INSPECTION PROCEDURE 69013

RESEARCH AND TEST REACTOR DECOMMISSIONING

PROGRAM APPLICABILITY: 2545

69013-01 INSPECTION OBJECTIVE

To determine if dismantlement and decontamination activities at a research reactor are conducted safely and in accordance with regulatory requirements, licensee commitments, and the NRC approved Decommissioning Plan (DP).

69013-02 INSPECTION REQUIREMENTS

02.01 Organization and Staffing

a. Determine if the licensee's organization satisfies the Decommissioning Plan requirements, license and technical specification requirements, and licensee commitments.

b. Determine whether temporary staffing satisfies Decommissioning Plan requirements, licensee commitments, and provides the expertise and skills needed to ensure safe completion of decommissioning.

c. Evaluate whether the licensee's decommissioning organization and staffing is adjusted to account for changes as decommissioning progresses.

02.02 Work Controls

a. Determine if the controls, policies, procedures, and work requirements are implemented as specified in the DP and the technical specifications (TS).

b. Determine whether oversight and control of contracted work are adequate.

c. Determine if engineering safety evaluations are completed prior to dismantlement or demolition of load-bearing structures.

02.03 Health Physics

a. Determine whether the licensee's radiation protection and As Low As Reasonably Achievable (ALARA) programs are documented as required by 10 CFR 20.1101 and the DP.

b. Determine if the required radiation surveys, sampling, and monitoring are performed and recorded in accordance with regulatory requirements and licensee procedures.

c. Determine whether an annual review of the radiation protection program is performed as required by 10 CFR 20.1101(c). Verify that the Radiation Safety Officer (or equivalent) reviews and approves radiation protection program changes, radiological event investigations, and corrective actions in accordance with the DP, the TS, and licensee procedural requirements.

d. Determine whether required calibrations of radiological survey, sampling, or monitoring instruments are commensurate with the DP and the licensee's procedures.

e. Determine whether the personnel dosimetry program is conducted in accordance with 10 CFR 20 Subpart F and occupational doses are limited as specified in 10 CFR 20 Subpart C.

f. Determine whether restricted areas and radioactive materials are labeled in accordance with 10 CFR 20 Subpart J.

g. Determine whether access to radioactive materials and contaminated areas is controlled in accordance with 10 CFR 20 Subpart I.

h. Determine whether use of protective clothing and exit frisking practices are in accordance with the licensee's procedural requirements.

i. Determine whether personnel working around radioactive materials are instructed in radiation safety as required by the licensee's procedures and by 10 CFR 19.12.

j. Determine whether the principles of ALARA are implemented by the licensee.

k. Determine whether the licensee's control of internal exposures satisfies the requirements of 10 CFR 20 Subpart H.

l. Where applicable, determine whether the dose to the embryo or fetus of declared pregnant women meets the requirements of 10 CFR 20.1208

02.04 Effluent Control and Environmental Monitoring

a. Determine whether releases of radioactive materials are controlled, monitored, and recorded as required by the DP and TS.

b. Determine whether radioactive liquid, gaseous, and particulate effluent releases are controlled based on the environmental ALARA Program and 10 CFR 20 Subpart D.

c. Determine whether environmental samples are collected, analyzed, and recorded as required.

02.05 Change Control

a. Determine if changes to the DP are made in accordance with 10 CFR 50.59, and the policies and procedures described in the DP.

02.06 Audits and Reviews

a. Determine whether the decommissioning safety committee meets the administrative requirements (membership, qualifications, quorums, meeting frequencies, etc.) of the DP and TS.

b. Determine whether the decommissioning safety committee provides the audits, reviews, and oversight as required in the DP or TS.

c. Review management evaluations of events, abnormal conditions, reportable occurrences, review and audit findings, employee safety concerns, and other issues and problems that arise. Determine whether management response is timely and appropriate.

02.07 Emergency Planning

a. Determine whether the policies and procedures for responding to emergencies as required by the DP and Emergency Plan are current.

b. Determine whether on-site and off-site emergency response personnel can acceptably respond to emergency conditions.

