

NRC INSPECTION MANUAL

MSTB

INSPECTION PROCEDURE 87142

SEALED SOURCES AND DEVICES (OTHER) USED IN MEASURING SYSTEMS, ANALYTICAL INSTRUMENTS, CALIBRATION AND CHECKING OF INSTRUMENTS, AND SIMILAR PURPOSES

Effective Date: 05/16/2022

PROGRAM APPLICABILITY: IMC 2800

87142-01 INSPECTION OBJECTIVES

- 01.01 To determine if licensed activities are being conducted in a manner that will protect the health and safety of workers and the general public.
- 01.02 To determine if licensed programs are being conducted in accordance with U.S. Nuclear Regulatory Commission (NRC) requirements using a risk-informed, performance-based regulatory approach.

87142-02 INSPECTION REQUIREMENTS

The review of the licensed activities will be commensurate with the scope of the licensee's program. The inspector's evaluation of a licensee's program will be based on direct observation of work activities, interviews with workers, demonstrations by workers performing tasks regulated by NRC, and independent measurements of radiation conditions at the facility, rather than exclusive reliance on a review of records. Additionally, the inspector should use a risk-informed approach to perform the inspection, such as choosing the activities that carry the highest risk to inspect first. This can help ensure that in cases of limited time with the licensee due to varying circumstances, the most risk-significant licensee activities are reviewed for each inspection.

"Sealed sources and devices (other)" includes all sealed sources, plated sources, foils sources, etcetera used independently or in a device, that are not inspected under other procedures. It also includes sealed sources under general licenses such as those in electron capture detectors (ECDs) and those which may be exempt from the requirements of a license, for which there is not a separate inspection procedure. The typical activities with sealed sources and devices (other) include uses in electron capture detectors for gas chromatographs; other gas and aerosol detectors such as chemical agent monitors and explosives detectors; x-ray fluorescence devices; ion mobility spectrometers; and a variety of sealed sources for other research, measurement, calibration and checking of instruments, and other purposes. Less common examples are clad depleted uranium used as shielding or ballast; plutonium/beryllium (PuBe) neutron sources for calibration, activation studies, or in a sub-critical assembly; mixed radionuclide calibration sources; and sources used in first responder training. Most licenses of broad scope possess and use a wide variety of these sealed sources and devices (other) for activities that require measurement and analysis; many limited scope licenses that perform

research and development (R&D), manufacturing and other activities also authorize such sealed sources and devices (other); and a few limited scope licenses may authorize only these sealed sources and devices (other).

In addition to the sealed sources and devices (other) that are possessed under the specific licenses, many similar sealed sources and devices are authorized by the general licenses in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 31; 10 CFR 40.22, 40.23, and 40.25; and 10 CFR 70.19. Other sealed sources and devices (other) possessed by specific licensees may be exempt from licensing pursuant to 10 CFR 30.11 through 30.22; and 10 CFR 40.11 through 40.14.

The structure and the emphasis of the inspection should be on the following risk modules that describe the outcomes of an effective radiation protection program for use of sealed sources and devices (other). Risk modules (RMs) are defined as program areas that present higher risk, or expected to effectively reduce risk, to health, safety, and security that are identified in each inspection procedure in order to focus inspection effort on these particular program areas. To consider an inspection complete, the inspector should review applicable RMs based on ongoing activities at the time of the inspection. The RMs that carry the highest risk components should always be completed to the best of the inspector's ability. Additional inspection elements that carry less risk can be found as an appendix to this inspection procedure. These additional elements are not required to be reviewed as part of a risk-informed inspection approach, but may be reviewed if the inspector has additional time, if the additional elements are related to safety issues identified in the RMs, or if multiple violations were identified through review of the following RMs.

02.01 RM-1: Observation of Activities

The inspector should observe a representative sample of the range of licensed activities that may be ongoing during the inspection, with emphasis on those of higher risk. If sealed sources and devices (other) are used at temporary job sites, observation of these activities is a high priority. This should include receipt, use, storage and transfer ordering sealed sources and devices (other), through the disposal or transfer of sealed sources and devices (other).

02.02 RM-2: Safety and Security of Sealed Sources and Devices (Other)

The inspector should observe a representative sample of facilities to determine if sealed sources and devices (other) are appropriately attended when in use or secured when in storage. If material is used at temporary job sites, the inspector should observe activities to transport, use, and secure materials at a job site. The inspector should observe if sealed sources and devices (other) are used or stored in the vicinity of other hazards or hazardous materials which could increase the risk of release of sealed sources and devices (other). The inspector should verify that the licensee has adequate inventory controls in place to ensure that all sealed sources and devices (other) are accounted for.

02.03 RM-3: Surveys for Contamination and Exposure Control

The inspector should observe licensee radiation workers perform leak tests or other surveys to ensure that 1)) the licensee staff performs adequate surveys and leak tests and 2) if the licensee analyzes their own leak tests or other survey samples, the

inspector should verify that the licensee has the necessary instrumentation, appropriately calibrated, to analyze leak test or other samples.

02.04 RM-4: Assessment of Dose to Workers and the Public

If monitoring is required, the inspector should review the results of dose assessment for the sealed sources and devices (other). Particular attention should be paid to verifying assessments of internal dose, if applicable, to ensure that appropriate procedures are implemented and results are accurate. The inspector should also review results of assessments of public dose due to use of sealed sources and devices (other).

02.05 RM-5: Management Oversight

For most sealed sources and devices (other), the Radiation Safety Officer (RSO) is usually an ancillary duty for a research scientist, or an industrial hygienist in the safety office, who require the support of upper management for resources and implementation of the radiation protection program. The inspector should inspect the effectiveness of the management of the sealed sources and devices (other) radiation protection program, and the communication between the RSO and management, and the RSO and users of the sealed sources and devices (other); and the overall management of the radiation protection program.

87142-03 INSPECTION GUIDANCE

General Guidance

The following inspection guidance is designed to assist the inspector in evaluating the performance of the licensee's radiation safety program. The guidance is organized by the individual risk modules described above; however, this does not mean that the risk modules should be reviewed in this specific order. Instead, the inspector should use a risk-informed approach to decide which of the risk modules to inspect first. This is likely going to be predicated upon what licensed activities are ongoing when the inspector arrives at the licensed facility. Furthermore, inspectors should not feel constrained by the guidance in this procedure. If an inspector obtains information that indicates that a problem may exist in an area within the NRC's jurisdiction that is not specifically addressed in this procedure, the inspector should redirect, or otherwise expend, inspection effort to address that problem.

