

April 28, 2004

MEMORANDUM TO: Stuart A. Richards, Chief  
Inspection Program Branch  
Division of Inspection Program Management

FROM: James E. Lyons, Program Director /RA/  
New, Research and Test Reactors Program  
Division of Regulatory Improvement Programs

SUBJECT: REQUEST TO ISSUE REVISIONS TO MANUAL CHAPTER (MC) 2545  
AND TO ISSUE NEW MANUAL CHAPTER ON RESEARCH AND  
TEST REACTOR INSPECTION REPORTS

We request that you issue a new manual chapter (MC-06XX) on research and test reactor inspection reports and issue the attached revision to MC 2545 for use. These MCs were distributed to the NRR research and test reactor staff in draft form for review and comment. Resolutions of comments received on drafts were incorporated, as appropriate, during the development process.

Attachments: 1. Document Issuing Form MC06XX  
2. Document Issuing Form MC2545  
3. MC 06xx  
4. MC 2545

cc: P. Madden, NRR  
M. Maley, NRR

CONTACT: Marvin Mendonca, NRR/DRIP/RNRP/R&TR  
301-415-1128

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**ADAMS ACCESSION #: ML041110663**

**TEMPLATE #: NRR-106**

OFFICE	RTRS:PM	RTRS:LA	RTRS:C	RNRP:PM
NAME	MMendonca:vxj	EHylton	PMadden	JLyons
DATE	4/ 20 /2004	4/ 23 /2004	4/ 23 /2004	4/ 23 /2004

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**N = NO COPY**

INSPECTION MANUAL DOCUMENT ISSUING FORM

To: Chief, IIPB/NRR

From: James E. Lyons  
(Originating Director)

1. Number and Title of Document:

Number: MC06XX

Title: RESEARCH AND TEST REACTOR INSPECTION REPORTS

2. Change Notice Information

Briefly explain why the inspection manual document in 1 above is being issued, revised, or deleted. This explanation will be inserted in the Remarks section of the change notice and will become part of the historical record for the document.

MC 06xx is being issued to provide appropriate guidance for research and test  
reactor inspection reports

3. Type of Document

Inspection Manual Chapter (IMC)  
 Appendix  
 Technical Guidance

Inspection Procedure (IP)  
 Temporary Instruction (TI)  
 10 CFR Guidance

4. Type of Action

New document

Revision

Deletion

5. ROP Basis

All program documents must conform with Inspection Manual Chapter 0308, "Reactor Oversight Process Basis Document." If changes or revisions alter the scope or basis, appropriate updates to the ROP Basis Document are required to be submitted for approval with this document.

Does the Program Document require a change to the ROP Basis Document?  YES  NO

If Yes, then proposed changes to the ROP Basis Document must be submitted by the program document lead for approval with the program document.

6. Baseline Inspection Procedures

6a. If a new IP is being prepared for the baseline inspection program, give the cornerstone to which it applies, the estimated direct inspection effort (DIE) needed to perform the procedure (with any variations for number of reactor units), and the inspection frequency.

Baseline Program:  Yes  No Cornerstone: \_\_\_\_\_  
Frequency of Inspection: \_\_\_\_\_ (Quarterly, annually, biennially, etc.)  
Annual average DIE: \_\_\_\_\_ 1-unit \_\_\_\_\_ 2-unit \_\_\_\_\_ 3-unit sites

6b. For all new or substantially revised baseline inspection procedures, fill out the baseline inspection program change form (IMC 0040, Exhibit 2).

7. New TIs

If a TI is being issued, state the applicability of the TI (i.e., number of plants, types of plants, or specific plants)

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8. Training

Identify any new or revised training requirements if needed as the result of the new IP, revised IP, or TI. The group responsible for establishing and presenting the training should also be identified.

	Yes	No
Is training required?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Type of training required (e.g. TTC course, presentation at counterpart meetings, read/sign, detailed change notice,...)		
Lead branch for establishing training:		
Training to be given by:		

Briefly describe proposed training:

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9. Give the IIPB Manual Coordinator this form, a paper copy of the document, and an electronic copy (e-mail, ADAMS, or on disk) of the document file (including exhibits such as drawings, reductions, or block diagrams) in the current version of WordPerfect.