02.08 Solid Radioactive Waste Management and Transportation

a. Determine if arrangements with burial sites, waste brokers, shippers, and processors will allow disposal of wastes identified during site characterization with particular attention to disposal of mixed waste.

b. Determine if staging and temporary storage areas for waste are controlled as required by 10 CFR 20.1801. Determine whether the packages and the storage area are properly labeled as required by 10 CFR 20 Subpart J.

c. Determine if individuals who package and ship waste are trained as required by 49 CFR 172 Subpart H. Determine if additional training required for users of Type B packages and spent fuel casks is conducted in accordance with 10 CFR 71.105(d). Verify that replacement personnel are properly trained.

d. Determine if waste is packaged for shipment in accordance with 49 CFR 173 Subpart I. Determine if the licensee's quality assurance program for the use of Type B packages and spent fuel shipping casks has been approved by the NRC in accordance with 10 CFR 71 Subpart H and is properly implemented.

e. Determine the adequacy of the licensee's program for ascertaining that the waste class and form are suitable for burial as required by 10 CFR 61.55 and 61.56. Verify that compliance with these restrictions is assured in accordance with 10 CFR 20 Appendix G III.A.3.

f. Determine if shipping manifests and records are prepared and maintained in accordance with 10 CFR 20.2006 and 10 CFR 20 Appendix G

g. Determine whether written procedures and policies are available for classification, characterization, processing, packaging, delivery, and transportation of waste. Verify that these are approved by management and/or the safety committee as specified in the DP. Also verify that they are adequate, current, and implemented in conformance with 10 CFR Parts 20, 61,and 71 and 49 CFR Parts 173-178.

69013-03 INSPECTION GUIDANCE

General Guidance

Safety concerns during the decontamination and dismantlement of a research reactor are significantly different from the concerns during operations. Radiological hazards may dominate the early phases of work, when the inventory of radioactive material is large, but lessen as decontamination and dismantlement progresses. The work environment will be similar to a prolonged maintenance outage.

While varying levels of radiological hazards are usually present, industrial hazards may become more safety significant during certain work. Industrial safety hazards will depend on the type of work in progress. Examples of these hazards include: elevated work from scaffolding or ladders, cutting, burning, grinding, soil excavation and trenching, asbestos removal, electrical and fire loading hazards. The licensee staff may include industrial hygienists and safety specialists who ensure that an effective industrial safety program is implemented and personnel protective equipment (e.g. hard hats, safety glasses, hearing protection, safety shoes) is available and properly used. In addition, careful attention to housekeeping and fire prevention is essential.

The equipment needed for initial response to industrial accidents is found in Occupational Safety and Health Administration (OSHA) requirements in 29 CFR 1910 and 1926, or the licensee's industrial safety manual. This may include eye wash stations, first aid kits, fire extinguishers, evacuation alarms, and rescue extraction equipment for work in confined spaces.

The NRC inspector is not an OSHA inspector but should review the NRC-OSHA Memorandum of Understanding and be alert for weaknesses in the licensee's industrial safety program. Significant observations in this area should be reported to licensee

management and the region-based NRC/OSHA Liaison Officer in accordance with IP 93001, “OSHA Interface Activities.” Furthermore, industrial hazards can be expected to change as work progresses.

Routine NRC inspections should be frequent during the early phases of the project. Initial inspections should verify that the decommissioning organization is in place and all key positions filled prior to the start of dismantlement and decontamination. The safety committee providing oversight and review of changes must be fully operational. General policies and procedures, as well as detailed work instructions, where appropriate, should be available. Arrangements for contractor support (tradesmen, supervision, engineering, HP, etc), specialized equipment, and waste disposal should be completed. The inspector should maintain frequent contact with the licensee and identify the schedule of safety significant work to be inspected. As-needed inspections should be conducted to observe preparation and performance of this work. A flexible inspection schedule will be needed for the duration of decommissioning.

