WASTE GENERATOR SERVICES—FROM CHAOS AND CONFUSION TO ORDER AND COMPLIANCE

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ABSTRACT

Waste management practices at the Department of Energy's (DOE) Idaho National Engineering and Environmental Laboratory (INEEL) have dramatically improved during the past four years. Past methods had resulted in a backlog of inadequately characterized waste stored at numerous locations scattered throughout the INEEL site, lack of knowledge of treatment capabilities, and absence of waste accountability. Escalating Resource Conservation and Recovery Act (RCRA) violations and associated fines averaged $800,000 annually.

Since the implementation of Waste Generator Services (WGS), a centralized waste management organization, waste backlog has been significantly reduced and contracts have been established with numerous commercial facilities for treatment and disposal of hazardous waste, low-level waste, and mixed low-level waste. Waste traceability and accountability have improved, and the number of violations has significantly decreased. WGS has also made a significant contribution in fine reduction, which averaged approximately $134,000 between 1998 through 2000, with Fiscal Year 2001 fines negotiated at just $12,000[a]. Temporary Accumulation Areas (TAAs) used for storage of waste for periods of less than 90 days, have been consolidated from 42 to 12. This consolidation has resulted in fewer areas that are more easily managed, each tracked and controlled by an assigned custodian. Additionally, the backlog of stored waste has been drastically decreased and there has been only one TAA storage area violation during the past four years.

HISTORY OF INEEL WASTE MANAGEMENT PRACTICES

Waste management practices at the INEEL have evolved considerably since the inception of the INEEL in 1952. Prior to the determination that the RCRA applied to DOE sites, and hence to the INEEL, waste management practices focused primarily on radiological, rather than hazardous concerns. Typical practices consisted of containerization and burial of all types of waste. Soil with low concentrations of radiological constituents was often used as fill for construction activities. In addition, radiologically-contaminated water was allowed to evaporate in unlined ponds.

As the INEEL began to implement compliance with the newly required environmental regulations, many sampling programs were initiated, as well as waste removal and remediation operations. Generators of waste began to increase in number site-wide. While the environmental programs were getting underway and rapidly growing, facilities were conducting business-as-usual, generating many varied waste streams, which needed to be evaluated under RCRA.

The INEEL consists of six major facilities, as well as several major programs, all of which continually generate waste from numerous maintenance, construction, operational, and remediation activities. Numerous generators within each of these facilities and programs create waste. In the past, each generator was responsible for the characterization and disposition of their own waste, causing considerable chaos and confusion. Not only did each organization, facility or program have their own

[a] Fiscal Year 2002 data has not been compiled.

perception of waste characterization; each had disparate ideas concerning employee environmental training programs, types of waste containers to use and how to obtain them, and how and where to disposition the waste.

Many individual storage areas were established and maintained throughout the INEEL, with little consistency in their management. These areas, which included Treatment, Storage, and/or Disposal Facilities (TSDFs) and TAAs, received waste from all INEEL generators. Once wastes were received for storage, generators believed their responsibility for managing the wastes was fulfilled. Organizations managing the storage areas did not recognize the urgent drivers to remove the waste to compliant disposal.

Because knowledge of waste characterization requirements, facility Waste Acceptance Criteria (WAC), and Department of Transportation (DOT) shipping requirements rested in the hands of a relative few, a backlog of inadequately characterized waste began to stockpile. Containers stored in TAAs routinely exceeded the RCRA mandated ninety-day time limit for transfer to a TSDF. Waste streams were often sampled and then resampled when the analytical data were found to be inadequate to ensure facility WAC compliance. Waste was often repackaged to meet DOT requirements, resulting in unnecessary cost increases, and additional radiological exposure to waste handlers. An additional hindrance for wastes destined for offsite waste treatment and disposal was that individual generators were responsible to procure and negotiate contracts. Not only were many of these generators not properly trained and qualified, but also there was no sitewide-centralized approach to contract procurement.

WGS AT THE INEEL

Overview

The scope of the WGS program includes waste management activities from the pregeneration planning phase through acceptance at a TSD facility to ultimate waste disposition. The WGS organization was established at the INEEL in 1998 following an extensive review of other similar programs, including Hanford, Lawrence Livermore, and Rocky Flats national laboratories and commercial operations at Micron Corporation. WGS represents a practical solution for eliminating hazardous, low-level, industrial, and mixed waste compliance problems. WGS is a service organization with a mission to streamline the waste acceptance process and to provide waste generators with a turnkey waste management service through a single, accountable organization to manage and disposition waste in a timely and cost effective manner.