An examination of the licensee's records should not be considered the primary part of the inspection program. Rather, observations of activities in progress, equipment, facilities and use areas, etc., will be a better indicator of the licensee's overall radiation safety program than a review of records alone.

Inspectors should be aware that some information, such as dose to workers, can be reviewed only through records. However, use of most sealed sources and devices (other) rarely result in doses that require monitoring. All inspections require some review of records which supplement the direct observations and discussions.

- Priority should be given to examination of records that are closely related to health and safety, such as incident reports, and leak tests. Look for licensee identification of issues and resulting corrective actions taken.

- Physical inventory records may also be examined closely to assess the licensee's ability to track items and prevent losses. Other records which support the radiation protection program, such as receipt and transfer of sealed sources and devices (other), training, audits and radiation protection program reviews, may be reviewed by random sampling and cross-checking until the inspector is satisfied that the records are being maintained and are correct. The inspector may examine records more thoroughly if necessary, to determine the extent of a suspected problem.

Common elements to all inspections include entrance and exit meetings with appropriate licensee management, including the RSO, observations of facilities and work in progress, independent confirmatory surveys, and the evaluation of program scope and any special license conditions. Specific guidance regarding these common elements can be found in IMC 2800.

Each of the following elements should be reviewed, as appropriate, during each inspection of a license using sealed sources and devices (other).

Specific Guidance

03.01 RM-1: Observation of Activities

The primary inspection activity for sealed sources and devices (other) should be the observation of activities in progress. Observation begins as soon as the inspector arrives at the licensee's facility or the temporary job site. The inspector should be alert for postings or other indications that sealed sources and devices (other) may be in use as the inspector walks through the facility to meet with the RSO.

Commonly used sealed sources and devices (other) authorized on a specific license include: a wide variety of calibration and reference sources typically containing nanocuries to millicuries of byproduct, source, and/or special nuclear materials; electron capture detectors (ECDs) containing a 15-20 millicurie of Nickel63 (Ni63) source, used in some gas chromatographs (GCs); other chemical agent monitors or detectors containing Ni63 or Americium241(Am241) sources; portable x-ray fluorescence (XRF) analyzers typically containing Cobalt57 (Co57), Iron55 (Fe55), and Cadmium109 (Cd109) source; Mossbauer spectrometer sources containing millicuries of Co57, Fe55 sources; and others. Sealed sources and devices containing millicurie and curie quantities of Co60, Cesium-137 (Cs137), Californium252, Plutonium/Beryllium (PuBe), Americium-241/Beryllium (Am-241/Be) and other gamma and/or neutron emitters, although less common, are included in this inspection procedure unless they are under other specific inspection procedures, such as the procedures for inspection of fixed gauges (IP 87124), portable gauges (IP 87139), and self-shielded irradiators (IP 87143).

Common sealed sources and devices possessed under a general license by persons who also hold specific licenses include various calibration and reference sources; liquid scintillation counters containing Cs-137 or Radium-226 (Ra-226) reference sources, EXIT signs containing 10 to 20 curies of Tritium (H-3), XRF devices; various Ra-226 items; and static eliminators containing Polonium-210 (Po-210). If time permits, or if the inspector identifies potential problems with the storage and use of sources and devices possessed under a general license, inspectors may review the applicable general license requirements. [10 CFR Part 31; 10 CFR 40.22; 40.25; and 10 CFR 70.19]

Common sealed sources and devices that are exempt from licensing but may be found during inspection of specific licenses include: a variety of calibration and reference sources; smoke detectors containing 1 microcurie Am-241; other gas and aerosol detectors containing Ni-63 or Am-241; timepieces, compasses, or other instruments with luminous tritium or radium dials; static eliminators; electron tubes; ceramic and glass items containing uranium; lenses containing or coated with source material. Inspectors need to be aware of these sources and devices in order to treat them appropriately. Inspectors should be aware that there are no requirements for these items so long as they were distributed to the persons as required; are used as intended; and are not modified (in which case, a specific license would be required). [10 CFR 30.11 through 30.22; and 40.13]

Note: The inspector should be aware that sealed sources and devices (other) may be used with, or in the vicinity of: biological hazards such as viruses, microbes, nanoparticles, etc.; chemical hazards such as strong acids or bases and compounds that may be skin or lung irritants or otherwise harmful; other ionizing radiation hazards such as state-regulated radionuclides and x-ray producing devices; non-ionizing radiation hazards such as lasers; physical hazards such as high-voltage equipment, sharps (needles, scalpels, etc.) and other industrial hazards. The inspector should follow the licensee's safety requirements in all areas.

Some areas may require special training prior to entry, and the inspector should be prepared to take the training or to conduct the inspection through alternate means. In rare instances, due to the nature of the associated hazards, the inspector may be prohibited from entry and must conduct the inspection through alternate means than direct, in-person observation. In addition, there are areas in some government agency facilities that may require a specific security clearance for entry, but this should be known prior to the inspection and appropriate means of inspection planned.

The activities to be observed should be selected based on the types, forms and quantities of materials being used; 2) the activities being performed; and 3) the size of the program.

The inspector should visit a reasonable number of facilities where sealed sources and devices (other) are used and stored. Sampling should be risk-informed by the type of activity and the number of facilities performing that activity. If the inspector identifies a suspected problem, the sample size may be increased to determine the scope of the problem.

The inspector should observe licensee staff using sealed sources and devices (other) at a temporary job site if that is authorized by the license. This may require additional inspection effort on another day at another location.

During any walk through the licensee's facilities, and considering the types of materials authorized to be possessed and used, the inspector should:

- Observe if facilities for use and storage of sealed sources and devices (other) are appropriately secured or attended, and if postings are appropriate. Inspectors should be aware that devices which contain sources may have required labels on the back of the device; on the source inside the device; and/or that no posting or labeling

of the device is required. [10 CFR 20.1901 through 20.1905; 10 CFR 32.15; 10 CFR 32.19; 10 CFR 32.21a; 10 CFR 32.25; 10 CFR 32.29; 10 CFR 32.32; 10 CFR 40.53 and 40.55; and 10 CFR 70.39]

- Observe radiation workers using licensed materials. If there is no use at the time of the inspection, a demonstration of selected activities may be requested. Watch for appropriate handling and use of sealed sources and devices (other); if applicable, look for use of protective equipment and dosimetry.
- If applicable, observe leak tests being performed or demonstrated. Watch for: appropriate equipment and technique for obtaining the leak test sample; appropriate location of sample collection; and appropriate handling of the sample.
- Interview licensee radiation workers, and selected ancillary persons working in the vicinity of sealed sources and devices (other). Ask questions to determine their understanding of radiation safety practices applicable to their tasks.
- Keep the inspector's survey meter on (but with the audible response turned off if walking through public areas where persons unfamiliar with radiation detection may become concerned) and observe if radiation levels are as expected. If unusual or unexpected radiation levels are detected, discuss them with the RSO and staff.
- Conduct surveys and make comparative measurements with licensee staff where appropriate.
- The inspectors should be aware that some records of interest will be maintained in work areas where sealed sources and devices (other) are used and may be reviewed while at those locations. Typical records in work areas for sealed sources and devices (other) are inventory records, and in some cases, "use logs" or other check-out/check-in documentation.

