MANUAL CHAPTER 2545

# RESEARCH AND TEST REACTOR INSPECTION PROGRAM

## 2545-01 PURPOSE

To establish the program for inspection of research and test reactors (RTRs).

## 2545-02 OBJECTIVES

To ensure that the licensee's systems and techniques are in accordance with regulatory requirements and provide acceptable protection of the health and safety of the public.

## 2545-03 APPLICABILITY

This RTR inspection program is applicable to research or test reactors, and critical facilities (also know as non-power reactors) licensed under §§50.21(a), 50.21(c) or 50.22 of 10 CFR Part 50 for research and development. It is implemented while an NRC license is issued for the facility. This inspection program will remain in effect from the time a facility gets licensed, through operations, shutdowns, possession only, and decommission, and until the license is terminated.

## 2545-04 DEFINITIONS OF INSPECTION FREQUENCIES

04.01 Annual. Means that the RTR inspection program should be performed at least once per year with the interval not to exceed 15 months.

04.02 Biennial. Means that the RTR inspection program should be performed at least once every two years with the interval not to exceed two years and six months.

04.03 Triennial. Means that the RTR inspection program should be performed at least once every three years with the interval not to exceed three years and nine months.

## 2545-05 RESPONSIBILITIES AND AUTHORITIES

05.01 Chief, Research and Test Reactors Section

a. Ensures, within budget limitations and management direction, that the RTR inspection staff includes adequate numbers of inspectors in the various disciplines necessary to carry out this RTR inspection program.

b. Applies inspection resources, as necessary, to deal with significant issues and problems at specific RTRs and generically.

c. Develops the implementation of policies, programs, and procedures for inspecting applicants, licensees, and other entities subject to NRC jurisdiction.

d. Assesses the effectiveness, uniformity, and completeness of implementation of the RTR inspection program.

05.02 Inspectors will, in accordance with management direction, plan and conduct inspections in accordance with this program.

## 2545-06 POLICY

The general policy for regulation of RTRs is described in the Atomic Energy Act of 1954, as amended, Section 104.c which states:

> "The Commission is directed to impose only such minimum amount of regulation of the licensee as the Commission finds will permit the Commission to fulfill its obligations under this Act to promote the common defense and security and to protect the health and safety of the public and will permit the conduct of widespread and diverse research and development."

This general policy is reenforced by the NRC's inspection policies. For example, the clear difference in licensee and NRC inspection responsibilities. That is, the licensee is responsible for facility safety and compliance with regulatory requirements, and the NRC inspector is responsible to independently assess the licensee's fulfilment of those responsibilities.

The NRC's minimum requirements referred to in the Atomic Energy Act of 1954, as amended, Section 104.c have been specified in various regulatory and licensing documents for RTRs. These documents include the 10 CFR, the License including Technical Specifications, the Operator Requalification Program, the Emergency Plan, the Radiation Protection Plan, and the Safeguards/Physical Security Plan. In the enforcement of these requirements, inspectors must keep in mind "the minimum amount of regulation ... to protect the public health and safety." Thus, consistent with the enforcement policy, particular attention should be placed on assuring the licensee is not penalized for effectively identifying and correcting their own problems.

The above "OBJECTIVES" will be accomplished by direct observations of licensed activities, interviews with personnel, and review of facility records. Guidance is provided in Inspection Procedures referenced in this Manual Chapter. These inspection procedures were designed to gather facts to support inspection findings and conclusions. Inspection observations, open items, or Inspection Procedure content is not to be levied on licensees as requirements. Advice or recommendations are not to be given to the licensee. Inspection conclusions are the judgement of the organizational unit issuing the inspection report and are not a personal document of the inspector. The licensee should be made aware that documents that it gives to inspectors are subject to Freedom of Information Act requests and may be placed in the Public Document Room.

Inspection and management personnel must maintain frequent communications to assure a consistent focus on regulatory issues. These communications should (1) keep in mind the policy of minimum regulation that applies to RTRs, (2) maintain an awareness of RTR safety significance, and (3) apply RTR requirements and standards.

## 2545-07 GENERAL PROGRAM GUIDANCE

This manual chapter provides guidance for the scheduling, conduct, and implementation of NRC inspections at RTRs. The program establishes inspection methodology for operating, safeguards, and decommissioning activities and conditions. The program is designed to provide sufficient flexibility to optimize the use of inspection resources and provide inspection commensurate with the safety significance of the RTR.

