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Needs Assessment Activity Report

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EXECUTIVE SUMMARY

As part of a Transportation Management Division task (TMD), the Packaging Programs and Testing Group within Westinghouse Hanford Company (WHC) has assessed the packaging needs of some of the mid- and small-sized U.S. Department of Energy (DOE) sites by visiting them and meeting with their transportation and packaging personnel. To date, ten DOE facilities have been visited. As a result, these sites have been informed of some of the packaging activities that TMD has sponsored and is sponsoring, have been apprised of possible upcoming changes to transportation regulations, have discussed their short-term packaging needs, and have shared unique packaging they have developed which may be of use to other DOE facilities. Program successes include developing a questionnaire that discusses the potential impact of U.S. Department of Transportation (DOT) Docket HM-169A, *Transportation Regulations; Compatibility with Regulations of the International Atomic Energy Agency; Notice of Proposed Rule* (DOT 1989), discovery of a need for a reusable Type A liquid sample packaging and starting its development within another TMD task, coordinating resources between Fermi Laboratory and Argonne National Laboratory, and widening the distribution of WHC-EP-0558, *Test and Evaluation Document for DOT Specification 7A Type A Packaging* (WHC 1994).

The future direction of this Needs Assessment activity includes continuing the strategy of visiting DOE sites to meet with their transportation and packaging personnel. The visits will continue to the smaller sites and visits to the larger DOE sites (e.g., Idaho National Engineering Laboratory, Savannah River) need to begin to ensure that all of DOE's needs

are met and to determine whether any redundant packaging development is underway. The site visits should be expanded to include meetings with the long-range and strategic planners at each site, and at the DOE-HQ level, to ensure that all future transportation and packaging needs are identified early enough to allow adequate transportation assessment and packaging development. This activity could become a permanent conduit for information and will ensure that all future DOE transportation and packaging needs are satisfied.

REFERENCES

WHC, 1994, *Test and Evaluation Document for DOT Specification 7A Type A Packaging*, WHC-EP-0558, Westinghouse Hanford Company, Richland, Washington.

DOT, 1989, *Transportation Regulations; Compatibility with Regulations of the International Atomic Energy Agency*; *Notice of Proposed Rule*, Docket HM-169A, U.S. Department of Transportation, Washington D.C.

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LIST OF TERMS

DOE	U.S. Department of Energy
ER	Office of Energy Research
DOT	U.S. Department of Transportation
LSA	low specific activity
EM-30	Office of the Deputy Assistant Secretary for Waste Management
TMD	Transportation Management Division
TRU	transuranic
WHC	Westinghouse Hanford Company
WIPP	Waste Isolation Pilot Project

NEEDS ASSESSMENT ACTIVITY REPORT

1.0 INTRODUCTION

The Packaging for Programs and Testing Group in the Transportation and Packaging Division of Westinghouse Hanford Company (WHC) started performing an assessment of the packaging needs for the U.S. Department of Energy (DOE) in FY 1994. This assessment has been funded by the Transportation Management Division (TMD) Packaging Development Technical Task Plan, as the Packaging Projections subtask within the overall Performance Oriented Packaging task.

This activity originated as a result of several packaging development tasks initiated by the Packaging Programs and Testing Group in FY 1993. The introductory phase of those packaging development efforts typically included needs assessments that involved searching the DOE Complex for information of relevance to the specific task. During those searches it was found that a wide range of packaging and associated transportation needs had no formal mechanism for being addressed by DOE. Therefore, the Packaging Programs and Testing Group requested TMD to begin a task to investigate the different DOE programmatic packaging requirements and needs, evaluate the determined needs as compared to existing packaging resources, and evaluate the needs compared to potential TMD developmental efforts. TMD approved the Packaging Programs and Testing Group request, and work on the Needs Assessment began in FY 1994.

2.0 SITE PRESENTATION FORMAT

A questionnaire on U.S. Department of Transportation (DOT) Docket HM-169A, *Transportation Regulations; Compatibility with Regulations of the International Atomic Energy Agency; Notice of Proposed Rule* (DOT 1989), and an agenda for the site visits was developed in early 1994. DOT Docket HM-169A, if implemented in its original form, will have a major impact on DOE radioactive materials transportation by eliminating the use of strong, tight containers for most low specific activity (LSA) shipments. It would instead require the use of packagings that have survived specific performance tests. DOT Docket HM-169A will also limit the radioactivity content of LSA shipments and introduce a new packaging category: surface contaminated object.