03.02 RM-2: Safety and Security of Sealed Sources and Devices (Other)

During the inspection of sealed sources and devices (other), the inspector should observe licensee oversight of the safety and security of the items.

- If the sealed sources and devices (other) have the potential to cause measurable exposure, the inspector should review the adequacy of shielding and other methods to maintain doses ALARA for workers, and for the public. If such sources are used at temporary job sites, the inspector should review the adequacy of transport and storage containers used in the field. [10 CFR 20, subparts C, D, F, G, and J]
- The inspector should observe how the radiation workers maintain security of licensed material at the various locations where sealed sources and devices (other) are used (attended) and stored (locked or secured to prevent access), with particular attention to security at temporary job sites. The inspector should discuss licensee practices to protect public access to sealed sources and devices (other) at temporary job sites as well as at the licensee's facility. [10 CFR 20.1801, 10 CFR 20.1802]
- During the inspection the inspector should observe if sealed sources and devices (other) are appropriately labelled. Labelling requirements will be different if a sealed source or device is possessed under a specific license, a general license, or if

exempt from the requirements of a license. [10 CFR 20.1901 through 20.1905; 10 CFR 32.15; 10 CFR 32.19; 10 CFR 32.21a; 10 CFR 32.25; 10 CFR 32.29; 10 CFR 32.32; 10 CFR 40.53 and 40.55; and 10 CFR 70.39]

Inspectors commonly observe small sealed sources and portable devices stored in locked cabinets or storage closets. Larger non-portable devices, such as gas chromatographs or liquid scintillation counters, are usually located in locked laboratories. Inspectors have identified unattended licensed material when staff left the room for some reason; and unlocked doors or doors propped open where materials are used or stored and unattended.

- During the inspection of areas where sealed sources and devices (other) are used or stored, the inspector should observe if other hazards are present in that could affect the safety and security of sealed sources and devices (other). The inspector should discuss such safety and security concerns with licensee staff if it appears that safe use and storage of sealed sources and devices (other) would be compromised by other hazards.
- During the inspection, the inspector should review and discuss, with the RSO and authorized users at a program using sealed sources and devices (other), the licensee's procedures for tracking sealed sources and devices (other) received, used, stored, and transferred or disposed.

Inspectors should request a current inventory of sealed sources and devices (other) in order to:

- Verify that the quantities of sealed sources and devices (other) actually possessed (in use, storage and waste) are within the license limits. Some sealed sources and devices which are under a general license, or exempt from licensing, contain limits per source, per device, or total possession according to the applicable regulations. [10 CFR 30.15; 10 CFR 40.13, 40.22; and 10 CFR 70.19]
- The inspector also may review selected records of receipt, inventory, transfer and disposal to determine the typical types and quantities of sealed sources and devices (other) used, and to identify unusual types or quantities that may merit additional inspection.

The inspector should determine if the licensee's inventory includes sealed sources and devices (other) possessed under a general license, and those that are exempt from the requirement of a license. The inspector should discuss with the licensee how they determine which sources are specifically licensed, or under a general license, or are exempt from licensing. [10 CFR Part 31; 10 CFR 40.22 and 40.25; and 10 CFR 70.19 (general) and 10 CFR 30.11 through 30.22; and 10 CFR 40.13 (exempt)]

- A routine physical inventory is required by license condition for those sealed sources and devices (other) under a specific license, and by regulation for some sources and devices under general licenses [10 CFR 31.5, 10 CFR 40.22]. If there are multiple sealed sources and devices (other), the inspector should select a sample of the items, and go to the areas where the selected samples are located to physically verify that the selected samples are present at the licensee's facility. If fewer than

100 items are possessed, at least 5 to 10 items should be selected. If more than 100, then 5 to 10 percent of the items is suggested as a reasonable sample. If the licensee maintains sources or devices secured using tamper-seals, the inspector should not require the licensee to open the tamper-seal so long as it is correct for that storage location.

- The inspector should use good ALARA practices in determining if “eyes on” the actual source is required. The inspector should avoid placing licensee staff or the inspector in situations that could lead to unnecessary exposure.
- The inspector should have the licensee handle the licensee’s sources in order to observe the licensee’s implementation of safe handling procedures. This also avoids the potential for the inspector to mishandle, drop, or otherwise damage the licensee’s sealed sources and devices (other).
- If the licensee transfers and ships sealed sources and devices (other) to other sites or other licensees, or as waste, the inspectors should review applicable transfer requirements in 10 CFR, and packaging and shipping requirements under the Department of Transportation. See Inspection Procedure 86740. Transfer and disposal of sealed sources and devices under a general license also have regulatory requirements. [10 CFR 30.34(h), 30.41, 30.51; 10 CFR Part 31; 10 CFR 40.22, 40.25, 40.61; and 10 CFR 70.19, 70.42, and 70.51]

Inspectors have identified licensees who lost sealed sources and devices (other) (permanent loss, and temporary loss due to borrowing of sealed sources and devices (other) among licensee staff); found sources that they were unaware had been lost, or unaware that licensee staff had acquired them; were unaware of the presence of sealed sources and devices (other) under a general license, or exempt from licensing, but were acquired by licensee staff and present at the facility; and did not include in the inventory of sealed sources and devices (other) awaiting disposal.

Inspectors have identified incomplete or incorrect transfer and shipping procedures, usually because these licensees do not perform these activities often enough to understand all requirements. Inspectors identified a licensee who used unshielded sources at temporary job sites in moving vehicles as part of training exercises at private locations, but then did not properly package and ship them when on public roads.

Inspectors have identified licensees who were unaware of the requirements of the general licenses applicable to the sealed sources and devices (other), therefore identified sources that had not been tested for leakage; were inappropriately modified without authorization; or were inappropriately transferred.

Inspectors have identified licensees who were unaware of the requirements for distribution of materials to persons who are exempt from licensing and possessed items the licensee incorrectly believed were exempt. Inspectors have identified licenses who inappropriately modified sources and devices that were exempt from the requirements of a license.

