implementing an integrated and cost effective Waste Certification Review Program for approved generators of low-level radioactive waste and low-level mixed waste. The program assures SWMD that approved waste generators maintain their approved waste certification programs.

New waste generator certification programs are approved through the established Waste Certification Approval Program. Approved waste generators are subject to the Waste Certification Review Program described in this paper (see Figure 1 - Waste Certification Programs).

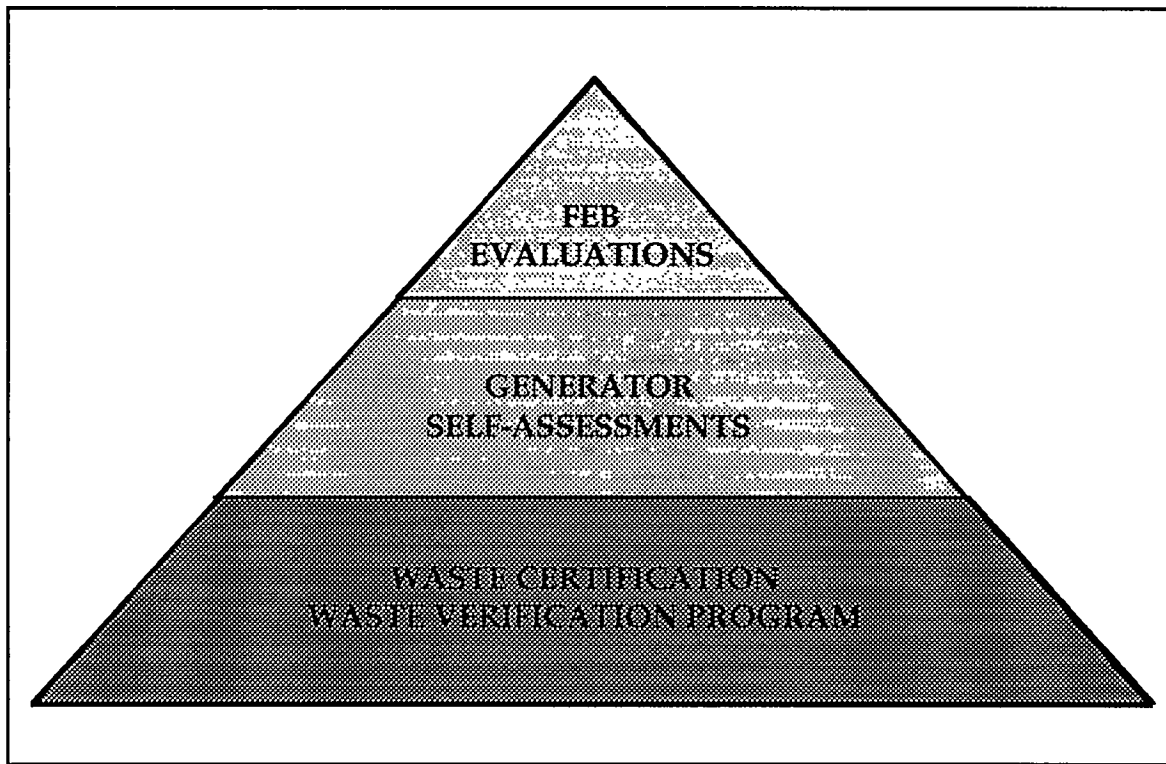


**Figure 1. Waste Certification Programs**

Both programs require review of waste generator certification programs for compliance with waste acceptance criteria of treatment, storage, and disposal (TSD) facilities. The Waste Certification Review Program integrates the use of existing SRS programs and waste verification to provide the assurance that approved generators maintain their required waste certification programs. The Waste Certification Review Program integrates the Facility Evaluation Board (FEB) reviews, waste generator self-assessments and SWMD waste verifications (see Figure 2). Waste verification evaluations coupled with FEB reviews and self-assessments provide a cost effective approach to waste certification for approved waste generators.