At the opening of each meeting, the role of TMD within DOE and its role in packaging development activities is discussed. Specific examples of packaging developed, or under development, within DOE -- such as Princeton tritium waste packaging, Type A liquid sample packaging, and Type B Drums -- are then presented. The presentation has evolved as

new packaging that may have use throughout DOE are "discovered" or common needs are recognized. The questionnaire on DOT Docket HM-169A is then presented, and other ongoing regulatory activities including Performance Oriented Packaging are discussed. During these meetings, an active discussion between the presenters and the attendees is encouraged and usually occurs. After the presentations are complete, the sites are then asked to discuss any packaging needs they may have that are not being satisfied, and any packaging they may have developed which could be of use to other DOE facilities. Finally, any unique packaging or shipping facilities are visited.

The attendees at these meetings have, in general, been personnel in the packaging and transportation areas. Representatives from local DOE offices have either attended the meetings or have been visited separately after the meeting. The format of the meetings has been successful in gathering the most information possible from each DOE site.

3.0 SITE VISITS

3.1 FERMI NATIONAL LABORATORY

The packaging needs and issues identified by Fermi are listed below. All of these needs have resulted from Fermi, which is a public-access site, losing an exemption from DOT regulations for onsite shipments. Currently, Fermi makes onsite shipments through use of administrative controls, but will lose that ability at some point between June 1995 and January 1996, when the DOT exemption expires. Fermi is an Office of Energy Research (ER) site operated by the Universities Research Association, and all of these packaging needs are required to support ongoing programs.

- Packaging for bulk radioactive materials (magnets), 2.5 ft x 2.5 ft x 40 ft and 3 ft x 3 ft x 45 to 60 ft. They are considering possible use of Type A packaging, LSA-exclusive use closed transport (tarp and cage), or a multimodal container.

- Type B packaging for a americium-beryllium source that has no certified packaging currently available. This source is one foot long with a diameter of about two inches. The source fits inside of a shielded "pig" approximately 18 in. long and 7 in. in diameter.

- Reusable Type A source packaging to support 100 to 200 shipments per year. They currently utilize triple-wall fiberboard containers that take approximately 30 minutes to assemble and can only be used once. These sources are one to two inch diameter discs or are wand sources that fit inside of an four inch by two inch by two inch diameter shielded "pig." None of these sources weigh more than six and one half pounds.

During this meeting the representatives from Fermi identified that they had not met with their transportation and packaging counterparts at Argonne National Laboratory, which is less than 20 miles away. They attended the meeting with Argonne. The contact between these two facilities should improve both transportation and packaging programs.

3.2 ARGONNE NATIONAL LABORATORY

The packaging needs and issues identified at the meeting with Argonne are listed below. Argonne is an ER site operated by the University of Chicago, but their packaging needs fall under the Office of the Deputy Assistant Secretary for Waste Management's (EM-30) work breakdown structures 1301.A and 1301.B. Argonne has developed several packagings to meet their specific needs that may be useful to the rest of the DOE Complex.

- Argonne has 140 tons of depleted uranium and lead that are available for use as shielding material for packaging.

- Packaging is currently not available for a 17,000 Ci ^{60}Co source destined for disposal as a result of Certificate of Compliance expirations. Argonne is in the process of developing a disposal container for this source that fits inside of a NuPac 10-142 cask. This cask has a U.S. Nuclear Regulatory Commission license and will be utilized to meet transportation requirements, while the disposal container will satisfy burial site criteria. The disposal container is a 6000 lb depleted uranium sleeve filled with 4000 lb of concrete with an inner cavity that has a 16 in. diameter and is 19 in. tall. The disposal container provides enough shielding to reduce the radiation level on its exterior to 140 mrem/h. The concrete pour can be adjusted to provide a variety of cavity sizes, which may meet the needs of other sites. Once this packaging has been developed, Argonne will ship this source to the Hanford Site for burial during early January 1995.

- Packaging for 75 to 100 Ci of ^{226}Ra sources which are expected to fit inside of one packaging. These sources are currently stored in a floor pit underneath a building at Argonne in a DOT 2R container. At present, these sources cannot be disposed of because they do not meet the waste acceptance criteria at any DOE burial site. (The Hanford burial site considers this to be a transuranic [TRU] waste that should be disposed at the Waste Isolation Pilot Plant [WIPP], while WIPP says that it is not TRU and cannot be disposed of at their site.)