03.03 RM-3: Surveys for Contamination and Exposure Control

If the sealed sources and devices (other) have the potential to cause measurable exposure, radiation surveys may be performed to determine exposure levels in adjacent public areas, during routine and non-routine maintenance activities, or as required by license condition. The inspector should exercise judgement in determining the extent of inspection of radiation surveys, depending on the types of sources possessed by the licensee. If only low-risk sources are possessed, then this RM may be considered as Supplemental Information.

Leak tests are required by license condition and are the most common survey performed of sealed sources and devices (other) to confirm control of contamination. Although it is uncommon for leakage from most types of sealed sources and devices (other), leakage has been identified from sources in ECDs, if carrier gases cause corrosion of the source or if the temperature control malfunctions so that the ECD becomes too warm. Contamination had been identified when licensees cleaned sealed sources or devices with caustic or corrosive agents, especially if the sources were in the form of foils or plated sources. Plated sources have caused contamination if leak tests are performed incorrectly. If the sealed sources and devices (other) are unlikely to cause doses that could lead to exposure of workers or to members of the public, and are unlikely to leak, then this Risk Module may be considered as Supplemental Information.

If licensees analyze their own leak tests, then that part of this Risk Module should be reviewed.

Persons who perform leak tests or other surveys for contamination and exposure control should be observed performing or demonstrating a leak test procedures. The level of detail of observations, discussions and review of records of surveys and the instrumentation used for these surveys and analyses will depend on the types, forms, and quantities of sealed sources and devices (other) actually used since the last inspection as well as the level of sensitivity necessary for the surveys.

- If applicable, observe licensee staff perform (or demonstrate) area radiation level surveys and/or leak test surveys for contamination control.
 - If the licensee analyzes their own leak test samples, observe and discuss their method of analyzing the samples and determining the level of leakage. Most licensees will commit to the Model Leak Test Program contained in the NUREG-1556 series documents or will have submitted alternate procedures for approval during licensing.
 - Observe if appropriate instrumentation, typically liquid scintillation counters, gamma counters, or alpha/beta counters, are available for leak test sample analysis. Discuss with licensee staff how the analytical instrumentation is calibrated.
 - Confirm that the licensee follows their approved procedures for performing leak test analyses. Confirm that the licensee has determined the sensitivity of the counting system and can detect leakage at the required sensitivity level for the radionuclides of concern. [A method of determining counting efficiency and system sensitivity is included in the Model Leak Test Program.] [10 CFR 20.1501]

- If leaking sources were detected, confirm that the sources were withdrawn from use and disposed of properly; and that surveys were performed to determine the extent of any contamination of facilities or personnel from the leaking sources.
- If the sealed sources and devices (other) possessed require monitoring for radiation levels, observe if appropriate portable instruments (such as a meter with a Geiger- Müller (GM) or low-energy gamma (LEG) detector, or ion chamber or microR meter) are readily available and operable. Observe if staff use instrumentation properly and discuss if the instrumentation is used for qualitative (detection) or quantitative (measurement) purposes. Perform comparative measurements with portable instruments to determine if instruments are operating correctly. [10 CFR 20.1501]
- If applicable, review a sample of leak test results and survey records to evaluate the typical levels of exposure and/or contamination, how often action levels are exceeded, and the licensee's response to exceeding action levels.

Inspectors have identified licensee staff using inoperable instruments; using the wrong scale or misreading the scale; performing surveys too quickly or at too great a distance from surfaces; using instruments or performing analyses not sensitive to, or not calibrated for, the radionuclides being used. Inspectors have identified inappropriate equipment, such as using a GM detector for evaluation of leak test samples for low-energy beta emitters; inoperable equipment with no batteries or corroded batteries in the survey meter; uncalibrated equipment used for measurements; measurements made that do not meet required minimum sensitivity; calibrations performed improperly; and incorrect factors provided in software resulting in incorrect results.

03.04 RM-4: Assessment of Dose to Workers and the Public

The typical activities with sealed sources and devices (other) result in doses less than 10 percent of limits for workers or the public; therefore, this risk module may be considered a supplemental area of inspection. However, some specialized activities, as well as incidents or events, have the potential to cause doses that require monitoring of workers, or may exceed the public dose limits. If worker doses are not required to be monitored, and public doses are not likely to be exceeded, this Risk Module may be considered as Supplemental Information.

Inspectors should review dose assessments for radiation workers required to be monitored, or in response to any events. This may be done anytime during the inspection and will require review of records and interviews.

- External radiation monitoring:
 - If applicable, during the inspection, observe how radiation workers use the dosimeters and where they are stored. If applicable, observe staff performing surveys of their work area.
 - If applicable, review records of external monitoring results with year-end totals for the past 3 years, and a sampling of records from dosimetry wear periods throughout the most recent year. Look for unusual or unexpected doses; missing

dosimeters in various wear periods; and actual frequency of exchange. Interview staff to determine what follow-up activities were performed. [10 CFR 19.13, 10 CFR 20.2106]

Inspectors have identified some licensees who ignore lost dosimeters and do not account for dose to the worker for that wear period; unusual doses due to incorrect storage of the dosimeter, which then requires adjustment of the dose record of the individual; and use of dosimeters incorrectly by radiation workers [dosimeter not worn; finger rings worn on wrong hand; dosimeters stored near radiation sources; spare dosimeters used by multiple persons; etc.] Inspectors have identified staff performing poor or incorrect contamination surveys.

- Internal Monitoring is rarely applicable. However, events have occurred resulting in internal dose to radiation workers and to members of the public, typically with sealed sources in the form of glass ampules containing liquid or powder forms of licensed materials or licensed materials adsorbed onto a powder. Broken sources have resulted in skin contamination and internal doses to radiation workers or members of the public. If internal monitoring was required, see IP 87141 for guidance on inspection of internal monitoring. [10 CFR 20.1201 through 20.1208; 10 CFR 20.2104, 20.2105, 20.2106]

Inspectors have identified events with broken, ruptured or leaking sealed sources and devices (other), where the source was contained and disposed of, but the event was not assessed to determine if any workers had skin contamination, external or internal exposures.

03.05 RM-5: Management Oversight

A typical program using sealed sources and devices (other) is required to have an RSO that performs activities as required by the license commitments. Important activities include developing and implementing the radiation safety procedures; responding to events with sealed sources and devices (other); and reviewing the radiation protection program to ensure it is effective and to identify areas where improvement is needed.