07.01 Program Timeliness. Experience has shown that the extent of the RTR inspection program is based on demands placed on available inspection resources and licensee resources consistent with the minimum regulation authorized by the Atomic Energy Act. For that reason, the time allowed to complete the program has a nominal period with a 25 percent maximum allowed period in the definitions of annual, biennial and triennial. Further, some inspections activities are to be performed as needed or when activities are conducted, e.g., decommissioning.

07.02 Performance Based Approach. Using a performance-based approach, inspectors focus their attention on activities important to safety. Performance-based inspection emphasizes observing activities and the results of licensee programs over reviewing procedures or records. For example, an inspector may identify an issue through observing a facility activity in progress, monitoring equipment performance, or the in-facility results of an activity (e.g., an engineering calculation), and then let the observation lead to evaluation of other associated areas. Discussions with facility personnel and reviewing documents should be used to enhance or verify performance-based observations. This approach is designed to emphasize observation of activities. Although most aspects of the inspection program are performed onsite using the performance based approach, certain activities can be conducted in the inspector's office, i.e., portions of procedure review and administrative program inspection.

NRC inspectors perform a basic mission in determining whether a licensee's RTR is acceptably safe and meets current regulatory requirements and commitments. Limiting inspection to identification of specific instances where a licensee fails to meet such

requirements and commitments could result in correction of symptoms rather than correction of underlying causes of licensee problems. The inspection and assessment processes establish thresholds for determining the significance of issues and whether those issues may require additional evaluation and follow up. Thus, the inspection program requires that inspectors and their managers evaluate problems to determine if followup inspections are necessary to diagnose whether a safety concern represents an isolated case or may signify a broader, more serious problem. Licensee management controls (e.g., review, audit and safety committees, management reviews, etc.) may need to be examined to determine if weaknesses in these controls contributed to identified safety concerns.

07.03 Program Feedback. The reactor inspection program is expected to be dynamic and to respond to changes in the RTR community and operational experience. Therefore, management and inspectors are to identify problems in implementing the program, and to recommend changes to the program for consideration by the program office. Any such feedback and recommendations should be submitted to the responsible Section Chief or Program Director.

The fundamental building blocks that form the framework for the regulatory feedback program are seven cornerstones of safety; initiating events, mitigating systems, barrier integrity, emergency preparedness, occupational radiation safety, public radiation safety, and physical protection. These cornerstones have been grouped into three strategic areas: reactor safety, radiation safety, and safeguards. This framework is based on the principle that the agency's mission of assuring public health and safety is met when the agency has reasonable assurance that licensee's are meeting the objectives of the seven cornerstones of safety. The reactor inspection program is an integral part, along with performance assessment, and enforcement, of this feedback program. Acceptable performance in the cornerstones, as measured by the inspection program, is indicative of overall performance that provides for adequate protection of public health and safety.

Another principle of the framework is that there is a level of performance above which the NRC does not need to engage the licensee beyond this inspection program's requirements. This inspection program provides the information used in determining licensee performance in the cornerstones of safety.

The supplemental inspection will provide more diagnostic inspections of identified problems and issues beyond the program. Supplemental inspections will be planned in response to issues assessed by the inspector, project manager, license examiner, and their supervisor to require such.

07.04 Use of Inspection Procedures. The RTR inspection programs consists of the inspection procedures for each RTR class, category or situation. The inspection procedures represent an acceptable inspection effort to allow the NRC to assess facility safety and compliance to applicable requirements. Although each inspection procedure contains many inspection requirements, the individual inspector is expected to apply professional judgment regarding the need for completing each specific item. For example, the inspector may have assurance that the basic requirement has been satisfied via some other source (i.e., licensee event report followup, independent inspection effort, temporary instructions followup). In such cases the inspector does not need to perform these specific

items and should discuss these differences with the responsible supervisor. In summary, the items in Section 02 of inspection procedures lists the attributes which should be considered when evaluating the area covered by the inspection procedure. Certain aspects may be conducted in the office, e.g., portions of administrative program inspection. Inspectors will conduct inspections using applicable inspection procedures as directed by their supervisor.