Specific Guidance

03.01 Organization and Staffing. This inspection element should be performance-based on the licensee's effectiveness at fulfilling commitments and meeting regulatory requirements. Performance-based elements characterizing adequate staffing could include the licensee's success at: (1) timely review, implementation, or revision of procedures, drawings, and design changes; (2) managing engineering backlogs; (3) supervising decommissioning activities; (4) performing facility tours to assess housekeeping and material condition; and, (5) conducting technical evaluations and insightful management reviews.

The inspector could also assess whether the licensee had performed a task analysis of their staff by functional description, job comparison, and qualification considerations. A possible licensee analysis could balance an estimation of future site activities with staff experiences, expertise, or work load. The licensee may or may not have documented these management decisions.

The inspector could also assess whether the site staff can effectively implement site procedures for accidents, events, fire emergencies, etc. This includes the inter-actions between site personnel performing decommissioning activities, security, and radiation protection functions.

a. Organization The DP provides specific requirements for the decommissioning organization and staffing. The facility license and technical specifications may also provide additional requirements. The inspector should verify that licensee personnel and contractors satisfy the qualifications, responsibilities, and authorities requirements. The inspector should interview supervisory personnel to verify that they posses a clear understanding of their role in the organization. Qualifications and experience of the radiation safety officer should be adequate to deal with the anticipated radiological hazards. The composition of the safety committee and qualifications of the members should enable the committee to provide effective oversight of dismantlement work. Efforts by licensee management to retain operating staff with knowledge of reactor system layout and historical events with

potential to impact decontamination and dismantlement should be reviewed. The licensee could consider the implementation of promotion, retention, or rotation programs to provide assurance that the experienced staff is retained.

b. Temporary Staffing. Contracted personnel may be hired to perform tasks beyond the capabilities of the reactor staff and management. This may include labor, supervision, rental equipment and equipment operators. Examples of this are health physics technicians, radioactive waste brokers, quality assurance inspectors, large crane operators, welders, scabble machine operators, and concrete cutters. Contractors who occupy positions described in the DP should be interviewed to determined if requirements for training and experience are met. The licensee retains prime responsibility for regulatory compliance by contracted workers and should provide the quality assurance and oversight of contractors that can be verified by the inspector.

c. The licensee's organization may undergo changes as the facility transitions through decommissioning. For example, health physics technicians supporting remediation work will be replaced by personnel qualified to perform the final status survey. The number and qualifications of the licensee staff should be adjusted to meet regulatory requirements and maintain safety commensurate with the conduct of decommissioning activities.

03.02 Work Control

a. The DP may require detailed work instructions if the contamination found during site characterization requires complex decontamination and dismantlement. The selected methods, techniques, surveillance, maintenance and equipment to be used for decontamination and dismantlement will be described in the DP and the TS. The inspector should verify that these are implemented as required. Except for work that is clearly within the skills of a trade, the inspector should verify the availability and use of detailed work instructions. The instructions may include reference to a job specific radiation work permit and other safety precautions or permits. For example, scaffolding should be inspected for proper installation before use, a flame permit and fire watch should be posted before flame cutting or arc gouging.

The DP may require work sequencing to ensure that required safety systems remain available for as long as required. For example, effluent monitors will be required until near the end of the project. The work schedule should also be used to avoid conflicts or work interferences. For example, a section of floor is removed that was needed to support a forklift designated to remove a large piece of equipment. The inspector should review management coordination and use of work schedules .

b. Licensee programs to provide oversight and control of the contractors should ensure that work performance and coordination are in accordance with regulatory requirements.

c. If major demolition or dismantlement of load bearing structures or soil is required to gain access to radioactive material, an engineering safety evaluation may be required. This should be completed by a competent and licensed professional engineer in accordance with local building codes and generally accepted practices. The evaluation may determine the need for bracing, shoring, or other temporary support structures. The inspector should determine if safety evaluations are completed and the recommended precautions are implemented.

03.03 Health Physics

a. The radiation protection and ALARA programs should be based on an assessment of the projected hazards during decommissioning and describe the methods to be used to limit personnel exposures. Program documentation and annual review requirements are specified in 10 CFR 20.1101 and program records in 10 CFR 20.2102.

