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RADIOACTIVE WASTE ACCEPTANCE TEAM AND GENERATOR INTERFACE YIELDS SUCCESSFUL IMPLEMENTATION OF WASTE ACCEPTANCE CRITERIA

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ABSTRACT

The Fernald Environmental Management Project has developed a successful Low Level Waste Shipping Program in compliance with the Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements, NVO-325, Revision 1. This shipping program is responsible for the successful disposal of more than 4 million cubic feet of Low Level Waste over the past decade.

The success of the Fernald Low Level Waste Shipping Program is due to the generator program staff working closely with the DOE-NV Radioactive Waste Acceptance Program Team to achieve win/win situations. The teamwork is the direct result of dedicated, proactive professionals working together toward a common objective: the safe disposition of low level radioactive waste.

The growth and development of this program has many lessons learned to share with the low level waste generating community. The recognition of reciprocal interests enables consistently high annual volumes of Fernald waste disposal at the Nevada Test Site without incident. The large volumes successfully disposed serve testimony to the success of the program which is equally important to all Nevada Test Site and Fernald stakeholders.

The Fernald approach to success is currently being shared with other low-level waste generators through DOE-NV sponsored outreach programs. This paper introduces examples of Fernald Environmental Restoration Management Corporation contributions to the DOE-NV Radioactive Waste Acceptance Program outreach initiatives. These practices are applicable to other low level waste disposal programs whether federal, commercial, domestic or international.

BACKGROUND

The Nevada Test Site encompasses 1,350 square miles of land located about 65 miles northwest of Las Vegas, Nevada. Since 1951, the Nevada Test Site has been the primary location for nuclear weapons testing in the United States. Between 1951 and 1992, the Nevada Test Site was the location for 925 nuclear weapons tests. Since the late 1960s, the Nevada Test Site has been actively cleaning up the contaminated areas resulting from nuclear weapons testing and support operations. While weapons testing remains the primary mission of the Nevada Test Site, the current treaty banning testing has altered the mission to maintaining readiness to resume testing. Expanded radioactive waste

disposal is one proposed alternative use of the Nevada Test Site in support of the DOE weapons complex remediation efforts.

Initial disposal of radioactive waste began in the early 1970s. Since the mid 1970s, all radioactive waste disposal at the Nevada Test Site has been restricted to one of two designated waste management areas. The Area 3 radioactive waste disposal facility utilizes subsidence craters from underground nuclear weapons tests for waste disposition. The Area 5 radioactive waste disposal facility uses shallow excavated pits and trenches for waste disposal. The volume of waste accepted and disposed in these two areas is approximately 17 million cubic feet of low level waste.

Disposal of radioactive waste from off site locations began in 1976. Waste acceptance criteria were developed to ensure waste received at the Nevada Test Site was in a form that was protective of the workers and the environment. The first waste management criteria was developed in the late 1970s titled, "Operational Radioactive Defense Waste Management Plan for the Nevada Test Site," NVO-185. Between 1978 and 1985, NVO-185 was revised four times to incorporate criteria that were evolving with radioactive waste disposal experience and regulatory changes.

In 1988, DOE Order 5820.2A was issued resulting in the development of the "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements," NVO-325. This document established waste acceptance criteria which incorporated the requirements of the new order and applicable RCRA regulations. The current waste acceptance criteria, "Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements," NVO-325, Revision 1 was issued in June 1992 to incorporate additional regulatory changes. The existing criteria were developed to provide increased oversight of radioactive waste disposal. All generators seeking approval for radioactive waste disposal at the Nevada Test Site must comply with the requirements of NVO-325, Revision 1.

The Fernald Environmental Management Project, formerly known as the Feed Materials Production Center, is located about 20 miles northwest of Cincinnati, Ohio. Uranium metal products for the nation's defense programs were produced at the facility between 1953 and 1989. During those years the facility produced slightly enriched or depleted products for use in production reactors to make plutonium and tritium at other DOE sites. Uranium production was suspended in July 1989 to focus on environmental restoration. The Fernald workforce has been dedicated entirely to environmental restoration since 1989. Also in 1989, the site was added to the Environmental Protection Agency's National Priority List of federal facilities in need of remediation. In 1991, the DOE officially announced that production at the facility was ended and the program management responsibility within the DOE was transferred to the Office of Environmental Restoration and Waste Management. In February 1992, an Ohio Field Office was established to oversee all aspects of a full-scale environmental restoration and waste management effort which is expected to last several years.