Inspection procedures identify requirements that the inspector considers while evaluating the associated area. These requirements may not be the same as NRC requirements placed on a specific licensee. As such, it is not implied or intended that inspection program requirements are to be levied on the licensee. Any attempt to force inspection program requirements on the licensee constitutes misinterpretation of NRC inspection philosophy and misuse of inspection requirements.

Temporary instructions are issued for specific inspection purposes. For inspections performed using a temporary instruction, the inspector is expected to complete all inspection requirements listed.

An open item is a matter that requires further review and evaluation by an inspector. It is used to document, track, and ensure adequate followup on matters of concern to the inspector.

As a general rule, inspections should be conducted in accordance with inspection procedures. However, it is not possible to anticipate all the unique circumstances that might be encountered during the course of a particular inspection and, therefore, individual inspectors are expected to exercise initiative in conducting inspections, based on their expertise and experience, as needed, to assure that all the inspection objectives are met. The inspector may also conduct independent inspection activities. There are no stated goals for inspections on backshift or for independent inspection. However, backshift inspection will be performed whenever required to complete the inspection.

07.05 Inspection Plans. To facilitate management of inspection resource allocations and tracking of inspection programs, the inspector shall annually develop facility-specific inspection plans consistent with this Manual Chapter. The responsible supervisor will develop an integrated inspection plan (i.e., the integration of individual facility or RTR plans). This integrated inspection plan should project the planned inspection activities and available resources for all RTRs for at least the next 12 months.

The results of past inspections, event evaluations, and inspector and management reviews shall be used to schedule and determine the focus of planned inspections at each facility. The basis for the allocation or significant reallocation of resources among the RTRs will be documented. It is expected that the integrated plans will be living documents and be reviewed periodically, adjusted, and reissued to reflect shifts in facility performance and safety concerns. Individual facility plans and the integrated inspection plan should be reviewed by management and updated at least semiannually.

07.06 Management Entrance and Exit Meetings. Inspectors are required to meet with licensee management as part of every inspection. Inspectors should hold an entrance meeting with the senior licensee representative who has responsibility for the areas to be

inspected. Each inspection must include discussing inspection results with licensee management. At the conclusion of an inspection, inspectors must discuss their preliminary findings with the licensee's management at a scheduled exit meeting. Entrance and exit meetings with licensee personnel should be scheduled to have the minimum impact on other licensee activities necessary to assure the safe operation of the facility.

Time spent on scheduled and periodic entrance and exit meetings is considered part of preparation and documentation of inspections and should be charged as such. Daily communications with licensee management are considered to be an integral part of every inspection procedure and the time used for such routine communications should be charged to the inspection procedures used.

Communicating inspection observations is an integral and important part of every inspection, whether done daily during the course of an inspection, or periodically with status meetings. Observations or insights that do not reach the threshold for describing in "Research and Test Reactor Inspection Reports" (see IMC 0615) should be conveyed to the licensee for its consideration.

07.07 Inspection Reports. Inspection reports will be prepared in accordance with the guidance in IMC 0615

07.08 Responding to Events and Event Reports. Events of low significance, such as uncomplicated reactor trips, may be followed up by an inspectors on the next planned inspection to verify that the events are not complicated by loss of mitigation equipment or other factors. Licensees often notify inspectors of events or conditions in anticipation of the inspectors' interest in the issue, but such notifications do not exempt the licensee from reporting events and conditions through the required regulatory processes. Therefore, licensees should be informed that such notifications may not fulfill all reporting requirements. Regardless of the source of the information on the event, inspectors should review facility events to determine whether the NRC should devote additional effort and resources to respond to the event. The review should be acknowledged in an inspection report. The agency's event response uses a graded approach based on the risk significance of events, as described in NRC Management Directive 8.3, "NRC Incident Response Program."

## 2545-08 OPERATIONAL INSPECTION

This section specifies the inspection frequencies and procedures for operating RTRs.