The licensee may choose to use selected radiation protection policies and procedures in effect during the reactor operations due to their familiarity to the staff. Enhancements to the program in selected areas should be reviewed. For example, use of full protective clothing, alarming personnel dosimeters, respirators, whole body counting, and planned special exposures are not routinely used during research reactor operations but may need to be added to the program during decommissioning.

The DP should include an estimate of the total person-REM for the project. Licensee progress towards this goal should be reviewed to assess the effectiveness of ALARA efforts. Management support of and commitment to the ALARA program may be verified through a review of radiological planning and observation of work practices.

b. Requirements for radiation surveying, sampling and monitoring can be found in Subpart F of 10 CFR Part 20 and licensee procedures. Record keeping requirements can be found in 10 CFR 20.2103. Radiation protection personnel should be observed performing radiological surveys of high radiation areas, contaminated areas, and during on-going work. Survey techniques and equipment should conform to generally accepted practices. A review of records of radiation surveys, sampling, and monitoring activities will provide an indication that radiological conditions are adequately assessed. Independent radiological surveys and split sampling may also be performed by the inspector to confirm the accuracy of licensee data.

Radiological conditions will change significantly as highly activated components are removed, packaged, stored, and shipped off site. Frequent surveys should be completed during this work and area postings adjusted as necessary.

During the latter phases of the project, technicians will conduct surveys of residual contamination in support of license termination. These surveys will generally use more sensitive techniques and equipment than were used during decontamination and dismantlement due to the lower levels of radioactivity. The

inspector should review the equipment, survey techniques, and data reduction for conformance with licensee procedures and good practices. A thorough review of the final status surveys is performed using inspection procedure IP 69014.

c. An annual review of the radiation protection programs is required by 10 CFR 20.1101(c). A record of this review is required by 10 CFR 20.2102. The inspector should review the audit results and corrective actions with the RSO. All program areas may be audited annually, or if decommissioning extends over several years, selected areas are audited such that all aspects are reviewed after two or three years. Experience with past decommissioning indicate that unanticipated radiological situations will occur in spite of the care exercised during the radiological characterization stage. Therefore, reviews of program implementation and identification of needed improvements may be more frequent than specified in 10 CFR 20.1101(c).

   Radiological incidents should be recorded in accordance with licensee procedures. Corrective actions related to these incidents should be approved by the radiation safety officer (RSO) and the safety committee as specified in the DP.

d. A review of about 50 percent of the calibration records for portable instruments is an acceptable sample for this inspection requirement. Instruments should be calibrated at the specified intervals using the manufacturers recommended techniques. The calibration of fixed area monitors, laboratory analytical equipment, airborne effluent, and liquid effluent monitors, if required by the DP, should be verified as current. An operational check of portable equipment by the technician prior to its use is an accepted good practice.

e. Verify that facility personnel have been issued dosimetry and are wearing it as required. Multiple whole body dosimeters, finger rings, and wrist badges may be appropriate for certain work. Face shields or goggles may be used to protect the lens of the eye from beta radiation. If neutron sources or reactor fuel is handled, neutron dosimeters should be issued. The dosimetry processor must be National Voluntary Laboratory Accreditation Program (NVLAP) accredited in accordance with 10 CFR 20.1501. Verify that the licensee's methods for determining internal dose are in conformance with 10 CFR 20.1204. Review records for all workers and verify that internal and external doses are properly summed as required by 10 CFR 20.1202 and the TEDE dose is within limits specified in 10 CFR 20.1201.

f. Commensurate with item b. above, verify that area postings are kept up-to-date as decontamination and dismantlement progresses and radiological conditions change. Temporary storage of waste may create transitory radiation areas. Some areas will be de-posted after decontamination and remediation are completed. Verify that materials removed from the controlled area and containers of waste are labeled as specified in 10 CFR 20.1904. Posting of radiation, high radiation, very high radiation, airborne radioactivity, and radioactive material storage areas is specified in 10 CFR 20.1902.