Fernald disposed of radioactive waste in on site disposal pits until 1985, when regulations pertaining to disposal cell design forced Fernald to suspend disposal of radioactive waste in the existing cells.

THE FERNALD DISPOSAL PROGRAM:

Fernald initiated radioactive waste disposal at the Nevada Test Site primarily to support ongoing production and construction waste management requirements. The volumes of Fernald waste disposed at the Nevada Test Site increased steadily from 1985 until 1990 (Figure 1). During this time, Fernald waste volumes increased to contribute fifty percent of the total annual volumes of waste received at the Nevada Test Site. The Fernald waste volumes combined with other waste disposal volumes to increase the Nevada Test Site disposal to more than one million cubic feet of off site waste in fiscal year 1989.

In 1990, a suspension of waste receipts at the Nevada Test Site resulted from a Tiger Team investigation identifying concern for verification of waste acceptance criteria compliance. This suspension caused the withdraw of all existing disposal approvals for generators shipping waste to the Nevada Test Site. Suspensions remained in effect until generators demonstrated compliance with the current waste acceptance criteria.

Recognizing the importance of the Nevada Test Site disposal option to the Fernald environmental mission, the facility waste management staff immediately initiated program improvements. Fernald was the first generator to successfully complete the redesigned approval process by demonstrating compliance to the waste acceptance criteria. Fernald resumed shipments in 1990 and remained the only approved facility shipping to the Nevada Test Site through fiscal year 1991.

As a result of the 1991 DOE announcement that production activities at Fernald was officially ended, Fernald concluded that waste volumes disposed at the Nevada Test Site would have to be increased to support the new environmental restoration mission. A backlog of material originally intended for recycle in the Fernald process accumulated on site between 1985 and 1991. A substantial portion of this material would consequently be designated as waste requiring disposal. The first priority of the environmental restoration project was to address this stockpile of legacy containers. Many of these containers were stored outside and were deteriorating. Escalating costs for maintaining safe storage and repackaging legacy material for off site disposal was the primary motivation for increasing alternative disposal options. With a clearly designated environmental restoration mission, Fernald commenced the DOE-NV approval process for additional waste streams.

The DOE announcement confirming Fernald as the first DOE facility to be in full environmental remediation coincided with increased DOE-NV compliance assessment. The criteria issued in NVO-325, Revision 1,

June 1992, required generators to provide more compliance documentation than previously requested. The revised waste acceptance criteria increased the level of documentation required to demonstrate compliance. The process for generators seeking Nevada Test Site disposal approval became more rigorous. Fernald was among the first generators to obtain application approval in compliance with the revised waste acceptance criteria.

The Fernald strategy for securing approval under the revised criteria was the same approach used in 1990. Fernald focused on the largest waste streams with the least impact resulting from the revised waste acceptance criteria. The first streams submitted were the bulk contaminated trash, maintenance, and construction rubble waste streams. These waste streams are primarily characterized by process knowledge which does not require sampling and analysis. With these approvals, Fernald was able to continue remediation of large piles of scrap metal and maintain disposal outlets for waste generated by ongoing construction at the facility. The effort directed toward gaining this approval enabled Fernald to continue shipments to the Nevada Test Site which in turn enabled the facility to maintain progress on the environmental remediation mission. Having established these waste approvals, Fernald then began to seek approval of the more difficult waste streams including uranium and thorium process residues. The approval process for these waste steams required further Fernald program development because this material was amenable to sampling. This aspect required more extensive compliance documentation. Fernald demonstrated compliance by developing sampling and analysis plans and procedures, laboratory acquisition protocols, and providing analytical results for DOE-NV review and approval. This process required nearly one year to complete during which time the waste streams characterized by process knowledge continued shipments to the Nevada Test Site. Fernald and DOE-NV also developed an innovative review process which provided for conditional approval of wastes amenable to sampling. The conditional approval was pending DOE-NV review of final data packages prior to approval for shipment to the Nevada Test Site. The interim approvals allowed Fernald to ship waste for which the sampling and analysis review was completed. This development allowed Fernald to make progress toward the remediation of the facility while the full approval process continued on course.

