SIMPLIFIED WASTE MANAGEMENT AT ROCKY FLATS

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ABSTRACT

Rocky Mountain Remediation Services, L.L.C., the prime Waste Management Subcontractor at the Rocky Flats Environmental Technology Site, has recently implemented a new Waste Management process. This process is a result of a re-engineering effort and focuses on the waste generator as a customer/client for the Waste Management Organization. This process has been patterned after practices in the commercial industry. Emphasis is placed on planning for waste generation and systematic control of the waste throughout the waste management process to facilitate off-site disposal as the final goal.

The previous waste management process was identified as a candidate for re-engineering due to its many problems. The system was burdened with numerous, constantly evolving requirements for waste packaging without a centralized management system to ensure generation of compliant waste packages for storage and disposal. Also, the limited disposal options for radioactive waste had gradually shifted the focus to compliant waste storage rather than waste disposal. The process in aggregate resulted in a large percentage of waste packages that were non-compliant with both storage and disposal requirements.

The goals of the new waste management process are to focus on producing a better product - compliant packaged waste, and to create a process that is largely transparent to the work activities on site. Elements of the waste management process include pre-planning waste generation, providing a simplified set of requirements for waste generation and packaging activities, and waste package verification prior to acceptance into the waste management system. The vision for the new process was modeled after the household waste disposal process where the waste is picked up at the curb if it meets the disposal facility's acceptance criteria. Implementation of a customer service oriented organization with single points of contact and centralized resource control provide improved communication and enhanced response to customer requests.

Process improvements, as a result of implementing the new waste management process, have increased throughput capability thereby reducing management, storage, and rework costs. Placing the emphasis on generation of compliant, road-ready waste has resulted in timely and well managed off-site waste disposal. The number of non-compliant waste packages was reduced in the first six months of implementation from over 12% to approximately 6.5%. WIPP auditors have recognized this process as an "exemplary practice". Creation of a customer service oriented organization with centralized resource control has resulted in an environment conducive to continuous process improvement. The process is constantly examined for opportunities to streamline systems and eliminate

unnecessary requirements in order to assist the waste generators in creating compliant waste.

INTRODUCTION

The Rocky Flats Environmental Technology Site (RFETS) is a Department of Energy (DOE) nuclear weapons facility undergoing closure. The historical production of components for nuclear weapons has created a backlog of "legacy" waste, contaminated equipment and buildings, and contaminated environmental media. Closure of the site will require the removal of legacy wastes as well as the waste generated from Decontamination and Decommissioning (D&D) of buildings and equipment and from environmental restoration activities.

Past waste management practices were decentralized and subject to continual procedural changes in response to changes in waste disposal alternatives. This resulted in a waste management system at RFETS that was costly to operate, difficult to improve quality, and could not meet the waste management demands of accelerated site cleanup. In response to these issues and pressures, Rocky Mountain Remediation Services, L.L.C., (RMRS) embarked on an aggressive re-engineering of the waste management system at RFETS. The result is creation of the Customer Service Organization (CSO), a centralized group of waste management specialists and Subject Matter Experts (SMEs) whose charter is to plan and systematically control waste management activities at the site.

Background

RFETS is located about 15 miles northwest of downtown Denver. The industrial complex of more than 100 buildings is located in the center of about nine square miles of undeveloped land. Until December 1989, the Rocky Flats Plant made components for nuclear weapons using various radioactive and hazardous materials, including plutonium, uranium and beryllium. Nearly 40 years of nuclear weapons production left behind a legacy of wastes, contaminated facilities, soils and groundwater that must now be safely cleaned up before the Site can be closed down.

Today, RFETS is on a path toward closure. Key mission activities include: Special Nuclear Materials (SNM) stabilization, packaging and consolidation; deactivation and decommissioning of facilities; environmental restoration; property disposition; waste disposition and offsite shipment. The key priority of Site management and surrounding community leaders is the safe, accelerated closure of RFETS. Site management and the DOE, working in close coordination with RFETS stakeholders, have developed a draft plan to substantially complete the cleanup and closure of RFETS within a ten-year period. The urgency to perform the cleanup work and ship waste and materials off site sooner is based on the fact that aging systems and facilities deteriorate with the passage of time. RFETS was not designed to be a long-term storage facility for the waste and SNM that currently exist at the Site. The Site must meet both the challenge to accelerate closure to reduce long-term risks and the challenge of maintaining the highest level of safety during cleanup. Key factors impacting the ability to reach the goal of 10-year cleanup will be the

adequacy of funding levels and the availability of locations to ship the Site's waste and nuclear materials.