	Yes	No	N/A
9a. Has document been reviewed by the technical editor?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

9b. If not, why:           This MC used previously accepted MCs 0610 and 0612 input          

10. Comments received on the document should be resolved. State comments, their sources, and if not adopted, why. Is summary of comments and their resolution attached?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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11. Approval Signatures

a.		d.	
Originator	Date	IIPB Manual Coordinator	Date
b.		e.	
Originator's Section/Branch Chief	Date	IIPB Branch Chief	Date
c.		f.	
NMSS Responsible Manager	Date	Director, DIPM/NRR	Date

12. Date received by IIPB Manual Coordinator:

\_\_\_\_\_

13. Change notice number and issue date:

\_\_\_\_\_

END

INSPECTION MANUAL DOCUMENT ISSUING FORM

To: Chief, IIPB/NRR

From: James E. Lyons  
(Originating Director)

1. Number and Title of Document:

Number: MC2545

Title: RESEARCH AND TEST REACTOR INSPECTION PROGRAM

2. Change Notice Information

Briefly explain why the inspection manual document in 1 above is being issued, revised, or deleted. This explanation will be inserted in the Remarks section of the change notice and will become part of the historical record for the document.

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MC 2545 is being revised to provide reference to the new manual chapter is being issued to provide appropriate guidance for research and test reactor inspection reports.

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3. Type of Document

Inspection Manual Chapter (IMC)  
 Appendix  
 Technical Guidance

Inspection Procedure (IP)  
 Temporary Instruction (TI)  
 10 CFR Guidance

4. Type of Action

New document

Revision

Deletion

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If Yes, then proposed changes to the ROP Basis Document must be submitted by the program document lead for approval with the program document.

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Baseline Program:  Yes  No Cornerstone: \_\_\_\_\_  
Frequency of Inspection: \_\_\_\_\_ (Quarterly, annually, biennially, etc.)  
Annual average DIE: \_\_\_\_\_ 1-unit \_\_\_\_\_ 2-unit \_\_\_\_\_ 3-unit sites

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	Yes	No
Is training required?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Type of training required (e.g. TTC course, presentation at counterpart meetings, read/sign, detailed change notice,...)		
Lead branch for establishing training:		
Training to be given by:		

Briefly describe proposed training:

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9. Give the IIPB Manual Coordinator this form, a paper copy of the document, and an electronic copy (e-mail, ADAMS, or on disk) of the document file (including exhibits such as drawings, reductions, or block diagrams) in the current version of WordPerfect.

	Yes	No	N/A
9a. Has document been reviewed by the technical editor?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

9b. If not, why:           This MC used previously accepted MCs 0610 and 0612 input          

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NMSS Responsible Manager	Date	Director, DIPM/NRR	Date

12. Date received by IIPB Manual Coordinator:

\_\_\_\_\_

13. Change notice number and issue date:

\_\_\_\_\_

END

## RESEARCH AND TEST REACTOR INSPECTION REPORTS

### 06xx-01 PURPOSE

To provide guidance on research and test reactor inspection report content, format, and style.

### 06xx-02 OBJECTIVES

To ensure that inspection reports:

02.01 Clearly communicate significant inspection results to licensees, NRC staff, and the public.

02.02 Provide conclusions about the effectiveness of the programs or activities inspected. The depth and scope of the conclusions should be commensurate with the depth and scope of the inspection.

02.03 Provide a basis for enforcement action in accordance with the NRC Enforcement Policy, NUREG-1600. The NRC Enforcement Manual gives additional guidance, which should be used.

02.04 Assess licensee performance in a periodic, short-term context, and present information in a manner that will be useful to NRC management in developing longer-term, broad assessments of licensee performance (e.g., quarterly facility performance reviews).

### 06xx-03 DEFINITIONS

03.01 Apparent violation: A potential noncompliance with a regulatory requirement regardless of possible significance or severity level, that has not yet been formally dispositioned by the NRC.

03.02 Certificate Holder: An entity responsible for meeting certain NRC requirements defined in an NRC-issued Certificate of Compliance (e.g., 10 CFR Part 71 or Part 72).

03.03 Closed Item: A matter previously reported, as a noncompliance, an inspection finding, a licensee event report, an unresolved item, an inspection follow-up item, or a Part 21 report, which the inspector concludes has been satisfactorily resolved, based on information obtained during the current inspection.