FERNALD INITIATIVES:

The process of gaining approval for individual waste streams requires at a minimum three to six months of review and response cycles for Fernald with an established program. For new generators without an established program, the approval process may be considerably longer. To accelerate radioactive waste disposal, Fernald adopted a programmatic waste stream approach to streamline the approval process. Although this approach does not match the NVO-325, Revision 1 waste acceptance criteria expectations, Fernald successfully demonstrated how the approach met the NVO-325, Revision 1 objectives. The NVO-325, Revision 1 perspective that waste streams were discrete groupings of

waste containers did not match the Fernald definition of waste stream. Fernald realized that the discrete waste stream approach would require many waste stream reviews and approvals. This would unnecessarily delay the Fernald mission and or increase disposal costs. To bridge the gap in waste stream definitions, Fernald established programs that provide sufficient process controls to demonstrate compliance with NVO-325 which affords Fernald more influence over the fate of their program. The programmatic approval is based on the assumption that following routine tasks, relatively similar waste can be certified in similar processes. The fundamental requirement of the programmatic approach is to design waste streams with broad descriptions and then manage individual waste container compliance with the waste stream approval through the characterization process. The programmatic waste stream approach reduces the time and cost required to get DOE-NV waste stream approval each time a population of waste is characterized. As Fernald worked with DOE-NV to develop this approach, the benefits became clear. Now, DOE-NV suggests to other generators to consider this approach.

To support this programmatic approval process, Fernald developed a complimentary sampling and analysis program in compliance with NVO-325, Revision 1. The NVO-325, Rev 1 requirement to review individual Sampling and Analysis Plans is minimized by a programmatic approach to waste characterization. The Fernald program provides consistency of documentation which aides the review and approval process. The consistency of characterization packages allows DOE-NV to select a representative number of sampling plans for compliance reviews. The reviews provide the level of confidence needed to overview the entire sampling and analysis program. This programmatic approach reduced the time and cost of DOE-NV compliance reviews and reduces the effort required to secure frequent individual waste stream approvals.

By reducing the approval efforts, Fernald realized that the volume of waste being approved for disposal could potentially exceed the capacity of the existing workforce and facilities. In anticipation of this impact, Fernald solicited vendor supplied waste processing services. This initiative forced Fernald and DOE-NV to think "outside of their box" and consider more than one way to manage NVO-325, Revision 1 compliance. Fernald secured DOE-NV approval for two remote vendor services contracts which enabled shipments of processed waste directly from the vendors facility to the Nevada Test Site. This was the first approval of this type ever awarded by the DOE-NV Radioactive Waste Acceptance Program team. This initiative allowed Fernald to increase waste disposal remediation by utilizing existing technology without the procurement, construction, and start-up cost of a DOE owned process. This approval required Fernald to establish a remote waste certification program at the vendors facility. Having developed this program, Fernald assumed a more independent oversight responsibility for the vendors waste management activities. This intermediate position resulted in Fernald gaining elevated awareness of their ownership in the DOE-NV Radioactive Waste Acceptance Program.

Successfully developing programmatic approvals and vendor supplied

services approvals requires that the generator understands the DOE-NV program. Fernald accomplishes this familiarization by maintaining close contact with the assigned Radioactive Waste Acceptance Program representative. Fernald avoids delays and interpretation differences through open conversation. This communication minimizes the surprises and keeps all participants at the same level of understanding.

Despite the close contact and the effective program established by Fernald, some compliance discrepancies have occurred. Fernald has disposed of more than 26,600 containers requiring 3,817 shipments to the Nevada Test Site over the past decade. Non-conformances have been recorded for less than 1% of all shipments during this time. Over the past five years, Fernald has reduced the non conformance rate to than 0.5% of the shipments. This improvement is the result of maintaining a program in compliance with the DOE/NV waste acceptance criteria. This improvement is significant when you consider that the number of shipments and containers per shipment have increased during this time. Never-the-less, despite doing the job right, non-conformances do occur. The nature of the business demands that mistakes be kept to a minimum. When non-conformances are discovered, doing the job right means accepting the responsibility of effecting corrective actions. To maintain low non-conformance rates, Fernald conducts self assessments and acts decisively when non-conforming conditions are identified. Corrective actions are completed quickly to restore compliance, improve the process, and prevent recurrence. Fernald sometimes utilizes self imposed shipment suspensions to motivate corrective action implementation. This strategy minimizes delays to the Fernald program while elevating DOE/NV confidence in the program. This dedication to program improvement is fundamental to maintaining a successful program.