Site Operators and Overseers

Rocky Flats is owned by the DOE and operated by Kaiser-Hill Company under a performance-based Integrating Management Contract. Under the contracting structure, Kaiser-Hill integrates the work at the Site, which is performed by a team of contractors, each with expertise in a specific area of Site activities. Kaiser-Hill Team members include: Kaiser-Hill, integrator; Safe Sites of Colorado, nuclear operations; RMRS, waste management, environmental cleanup and decontamination and decommissioning; Closure Site Services, Site operations; and Wackenhut Services, security.

The DOE Rocky Flats field Office performs direct oversight of the contractor at Rocky Flats with additional oversight from DOE Headquarters. In addition, the Site is regulated by the Colorado Department of Public Health and Environment (CDPHE) and the U.S. Environmental Protection Agency (EPA). The Rocky Flats Cleanup Agreement, signed by DOE, EPA, and CDPHE on July 19, 1996, is the regulatory agreement that provides the framework for and governs cleanup activities at the Site. Nuclear activities at the Site also fall under the oversight of the Defense Nuclear Facilities Safety Board.

The Legacy

Special Nuclear Materials – RFETS houses approximately 14 U.S. tons of plutonium and seven U.S. tons of uranium. RFETS' plutonium in the form of pits is being shipped to the Pantex Site near Amarillo, Texas, and other RFETS plutonium metals and oxides are planned to be shipped to the Savannah River Site in South Carolina, beginning in 2002. Highly enriched uranium is destined for Oak Ridge, Tennessee.

Environmental Contamination – Approximately 170 areas of possible environmental contamination have been recorded, 89 of which will undergo further characterization and analysis. Fewer than 25 of these areas are expected to require extensive cleanup or management actions.

Radioactive Waste – RFETS has approximately 1,300 cubic meters (6,200 drum equivalents) of transuranic waste. During cleanup operations, an additional 9,000 to 13,000 cubic meters (43,000 to 62,000 drum equivalents) are expected to be generated. Transuranic (TRU) waste will be shipped to the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico, when it opens.

In addition to TRU waste, RFETS has approximately 23,000 cubic meters (110,000 drum equivalents) of low-level and low-level mixed wastes. These include soil, debris, protective clothing and tools that have become contaminated with plutonium, americium, and uranium. During cleanup, more than 110,000 cubic meters (524,000 drum equivalents) of additional low-level and low-level mixed wastes are expected to be

generated. Low-level waste is being shipped to the Nevada Test Site (NTS). Limited disposal options exist for low-level mixed waste.

HISTORICAL WASTE MANAGEMENT

The waste management process in existence at RFETS prior to November 1997 (old process) was developed during the weapons production era and had not sufficiently evolved to meet the demands of decommissioning the site. The old system had failed to make the shift from the production era when waste was an afterthought and there were mechanisms in place to deal with it. For instance,

- RFETS operated an incinerator prior to 1989, which was used to recover plutonium from highly contaminated wastes concurrent with perform waste size reduction.
- Transuranic wastes were shipped by rail to the Idaho National Engineering Laboratory until then-Governor Cecil Andrus banned all incoming shipments in 1988.
- The Nevada Test Site was accepting all low-level waste.
- The DOE contended that the environmental/hazardous waste regulations were not applicable to the weapons complex.

Today, waste generated at RFETS includes sanitary, hazardous, low level, low level mixed, transuranic, and transuranic mixed. Plutonium, americium, depleted uranium, and enriched uranium are the primary radioactive contaminants. Waste is primarily packaged in 55-gallon drums, wooden crates, and metal boxes. Waste packages are stored in approximately 80 separate facilities throughout the Site. Most storage areas are located within inactive production buildings not designed or engineered for long-term waste storage. The location of waste management support systems, e.g. assay units, radiography, and RCRA regulated storage units, requires frequent movement of waste packages prior to disposal. The lack of viable disposal options for large populations of radioactive wastes, e.g., limited disposal options for low level mixed, and non-existent disposal capacity pending the opening of the Waste Isolation Pilot Project (WIPP), for all transuranic wastes, results in storage of large volumes of wastes and adds additional complexities to an already inefficient system.