g. Verify that only personnel authorized by the licensee will have access to the radioactive materials area. Installation of fencing, gates, and locks may be

required, depending on the site and need for staging or storage areas. For large sites, the NRC may authorize the unrestricted release of a portion of the site if the conditions specified in 10 CFR 20.1402 are satisfied. If reactor fuel and special nuclear material are still on-site, refer to the NRC approved security plan for detailed requirements.

h. The licensee's radioactive material control program is to ensure that licensed radioactive material is controlled in accordance with the requirements of 10 CFR Part 20. 10 CFR Part 20 does not contain release limits for the release of contaminated material to unrestricted areas; thus, the licensee's criteria should be that no detectable licensed radioactive material (radioactive gaseous and liquid effluents excepted) is released for unrestricted use or as waste into an unrestricted area. The licensee's equipment should ensure the radiation detection sensitivities are consistent with the NRC guidance contained in IE Circular 81-07 and IE Information Notice 85-92 for surface contamination and HPPOS-221 for volumetrically contaminated material. If applicable, radiation surveys for hard-to-detect radio nuclides that decay by electron capture should be as discussed in HPPOS-250. The licensee's radiation detection instrumentation should be used at its typical sensitivity level based on appropriate counting parameters (i.e., counting times and background radiation levels). The licensee should not establish a "release limit" by altering the instrument's typical sensitivity through such methods as raising the discriminator level or locating the instrument in a high radiation background area.

   Verify that practices to prevent the spread of contamination are effective. This may include painting or coating surfaces to fix any loose contamination. If protective clothing is used, workers should be trained in its use. Contaminated components should be wrapped before removal from the work area. The use of barriers, signs, and step off pads may be employed. Exit frisking of personnel and equipment should be in a low background area using sensitive monitors.

i. The inspector should verify that the general employee training (GET) remains an effective tool in assuring personnel and facility safety. This training, at a minimum, should incorporate the material in 10 CFR 19.12 through 19.16, and Part 20, facility security requirements, and emergency preparedness actions, if any. GET should be updated as required to reflect the current state of decommissioning and site organization. GET should include the information in RG 8.29 with periodic refresher training. An effective training program could also include, in part, safety evaluations, modifications, radiation protection, effluent controls, and design changes. Observe a pre-job safety briefing to verify that radiological hazards and protective measures are described to workers in detail. Full time job coverage by HP technicians may be appropriate for work crews with little prior nuclear experience. Note if briefings also include a discussion of industrial hazards and precautions.

j. Select a job with a potential for significant dose to the workers. Verify that ALARA techniques are effectively employed such as mockup training, special tooling, or use of robots. Assess the commitment to ALARA through discussions with workers and supervision. Review the percentage of work completion relative to

dose projections as described in the DP and discuss any anomalies with the licensee.

k. Many aggressive decontamination techniques, such as scabbling and grinding, will generate airborne radioactivity. Verify that engineering controls, such as vacuum systems, local high-efficiency particulate air ventilation, or wet working, are adequate to control airborne concentrations as required by 20.1701. Determine if airborne concentrations are monitored using the preferred method of breathing zone air sampling of workers. When individual respirators are used, verify that the respiratory protection program elements specified in 20.1703 are properly implemented following the guidance in Regulatory Guide 8.15 Rev 1 (October 1999). The protection factors afforded by respirators listed in 10 CFR 20 Appendix A may be used when calculating the internal doses to workers.

l. Review training records and verify that the information in RG 8.13 or a copy of the guide was provided to all fertile females and their supervisors. Declaration of pregnancy is voluntary and is required to be in writing; the declaration is revocable by the woman, who does not need to provide any "medical proof" of pregnancy. For declared pregnant workers, verify that the licensee's dose records conform to 10 CFR 20.1502 and guidance in RG 8.7 and RG 8.36. Confirm that the dose to the embryo/fetus (not to the worker) is within the limit specified in 10 CFR 20.1208