03.04 Conclusion: As used in this chapter, an assessment that relates one or more findings to the broader context of a licensee program functional area.

03.05 Deviation: A licensee's failure to satisfy a regulatory commitment. NOTE: This is different from the term "deviation" in 10 CFR Part 21 (i.e., "a departure from the technical requirements included in a procurement document").

03.06 Escalated Enforcement Action: A Notice of Violation or civil penalty for any Severity Level I, II, or III violation (or problem), or an order based on a violation.

03.07 Finding: As used in this document, an observation that has been placed in context and assessed for significance. For example, a safety issue of concern that is related to a licensee performance, which may or may not be related to regulatory requirements and, therefore, may or may not be related to a violation.

03.08 Inspection: The examination and assessment of any licensee NRC-regulated activity to determine its effectiveness, to ensure safety, and/or to determine compliance. A single inspection report may encompass in-office document review, and/or one or more visits by inspectors; however, a single report is normally limited to a specific period of inspection (e.g., a 1-week period).

03.09 Inspection Follow-Up Item: A matter that requires further inspection because of a potential problem, because specific licensee or NRC action is pending, or because additional information is needed that was not available at the time of the inspection.

03.10 Issue: A well-defined observation or collection of observations that is of concern and may or may not result in a finding.

03.11 Licensee: The applicant for or the holder of an NRC license, construction permit, or combined license. NOTE: In general, the provisions listed as applicable to "licensees" in this chapter are also applicable to vendors and certificate holders.

03.12 Minor Violation: A violation that is less significant than a Severity Level IV violation and not the subject of formal enforcement action. Although minor violations must be corrected, they are not usually described in inspection reports or inspection records.

03.13 Non-Cited Violation (NCV): A method to address a Severity Level IV violation. Provided applicable criteria in the NRC's Enforcement Policy are met, such findings are documented as violations, but are not cited in notices of violation.

03.14 Noncompliance: A violation (regardless of whether it is cited or not), nonconformance, or deviation.

03.15 Nonconformance: A vendor's or certificate holder's failure to meet a contract requirement related to NRC activities (e.g., 10 CFR Parts 71 or 72), where the NRC has not placed the requirement directly on the vendor or certificate holder.

03.16 Notice of Violation (NOV): A formal written citation in accordance with 10 CFR 2.201 that sets forth one or more violations of a legally binding regulatory requirement.

03.17 Observation: A factual detail noted during an inspection.

03.18 Open Item: A matter that requires further inspection. The reason for requiring further inspection may be that the matter has been identified as a noncompliance, unresolved item, inspection follow-up item, licensee event report, or Part 21 report.

03.19 Potentially Generic Issue: An inspection finding that may have implications for other licensees, certificate holders, and vendors whose facilities or activities are of the same or similar manufacture or style.

03.20 Regulatory Commitment: An explicit statement to take a specific action, agreed to or volunteered by a licensee, where the statement has been submitted in writing on the docket to the NRC (e.g., a commitment as formalized in a Confirmatory Action Letter, or a commitment to conform to the provisions of applicable codes, standards, guides, or accepted industry practices when the commitment, code, standard, guide, or practice involved has not been made a requirement by the Commission).

03.21 Requirement: A legally binding obligation such as a statute, regulation, license condition, technical specification, or order.

03.22 Unresolved Item: An issue about which more information is required to determine if it is acceptable, if it is a finding, or if it constitutes a deviation, nonconformance or violation. Such a matter may require additional information from the licensee or cannot be resolved without additional guidance or clarification/interpretation of the existing guidance.

03.23 Vendor: A supplier of products or services to be used in an NRC-licensed facility or activity. In some cases, the vendor may be an NRC or Agreement State licensee (e.g., nuclear fuel fabricator, radioactive waste broker) or the vendor's product may be required to have an NRC Certificate of Compliance (e.g., certain transport packages such as waste casks or radiography devices).

03.24 Violation: The failure to comply with a legally binding regulatory requirement, such as a statute, regulation, order, license condition, or technical specification.

## 06xx-04          RESPONSIBILITIES

04.01 General Responsibilities. Each inspection of a research or test reactor facility shall be documented in a report as described in this document.