Efforts by previous managing contractors to standardize waste management practices resulted in the development of onerous and confusing requirements documents and procedures. As these procedures continually grew in size and complexity to capture the requirements imposed by the regulations, DOE Orders and the disposal facilities, they became proportionally less usable by the target audience – the waste generators. The move in 1995 to an Integrating Management Contract (IMC), coupled with the advent of facility decommissioning, further complicated the problem. The IMCs' charter to subcontract as much work as possible brought hundreds of poorly trained, transient waste generators to the Site. These factors, individually and/or in combination, resulted in the generation of large volumes of non-compliant, non-shippable packaged waste.

WASTE MANAGEMENT REENGINEERING

The historical waste management process created numerous possibilities for single-point failure and many instances of duplication of effort. Historical data indicates at least 13% of the waste generated at RFETS required rework prior to off-site shipment. Using waste generation forecasts and existing rework capabilities, it was concluded Site closure schedules would be extended approximately 20 years if the nonconformance rate and rework capabilities remained unchanged. This data alone prompted Site management to support reengineering of the waste management process.

RFETS embarked on an aggressive reengineering of waste management operations in January 1997. Reengineering focused on defining how the waste management process should function, and then making the necessary changes to achieve this end state. The limited disposal options, and the difficulties created by the lack of a consolidated waste management facility forced the team to focus on developing a system that would facilitate the generation of compliant packaged waste – the first time.

The re-engineering effort produced a fundamental change in the philosophy at RFETS. This philosophy centered on RFETS' new product, waste. This shift in production product required adjustments in the way RMRS and the other operating entities at RFETS conducted business. The fundamental change was creation of a centralized waste management support group within RMRS that serves the waste generators to achieve compliant packaged wastes at the point of generation. The waste generators are the "customers" and the waste management support group is the Customer Service Organization.

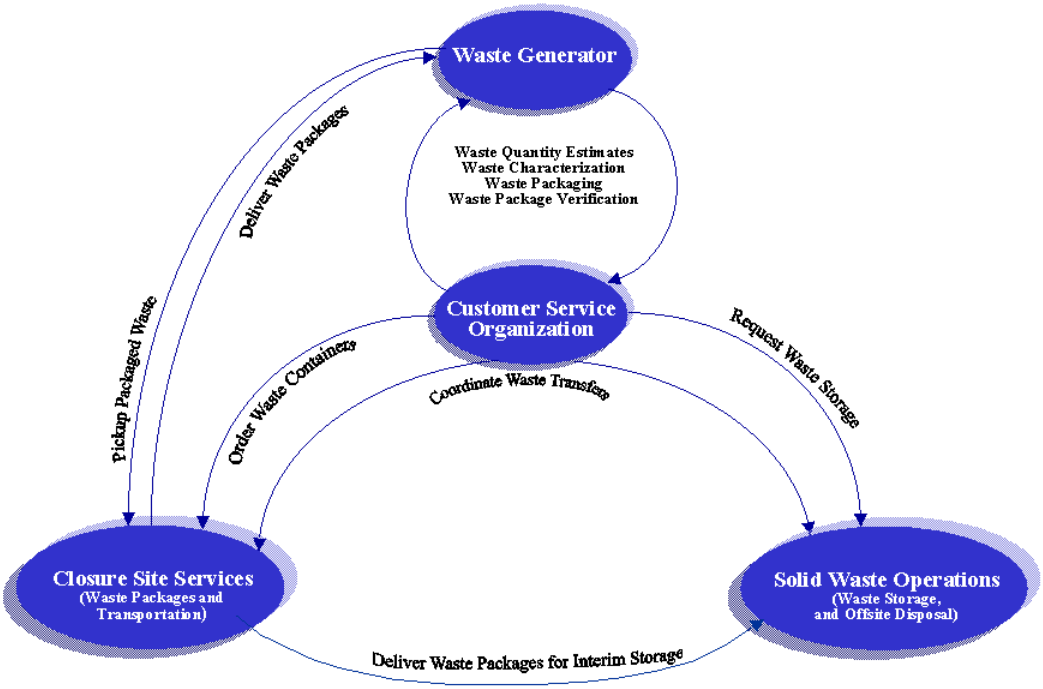
CUSTOMER SERVICE ORGANIZATION

The CSO provides waste generators with one-stop shopping for waste characterization, generation, and packaging guidance. This focus provides the waste generator with floor-level assistance to coordinate and facilitate the compliant generation and processing of newly generated waste. The on-the-floor presence of the CSO allows for enhanced communication and resolution of waste issues in a timely fashion.