- Argonne intends to ship 1,000 ft^3 of TRU from decommissioning 62 contaminated gloveboxes in 150 55-gal drums in the TRUPACT II container to WIPP for disposal, once WIPP begins accepting waste. The 62 gloveboxes have been decontaminated, are no longer considered TRU waste, and can be disposed

of at the Hanford burial site. These gloveboxes will fit inside of Argonne M-3 steel boxes (referred to as the "half bin" container) and will be shipped as a LSA material to Hanford as soon as the packages have been loaded.

- Packaging for contaminated labware from a hot cell. This labware is contaminated with a Type B quantity of remote handled TRU. Currently, it is stored within 30-gal drums. In order to transport these drums, Argonne intends to place them inside of a cask liner and insert them into either a Chem Nuclear A120B cask or the NuPac 10-142 cask. Argonne will ship this waste to an interim TRU storage facility, which will eventually ship the waste to WIPP for burial, once a storage site is selected and opens.

- Argonne needs to ship neutralized nitric acid contaminated with plutonium that is currently contained in 56 drums. Argonne is developing a liquid corrosive TRU extraction process to be used to extract as much plutonium as possible from this waste. However, not all of the plutonium in this nitric acid will be recoverable, so the nitric acid contaminated with the residual plutonium will need to be disposed. Argonne intends to solidify this waste and ship it as a LSA material to the storage/disposal site.

- Packaging for contaminated lead and depleted uranium waste. Argonne plans to ship this waste in Argonne-West 7A-960 steel boxes. This waste will be shipped to the Hanford site for storage in the Waste Receiving and Processing Facility, until a disposal site begins accepting this type of waste for burial. The Waste Receiving and Processing Facility will then process the waste to a form suitable for final disposal. The contaminated depleted uranium (140 tons) will be shipped to Waste Receiving and Processing Facility by March 1995, while the contaminated lead will be shipped by the end of 1995.

- Packaging for highly tritiated water in a 55-gal drum. Argonne intends to use the Type A Princeton Plasma Physics Laboratory molecular sieve packaging to ship the waste to the Hanford disposal site for burial as soon as possible.

- Packaging for the 72,000 lb carbon steel reactor vessel (120,000 lb with lid and internal components) from Chicago Pile #5. This reactor vessel has 20-50 mrem from activated metal surface contamination and is 28 ft x 7 ft in diameter. They are considering cutting the vessel into five sections and segmenting each section, possibly using plastic wrap and paint to affix surface contamination, then placing the segments inside of a Type B cask for shipment to the disposal site. This is the same procedure that Argonne is currently using for disposing of the reactor vessels and waste from the ZGS and EBWR reactors, but they consider this to be a very difficult procedure. Argonne will not need this packaging for at least two more years.

- Shipment of 1,000,000 lb of activated metal (e.g., magnets) that have no surface contamination. Several magnets have been shipped to Fermi as LSA for their use. They intend to ship these magnets as a nonradioactive material (the contamination level of this material is less than 0.02 nCi/g) to Hanford for burial. However, once at Hanford, a plastic wrap to cover the magnets is still required to meet burial site requirements.

3.3 NEW BRUNSWICK LABORATORY

The packaging issues and needs listed below were identified at New Brunswick Laboratory. New Brunswick is run by DOE's Office of Nonproliferation and National Security (NN-51), and all packaging needs fall within the scope of that program.

- Requested a change in distribution for the *Test and Evaluation Document for DOT Specification 7A Type A Packaging*, WHC-EP-0558 (WHC 1994).

- A user-friendly Type A liquid packaging for use with routine shipments from gram quantities to kilogram size bulk standards by air, using both domestic and international carriers. This packaging should have a one to two liter capacity. This packaging should be compatible with acids (e.g., uranyl nitrate packaged in 50 mL ampules), provide absorbent and secondary containment, and have the ability to ship multiple inner packagings within the outer packaging. New Brunswick would use up to 100 of these packagings per year (at minimum, one packaging per month) and would use these packagings as soon as they became available.

- New Brunswick stated that the inability to obtain U.S. Nuclear Regulatory Commission certification for International Atomic Energy Agency-certified packagings for transport of plutonium by air has resulted in serious logistical problems for some standards shipments. The packagings in question are Croft Associates' Safekeg and Safepak containers.

3.4 EG&G MOUND APPLIED TECHNOLOGIES

The packaging need at Mound, which is run by EG&G, falls within the scope of the EM-30 program. The packaging need identified by Mound is for a two-liter chilled liquid sample packaging that can ship glass or polyethylene inner packagings. The ability to use this container for Type A liquid samples would also be beneficial. Mound would use one of these packagings at least once every two weeks to ship their environmental samples. Currently, Mound has been dewatering the samples in order to ship the samples as solids.