- The inspector should interview licensee staff, including management representatives, to understand:
 - the licensee's organization and management of the persons who implement the radiation protection program and the persons who use and store licensed materials;
 - the level of involvement of licensee management in oversight of the radiation protection program;
 - the relationship and authority between the RSO, and the authorized users, and licensee management; and
 - how the RSO ensures that the inventory of licensed materials meet the license limits.
- The inspector should interview the RSO and other licensee staff to determine if the RSO is conducting oversight activities as required license commitments. The

inspector should determine if the RSO seeks out areas for improvement; responds to events; takes corrective and preventive actions; and implements improvements.

- The inspector should read all the annual radiation program reviews for at least the past 3 years and discuss the activities by the licensee staff that support the annual review of the radiation protection program. The inspector should review other licensee actions to identify problems, take corrective actions, and implement preventive measures. The inspector may review selected records of these activities. [10 CFR 20.1101 and 10 CFR 20.2102]
- The inspector should review the records of incidents and events since the last inspection. The inspector should determine if any of the incidents and events were reportable or could have resulted in doses in excess of limits to workers or the public. Actual events have occurred with sealed sources in the form glass-encapsulated liquid solutions of Am-241, glass-encapsulated Pu in powder form, and multiple examples of broken tritium EXIT signs. Interview licensee staff members to determine if any incidents or events occurred since the last inspection. If so, determine if the incidents or events involved exposure to workers or to members of the public. Through interviews and records review, determine if the licensee took prompt and effective corrective actions, and performed sufficient investigation to determine the extent of contamination, assess doses, identify the cause, and prevent recurrence. [10 CFR Part 20, Subpart M; 10 CFR 30.50; 10 CFR 40.60; and 10 CFR 70.50]

Inspectors have identified licensees who were unaware of various reporting requirements and did not report required events.

87142-04 RESOURCE ESTIMATE

The length of time necessary for this inspection will depend on three major factors:

1. The number and types of sealed sources and devices (other) quantities and forms of sealed sources and devices (other) authorized on the license;
2. The range of activities performed with the sealed sources and devices (other), along with the range of activities able to be observed during the onsite inspection; and
3. The scope of the licensed program, including the number of locations (buildings or laboratories) in which sealed sources and devices (other) are used; the number of radiation workers using the sealed sources and devices (other); and the frequency of activities performed with the sealed sources and devices (other).

A typical inspection of a license authorizing only sealed sources and devices (other) may take a single inspector 1 to 2 hours to complete if fewer than 10 items are possessed. Inspection of typical licenses that possess and use tens to hundreds of sealed sources and devices (other) may take 2 to 4 hours total time to inspect the sealed sources and devices (other). Inspection of licenses that possess and use hundreds to thousands of sealed sources and devices (other), such as some Department of Defense licenses, may take 4 or more hours, depending on the types of sealed sources and devices (other) possessed, the range of activities with them, and the number of locations and number of authorized users under the program.

87142-05 REFERENCES

A listing of IMCs and IPs, applicable to the inspection program for materials licensees, can be found in IMC 2800. These documents are to be used as guidelines for inspectors in determining the inspection requirements for operational and radiological safety aspects of various types of licensee activities.

END

Appendix:

Appendix A: Additional Inspection Elements

Attachment:

Attachment 1: Revision History for IP 87142

Appendix A: Additional Inspection Elements

87142A-01 PURPOSE

The guidance in this Appendix is intended to supplement inspection requirements and associated guidance provided in this procedure. The additional inspection guidance provided herein may be used as time allows or to assist in completing a rounded performance-based inspection.

87142A-02 BACKGROUND

Risk modules are defined as program areas that present higher risk, or expected to effectively reduce risk, to health, safety, and security that are identified in each inspection procedure in order to focus inspection effort on these particular program areas. The risk profile for each licensed program could be different and some programs may need more in-depth review. Therefore, the additional inspection elements included herein may be used to expand the scope inspection effort and/or supplement the risk modules in this procedure.

87142A-03 GUIDANCE

03.01 Facility Security

Through direct observation, determine that all entrances to licensee facilities are normally closed, locked or otherwise secured to prevent unauthorized entry. This should include main facility gates, main building entrances, doors to waste storage facilities, etc.

- Through observations, verify that use and storage areas are locked and have limited and controlled access. At a minimum, radioactive material use areas should be under constant surveillance during normal business hours when licensee personnel are present or physically secured against unauthorized access. Storage areas should be physically secured when unattended.
- Evaluate licensee practices regarding access controls including control of keys and access codes to ensure only currently authorized individuals have access to sealed sources and devices (other).
- Ensure licensee practices include testing of interlock systems, as applicable. (such as for hot cells)

If the inspector finds any entrance or area to be unsecured, the inspector should determine, through questioning of licensee staff, the reason for the area or entrance being unsecured. The inspector should determine if the licensee failed to follow established procedures in securing the area or if additional training of staff is needed. The inspector should determine if the licensee's facility is configured to separate working areas from unrestricted areas.

03.02 Receipt and Transfer of Sealed Sources and Devices (other)

- a. Through observations and interviews of licensee personnel, verify that the licensee: 1) properly secures package receipt areas, such as loading docks or other shipping and

receiving areas; 2) inspects packages for damage; 3) performs appropriate package receipt surveys; 4) opens packages in a safe manner; 5) assures that packages are properly prepared for transport; and 6) controls packages in a secure manner prior to pickup by courier personnel or transport by licensee personnel. If the inspector is unable to observe the receipt of packages, the inspector should request that personnel who normally receive packages for the licensee demonstrate package receipt processes and surveys.

1. If packages are left unattended, the inspector should assess the licensee's receipt procedures, including instructions provided to couriers, to assure that packages are being delivered to the appropriate location(s).
 2. If surveys of packages (whether during receipt or preparation for shipment) are not adequate to verify that radiation and contamination levels are within regulatory limits, the inspector should interview licensee staff and the radiation safety officer (RSO) further to assess worker knowledge. Deficiencies regarding instrumentation should be reviewed in more depth.
- b. Through interviews of licensee personnel and review of selected transfer documentation, verify that the licensee has an adequate method of determining that recipients of radioactive shipments are licensed to receive the forms and quantities of such materials.

03.03 Comprehensive Safety Measures

The inspector should be attentive to potential industrial safety hazards, for referral to the U.S. Department of Labor's Occupational Safety and Health Administration (see Manual Chapter 1007). The focus should be on potential non-radiological hazards personally observed or brought to the inspector's attention by licensee staff.