Customer Service Representatives

To minimize time wasted contacting numerous sources for essential assistance, a Customer Service Representative (CSR) from the CSO is assigned to each major building/area/project providing single point contact for waste management services. The CSR function is to assure that newly generated waste complies with all applicable regulations and waste management practices. The single point of contact allows for coordination of activities between the waste generator, and other waste management entities at RFETS (Figure 1). These other entities include, for example, Closure Site Services who provides empty waste containers and transportation of packaged wastes, and RMRS Solid Waste Operations who provides waste tracking, storage and offsite treatment/disposal.

Figure 1
Customer Service Organization (CSO)
Provides Centralized Coordination of Waste Management Activities



The responsibilities of the CSR include establishing and maintaining a professional relationship with the waste generators to plan and coordinate waste management activities. Waste generators are tasked with scheduling their waste generating activities as much as possible with the assistance of the CSR. This process involves walking down the waste generating project, performing appropriate characterization to establish disposal options and waste forecasts by waste type and quantity, preparing a Waste Generating Instruction (WGI), ordering the appropriate types and numbers of waste containers for delivery to the generator, providing additional consultation for packaging the wastes as required, verifying that the waste was packaged in accordance with the WGI, coordinating the transfer of the packaged waste to Waste Operations, and planning for the disposal of the waste with Waste Operations.

To ensure success of the process, many of the CSR's are Subject Matter Experts (SME) in various disciplines that provide on-the-floor support and assistance to the waste generators and other CSRs alike. The SMEs provide high-level expertise in Department of Transportation regulations, RCRA hazardous waste regulations, radiological engineering, and other areas. The SMEs assist the other CSRs with project walk-downs, preparing WGIs, and providing customer support in the areas of waste packaging, characterization, waste sampling and analysis, transportation and/or verification of waste packages. Support is available on either a part-time or full-time basis depending on the

needs of the customer. These SMEs may be assigned as team members to various waste-generating projects as necessary to facilitate the generation and packaging of compliant, ready-to-ship waste.

Pre-Planned Authorized Waste Generation

As previously mentioned, the CSR works with the waste generator to plan and coordinate waste management activities, from waste generation and characterization to transfer of compliant packaged waste to interim storage awaiting off-site treatment/disposal. Information provided by the waste generator includes the amount of waste that will be generated (volume or number of packages), type of waste generated and the rate of waste generation. The forecasting information provides the required characterization data used when determining waste disposal options for the waste. This minimizes the incidence of generating waste that has no disposal options available, waste that does not meet disposal facility waste acceptance criteria (WAC) due to package configuration or inadequate characterization data, or generating waste that has limited on-site storage availability. It also allows for bulk ordering of waste containers that reduces unit costs, and for packaging and shipping wastes in higher volumes.

Another benefit of pre-planning waste generation and management is that waste minimization actions can be explored. Decontaminating equipment and structures destined for decommissioning and demolition can reduce the volume of TRU waste that is generated, a waste with no disposal options at this time. Decontamination can also reduce the volume of low level waste generation by creating non-radioactive debris and rubble suitable for disposal in a sanitary landfill. Decontamination thus “frees up” the limited disposal space in low level waste landfills for waste that is not readily decontaminated. Notwithstanding these factors, the increased cost to conduct decontamination must also be weighed against the cost reduction for waste disposal in defining the scope of decontamination activities.