04.02 Division Director. The applicable Division Director is responsible for providing guidance for situations not covered in this manual chapter.

### 04.03 Research and Test Reactor Section Chief

- a. The Research and Test Reactor Section Chief or designate familiar with NRC requirements in the inspected area shall review each inspection report to ensure that the report follows the guidance given in this document.
- b. The Research and Test Reactor Section Chief or designate shall use applicable internal NRC procedures to provide a record of inspectors' and reviewers' concurrences. The procedures should include how to ensure continued inspector concurrence when substantive changes are made to the report as originally submitted, and how to treat disagreements that occur during the review process (e.g., differing professional views).
- c. The Research and Test Reactor Section Chief or designate is responsible for issuing the report to the licensee.

- d. The Research and Test Reactor Section Chief or designate is responsible for providing interpretations of the information contained in this document and for answering questions related to the guidance.

#### 04.04 Inspectors

- a. Each inspector is responsible to prepare research and test reactor inspection reports in accordance with the guidance provided in this document, including report timeliness. General and specific responsibilities are listed below.
- b. Each inspector is responsible for ensuring that the inspection report is accurate, and that referenced material is correctly characterized. Advice and recommendations are not to be included in inspection reports.
- c. Each inspector is responsible for ensuring that the scope and depth of conclusions are logically drawn and adequately supported by documented observations and findings.
- d. Each inspector is responsible to ensure that the observations, findings, and conclusions are consistent with NRC policies and requirements. For example, enforcement-related findings are addressed in accordance with the NRC Enforcement Policy and the NRC Enforcement Manual.
- e. Each inspector is responsible for ensuring that the content, tone and focus of the inspection report, as issued, is consistent with the content and tone of the exit meeting presentation or that the licensee is appropriately informed of changes after the exit meeting.

#### 06xx-05 GUIDANCE - INSPECTION REPORTS

Inspectors may use previously issued research and test reactor inspection reports for examples and guidance.

05.01 Cover Letter. Inspection reports are transmitted using a cover letter from the applicable NRC official in accordance with the NRR Office Letter on signature authority. The letter is sent to the designated licensee contact. Cover letter content varies somewhat depending on whether or not the inspection identified a noncompliance. In general, however, every cover letter uses the same basic structure. NOTE: Management Directive (MD) 3.57, "Correspondence Management," Part III provides guidance for NRC letters, including inspection report cover letters. In addition, the NRC Enforcement Manual provides standard transmittal letter formats for inspections in which any noncompliance is identified. The subject line of the letter should state the type of inspection report (e.g., NRC ROUTINE INSPECTION REPORT) followed by the report number.

05.02 Cover Page. The report cover page provides a quick glance summary of information about the inspection.

05.03 Executive Summary. The summary should be informative but concise. An ideal inspection report summary will be useful as an overview tool for licensee management and for NRC management. The summary should begin with an one- or two sentence introduction that covers the type of inspection, the scope (i.e., the licensee programs or functional areas inspected), a summary of the overall regulatory conclusion on facility safety and compliance, and a list of the conclusions from the report details.

05.04 Table of Contents. For reports of significant length (i.e., in which the report details section exceeds 20 pages), the inspector should consider including a table of contents as an aid to clarity.

05.05 Report Details. The inspection report should be written with a corresponding level of technical detail, so that it will be understood by a knowledgeable individual conversant with nuclear technology, but who may not be an expert in the specific area inspected. The basic details need only be presented once. Cross references should be made in other sections as appropriate.

- a. Research and test reactor inspection reports should begin with a "Summary of Facility Status" section that briefly describes any shut downs or significant changes in power.
- b. The next section(s) of the report details should be topically arranged in accordance with the inspection procedure specified in Manual Chapter 2545. Each area inspected will include the scope, observations and findings, and conclusions.

1. Inspection Scope. Concisely describe the inspection scope including the inspection procedure used. Do not repeat any portion of the Scope in the Observations and Findings section. The scope should include the following:

Identify how the inspection was conducted (i.e., the methods of inspection). Methods can include walk-downs, an in-office review, observation of test from the control room, discussion with specific personnel, procedure review, or observation of training or an exercise.