- a. Operational Limits. Through observation, discussions with licensee staff and review of product specification information, verify that the licensee operates process equipment within the equipment manufacturers or industry consensus operational limits. Such limits may include temperature, humidity, vibration, or radiological considerations. In addition, such equipment may be subject to periodic preventative maintenance requirements/recommendations. If so, verify that such maintenance is performed. For example, gas chromatographs should include a temperature control system to keep the Ni-63 foil below the temperature at which it is released from the foil source.
- b. Industrial/Chemical Hazards. Verify that the licensee controls the use/storage of hazardous (corrosive or combustible) chemicals near process equipment which could degrade their performance or render safety features inoperable. If the licensee is required to implement an emergency plan, verify that the plan includes these hazards, as appropriate, as initiating events. For example, licenses have cleaned sealed sources with harsh or acidic solutions, resulting in release of licensed materials from foil or plated sources.
- c. Fire Protection. In many cases, the risk posed to radiological safety by fires is comparable to or exceeds the risk from other events involving licensed activities. During the course of inspection of the licensee's facilities, the inspector should be alert to potential fire hazards. An effective licensee fire protection program should (1) prevent fires from starting, (2) rapidly detect, control, and extinguish those fires that do occur, and (3) provide protection for structures, systems, and components important to safety

so that a fire that is not promptly extinguished by fire suppression activities will not prevent the licensee from taking actions to safely control licensed material and prevent the spread of contamination and unnecessary exposures to workers or the public.

Through observation and discussion with the licensee, while touring the facilities, assess firesafe conditions and equipment, i.e., that: (1) work areas are generally uncluttered and free of combustible debris, (2) incompatible materials (i.e., materials labeled as “corrosive”, “flammable”, or “oxidizer”) are isolated from each other and enclosed by fire resistant barriers, (3) fire detection systems are operable, (4) fire suppression systems are operable, (5) portable fire extinguishers are unexpired (check maintenance tags), (6) electric switches and electric motors are explosion-proof, arc welders or open flames are administratively controlled in work areas that also contain flammable or combustible liquids or gases or highly reactive chemicals, and that (7) the local fire department is involved with the licensee’s fire protection program.

Problems/deficiencies noted by the inspector should be promptly brought to the licensee’s attention and discussed with Regional management. Additional guidance for reporting fire protection concerns can be found in IMC 1007 “Interfacing Activities Between Regional Offices of NRC and OSHA.”

- d. Natural Hazards. Depending on the licensee’s geographic location, it could be susceptible to natural hazards, such as tornadoes, flooding, and earthquakes. Verify that those licensees have considered the impact of such hazards in the design and modification of areas critical to safety; the selection and location of facilities for the storage of large quantities of radioactive materials, including radioactive waste storage facilities; and in the development of emergency procedures and contingency plans, when applicable.

03.04 Transportation

Verify that the licensee's procedures and documentation are sufficient to ensure that licensed material is packaged and transported (or offered for transport) in accordance with 10 CFR Part 71 and U. S. Department of Transportation (DOT) regulations for transportation of radioactive materials.

- Observe the preparation of radioactive materials for shipment. Verify that the proper packaging is used for the type of materials/devices shipped. Verify that the licensee properly marks and labels packages in accordance with DOT requirements. Verify that the licensee performs appropriate examinations to confirm that package radiation and contamination levels are within applicable DOT limits prior to offering them for transport. Verify that proper shipping papers are prepared for each package/shipment and that, if necessary, the licensee maintains and offers appropriate placards to common carriers. Examine any incidents that were required to be reported to the DOT.
- If the licensee tests and certifies its own DOT Type A packaging materials, review test procedures and required certification documentation for selected packages. Verify that the packaging materials are used in the same or similar configurations as in their certification testing.

- Verify that any DOT Type B containers are used in accordance with their Certificates of Compliance (COCs) issued by the NRC. The licensee must maintain copies of the COCs for the packages that it has used and ensure that it follows the instructions and limitations of the COCs when preparing the packages for shipment.

For further inspection guidance refer to IP 86740, "Inspection of Transportation Activities." Inspectors should also refer to "[Hazard Communications for Class 7 \(Radioactive\) Materials](#)." These field reference charts, related to hazard communications for transportation of radioactive materials, are useful field references for determining compliance with the transportation rules on labeling, placarding, shipping papers, and package markings. They also contain references to the DOT regulatory requirements.

03.05 Waste Management

- a. Waste Storage and Disposal. Verify that the small sealed sources and devices considered to be waste are protected from fire and the elements, that package integrity is adequately maintained, that the storage area is properly ventilated, and that adequate controls are in effect to minimize the risk from other hazardous materials. Verify that the licensee has appropriate methods to track the items in storage.

Inspection effort should be directed at verifying that written procedures have been established in a manner approved by management. The procedures should be readily available to any persons having responsibility for low-level waste classification and preparation for transfer of such wastes to land disposal facilities.

For licensees who have implemented an interim waste storage program, verify that the program is consistent with the license. For further guidance on interim waste storage, see Information Notice 90-09, "Extended Interim Storage of Low-Level Radioactive Waste by Fuel Cycle and Materials Licensees."

Examine monitoring systems. Review and evaluate a sample of the procedures and other administrative and physical controls for the release and disposal of radioactive waste. The inspector should determine whether radioactive material labels have been removed or defaced from discarded materials, being careful to not endanger him or herself to biological, chemical, or physically hazardous waste (e.g., sharp objects). Ensure that wastes prepared for shipment to a disposal site comply with applicable standards and regulations regarding chemical and physical form, stability, type of container, and labeling. Also ensure that the licensee implements an adequate QC program as required by Appendix F of 10 CFR Part 20 to ensure compliance with applicable regulations.

For further inspection guidance, refer to IP 84850, "Radioactive Waste Management-Inspection of Waste Generator Requirements of 10 CFR Part 20 and 10 CFR Part 61."

03.06 Reports to Workers

10 CFR 19.13(b) requires that each licensee shall advise each worker annually of the worker's dose, as shown in dose records maintained by the licensee. Verify, through discussions with workers and management, and through records review, that the licensee has advised workers of their doses annually. The licensee must advise all workers for whom monitoring is required (and, therefore, dose records are required).

The licensee must advise these workers of internal and external doses from routine operations, and doses received during planned special exposures, accidents, and emergencies. The report to the individual must be in writing and must contain all the information required in 10 CFR 19.13(a).

03.07 ALARA

The licensee should, in addition to complying with regulatory requirements and license conditions, make reasonable efforts to maintain radiation exposures and releases of radioactive materials in effluents to unrestricted areas ALARA. This can be accomplished by the implementation of good radiation planning and practices, and by the commitment, from management and workers, to policies that prevent departure from ALARA practices. Also, licensees are required to keep occupational doses and doses to members of the public ALARA, in 10 CFR 20.1101(b).