Waste Generating Instruction

A central feature of the CSO’s charter is the creation of the Waste Generating Instructions (WGI). The magnitude of requirement documents and procedures used as guidance for waste generation mandated the implementation of this simple, easy to follow set of instructions. The WGI is used in lieu of confusing programmatic procedures and ill-defined requirements to clarify the conditions required for compliant waste generation and packaging. The WGI consists of a short consolidated set of instructions for the waste generator based on the requirements taken from waste handling procedures, and on-site storage and off-site waste disposal site waste acceptance criteria. The waste generator no longer is required to reference and maintain the overwhelming infrastructure of waste management procedures to be able to gather the information needed to generate compliant waste for their particular project or process. Simplifying the waste generator's task of interpreting waste management procedural requirements has lead to improved quality control and thus the generation of compliant waste. Waste management procedures continue to be maintained, but they are now internal to the CSO and other waste management organizations.

Components of the WGI describe the required information needed by the waste generator to properly characterize, package, label, and document waste (Figure 2). The WGI consists of two main parts. The first part describes the waste type, characteristics, quantity, and storage location, as well as specific waste packaging and labeling requirements; the second part provides a detailed procedure for inspection of the empty package, filling of the package with waste, and closure of the waste package. The second part is drawn from a file of detailed packaging instructions that have been prepared for various waste types (hazardous, low level, TRU) in various packages (drums, crates, IP-2 boxes, cargo containers, B-12 boxes, B-88 boxes, roll-offs, and others). The WGI represents a formal authorization for the generation of waste. The CSR and the waste generator review the contents of the WGI to ensure accuracy of information and agreement with conditions of waste generation. Both parties sign in their respective signature block, which formalizes the authorization for waste generation.

WASTE GENERATING INSTRUCTION

NO. GI9807290876A

WASTE DESCRIPTION: IDC: 0330 Waste Type: LLW

Non-line generated dry combustibles including Kimwipes, rags, paper, cloth, filter paper, packaging, gloves, tape, and other combustible materials. This waste is generated from D&D activities in Building 779.

CHARACTERIZATION BASIS:

Characterization of this waste stream is based on process knowledge for the following WSRIC waste stream:

PROCESS NAME	PROCESS NUMBER	IDC OR WFC	CHEMICAL CONSTITUENT CODE RCRA-REGULATED	CHEMICAL CONSTITUENT CODE NONRCRA-REGULATED	COMP. CODE	RCRA HAZARDOUS WASTE	LAND DISPOSAL RESTRICTED	EPA CODE/S
LOW-LEVEL & TRU, NONHAZARDOUS WASTE STREAMS	D&D-3-2	0330	00	00	NA	No	No	

The above table should be used to complete the informational requirements in Subsection 1C of the Traveler.

These WSRIC waste streams may be generated only as LLW and will all be packaged as LLW under this WGI. All the listed WSRIC waste streams may be packaged together if the generator believes they will all have the same assay type (LLW).

Other wastes exhibiting the same characterization as the above WSRIC waste streams and for which acceptable documentation is provided to the Customer Service Representative may also be packaged under this WGI.

PACKAGE TYPE/QUANTITY:

Based on waste generation forecasts for this project, ten (10) DOT Strong Tight Packaging, 55-gal white, open-top drums are approved for this WGI. The number of approved packages may only be changed electronically by the CSR. WEMS is the official record of approved packages and may vary from that number listed above.

NOTE: The approved package quantity limitation is used for planning purpose only. Actual waste generated under this WGI will be tracked by WEMS. Contact the CSR to modify the number of approved containers which will eliminate to "approved packages exceeded" warning message.

WEMS barcode numbers will be recorded on the WEMS container worksheet and submitted to the Customer Service Representative or WEMS Coordinator at the time of generation.

Order empty containers from the RFETS warehouse (signature of the Customer Service Representative is required on the Material and Supply card).

PACKAGE LABEL REQUIREMENTS:

Radioactive On-Site Transfer Label
Refer to Addendum for waste item labeling requirements.

PACKAGE LINER REQUIREMENTS:

Two (2) 55-gal polyethylene drum liner bags (5 mil).

PACKAGING REQUIREMENTS:

1. Refer to Addendum for specific packaging requirements.

PACKAGE DOCUMENTATION REQUIREMENTS:

1. Waste/Residue Traveler
2. Radioactive Material Transfer Tag
3. Nuclear Material Drum and Transfer Report (NMDTR)

ACCUMULATION/STORAGE/DISPOSAL

1. Filled packages will be assayed in Building 371 or Building 569.
2. Filled packages will be examined by RTR in Building 664 or Building 569.