The foundation of the Waste Certification Review Program, the Waste Certification Waste Verification Program Evaluations, permits the SWMD to address the DOE Order 5820.2A requirement that waste generator certification programs undergo periodic audit by the operators of the facilities to which waste is sent. Waste verification evaluations are the method used to confirm that waste contents and waste generator performance meet the DOE Order requirements for waste certification.

Waste verification evaluations are utilized by TSD facilities. It involves the inspection and verification of waste generator shipments by various methods to ensure consistency between the shipping documentation and the received wastes. As performed at most DOE and commercial facilities, waste verification confirms that the waste from a particular generator meets both general and specific verification criteria.

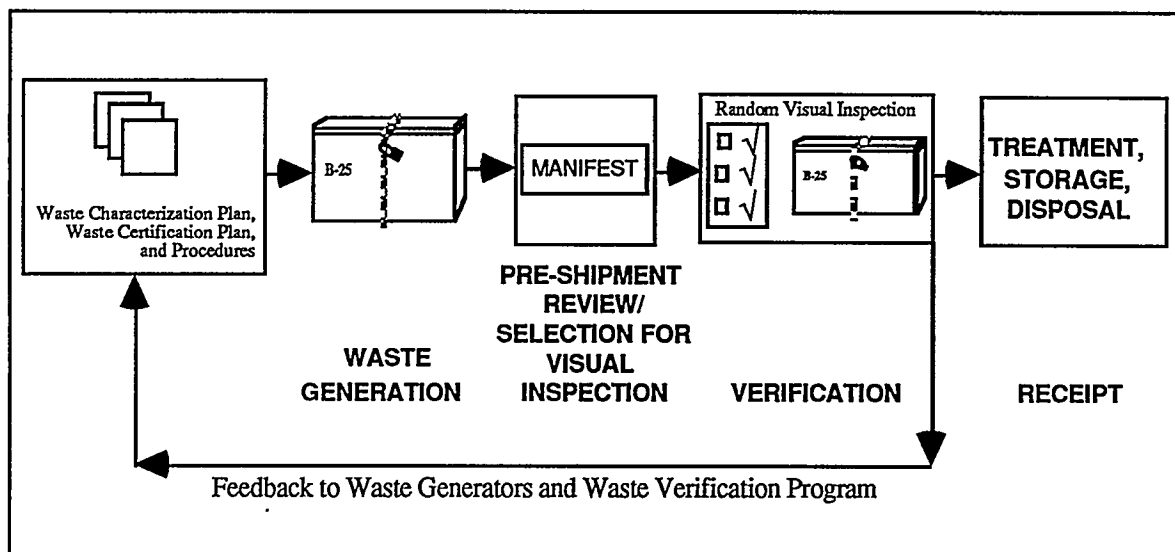


**Figure 2. Integrated Approach for Approved Waste Generators**

#### THE CHALLENGES

SWMD is implementing waste verification procedures that check and document information on waste generators' compliance with the waste acceptance criteria. SWMD procedure 724-EAV-9, "E-Area Vaults Waste Shipment Receipt Examination for Onsite Generators", details the process for performing receipt inspection of low-level waste. SWMD procedure 643-E-2079, "Examination of B-25's or B-12's at SWDF", provides instructions for the periodic visual inspection of containers of low-level waste.

These procedures require collecting and reporting inspection results for feedback on waste generator performance for use in the Waste Verification Program Evaluations. Figure 3, Waste Verification Flow Chart, shows the process flow. Procedures for visual inspection of low-level waste call for the selection of waste containers based upon generator shipments.



**Figure 3. Waste Verification Flow Chart**

SWMD establishes the frequency for verification of containers from waste generators. Verification frequency is adjusted according to the generators' performance. It is noteworthy that an initiative was implemented sitewide to improve the effectiveness of visual inspections of waste bags. Clear polyethylene plastic bags are being procured for improved visibility of waste bag contents. The new bags are being used by waste generators for improved inspection capability.