The prime objective of WGS is to ensure waste characterization-related activities are performed in compliance with all applicable laws and regulations governing those activities. Additional objectives include providing a streamlined approach to waste determination, proactively working with generators to minimize the generation of waste, achieving single-point accountability for management of each waste stream, improving cost-effectiveness, and reducing compliance related fines and penalties.

Organization, Responsibilities, and Tools

The WGS organization consists of a project manager and six facility representatives (FRs), who each lead a team of waste technical specialists (WTSs). There is one team for each major INEEL facility, tailored to the needs and magnitude of that facility. The programs, projects, and operations that take place within each facility are the responsibility of that FR.

By appointing the FR as a single point of contact within a facility, the FR is better able to make an accurate forecast of future waste generation. This forecast is instrumental in establishing waste storage

needs, identifying resources such as containers and personnel to perform sampling and waste determinations, and to project necessary funding commitments. The waste generation forecast is also advantageous in coordinating with TSDFs to ensure the submittal of information when the facility has the resources to review and approve waste profiles and accept shipments.

WGS performs the following waste management services for the INEEL:

- Provide a WGS FR, as a single point of contact to all generators within each of the six INEEL facilities. This individual coordinates the initial waste characterization determinations to identify waste type as radiological, hazardous, or mixed radiological and hazardous), based upon generator process knowledge.
- Consult with and advise waste generators on potential methods of waste minimization or avoidance.
- Complete Waste Determination and Disposition Forms (WDDFs) that document the life-cycle management of the waste, including process knowledge evaluation, additional waste determination, characterization requirements, verification, and selection of receiving facilities.
- Provide sampling services to support waste characterization.
- Provide and manage accumulation and storage facilities for wastes awaiting treatment or disposal.
- Coordinate waste transfer and receipt with INEEL onsite and offsite TSDFs (including negotiating contracts and pricing).
- Segregate, package, and ship waste to receiving facilities.
- Manage the Integrated Waste Tracking System (IWTS)—an electronic waste tracking database used at the INEEL.

A tool that has been especially helpful both to WGS and to waste generators is the above-mentioned WDDF. This form was designed by WGS and results from past trial and error methods of extracting pertinent information from generators. The first two pages of the form identify the generator and describe the process that generated, or will generate, the waste. Waste minimization techniques and activities are suggested and described, if applicable. Chemical and physical properties are described, probable waste types are identified, and initial hazard codes are assigned. The FR and the generator sign a certification statement, giving accountability to both parties. Completing the WDDF in the pregeneration or preproject start-up phase allows the FR and generator to determine if the waste legitimately requires generation, and if opportunities exist for volume reduction or hazard mitigation. The WDDF identifies the need for sampling and analysis and/or waste treatment, as well as container requirements. This form also establishes the basis for resource planning and initial identification of potential costs.

Upon completion of the first sections of the WDDF form by the FR and generator, the FR assigns a WTS to the project. The WTS is responsible for researching further process knowledge, if necessary, identifying specific sampling and analysis needs and coordinating the sampling event, evaluating analytical data against regulatory limits, performing a hazardous waste determination, inspecting stored waste, and shipping the waste to the identified TSDF. The last section of the WDDF documents the hazardous waste determination, identifies any underlying hazardous constituents, identifies the disposition pathway for the waste, and documents any waste verification performed, such as sampling or visual verification. Proper DOT containers for the waste are specified on the WDDF by the Packaging and Transportation organization, which are subject matter experts on DOT regulations for the INEEL. The

probable proper shipping name for the waste is also assigned. The completed WDDF is reviewed by as an independent reviewer, who signs the certification statement to finalize the WDDF.