WGI ATTACHMENTS:

1. Waste Generating Instruction Addendum for Radioactive Waste Drums

AUTHORIZATION:

The signature below authorizes the generation and packaging of the above described waste.

NAME G. Engelmann SIGNATURE_____ DATE_____

GENERATOR ACKNOWLEDGEMENT:

This instruction has been issued to:

The signature below acknowledges the contents of this instruction and documents the agreement to adhere to these requirements.

SIGNATURE_____ EMPLOYEE #_____ DATE_____

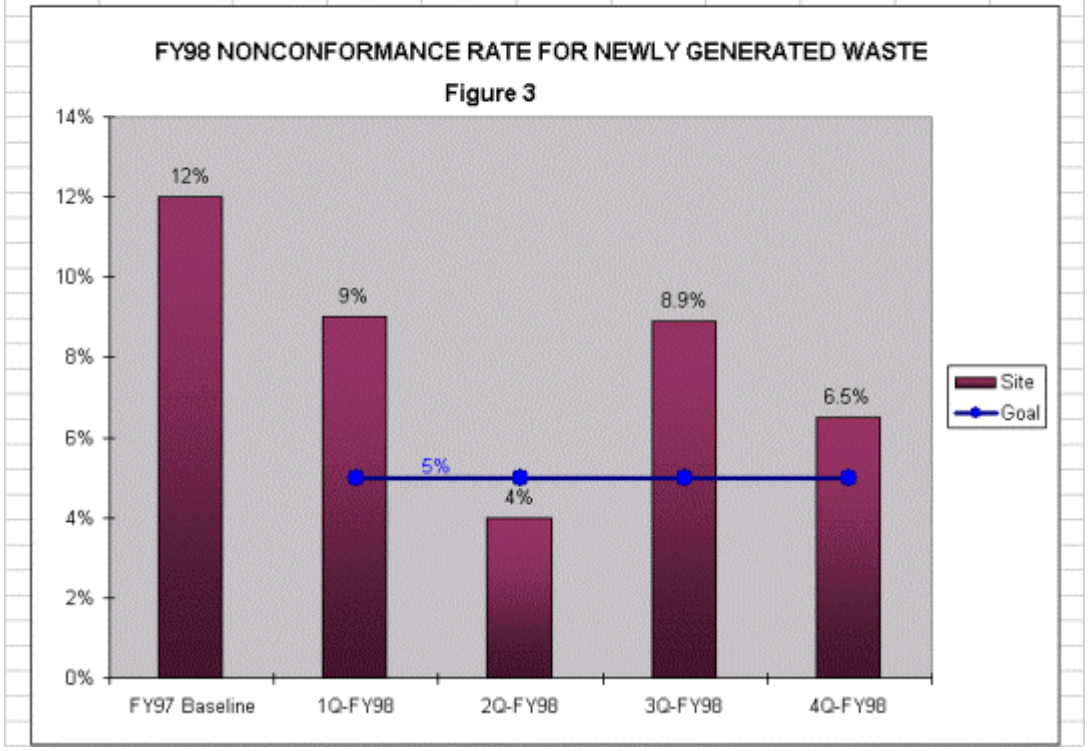
Control and Distribution of Empty Waste Packages

Common practice among waste generators was to request large numbers of empty waste packages with minimal fore thought as to realistic waste generation rates. This resulted in stockpiles of empty waste packages that may no longer have utility given changes that occur in packaging requirements. Control and distribution of empty waste packages was needed and this function was placed within the CSO. The type and number of waste packages is determined by the CSR, with assistance from the waste generator, and specified in the WGI. This controlled distribution of empty waste packages reduces costs and contributes to enhanced quality control for the waste packages. Cost reduction is achieved by waste generation forecasting which allows ordering waste packages in bulk (economies of scale) but only to meet the demand (minimize long-term storage of empty waste packages that may become out-of-date). Quality control is achieved by centralizing within the CSO 1) the process for establishing engineering specifications for waste packages that meet the Department of Transportation requirements and disposal site waste acceptance criteria, and 2) the quality assurance/quality control function to ensure the waste packages meet these specifications. Only those waste packages that are prepared using waste packaging issued by the CSO via a WGI will be accepted for interim storage and offsite disposal with respect to newly generated waste. This process prevents unauthorized waste generation, storage, and offsite shipment.