3.5 FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

The transportation and packaging needs and issues identified by Fernald are listed below. All of these packaging needs fall within the scope of the Fernald Environmental Management Division (EM-423), which oversees the Fernald site. The Fernald site is operated by Westinghouse Electric.

- Requested a change in distribution for WHC-EP-0558.

- Fernald expressed interest in a chilled sample cooler for radioactive and hazardous material in Packing Group II and III. They would require approximately 30 L in one package. Their present shipments are limited to five liters. Their preferred packaging, fiberboard box with foam, DOT 33A or UN 4G, is no longer available as an assembled stock item from their vendor, and they must order as separate parts, which unnecessarily drives up costs. Currently, Fernald makes about eight sample shipments per day using Coleman coolers packed with dry ice and absorbent material. Fernald would use a new packaging as soon as it became available.

- Packaging for large amounts of low-level mixed waste. Fernald has 104 M ft^3 of this mixed waste that will be shipped to the mixed waste disposal site in Utah beginning in 1997. Fernald has been considering the use of railcars, intermodal containers, or roll-off boxes. Fernald expects the visibility of this packaging need to increase as 1997 draws closer.

- Fernald has a need for economical packaging for 230,000 ft^3 of vitrified waste that will require Type B packaging. The vitrified waste may qualify as special form material. Fernald stated that obtaining existing casks solely for the transportation of this material to the Nevada Test Site for burial will cost at least $47,000,000. Fernald would prefer to obtain a less expensive packaging. This waste will be shipped as soon as the vitrification plant starts operating.

- Packaging for 230 metric tons of enriched and depleted UF_4 and UO_3 (most of this material is enriched). Fernald had intended to sell this material to France for use and/or reprocessing, but that project has been canceled. This packaging need is not a high priority, but eventually will be solved.

- Fernald found packaging for their poison inhalation hazard cylinders, most of which contained chlorine. Fernald worked with the cylinder manufacturers to determine the cylinder contents and released the cylinders to those manufacturers for recovery of the gases.

3.6 WEST VALLEY DEMONSTRATION PROJECT

West Valley is an EM-30 site that is operated by Westinghouse and managed by the Idaho Operations Office of the DOE. West Valley has a need for a reusable chilled liquid sample packaging to ship organic and radioactive samples to testing laboratories. West Valley currently uses a Coleman cooler to make these shipments, but has five to ten shipments per year that cannot use that cooler. West Valley expects the sampling schedule to accelerate next year and anticipates that up to two samples per month will require alternative packaging. West Valley would immediately use an alternative chilled liquid sample container for all samples if one was available.

3.7 LAWRENCE BERKELEY LABORATORY

The packaging needs and issues identified during the meeting with Lawrence Berkeley are listed below. Lawrence Berkeley is an ER site operated by the University of California, but their tritium waste packaging needs fall within the scope of EM-30. Their Type A source packaging need falls within the scope of the ER program.

- Packaging or suitable overpacks for storage, transportation, and subsequent disposal of tritiated water on a silica base (containing 12,000 to 15,000 Ci of tritium) where hydrogen gas generation is a concern. Lawrence Berkeley has been in contact with Princeton Plasma Physics Laboratory about using their tritium shipping containers. This waste is currently stored in one gallon "paint cans" inside of approximately 30 55-gal drums. Lawrence Berkeley has stated that finding packaging for transportation is not the problem, finding disposal packaging is. Lawrence Berkeley will ship this waste as soon as a disposal packaging becomes available (a disposal packaging has been tentatively identified and this waste is expected to be shipped within the next year).

- Packaging or suitable overpacks for storage, transportation, and disposal of LSA tritiated mixed waste, where contamination of a tar substance used in the original package is a concern. This material is also stored inside of small inner containers inside of approximately 40 55-gal drums. Once again, finding packaging for transportation of this waste is not difficult, finding acceptable disposal packaging is. At this time, no disposal packaging has been found, but the Hanford site will accept this waste for storage until a disposal site and disposal packaging can be found.

- Suitable packaging for a variety of Type A sources. Lawrence Berkeley wants to ship these sources to a new building that is across a public access highway late in FY 1995. Most of these sources are small enough to fit inside of a 2R

Packaging, so a reusable source packaging with that inner volume would be acceptable.

- Request for additional distribution of WHC-EP-0558.