08.01 Class I RTRs. These have licensed power levels of 2 megawatts (MW) or greater. For these RTRs, the operations portion of the inspection program will be completed annually. Completion of this portion of the program involves the conduct of the following inspection procedures:

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| Inspection Procedure 69003- | Class I Research and Test Reactor Operator Licenses, Requalification, and Medical Activities |
| Inspection Procedure 69004- | Class I Research and Test Reactor Effluent and Environmental Monitoring |

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| Inspection Procedure 69005- | Class I Research and Test Reactor Experiments |
| Inspection Procedure 69006- | Class I Research and Test Reactors Organization and Operations and Maintenance Activities |
| Inspection Procedure 69007- | Class I Research and Test Reactor Review and Audit and Design Change Functions |
| Inspection Procedure 69008- | Class I Research and Test Reactor Procedures |
| Inspection Procedure 69009- | Class I Research and Test Reactor Fuel Movement |
| Inspection Procedure 69010- | Class I Research and Test Reactor Surveillance |
| Inspection Procedure 69011- | Class I Research and Test Reactor Emergency Preparedness |
| Inspection Procedure 69012- | Class I Research and Test Reactors Radiation Protection |
| Inspection Procedure 86740- | Transportation |

08.02 Class II RTRs. These have licensed power levels of less than 2 MW. For these RTRs, the operations portion of the inspection program will be completed biennially. Completion of this portion of the program involves the conduct of the Inspection Procedure 69001, "Class II Research and Test Reactors," and Inspection Procedure 86740, "Transportation."

08.03 Class III RTRs are Class I RTRs or Class II RTRs that are on extended shutdown (e.g., shutdowns greater than one year for a Class I and greater than two years for a Class II) or that only have authority to possess and not operate. For these RTRs, the operations portion of the inspection program will be completed triennially. Completion of this portion of the program involves the conduct of the Inspection Procedure 69002, "Class III Research and Test Reactors," and Inspection Procedure 86740, "Transportation." For Class III RTRs, reactive inspection of safety significant changes, such as shipment of fuel, loss of operating staff, or degradation of safety equipment should be conducted at the inspector's discretion. These inspections should use the appropriate inspection procedure from the Class I or Class II portions of this program and should be discussed with the responsible supervisor. Since reactor fuel and SNM may be stored on-site, physical security and safeguards programs should be inspected at the interval specified for the safeguards category.

This class of RTR may also include reactors that have decided to permanently shutdown. To reduce the effort required to maintain the facility in a non-operating mode, the licensee may propose to reduce related Technical Specification requirements, including equipment operability, inspections, and surveillance procedures. Other program reductions may also be proposed in the areas of security, emergency planning, operator requalification, and staffing. After NRC approval of these reductions, the facility enters the possession only (PO) phase. In general, the licensee will not be authorized to remove or dismantle major reactor systems under a possession only amendment. Certain changes to the facility can be made as allowed by 10 CFR 50.59. The Inspector should verify implementation of the amendments and maintain the inspection frequency on a three-year-cycle until decommissioning.

RTRs that are authorized by license amendment or order to decommission the facility will be inspected in accordance with the decommissioning inspection portion of this program.

## 2545-09 DECOMMISSIONING INSPECTION

This portion of the inspection program will be applied to RTRs that are authorized by license amendment or order to decommission. For permanently shutdown reactors, reactive inspection of safety significant changes, such as shipment of fuel, loss of operating staff, or degradation of safety equipment should be conducted at the inspector's discretion. These inspections should use the appropriate inspection procedure from the operations phase and be discussed with the responsible supervisor.

Fuel disposal delays could also influence the licensee to submit a less detailed decommissioning plan (DP) as allowed by 10 CFR 50.82(b)(2) within two years of the permanent cessation of operations. In recognition of this, licensees may delay decommissioning as allowed by 10 CFR 50.82(b)(4)(i). Inspection in this case would follow the program requirements for Class III RTRs.

Prior to decommissioning, the licensee should characterize the amount, type, form, and location of radioactive material remaining at the facility. This could include minor disassembly, breaching of some protective barriers, or other physical modifications. The licensee should also be expected to inventory, rearrange, organize, survey, prepare, and dispose of miscellaneous radioactive materials and wastes, in a manner similar to activities customary under the Operating License and in accordance with 10 CFR 50.59. This includes routine housekeeping, removal of systems not described in the SAR, and removal of easily accessed and removed facility and experimental components. After characterization of the residual radioactive material, the licensee should prepare and submit for NRC approval a Decommissioning Plan (DP) in accordance with 50.82(b)(4) using as guidance the format and content suggested in NUREG-1537. Concurrently, management policies and procedures should be prepared to support dismantling and decontamination of the facility as described in the DP.