03.04 Effluent Control and Environmental Monitoring

a. Review the records for radioactive airborne releases to the environment since the last inspection and verify that the constraint limit (10 millirem/year) specified in 10 CFR 20.1101(d) was satisfied. If exceeded, verify that reporting was completed as specified in 10 CFR 20.2203 and the limits specified in 10 CF 20.1301 and 10 CFR 20 Appendix B, Table 2 were satisfied. Acceptable methods to estimate the dose from air emissions are described in Regulatory Guide 4.20, "Constraint on Releases of Airborne Radioactive Materials to the Environment for Licensees Other than Power Reactors." Of these methods, the computer program COMPLY (available free from EPA) is most often used.

Review records of radioactive liquid releases since the last inspection and verify that the limits in 10 CFR 20 Appendix B, Table 2, the TS or DP conditions were met. For releases to the sanitary sewer system, verify that the solubility and other requirements in 10 CFR 20.2003 were satisfied. Solubility assessment techniques can be found in Information Notice 94-07.

Review the most recent calibration results for the effluent radiation monitoring systems (RMS) and determine whether the licensee calibrated the RMS appropriately for: (1) the isotope mix (or average gamma energy); (2) concentration level; and (3) licensee procedures. The isotopic mix may be different from the normal mix found during reactor operations. Confirm that batch releases were properly sampled, analyzed, and authorized for release by the RSO or designated alternate. Verify that controls are effective in preventing releases through unmonitored release pathways.

b. Review the techniques used to implement the effluent releases ALARA program. This may include storage for decay, filtering, solidification of liquids, and other techniques as appropriate.

c. Verify that on-site and off-site environmental samples are taken at the locations and at the frequencies specified in the DP. Review the sample preparation and laboratory measurement techniques to verify that adequate sensitivities were achieved. Verify the measurement accuracy through the laboratory quality control program. Review the records and verify that the projected doses to the public from site activities were within the limits specified in 10 CFR 20.1301 and ALARA.

03.05 Change Control. Changes to the DP are likely when unanticipated events or conditions develop as dismantlement progresses. For example, contamination from a hidden leak may require significant additional decontamination and dismantlement efforts. In such a case, major changes may be required to the completion schedule, cost and dose projections, volume of waste, and the need for new procedures and specialized equipment. Verify that changes are identified, reviewed, approved, and recorded in accordance with the administrative process described in 10 CFR 50.59, and the DP or TS. The inspector should (1) assess the rigor of engineering and management reviews; (2) determine whether the proposed activities are bounded by the general decommissioning safety evaluation; and, (3) identify whether the changes, tests, or experiments are consistent with 10 CFR 50.59. NRC inspector/staff review of licensee safety evaluations are conducted after licensee management final approval and should be inspected prior to the activity occurring, if possible.

The safety review process used by a licensee during decommissioning should be comparable to the program in use during reactor operations. If a licensee enters into long-term storage and implements a 50.59 program that has not been exercised for a long period of time, the licensee may experience a loss of expertise in the conduct of the technical or safety reviews due to staff changes. Regardless, the inspector should assess whether the program: (1) reflects the licensee's current decommissioned organization and staffing configuration; (2) incorporates the most recent regulatory requirements and guidance; (3) applies appropriate management and technical reviews; and, (4) includes appropriate audit considerations to assure that safety questions, evaluations, and justifications are performed and documented.

03.06 Audits, and Reviews

a. Verify that the decommissioning safety committee members have the necessary knowledge and experience in areas important to decommissioning. For example, experience with oversight of contractors, radiological and industrial safety, and large volume waste handling and shipping become important. The composition and number of members on the committee should be adjusted by the licensee to deal with emerging issues as long as minimum staffing specified in the TS or DP is maintained. The required meeting frequency will be described in the TS or DP. However, meetings should be held as frequently as needed to support a timely decommissioning schedule.

b. The responsibilities of the decommissioning safety committee will be described in the TS, DP, and/or the committee charter. A performance-based assessment should be performed to assure that significant decommissioning activities are independently and effectively reviewed, as required by the DP, the TSs, and docketed commitments. The inspector and/or PM should observe the conduct of a safety review committee and assess the effectiveness of this review body at: (1) questioning risks and benefits and the technical adequacy of the particular activity; (2) providing an independent safety perspective; and, (3) contributing to plant safety through, in part, the incorporation of lessons learned and experience. Minutes of meeting can also be used to verify that the committee functions and oversight are as required. For example, committee concurrence with policy changes (but not specific work instructions) may be required. Observe a meeting if possible.