INTERFACE INTANGIBLES:

In addition to specific program developments, Fernald also contributes to the DOE-NV Radioactive Waste Acceptance Program development in other ways. Fernald willingly participates in information exchange meetings with other Nevada Test Site waste generators. An example is Fernald presentations of lessons learned materials at DOE-NV Waste Generator Workshops. Or when appropriate, DOE-NV refers potential generators to contact Fernald directly to evaluate this program as an example for developing their programs. Sharing information assists with developing a level of consistency across the complex which improves the generator review and approval process. This consistency reduces the time and cost of generator program development and DOE-NV approval reviews as compliance becomes more routine rather than trial and error.

Fernald further supports program consistency through generator supported audits. As a result of the limited Radioactive Waste Acceptance Program Team resources, other generators expressed concerns that Fernald was monopolizing the team time. This was perceived to be affecting other program reviews. In response, Fernald proposed and supports the DOE-NV audit team by supplementing the team with FERMCO

staff. This initiative yields many dividends. One benefit is generator support makes it possible for DOE-NV to maintain the size of the audit staff while freeing permanent team personnel to address other duties. Audit team participation also enables generator personnel to visit other sites and review their programs and establish working relationships with their counterparts. Audit team participation also enables generators an opportunity to evaluate program compliance with waste acceptance criteria from the DOE-NV perspective. This interaction contributes to developing consistency of criteria compliance among the generators which reduces the time and effort required to review and approve individual programs. This program continues even after the Radioactive Waste Acceptance Program Team has been expanded because of the benefits derived from the experience.

Additional generator staff interaction is achieved through work group participation. Fernald supports generator work groups which allows generators an opportunity to provide input to Radioactive Waste Acceptance Program development. Work groups promote communication among generators and encourages an exchange of information and methodology. Fernald supports DOE-NV by participation in several work groups. The first work group supported by Fernald was tasked with RCRA characterization data package development. The work group produced a data package format guidance which has been incorporated into the Radioactive Waste Acceptance Program approval process. One recently concluded work group activity supported by Fernald involved development of a sealed source disposal position paper. Longer term work group activities currently in progress is the NVO-325, Revision 2 rewrite and standardized waste disposal containers. Fernald continues to support work group opportunities evaluating common issues and recommending solutions to DOE-NV. When appropriate, DOE-NV supports work group deliverable and elevates proposals to higher approval authorities for concurrence. Accepted positions become available to all Nevada Test Site generators for application in their programs.

Supporting Radioactive Waste Acceptance Program and other Nevada Test Site generators is only one piece of the success formula. Keeping the stakeholders informed and addressing their concerns is equally important to the overall success of every DOE facility. Fernald has a successful community relations program with the Fernald stakeholders. The lessons learned from the Fernald facility experience demonstrates the importance of good community awareness. Fernald promotes stakeholder interaction and lends experience and support to the Nevada Test Site stakeholders programs. Fernald supports the DOE-NV stakeholder interests by attending and providing input to Las Vegas area community meetings. Fernald often sends representatives to community meetings to represent the facility and provide prompt responses to Fernald related issues. An example of the value of this service was demonstrated in 1994, when Fernald recorded the first significant shipping accident. A Fernald representative was in attendance at the Nevada Test Site Citizens Advisory Board meeting one week after the incident providing details of the accident and

recovery operation. Two weeks after the event, the same representative attended a Nevada Test Site Citizens Advisory Board meeting with photographs and updated information. One month after the incident, a second individual attended a Citizens Advisory Board meeting related to transportation safety to provide first hand accounts of the accident recovery operation. Each meeting attended allowed Fernald the opportunity to personally present the Fernald side of issues and proactively address Nevada resident's concerns for LLW shipment and disposal safety. The result is an informed and accommodating attitude by Nevada Test Site stakeholders toward disposal of Fernald waste.

In addition to attending citizens meetings, Fernald supports DOE-NV studies intended to address other community concerns. Fernald voluntary provides data in support of Nevada Test Site issues such as the Environmental Impact Statement, Transportation Safety Studies, and the Performance Assessment for the disposal facilities. Fernald representatives often review Nevada Test Site documents and provide comments to assist development and implementation of new program policies.

CONCLUSIONS:

As radioactive waste disposal costs continue to increase, maintaining efficient disposal programs becomes more important. The Fernald Environmental Management Project Mission statement...