All information from the WDDF is transcribed into the IWTS. This electronic database is another critical WGS tool that has been developed to track waste types, volumes, number, type and location of containers; waste shipments; and methods of treatment and disposal. The database includes such capabilities as bar code waste tracking, hand held technology for near real time scanning of field inventory, and generation of shipment manifests. The IWTS creates an entire Department of Transportation manifest, required by hazardous waste regulations, in less than one hour, compared to several hours when performed by hand. The capabilities of this database have favorably impressed both state and federal agencies during audits of waste management practices at the INEEL. The material and container profiles generated by the WTS in IWTS are considered the official quality record for the waste. The IWTS can be queried to generate numerous types of reports for a variety of customers. Common requests for information include quantities of waste generated and/or disposed by facility or project and/or by waste type. The system is used to track storage time limits and storage quantity limits at onsite TAAs and TSDFs and to prepare the annual and biennial Hazardous Waste Reports.

RESULTS OF WGS IMPLEMENTATION

One of the most notable and measurable successes for WGS has been the reduction of waste backlog from over 8,000 cubic meters to less than 500 cubic meters for low-level (radioactive only) waste and from 4,000 cubic meters to less than 1,900 cubic meters for mixed waste. This backlog reduction can be attributed to several key factors. The most significant change was that a single individual, the WGS Project Manager, was made responsible for the waste in storage at the site. Additionally, contracts have been established and are ongoing with several commercial waste treatment and disposal vendors; these are maintained by WGS and include price negotiation. Although a one-year timeframe for disposition of hazardous waste is mandated by RCRA and by DOE for radioactive waste, this timeframe has now been established for the disposition of newly generated mixed wastes as well, ensuring there will be no further backlog problems at the INEEL.

Prior to the inception of WGS, regulatory fines resulting from mismanaged waste averaged $800,000 annually. WGS has contributed significantly to reduction in regulatory violations and associated fines, which averaged approximately $134,000 between 1998 through 2000. The fines for Fiscal Year 2001 have been recently negotiated at $12,000. Relations with state (IDEQ) and federal (EPA, Region X) agencies have improved as significant effort has been exerted to bring about positive changes in regulatory knowledge and waste disposition accountability at the INEEL.

One of the main goals in establishing WGS was to ensure site-wide consistency in waste management practices. Procedures were developed which provide instructions for a standardized process to be used from point-of-generation to final waste disposition. Now all waste, regardless of its location at the site, is managed by the same methods. Checklists have been developed for storage locations, and consistent procedures are followed Site-wide.

AREAS OF ON-GOING PROGRAM ENHANCEMENT

WGS has strived to improve its performance each year. The use and continual upgrades to the IWTS system increase the effectiveness of WGS waste management processes, which result in time and cost savings. Using the wireless hand-held scanning device, inventory accuracy has been greatly improved and inventory time has been reduced by 30%. Additionally, the wireless scanners improved emergency response by allowing the user to determine the contents of a spilled container at the scene and immediately initiate emergency actions.

A yearly survey is sent to all WGS customers to identify any weaknesses in the program and gauge customer satisfaction. Results of the survey are tabulated by facility and distributed to the FRs. The FRs, in turn, disseminate the information to the WTSs and discuss actions for improvement.

The WGS quality assurance/quality control program is being improved to address such issues as waste verification. A Waste Certification Officer has recently been identified as the individual with final responsibility and authority to approve all offsite shipments. This change was implemented to help eliminate costly shipping mistakes.

Another area identified for enhancement of the program, and currently under implementation, was financial accountability for waste generated. Previously, the WGS program was funded to disposition many of the waste streams generated by the INEEL. However, beginning in Fiscal Year 2003, increased financial accountability for waste has been transferred back to the generator. This was a two-step process, whereby the generators were first assisted by WGS in forecasting waste management costs for the up-coming year. Then funding was transferred from WGS to the programs in accordance with the projections. Any money saved by waste reduction would be retained by the generators, thus encouraging waste minimization practices and improved waste generation planning.

Reduction of the waste backlog is yet another area of on-going improvement. Continued backlog reduction of MLLW is currently being ensured by the Eliminate MLLW Backlog project. This project was accelerated by fifty percent under the INEEL 2012 Project Management Plan, in order to completely disposition all of the mixed waste backlog (with an available path to disposition) by the end of FY-2004.

CONCLUSION

Prior to the implementation of the WGS program at the INEEL, waste management was poorly controlled. Past methods of waste management that resulted in large amounts of waste backlog caused by lack of knowledge and absence of waste accountability have been completely reformed over the last four years. Escalating violations and associated fines have been brought under control and all but eliminated. Since the inception of WGS, waste management practices at the INEEL have undergone extensive improvements, and continue to improve through constant enhancements to the program.

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