If periodic audits are performed, a review of the depth of findings, timeliness and thoroughness of corrective actions for identified concerns will indicate the effectiveness of the audit program.

c.. Management should evaluate audit and review findings, events, conditions, reportable occurrences, and other issues and problems that arise. Management response should be in writing and include a root causes analysis and effective corrective actions. Management response should meet schedule commitments. The response should clearly state the corrective action taken to prevent recurrence. In the event that corrective action can not be taken immediately, the response should include a scheduled date for initiation and completion of corrective actions. Management should report the status of corrective action to their management or to the safety review committee. Once complete, management should report on the effectiveness of the corrective actions. Management or the safety review committee should assess the effectiveness of the corrective actions. The licensee's program should provide contingencies for decisions by higher level management should an impasse be reached between the reviewing and responsible organizations.

03.07 <u>Emergency Planning</u>

a. The NRC-approved Emergency Plan required for reactor operations may be eliminated once the reactor fuel is removed from the site. However, response to emergencies involving radioactive materials and industrial hazards will continue to be required. For example, planning for response to a contaminated, injured worker or a fire in a radiation area is appropriate. Verify that emergency preparedness policies are documented, kept up-to-date, posted or otherwise made available to supervisors and workers. Emergency response during decommissioning may rely on support from off-site agencies. Verify that support agreements with the local fire department, police, ambulance service, and hospitals are current.

b. Drills and exercises may not be required by the DP or TS. If the licensee is required to conducts drills, verify that they are conducted at the required frequency and that emergency program weaknesses are identified and corrected. Review

the training programs and pre-job worker briefings and verify that the policies and procedures are disseminated and understood. Verify that emergency response equipment required by the DP and licensee's procedures is available and maintained.

Fire protection at the decommissioning facility can be part of the emergency response. The licensee should determine whether the quality and amount of fire prevention, detection, and mitigation features as described in licensing basis documentation are sufficient to ensure that decommissioning can be performed safely and that the spread of contamination can be minimized and controlled in event of a fire. Other licensee considerations could include strategies and/or systems specifically implemented for insurance and indemnity purposes. The inspector should focus on fire protection requirements as described in license requirements. These may include: (1) periodic updating of the licensee fire plan to reflect the status of decommissioning; (2) training; (3) conduct of fire fighting drills; and, (4) fire detection and suppression systems. Inspection emphasis should also be placed on ensuring that areas undergoing decontamination have fire detection and/or suppression systems capable of fulfilling their intended function. Verify that the fire protection program or plan addresses both transient and permanent fire loading conditions.

03.08 Solid Radioactive Waste Management and Transportation

a. The licensee may dispose of small quantities of LSA and SCO byproduct and activated waste by shipment to a disposal site for direct burial. This is usually the case for zero power reactors and AGN facilities. (Note that waste with a specific activity less that 0.002 µCi/g is exempt from 10 CFR Part 71 regulations by 71.10.) Disposal of larger quantities of waste will likely be arranged through a waste broker. The broker may provide services such as sorting, solidification, reclamation, decontamination ,volume reduction, metal melt, shipping containers, transportation, and ultimate disposal of waste at an off-site burial facility.