"Together DOE and FERMCO are committed to the safe, least cost, earliest, final cleanup of the Fernald Site, with in applicable DOE Orders, regulations, and commitments in a manner which addresses stakeholder concerns"

...requires that Fernald support the DOE-NV Radioactive Waste Acceptance Program if the mission goals are to be achieved. The Fernald radioactive waste disposal program consistently achieves goals established to demonstrate significant progress toward restoration of the Fernald site. Fernald realized early in the remediation effort that success can influence future funding considerations. In recognition of this relationship, Fernald dedicates the support required to maintain an effective disposal program with the Nevada Test Site.

Fernald realizes that the Fernald mission is related to the Nevada Test Site mission and that the Nevada Test Site must remain open to off site disposal if the Fernald mission is to succeed. To achieve this objective, Fernald supports the Nevada Test Site program development and maintenance as necessary to address stakeholders concerns. Meeting local community expectations is critical to the success of both sites. Fernald accepts the obligation to do the job right and is dedicated to achieving program results that support this commitment.

Accepting a share of the responsibility for the Nevada Test Site radioactive waste disposal program success cultivates a sense of program ownership at Fernald. This ownership is the result of the recognition that the two sites destinies are closely related. Ownership motivates Fernald to maintaining a high level of performance that is in compliance with the Nevada Test Site waste acceptance criteria. Through consistent compliance with the waste acceptance criteria, a level of confidence and respect develops. The Fernald program maintains a mutually supportive relationship with DOE-NV. This relationship is difficult to establish and even more difficult to sustain. To avoid damaging this relationship, both programs must remain flexible and willing to evolve with changing conditions. Fernald dedicates considerable effort to maintain compliance with NVO-325, Revision 1 and avoid program conflicts.

Establishing effective customer relations is the primary message to be shared by promoting the Fernald program. Success is achieved through learning your customer expectations and then working to meet them. Provided your customer has an equal understanding of your expectations, developing a successful working relationship is natural. Fernald and the DOE-NV Radioactive Waste Acceptance Program Team has developed this relationship. By sharing this information, the message bridges facility and program boundaries. The key point being that by utilizing an innovative mix of dedication and interpersonal skills, Fernald and DOE-NV have implemented a mutually supportive, ergo successful, waste acceptance program in compliance with NVO-325, Revision 1 waste acceptance criteria.

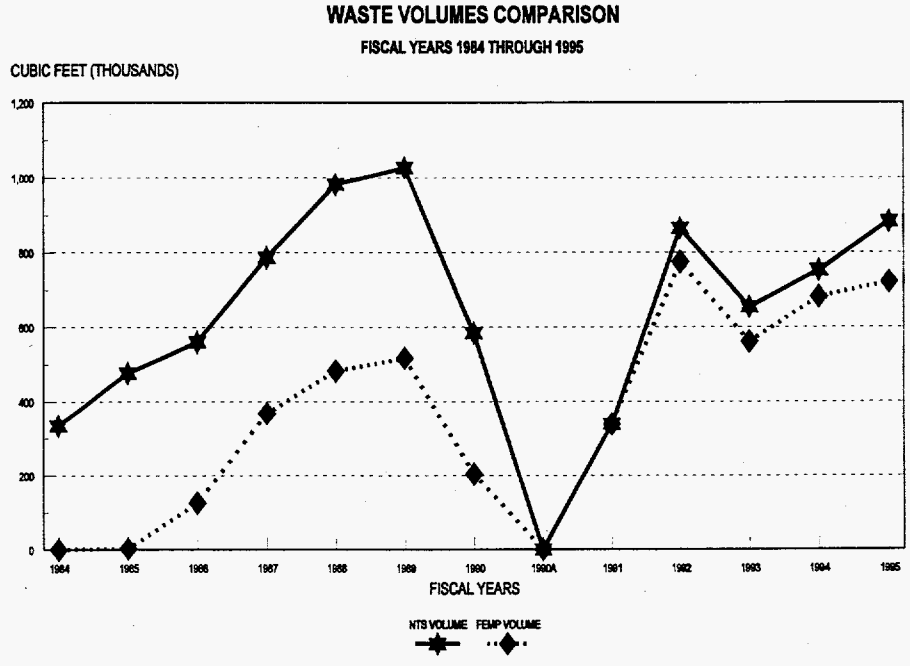

Fig.1: Comparison of Fernald waste volumes to total waste volumes received at the NTS. 1990A represents the suspension of waste receipts resulting from Tiger Team findings.