3.8 STANFORD LINEAR ACCELERATOR CENTER

The packaging needs and issues identified during the meeting with Stanford are listed below. Stanford is an ER site that is operated by Stanford University. Their packaging need is a long-term need that will fall within the scope of the EM-30 program.

- A request for more information regarding the RAMPAC database or other resources that may be accessed in order to plan Type B shipments and to select appropriate packaging. This information was provided.

- Packaging for numerous sources, including californium and cobalt. Packaging for a ^{60}Co source that is currently 70 Ci will be required within the next five to ten years. At present, there is not a specific date that requires packaging for the californium source (it currently emits 5×10^8 neutrons per second), but it will eventually need a packaging for transportation and disposal.

3.9 BROOKHAVEN NATIONAL LABORATORY

The packaging needs listed below were identified during the meeting with Brookhaven. Brookhaven is an ER site operated by Associated Universities, Inc., but all of their packaging needs fall within the scope of the EM-30 program.

- Packaging for a 46,000 curie ^{90}Sr source that no other facilities want to reuse or dispose of, and packaging for an approximately 30,000 curie ^{60}Co source. Brookhaven does not have a deadline for disposing of these sources, but would like to dispose of them as soon as possible. The shipping container being designed by Argonne should be able to ship the ^{90}Sr source, but may not have enough shielding to be used with the ^{60}Co source. Brookhaven has contacted with Argonne to further explore the possibility of using the packaging that Argonne is currently developing.

- Brookhaven was able to find and use approved configurations for DOT 6M shipping containers to ship their plutonium-beryllium sources after conversations with personnel conducting the Needs Assessment, so this packaging need no longer exists.

- Packaging for two tritium cylinders. The tritium has been emptied from these cylinders, however some residual tritium gas still remains. These cylinders do not meet DOT packaging standards and there does not appear to be a way to remove the tritium from the cylinders. Brookhaven does not have a deadline for shipping these cylinders, but would like to find a final disposition for them as soon as practicable.

- Shipping and disposal containers for several large activated magnets that have some external rust. The external rust prevents, because of radiation exposure concerns, cutting these magnets into smaller pieces for shipment and disposal. Brookhaven is investigating the possibility of shipping these magnets to a metal melting facility run by the Scientific Ecology Group in Tennessee for recycling the metal, with the magnets shipped to Tennessee as a bulk LSA shipment.

Brookhaven had developed a container that could have been used throughout DOE for transportation and possibly disposal. Brookhaven had modified a multimodal container that is normally eight feet tall and developed two and four foot tall versions. The reduced height allowed these containers to be completely filled and shipped on a legal weight truck. Unmodified multimodal containers require a large amount of void volume for shipment on legal weight trucks, which drives up disposal costs. However, after Brookhaven discussed this packaging with personnel from other sites, they decided to no longer use these modified multi-modal containers because commercial containers were available at half the cost.

3.10 PRINCETON PLASMA PHYSICS LABORATORY

The packaging needs and issues listed below were identified during the meeting with Princeton. Princeton is an ER site operated by Princeton University, but all of their packaging needs fall within the scope of the EM-30 program.

- Princeton will be developing packaging for their present physics experiment, which will be activated metal in a torus shape with a maximum of 1,500 Ci. Their current plan is to cut the torus into five to ten pieces and develop Type A packaging for those pieces. They will also be developing Type A packaging for a neutral beam box. The development of this packaging will not begin until early FY 1996 since the physics experiment will be running until the end of FY 1995.

- Princeton has 400 tons of slightly activated 304 stainless steel, 250 tons of slightly activated copper, and 20 tons of slightly activated titanium that they want to recycle, instead of dispose. However, Princeton has determined that it would be more expensive to recycle the metal at the Scientific Ecology Group metal melter than it would be to bury the metal, so they are reluctant to pursue either

of those two alternatives at this time. All of these metals are slightly activated with ^{60}Co, as a result of neutron activation of small ^{59}Co impurities left inside of these very pure metals.

- Potential need for LSA liquid packaging for 5,000 gal of fluorinert (liquid teflon), if the fluorinert becomes radioactively contaminated during the current physics experiment. Princeton will not know whether the fluorinert is contaminated until the experiment concludes at the end of FY 1995. If contaminated, Princeton would like to be able to ship this LSA waste in 55-gal drums.

- Princeton requested that all shipping containers developed for large sources also meet applicable burial site acceptance criteria so that one design can be used for both functions.