Assess the licensee's ALARA practices, and verify implementation of any ALARA commitments in licensing documents, by reviewing:

- (a) A written commitment by high-level management to minimize worker exposure by the implementation of clearly defined procedures and policies;
- (b) That licensee personnel are made aware of management's commitment to keep occupational exposures ALARA;
- (c) That the radiation safety staff have been given authority to assure ALARA procedures and policies are carried out;
- (d) That workers are adequately trained, not only in the radiation safety procedures, but also in the ALARA philosophy;
- (e) That management and its designees perform periodic audits to find out how exposures and effluent releases might be lowered;
- (f) That modifications to procedures, equipment, and facilities have been made to reduce exposures at reasonable costs, where possible;
- (g) That the licensee has QA and QC programs, where applicable; and
- (h) That the licensee has a functioning and effective preventive maintenance program, where applicable.

Review and evaluate engineering controls to assure that, for example, exhausts from ventilated enclosures are adequately treated to reduce emissions to the out-of-plant environs to the lowest reasonably achievable levels within regulatory limits. Evaluate ventilated enclosures to assure that they are adequate to minimize internal exposures. Review shielding and the use of remote handling tools to assure that facilities and equipment are adequate to reduce exposure (both internal and external) to the lowest reasonably achievable levels within regulatory limits.

03.08 Event Evaluation

Through reviews of dosimetry reports and annual licensee evaluations of public dose, and interviews of the RSO and selected licensee personnel, verify that the licensee has

not experienced any events, since the last inspection, involving exposures to occupational workers or members of the public that were in excess of any regulatory limit.

- Review and evaluate any such incident or unusual occurrence that took place since the last inspection. If such incidents were required to be reported, verify, through interview of the RSO and review of event reports, that a complete and timely report was made to the NRC.
- For incidents or unusual occurrences that were not required to be reported, verify that the licensee performed sufficient investigation to identify the cause of the incident, and took appropriate corrections to prevent recurrence of the situation leading to the incident or unusual occurrence.

03.09 Instrumentation

Through observations of portable radiation detection and measurement equipment in use and available for use, determine whether the quantity and type are adequate for the licensee's radiation detection and measurement needs. Verify that instruments used to meet regulatory requirements (area and transportation surveys) have been calibrated at the required frequency.

- a. If the licensee uses a vendor to calibrate instruments, verify through interviews of the RSO that the vendor is authorized by the NRC or an Agreement State to perform that service.
- b. If the licensee performs maintenance/repair on survey instruments, through interviews of appropriate licensee personnel and the RSO, determine whether the licensee possesses instrument manufacturer manuals and that any replacement parts used are "like-for-like."
- c. Through observations and demonstrations, determine whether selected licensee survey instruments in use and available for use are operational (battery check) and respond appropriately to radiation (instrument source check). Compare licensee instrument readings to NRC instrument. Verify that licensee's instrument response is comparable to NRC instrument (± 20 percent).
- d. Through interviews of the RSO and workers, and by observation, verify that licensee has a system for tagging out inoperable and out-of-service survey instruments.
- e. Through observations and interviews of the RSO and workers, determine whether the licensee's instrumentation for performing bioassay measurements is adequate for those measurements. Verify that bioassay probes and scalers are compatible. Verify that licensee staff perform a response check using appropriate sources and a suitable background measurement before taking bioassay measurements.
- f. Through observations and interviews of the RSO and workers, assess the procedures and methods, and equipment used by the licensee to assure compliance with air-monitoring and air-handling commitments requirements (such as flow rates into hoods, air flows in ventilation systems, differential pressures in cells, in glove boxes, and across filter systems).

- g. Assess the equipment used by the licensee to satisfy these measurements. If appropriate, verify that air measurement equipment is functional and calibrated at the required frequency. Examine a representative sample of sampling gauges and data recorders and verify that it is operating within its design specifications. Using a properly calibrated hand-held anemometer, spot-check the linear airflow rate (corrected for altitude, when necessary) at the face of several hoods to verify that it meets the commitments made in the license. Using smoke tubes, visualize the airflow at the hood face to ensure that no excessive turbulence is present that may result in the spread of radioactive contamination.

03.10 Training

- a. Authorized Users. Authorized users may either be named in the license application or be appointed by the licensee, depending on the type of license issued and/or the wording in the license. For those appointed by the licensee, verify through interviews that the authorized user has knowledge commensurate with operational duties. In cases where users are specified by license condition, determine that the licensed materials they use conform to the license condition.

Determine that the authorized users are personally performing or, if permitted in the license, supervising, the authorized work, rather than someone else not named in the license. The level of supervision will depend on the wording in the license conditions or regulations. Some licenses have conditions such as "... used by or under the supervision of" For other types of licensees, supervision is defined in the regulations. For some licenses that have the condition "... under the direct supervision of ..," the authorized user must be physically present at the facility, for easy contact or to observe the individual(s) working. Another phrase used is "... may only be used by" Finally, "... under the direct supervision and physical presence of ..." means the authorized user must directly supervise and be present at the work station. Considering the many license condition phrases and regulations, the inspector must exercise judgment when assessing the role of the authorized users.

When the wording of the license condition is "... used by or under the supervision of ...," an authorized user named on the license is considered to be supervising the use of licensed materials when he/she directs personnel in the conduct of operations involving the licensed material. This does not mean that the authorized user must be present at all times during the use of such materials. The authorized user/supervisor is responsible for assuring that personnel under his/her supervision have been properly trained and instructed, and is responsible for the supervision of operations involving the use of licensed materials whether he/she is present or absent.

- b. General Training. Certain kinds of training and instruction are found in the regulations; how they are implemented will be found in the license. Discuss with the licensee how, and by whom, training is conducted and the content of the training provided to workers (generally found in the license application).
- c. 10 CFR Part 19-Required Training. Verify, through interviews of selected licensee personnel, that initial instructions have been given to individuals who, in the course of employment, are likely to receive in a year an occupational dose in excess of 1 mSv (100 mrem). Under the basic instructions, it is management's responsibility to inform the workers of precautions to take when entering a restricted area, kinds and uses of radioactive materials in that area, exposure levels, and the types of protective equipment

to be used. The workers should also be informed of the pertinent provisions of NRC regulations and the license, and the requirement to notify management of conditions observed that may, if not corrected, result in a violation of NRC requirements. Also verify that authorized users and workers understand the mechanism for raising safety concerns.