09.01 Phases of Decommissioning. Two phases of decommissioning apply to this portion of the inspection program.

a. The decontamination and dismantlement phase, which occurs after the license amendment authorizing implementation of the Decommissioning Plan has been issued.

b. The license termination phase, which occurs after all licensee remediation and final status surveys have been completed. This phase may include an NRC confirmatory radiation survey to verify that the facility is suitable for unconditional or conditional release and license termination.

09.02 Decontamination and Dismantlement

Upon the issuance of the license amendment authorizing dismantlement and decontamination, the licensee will be functioning under entirely new requirements and responsibilities. Inspectors should use Inspection Procedure 69013, "Research and Test Reactor Decommissioning," at this time. Since decommissioning is a one time process, the inspection program consists of a combination of routine and reactive inspections that are planned to coincide with the preparation and performance of safety significant

activities. Inspections are expected to be more frequent during the initial stages of decommissioning to verify that the licensee has implemented the programs to support decontamination and dismantlement activities. The inspector should discuss progress and milestones with the licensee and adjust the inspection schedule accordingly in consultation with the responsible supervisor. In summary, the inspector should prepare a plan to complete the requirements of Inspection Procedure 69013 coincident with the licensee's decontamination and dismantlement schedule.

The inspector should verify that the organizational structure, assignment of responsibilities and authorities, and appointment of key personnel as described in the DP is complete before the work begins. Work activities at the facility should be in accordance with the approved DP. This document also becomes the new bases for continuing NRC inspections. Because of the wide variability in RTR facility characteristics, the DP will be facility specific. The specificity will include the management structure and arrangements for planning and implementing the decommissioning activities, programs for protection of worker and public health and safety, handling and disposal of radioactive materials, quality assurance, physical security, and the final radiological measurements and report to support the request for termination of the license.

09.03 Confirmatory Radiation Surveys

Included in the DP will be a requirement for the licensee to provide a final report that shows comprehensively, and in quantitative detail, the residual radiological conditions of the facility. This information should support the licensee conclusions that there is reasonable assurance that the residual radioactive contamination and direct radiation exposure conditions satisfy criteria for license termination as specified in 10 CFR 20 Subpart E. Inspectors should use as applicable Inspection Procedure 83801, "Inspection of Final Surveys at Permanently Shutdown Rectors" at this time. Similar to the decontamination and dismantlement portion of the program, the inspection will be of the specific activities and should be tailored to licensee schedules.

The final NRC inspections must also be detailed and comprehensive enough to validate that conclusion. Inspection personnel should be alert to potential discrepancies of data, absences of significant information, or areas and locations where confirmation measurements and analyses might require unusual or special preparations or capabilities.

Licensees can use the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) to determine sampling methods and locations. This process yields probabilistic estimates of the likelihood that the decontaminated site does not contain radioactive materials or pose exposure conditions exceeding the criteria for license termination. The inspector may need to plan a verification procedure to be consistent with the licensee's methods of analysis and presentation of results of the final survey.

The inspector should determine if the final status survey is acceptably implemented as described in the DP. If the sampling and measurement techniques, data, and quality assurance program are adequate as determined by inspection, the licensee's results may be accepted without further verification. However, for large sites with high levels or extensive initial contamination, sites with considerable population density after license termination, or sites where the inspection program has shown multiple examples of

unsatisfactory performance, an independent review and a confirmatory survey should be arranged. In this case, the inspector could choose to do a survey or send a Request For Technical Assistance (RFTA) to the NMSS contract administrator who will arrange for contractor assistance. The contractor will review the licensee report for completeness and propose a confirmatory survey to the inspector. If the proposal is acceptable, a Survey Plan Approval Form (SPAF) will be returned to the contractor via NMSS. The inspector will then schedule and coordinate the confirmatory survey with the licensee. The results will be documented in a Confirmatory Survey Report from the contractor. If the report demonstrates that the licensee's survey is not statistically valid, additional remediation and resampling will be required. If the report supports the licensee's results, the site is suitable for release. The inspector then informs the RTR project manager that decommissioning is complete and recommends that the license be terminated.