Clear Hand-off of Waste Management Ownership/Responsibility

To eliminate confusion regarding when a waste package no longer is the responsibility of the waste generator, a clear hand-off of waste management ownership/responsibility at the building shipping dock versus dual responsibility within the facility was proposed as another aspect of the new waste management process. The waste generator will retain ownership and responsibility of the waste package while the waste package is being prepared. Once the waste package is closed, the waste generator will notify the CSO that the waste package is ready for pick-up. The CSO will then perform waste package verification/certification. Once the waste package has been placed on a truck for delivery to interim storage, it becomes the responsibility of Solid Waste Operations. These clear boundaries of responsibility facilitate problem resolution but in no way reduce the accountability of the waste generator, CSO, and Solid Waste Operations for their prior actions.

	FY97 Baseline	1Q-FY98	2Q-FY98	3Q-FY98	4Q-FY98
Site	12%	9%	4%	8.90%	6.50%
Goal		5%	5%	5%	5%



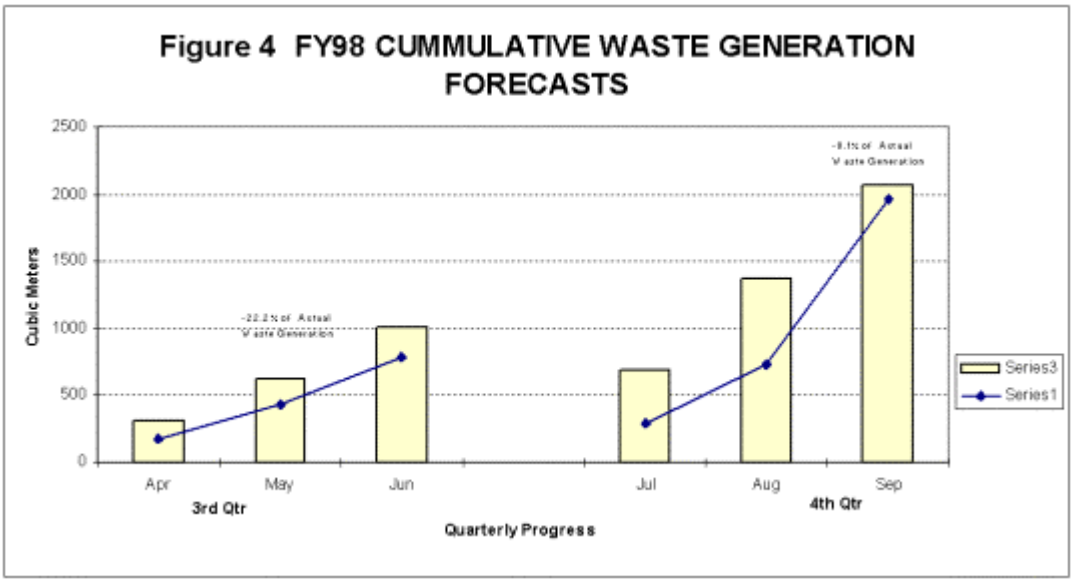
The result of this new waste management process is that waste management is transparent to the waste generator with the CSO as the hub. Centralized resource control, effective communication, clear ownership and accountability of the waste, and a reduction of failure points are the key operational benefits of the new waste management process.

PROGRESS TO DATE

Evaluating the success of the new waste management process proved to be a challenging task. Two performance indicators were established early in FY98 which reflect aspects of the impact of the new process on waste generation. The performance indicators measure reject rate and waste forecasting accuracy for newly generated waste.

For the purpose of evaluating change in the reject rate of waste packages, waste managed under the new program was defined as all low level, low level mixed, transuranic, transuranic mixed, and low level TSCA waste generated after November 10, 1997. Based on this criterion, a total of 2320 waste packages were generated. A reject package was defined as a waste package with one or more non-conformance reports.. As shown in Figure 3, the overall site reject rate for newly generated waste was never below the goal of 5%. However, the reject rate had decreased from the Fiscal Year 97 baseline of 12% to 6.5%.