- d. Training Required by License Commitments. Of the training program elements in the license application, training given to authorized users, and those individuals under the supervision of authorized users, is of primary importance. One or more users of radioactive materials should be interviewed to determine their understanding of the training that they have received, both in the basic instructions and that specified in the license application. For some licensees, this includes specific training needed to perform infrequent procedures and prepare and use radioactive material in research studies or in production. Note that the training should be (and in most cases is required to be) provided to workers before the individual's performance of licensed activities.

The inspector should also observe related activities and discuss the radiation safety training received by selected individuals to assure that appropriate training was actually received by these individuals. Authorized users and supervised individuals should understand the radiation protection requirements associated with their assigned activities. The licensee's radiation safety training may include, but is not limited to, demonstrations by cognizant facility personnel, formal lectures, testing, films, and "dry runs" for more complex or hazardous operations.

Determine if ancillary workers (such as janitorial or clerical staff), contract workers, and visitors are informed about basic radiation safety practices for the type of material used by the licensee.

Determine, by observing and interviewing workers, if training and experience are adequate to enable users to safely undertake activities authorized by the license and whether they are aware of the risks involved. Examine the licensee's program for on-the-job training of new workers. Determine if there is adequate retraining for workers if there are regulation changes and/or radiation safety program changes that affect the workers. Review workers' knowledge of the risks associated with the licensed activities.

03.11 Operating and Emergency Procedures

Operating and emergency procedures will be found in license applications and may vary from step-by-step procedures to more generalized procedures for licensees with lower inspection priority. The emergency procedures may be approved by NRC and reviewed and updated by the licensee. However, licensees who follow the guidance in the appropriate NUREG 1556 series will likely develop procedures, including emergency procedures that have not received specific NRC review and approval.

- a. Review and evaluate the licensee's process for controlling documents (procedures) and making revisions to procedures. Revisions to operating procedures should be reviewed by licensee health physics staff to ensure that the revisions do not adversely affect radiological safety. Select a sample of operating or process areas and verify that pertinent procedures are available to personnel, are current, and are in use in those selected areas. If no operations are being performed, ask workers to describe their work and the procedures that govern their work activities. Determine whether process activities use procedures for reference or are required to be used "in-hand."

- b. During interviews of selected licensee personnel, propose hypothetical emergency scenarios to assess the worker's knowledge and understanding of the licensee's emergency procedures. The scenarios should include those types of accidents appropriate to the licensee's program (i.e., contaminated packages identified during receipt surveys, fires, contamination events involving large quantities of licensed materials).
- c. If the licensee is required to have and implement an emergency plan, pursuant to 10 CFR 30.32(i), evaluate in-plant procedures for handling accidents including evacuation, prevention of spread of contamination, securing sources, handling accident victims, and any other major portions of the emergency plan. Verify, by discussions with workers, and review of procedures, that the emergency plan has been implemented and is being maintained. Verify that lines of communication with outside organizations that may be called on to assist in an emergency are current and tested. Ensure that biennial emergency plan drills and/or exercises include observation by NRC staff.
- d. Some licensees may have agreements with other agencies (e.g., fire, law enforcement, and medical organizations) regarding response to emergencies. Discuss with the licensee's representatives what has been done to ensure that agencies (involved in such agreements) understand their roles in emergency responses.

03.12 Posting and Labeling

- a. The inspector should determine through observation whether proper caution signs are being used at access points to areas containing radioactive materials, radiation areas, and those areas containing airborne radioactive materials. 10 CFR Section 20.1903 provides exceptions to posting caution signs. The inspector should also selectively observe labeling on packages or other containers to determine that proper information (e.g., isotope, quantity, and date of measurement) is recorded.
- b. Areas with radiation hazards should be conspicuously posted, as required by 10 CFR 20.1902. Depending on the associated hazard, controls may include tape, rope, or structural barriers to prevent access. If volatile radioactive materials are used in an area, such as area should be controlled for airborne contamination. High-radiation areas should be strictly controlled to prevent unauthorized or inadvertent access. Such controls may include, but are not limited to, direct surveillance, locking the high-radiation area, warning lights, and audible alarms. Areas occupied by radiation workers for long periods of time and common-use areas should be controlled in accordance with licensee procedures and be consistent with the licensee's ALARA program.
- c. The inspector should also examine locations where notices to workers are posted. Applicable documents, notices, or forms should be posted in a sufficient number of places to permit individuals engaged in licensed activities to observe them on the way to or from any particular licensed activity location to which the postings would apply.

03.13 Senior Management Responsibilities

The NRC holds the licensee responsible for the radiation protection program; therefore, it is essential that strong management controls and oversight exist to ensure that licensed activities are conducted properly. Management responsibility and liability are sometimes under emphasized or not addressed in applications and are often poorly understood by licensee employees and managers. Senior management should delegate

to the RSO sufficient authority, organizational freedom, and management prerogative to communicate with and direct personnel regarding NRC regulations and license provisions and to terminate unsafe activities involving byproduct material.

Through observations, interviews, and the review of selected records, determine that senior licensee management is fulfilling its responsibility of ensuring the effective operation of the radiation safety program. Specific areas of management focus should include:

- Maintaining awareness of significant events such as the loss or theft of licensed materials. Maintaining radiation safety, security and control of radioactive materials, and compliance with regulations.
- Committing adequate resources (including space, equipment, personnel, time, and, if needed, contractors) to the radiation protection program to ensure that members of the public and workers are adequately protected from radiation hazards and that compliance with regulations is maintained.
- Obtaining the NRC's prior written consent before transferring control of the license (10 CFR 30.34(b)).
- Notifying the appropriate NRC regional administrator in writing, immediately following filing of petition for voluntary or involuntary bankruptcy (10 CFR 30.34(h)).
- Assuring the appropriate response, when applicable, to generic communications from the NRC.
- Assuring that adequate provisions have been made to fund the safe and effective decommissioning of licensee facilities. (10 CFR 30.35)
- Notifying the NRC of the decision to discontinue licensed activities or to decommission a facility in which licensed activities took place. (10 CFR 30.36)
- Notifying the NRC of defects or other radiation safety equipment malfunctions in accordance with the requirements of 10 CFR, Part 21.
- Maintaining awareness of issues and measures to ensure worker performance and safety are not being compromised due to safety significant human performance issues.

END

Attachment 1: Revision History for IP 87142

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
N/A	ML22053A019 04/26/22 CN 22-008	New Inspection Procedure. Guidance was previously contained in IP 87126. Specific changes include: (1) divided inspection guidance into risk-modules; (2) included inspectors' observations; (3) updated inspection guidance; (4) added an estimated level of effort to complete an inspection; and (5) developed new appendix titled "Additional inspection elements."	N/A	ML22053A020