## 2545-10 SAFEGUARDS INSPECTIONS

The safeguards and security portion of the RTR inspection program uses a graded approach. The approach is based on the amount of plutonium (Pu), uranium-233 (U-233) and uranium-235 (U-235) that a RTR possesses. RTRs possessing a formula quantity of non-exempt strategic special nuclear material (FSNM) are the highest category, followed in order by RTRs possessing non-exempt moderate strategic significance special nuclear material (MSNM) and RTRs possessing quantities of non-exempt special nuclear material of low strategic significance (LSNM). Currently, security plans are tailored to the safeguards categories of material that the licensee may possess, considering the quantity exempted under 10 CFR 73.60 or 73.67(b). The following table also shows the Safeguard Category requirements for non-exempt (see below) inventory:

| Material | Enrichment | Cat I or FSNM | Cat II or MSNM | Cat III or LSNM |
|---|---|---|---|---|
| Pu | | ≥2 kg | <2 kg & >500 g | ≤500 g & >15 g |
| U-233 | | ≥2 kg | <2 kg & >500 g | ≤500 g & >15 g |
| U-235 | ≥20% U-235<br><20% & ≥10%<br><10% & >natural | ≥5 kg | <5 kg & > 1 kg<br>≥10 kg | ≤1 kg & >15 g<br><10 kg & >1 kg<br>≥10 kg |
| Sum of Pu, U-233, & U-235 | | ≥5 kg by FSNM formula below | <5 kg by FSNM formula below & >1 kg by MSNM formula below | ≤1 kg by MSNM formula below & >15 g U-233 + U-235 + Pu |

FSNM formula = (grams of non-exempt contained U-235) +
2.5 (grams of non-exempt U-233 + grams of non-exempt plutonium)

MSNM formula = (grams of non-exempt contained U-235)
+ 2 (grams of non-exempt U-233 + grams of non-exempt plutonium)

The category of the safeguards protection that must be afforded by the licensee should be determined before the inspector departs for the facility, and the facility inspected as one of the following safeguards category.

10.01 Safeguards Category I (Cat I) or FSNM. This is a RTR that possesses non-exempt material in a quantity of 5,000 grams or more computed by the formula, grams = (grams contained U-235) + 2.5 (grams U-233 + grams Pu). For these RTRs, the safeguards portion of the inspection program will be completed annually. Completion of this portion of the program involves the conduct of the following inspection procedures:

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| Inspection Procedure 81401- | Plans, Procedures, and Reviews |
| Inspection Procedure 81402- | Reports of Safeguards Events |
| Inspection Procedure 81411- | Physical Protection for Reactors with Formula Quantities of Special Nuclear Material |
| Inspection Procedure 81810- | Protection of Safeguards Information |
| Inspection Procedure 85102- | Material Control and Accounting - Reactors |

Additionally, when new fuel is received, Inspection Procedure 81403, “Receipt of New Fuel at Reactor Facilities” should be performed.

10.02 Safeguards Category II (Cat II) or MSNM. This is a RTR that possesses non-exempt material (1) Less than a Safeguards Category I quantity but more than 1,000 grams of uranium-235 (contained in uranium enriched to 20 percent or more in the U-235 isotope) or more than 500 grams of uranium-233 or Pu, or in a combined quantity of more than 1,000 grams when computed by the equation, grams = (grams contained U-235) + 2 (grams U-233 + grams Pu); or (2) 10,000 grams or more of non-exempt uranium-235 (contained in uranium enriched to 10 percent or more but less than 20 percent in the U-235 isotope). For these RTRs, the safeguards portion of the inspection program will be completed biennially. Completion of this portion of the program involves the conduct of the following inspection procedures:

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| Inspection Procedure 81401- | Plans, Procedures, and Reviews |
| Inspection Procedure 81402- | Reports of Safeguards Events |
| Inspection Procedure 81421- | Fixed Site Physical Protection of Special Nuclear Material of Moderate Strategic Significance |
| Inspection Procedure 81810- | Protection of Safeguards Information |
| Inspection Procedure 85102- | Material Control and Accounting - Reactors |

Additionally, when new fuel is received, Inspection Procedure 81403, “Receipt of New Fuel at Reactor Facilities” should be performed.