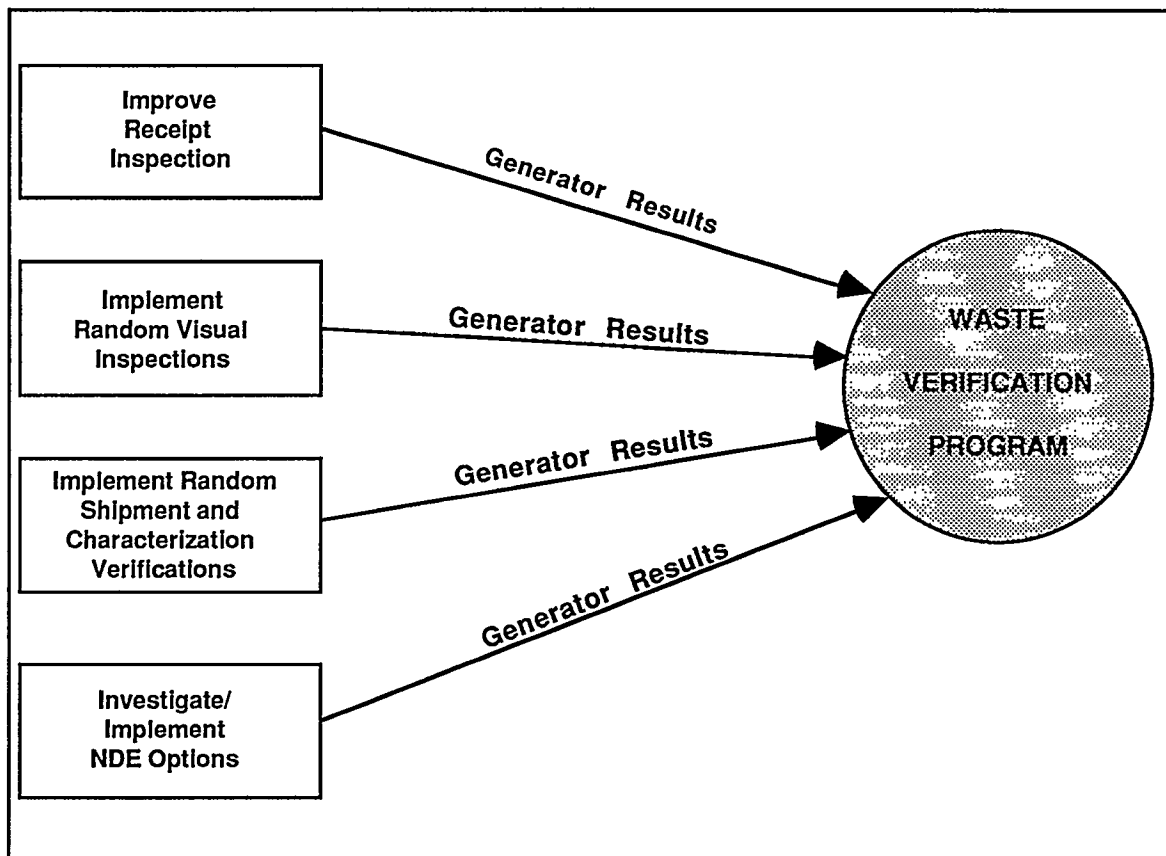
SWMD receipt inspection results are collected from all waste generators in the Waste Verification Program. Non-destructive examination (NDE), non-destructive assay (NDA), and chemical screening techniques similar to those employed at other DOE and commercial facilities will be phased into the program. Figure 4, Waste Verification Programs, shows the inspection and verification results included in the Waste Verification Program. Nonconformances found during verification are identified, tracked, and corrected with waste generators prior to formal acceptance of the waste.