The new waste generation forecast rate performance measure was established in the third quarter of FY98. Generators were asked to forecast their waste generation rate for the third and fourth quarter of FY98. The performance measure required the waste generators to forecast their waste generation rate to within 20% of the actual waste generation rate. Waste forecasting is a new concept for the waste generators and requires time to gain experience and expertise to provide accurate and meaningful projections. The third quarter forecast exceeded the 20% acceptance margin (Figure 4). By the end of the fourth quarter, the forecast rate accuracy was well below the 20% acceptance margin.



Other performance indicators are more difficult to measure as they are somewhat intangible. One could contend that communication between waste generators and Waste Management has improved due to the increased number of calls CSO has received from waste generators requesting assistance. The waste generators have informed the CSO that they appreciate the WGI for its functionality. It has become easier to characterize and package waste using the short set of instructions rather than sorting through numerous large volume manuals and procedures.

Waste generator training went through a revision to include the new waste management process. The training was reviewed and consolidated to reflect these changes. The responsibilities of the waste generator have changed from what was in place a year ago and the training qualification package needed updating. The training package has been modified to provide additional training for Waste Characterization SMEs and Regulatory Compliance SMEs.

FUTURE IMPROVEMENTS

There are elements of the new waste management process that have yet to be fully implemented. To put these elements into play, programs need to be developed, functions

need to be defined, resource allocation needs must be identified, and funding must be provided. Discussion of these elements follows.

In-process Waste Inspection

To increase throughput of waste packages, in-process waste inspection has been implemented on a pilot scale and is currently taking place in selected generation areas. Waste inspectors are available to inspect the waste as the waste item is placed into the waste package during the packaging process. The waste packages are not required to go through Real-Time Radiography (RTR) and can therefore be certified at the point-of generation. In-process waste inspection has proven successful where resources are available. The program will be expanded if the process proves to reduce the number of non-compliant waste packages, and is cost effective.

Shipment of Certified Waste Packages from the Point-of-Generation to Offsite Disposal

Certification of waste packages at the point-of -generation is essential to achieve a steady throughput of ready-to-ship waste for offsite shipments of waste packages for disposal. Currently, waste certification for disposal of low level waste at the Nevada Test Site and TRU waste at the WIPP occurs at interim storage locations after the waste packages have been screened using RTR. Once the “floor-level” waste package certification function is in place, shipping waste packages from the point of generation will become a common place event. This activity is currently taking place but only in a few locations. These waste generation areas have in-process inspection in place (RTR is not required) and waste package certification occurs very soon after generation.

It is proposed that an independent group be formed to conduct “floor level” waste package certification. The CSO would coordinate waste package certification activities with the waste generating and packaging process. The waste packages will be certified prior to leaving the generation area and will be available for shipment from the generation building.

Consolidation of Waste Processing Capabilities and Facilities

Taking waste package storage out of the generating facilities and into designated processing/storage facilities allows for reduction of the waste package movement. Consolidation of waste processing capabilities and facilities will provide independence from the existing plutonium processing facilities. Waste package control, by reducing the number of package moves, ultimately lowers costs and lowers worker radiological exposure. A consolidated waste processing facility allows for staging and rework, if necessary, of the waste package prior to shipment to final disposal facility. There is an increase in throughput of waste due to fewer waste package moves within the system.

CONCLUSION

The previous waste management system did not produce a quality product, waste. Due to gross inefficiencies, the system would not meet the needs of a site closure goal of 2006 because of the number of waste packages requiring some sort of rework. The required

rate of offsite waste shipments needed to meet the site closure goal is approximately 20,000 m^3/yr, which is far above the RFETS best practice rate of 9,150 m^3/yr. Packaging waste for onsite storage rather than for the goal of offsite disposal was the prevalent practice.

The new waste management process resulted in a system for pre-planning waste management utilizing the CSO as the single-point contact for coordinating waste generation activities with the waste generator. A clear line of ownership and responsibility for waste management was established to enable streamlining the process. Enhanced communication and skillful problem resolution tactics on the part of the CSO improved the working relationship between Waste Management and the waste generators. The pre-planning phase of waste generation aided in the improved quality of the waste characterization. Creating the WGI to compile the vast amount of information needed to generate compliant waste simplified the data-gathering task for the waste generator. The new process resulted in an increase in the number of compliant waste packages, which can be certified for disposal offsite. This increase in compliant waste packages equates to a reduction in unit cost for waste management services.