   Verify that the licensee has arranged for the disposal of the waste type, form, quantity, isotope mix, and mixed waste that will be generated during decontamination and dismantlement. Verify that the waste broker is licensed to accept these wastes in accordance with 10 CFR 20.2001.

b. Ropes and stanchions do not provide adequate control for temporary waste storage areas unless under constant surveillance. Review the management controls, policies, procedures and physical barriers that ensure the safe placement and removal of waste in temporary storage. Verify that waste is properly packaged, labeled, and inventoried while in storage. Confirm that radiation survey results and posting are current.

c. A graded approach to training is preferred. Review the content and depth of training provided to radioactive waste handlers. Review training, testing, or certification records of the workers and contractors. For training provided on site, review the credentials of the instructors. Review the management process to identify updates, regulatory changes, and provisions for retraining.

d. Verify that certified Industrial Packages (IP-1, -2, -3) are used to ship low specific activity and surface contaminated objects waste in accordance with 49 CFR 173.427. Dose rate and surface contamination limits for packages is specified in 49 CFR 173.441 and 443.The activity limits for use of Type A and Type B packages is specified in 49 CFR 173.431. Users of Type B packages and spent fuel casks (highway route controlled quantities) must have a letter from the NRC (NMSS) approving their quality assurance program. Review the implementation of the elements of the approved program. Additional inspection guidance in this area can be found in Inspection Procedure 86740.

e. Review the radioactive waste procedures and ensure that the responsibility for classifying (DOT and NRC criteria) and verifying the classification of waste is clearly assigned. Acceptable methods for identifying the isotopic mix and concentrations are needed to classify the waste include waste stream analysis, laboratory analysis of individual batch samples, or the site characterization report. Review the records for waste prepared for shipment and verify the classification is proper and the package labeled with the class as required by 10 CFR 61.57. Most waste is expected to be in the form of dry active waste (DAW). For mixed waste containing radioactive material mixed with chemical, toxic, biological, or gaseous agents not meeting the criteria in 10 CFR 61.56 for direct burial, verify that acceptable arrangements with a waste processor will allow disposal.

f. Review shipping manifests for completeness and accuracy of the data. Burial sites may impose restrictions in addition to NRC and DOT record requirements. Verify that the receiver is authorized to accept the shipment and acknowledges receipt. Records should also include the results of radiation surveys of the truck, incoming and outgoing inspections of the truck, placarding, and driver briefings for exclusive use shipments.

g. Documentation that the wastes were processed, controlled, stored, and transported in accordance with procedures that were qualified through a licensee's DP approved program. If procedures were modified by the licensee, under 10 CFR 50.59, determine the acceptability of the modifications via inspection of the licensee's records of the changes, including the safety evaluation for each change, to ensure that the changes did not result in a product that does not possess the long-term structural stability required by 10 CFR 61.56(b)(1). Additional guidance is in the most recent version of the NRC Technical Position on Waste Form.

69013-04 RESOURCE ESTIMATE

Inspection resources for this inspection procedure will vary from site-to-site based on NRC management's assessment of licensee performance. In addition, inspection resources will be dependent on the phase of decommissioning being implemented. It is estimated that during active periods of decommissioning approximately 24 onsite inspection hours will be needed to adequately assess and document licensee performance quarterly.

69013-05 REFERENCES

NUREG/CR-6204 Questions and Answers Based on Revised 10 CFR Part 20

NUREG/CR-5569 Health Physics Positions Data Base (HPPOS)

NUREG -1660 U.S. - Specific Schedules of Requirements for Transport of Specified Types of Radioactive Material Consignments (Note; Schedule Summary on page 7 is a useful compilation of shipping requirements.)

NUREG -1608 Categorizing and Transporting Low Specific Activity Materials and Surface Contaminated Objects

ANS - 15.19 Shipment and Receipt of Special Nuclear Material (SNM) by Research Reactor Facilities

NRC Inspection Procedure 86740 Inspection of Transportation Activities

NRC Information Notice No. 94-23; Guidance to Hazardous, Radioactive and Mixed Waste Generators on the Elements of a Waste Minimization Program

NRC Information Notice No. 92-72: Employee Training and Shipper Registration Requirements for Transporting Radioactive Materials

NRC Information Notice No. 85-92: Surveys of Wastes Before Disposal from Nuclear Reactor Facilities

END