NDE, NDA and chemical screening are important features of any waste verification program. These methods provide a non-intrusive means of screening and quantifying radiological and chemical constituents in a waste container. SWMD compared NDE, NDA and chemical screening methods at other DOE and commercial TSD facilities and found the emphasis and level of scrutiny vary between facilities, based on federal and state regulatory requirements. Some features of radioisotopic assaying, radiography, and chemical screening are:

- **Radioisotopic Assaying** - a method of identifying and quantifying radioisotopes in a given waste container. The purpose of the assay is to verify radioisotopic content to the extent and accuracy reported on the waste characterization forms for the waste stream being checked. Assaying may also be used to verify that low-level waste is below the transuranic threshold limit (100 nCi/g).
- **Radiography** - a means of inspecting a container for prohibited items listed in the waste acceptance criteria. There are two technologies available, real-time radiography and digital radiography. Real-time radiography allows for a virtual "real-time" image of waste container contents and typically includes videotaping capabilities. digital radiography takes an image of the container contents and digitizes the picture such that it can be viewed and stored electronically.

- **Chemical Screening** - analytical tests performed on representative samples of the waste. Typically, these analyses are performed to determine the presence of polychlorinated biphenyls, Resource Conservation Recovery Act or Toxic Substance Control Act controlled substances which, if found, would categorize the waste as mixed rather than low-level waste. The specific analysis performed is dependent on the waste acceptance criteria. A field-deployable lab cart is used to perform gross screenings and, if necessary, samples are then sent to an analytical laboratory for more in-depth analysis.

These NDE, NDA and chemical screening methods are available both onsite and offsite; however, the associated costs and logistics vary greatly. After evaluating the various options and considering the requirements of DOE Order 5820.2A, SWMD selected a combination of assay, radiography and limited chemical screening to verify that incoming waste is in compliance with the waste acceptance criteria. Radioisotopic assay and digital radiography were the most cost effective and logistically feasible approaches. A portable Hazcat Kit is being obtained for chemical screening, and personnel are to be trained accordingly for use on a limited basis and under special circumstances to analyze various homogeneous waste forms.



**Figure 4. Waste Verification Programs**

#### THE PATH FORWARD

Information on waste generators is collected and analyzed from receipt inspections, random visual inspections, shipment and characterization verifications, and NDE and NDA results when available. Other performance information, such as nonconformance reports, is considered as

appropriate. Overall, this information provides a performance-based method of reviewing generator waste certification programs and a method for adjustment of waste verification.

In general, SWMD evaluates approved waste generators on a periodic basis. Waste Certification Assessment and Minimization procedures are developed to describe the evaluation process, evaluation criteria, reporting, and department required actions, as appropriate. In the evaluation process, waste verification results are discussed with waste generators, documented for trending purposes, and serve as a tool for continuous improvement. Performance areas requiring improvement or correction are identified on a case-by-case basis and presented to waste generators for resolution.

SWMD uses performance evaluation criteria to review the approved status of generator waste certification programs. The performance criteria are improved with its application to assure consistent evaluations and provide a mechanism to identify waste generator strengths and areas needing improvement. The performance criteria are structured to provide a graded method for evaluation of performance. Each waste generator's performance is graded as satisfactory, needing improvement, weak, or a strength area based upon an evaluation of the information collected over a specified evaluation period. The evaluation criteria define the basis for the grading of waste generator's performance from waste verification results.

## CONCLUSION

After waste generator certification programs were initially approved and operating, SWMD needed a real-time waste verification program to confirm waste contents and evaluate generator performance. Waste verification is the foundation of Waste Certification Review Program, which includes waste generator self-assessments and independent oversight by the FEB. Random visual inspections of waste shipments, digital radiography, and radioisotopic assay are performed and results are evaluated with receipt inspection information to confirm generators are maintaining their waste certification programs. SWMD performs a review of approved waste generator status using information from the Waste Verification Program as part of the Waste Certification Review Program.

## REFERENCE LIST

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