10.03 Safeguards Category III (Cat III) or LSNM. This is a RTR that possesses non-exempt material (1) Less than a Safeguards Category II quantity as defined in paragraph (1) of the definition of Safeguards Category II, but more than 15 grams of uranium-235 (contained in uranium enriched to 20 percent or more in U-235 isotope) or 15 grams of uranium-233 or 15 grams of Pu or the combination of 15 grams when computed by the equation, grams = (grams contained U-235) + (grams Pu) + (grams U-233); or (2) Less than 10,000 grams but more than 1,000 grams of uranium-235 (contained in uranium enriched to 10 percent or more but less than 20 percent in the U-235 isotope); or (3)

10,000 grams or more of uranium-235 (contained in uranium enriched above natural but less than 10 percent in the U-235 isotope). For these RTRs, the safeguards portion of the inspection program will be completed triennually. Completion of this portion of the program involves the conduct of the following inspection procedures:

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| Inspection Procedure 81401- | Plans, Procedures, and Reviews |
| Inspection Procedure 81402- | Reports of Safeguards Events |
| Inspection Procedure 81431- | Fixed Site Physical Protection of Special Nuclear Material of Low Strategic Significance |
| Inspection Procedure 81810- | Protection of Safeguards Information |
| Inspection Procedure 85102- | Material Control and Accounting - Reactors |

Additionally, when new fuel is received, Inspection Procedure 81403, “Receipt of New Fuel at Reactor Facilities” should be performed.

10.04 Non-exempt Material. This is the aggregate of all U-235, U-233, or Pu within a specified site or building, except that which is exempt due to its self-protecting nature. Material is exempt from inclusion in the total inventory to the extent that it is not readily separable from other radioactive material and has a radiation dose rate in excess of 100 rem/hour at 3 feet (see 10 CFR 73.60 and 73.67(b)(1)). Furthermore, if the total inventory is equal to quantities of MSNM, but the quantity in each building is equal to or less than quantities of low strategic significance, the facility will be considered to be Category III (10 CFR 73.67(b)(2)). However, the same exemption (use of several buildings) does not exempt licensees possessing LSNM from the physical protection requirements for LSNM.

Inspectors shall verify the licensee's contention that the quantity of material exempt from inventory is not readily separable and does in fact have a radiation dose rate in excess of 100 rem/hour at 3 feet. Verification can be accomplished through evaluation and review of operating history, screening through use of nomographs, or computation by computer program.

In the event that material has not been maintained at the self-protecting level so that the total nonexempt inventory rises to the next highest safeguards category, the licensee should provide increased protection as required by their NRC-approved security plan. If the approved plan includes sections to deal with this event, the licensee must be inspected against these additional requirements. This can happen during a long term shutdown, i.e., for a Class III RTR, or during decommissioning.

Once a decision is made by the licensee to permanently shutdown, the licensee should return the fuel and other special nuclear material (SNM) to Department of Energy (DOE). The inspection requirements related to the fuel and SNM can then be eliminated. However, factors beyond the licensee's control could delay or prevent shipment of the fuel, such as the availability of shipping casks or availability of DOE storage or reprocessing capability. The need to store fuel and changing fuel fission product conditions could change the inspection requirements and procedures as discussed previously.

10.05 Use of Safeguards Inspection Procedures. Except in cases when the licensee has no physical security plan (PSP) for the category of SNM possessed (e.g., see below), inspectors shall determine compliance based on the licensee's approved PSP, and shall

determine adequacy and effectiveness of the licensee's program based on the applicable portions of 10 CFR 73.60 and 73.67 and generally accepted practices. Citations for noncompliance should be based on the approved plan. Findings of inadequacy should be referred to the appropriate licensing staff.

Licensees with possession limits less than MSNM or less than 10 kg of LSNM are not required to have security plans (10 CFR 73.67(c)). Several RTR are in this situation and are not required to have security plans. Such licensees are required to meet the provisions of 10 CFR 73.67(f). These requirements include: to store or use the material only within a controlled access area; to monitor with an intrusion alarm or other device or procedures, the controlled access areas to detect unauthorized penetrations or activities; to assure that a watchman or offsite response force will respond to all unauthorized penetrations or activities; and to establish and maintain response procedures for dealing with threats of thefts or thefts of this material. The inspector will ensure that the licensee acceptably complies with these and other requirements of 10 CFR 73.67(f). Findings in this regard should be referred to the appropriate licensing staff.

END