Princeton has developed two Type A packagings for tritium. Both packagings utilize a molecular sieve bed to capture tritium oxide vapor and then ship the molecular sieve bed. These packagings are available for use throughout the DOE Complex.

4.0 REMAINDER OF FY 1994 AND 1995 ACTIVITY

The Packaging Programs and Testing Group plans to continue site visits with the same format over the remainder of FY 1994 and into FY 1995. Rocky Flats and the Waste Isolation Pilot Plant were visited in late August and early September. Savannah River Site and Oak Ridge National Laboratory were visited in mid-October. Idaho National Engineering Laboratory, the Pantex Plant, and Los Alamos National Laboratory will be visited in early December.

5.0 CONCLUSIONS

The site visit format has been very effective to date. The sites visited have been cooperative and forthcoming with their packaging needs and developments. Visiting each site, in lieu of having one large meeting with attendees from each site, allows participation by site organizations not fully devoted to transportation and packaging. This increases the input from each site.

The most prevalent packaging needs within the DOE Complex, that have been discovered by the Needs Assessment include:

- Reusable Type A packaging for sources.
- User-friendly reusable Type A packaging for liquid samples.
- Chilled sample packaging that meets both Type A and hazardous materials packaging requirements.
- LSA or Type A packaging for large contaminated or activated objects (e.g., magnets).
- Radioactive materials packaging that can be used for both transportation and burial.
- Type B Packaging for high activity sources that currently do not have certified packaging because the certification of their existing packaging has expired.

All of these packaging needs, except for the reusable Type A source packaging, are needed to support environmental cleanup activities across the DOE Complex. Most of these activities fall within the scope of the EM-30 program. The reusable Type A source carrier is needed to support the ongoing ER program

The Needs Assessment activity has found several packagings, including the Princeton-developed tritium packagings, that could be used throughout the DOE Complex. It has also initiated other important developments including the Type A laboratory sample packaging currently being developed by the Packaging Programs and Testing Group. The Needs Assessment has the potential to lead to many more packaging developments efforts by several different facilities within the DOE Complex. Finally, the Needs Assessment activity has opened up communication pathways between various DOE sites that should help some of the smaller sites pool their resources and improve efficiency. This rewarding activity should help the DOE Complex, as a whole, become more efficient in transportation and packaging.

6.0 PROPOSED FUTURE ACTIVITY

The Packaging Programs and Testing Group proposes that the Needs Assessment activity continue for the foreseeable future with an expanded scope. To date, the sites visited have been smaller facilities with small transportation and packaging staffs. To ensure that their needs are met, the smaller sites should continue to be visited, because most smaller sites are unlikely to do much independent packaging development work. However, the larger sites also need to be visited. These sites are developing packaging of their own and, in many

cases, have no knowledge of how that packaging could be used at other sites. This can lead to a duplication of effort by several sites. The visits to sites developing packaging would allow TMD to determine which sites have packagings that could be of use to other sites. TMD can also coordinate that development and ensure that the needs of all sites are addressed. These TMD functions will make all DOE transportation and packaging activities more efficient and productive.

The Packaging Programs and Testing Group also recommends an expansion of the Needs Assessment activity to involve the long-range planners at each site and at DOE - Headquarters. Presently, the visits have, in general, only included personnel aware of the immediate and short-term packaging needs at each site. Therefore, only the current and short-term packaging needs of each site have been included. Expanding the scope of the visits to include long-range planners at each site, and at the Headquarters level, would enable TMD to determine what the future packaging needs are. It would also prioritize development of those packagings, along with any technology required to support development, and ensure that the required packagings are available when needed.

Expanding the scope of the Needs Assessment activity would help TMD realize several strategic objectives. By becoming aware of all of the current and future transportation and packaging needs within DOE, TMD would be able to ensure that DOE can provide all capabilities required for transportation and packaging. TMD would also be able to provide centralized transportation management, create and utilize innovative technologies as necessary, and integrate transportation and packaging into all stages of DOE planning. Finally, the information gained from the expanded Needs Assessment activity would allow TMD to develop a method for prioritization of packaging and transportation development activities.

7.0 REFERENCES

WHC, 1994, *Test and Evaluation Document for DOT Specification 7A Type A Packaging*, WHC-EP-0558, Westinghouse Hanford Company, Richland, Washington.

DOT, 1989, *Transportation Regulations; Compatibility with Regulations of the International Atomic Energy Agency*; *Notice of Proposed Rule*, Docket HM-169A, U.S. Department of Transportation, Washington D.C.

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