Identify what was inspected. A tabular format is frequently the most clear; the inspector can use this format to list systems, trains or components inspected, specific work activities or evolutions that were monitored, reviewed procedures or records with revision numbers or dates, event reports, etc. When the inspector is present during a significant facility event or an unusual evolution, more detail may be appropriate concerning which portions of the event or evolution were actually observed. For inspections of significant facility modifications, strong emphasis is generally given to quality verification of newly installed or re-worked components or systems. In such cases, the description of inspection activities should be very detailed about what the inspector actually examined (e.g., a listing of welds observed or radiographs reviewed).

Identify the inspection objectives and the criteria used to determine whether the licensee is in compliance. Sources of objectives and criteria include the License, Technical Specifications, and required programs and plans (e.g., the radiation protection plan, the security plan, the emergency plan, and the operator re-qualification plan). Other possible sources include the licensee's commitments.

If the inspection activities were conducted at a location other than the facility, (e.g., an evaluation of emergency or security services), then identify where the inspection took place.

2. Observations and Findings. This section should be used to present, in a narrative format, the inspection results. Within each category, present the observations and findings beginning with the most significant.

- (a) Observations are the facts an inspector gathers--through watching work activities, examining equipment, interviewing licensee employees, reviewing records, and other inspection methods. When documenting an observation, the inspector will

use language that clearly identifies how the observation was discovered and verified. Factual information, which is relevant to an observation, will be documented (e.g., the date and time of discovery, the type, size, manufacturer or model of the equipment, facility-specific design feature, relevant procedures and documents, and chronology of the event including the length of time the condition existed). The facts will be presented in sufficient detail to allow understanding of the characteristics and significance of the inspection findings.

Whenever possible, an observation should be related to a requirement or commitment. Often this context is achieved by direct numerical comparison. For example, comparison to a technical specification required value. Some observations will be qualitative (e.g., reference to an required licensee procedure). Whether the observation is or is not covered by regulatory requirements, the inspector must clearly state the safety significance (further guidance on the level of safety significance to document is provided below). In such a case, the inspector should use inspection procedures and discussions with NRC and licensee management to arrive at a clear statement of safety significance. Detail must be adequate to support the findings and subsequent conclusion.

- (b) Findings are an assessment of the significance and context of the observations. Inspection reports will clearly relate (1) how the finding relates to the observation(s), (2) whether the finding is neutral, positive or negative, and (3) how significant the finding is.

Fully assessing and documenting the significance of an observation as a finding requires consideration of what are the safety and regulatory impacts. This process involves considering the following questions: What was the actual or potential safety significance? What is safety or regulatory impact with regard to equipment, system or human performance? Who was involved in the issue? Are there programmatic implications? What were the root causes? Has this occurred before? Is a trend or pattern developing? Who found the problem? Should it have been found by the licensee sooner? What was done to correct it? Were those corrective actions prompt and thorough? How does the licensee characterize the significance of this matter? Are there potentially generic issues? The inspection report needs not always answer each of these questions, and need not exhaustively provide every supporting detail for every observation. The inspector will include those details and analyses that contribute to understanding the significance of the finding. The level of detail should reflect the actual or potential safety consequence associated with a finding. The level of detail must provide the decision logic used to arrive at the final conclusion. Include a description of any licensee performance that exasperated or mitigated the issue and influenced the significance of the finding.

In determining the significance of negative findings, the following questions should be used to determine whether or not a finding should be documented in the inspection report: Has this finding shown any actual impact (or any significant potential for impact) on safety? Is this finding illustrative of a programmatic licensee problem, which could have a safety or regulatory impact (e.g., multiple examples of the problem, a related series of failures, an underlying training deficiency, inadequate management oversight, or diverse effects resulting from the same root causes)? Had the licensee previously documented the problem in a corrective action program and not taken effective corrective action? Should the

licensee have identified the problem through an NRC required program, evaluation, or audit? Is this finding a possible precursor to a significant event? If the licensee takes no action on this matter, will the condition worsen (i.e., will the safety significance increase)? If this finding recurs, will its recurrence result in more significant or additional safety concerns? Will this information be useful in assessing the long-term performance of this licensee program or functional area? Does this finding have potentially generic issues? If the answer to any one of these questions is "yes," the finding should be documented in the inspection report. In this case, the documentation should clearly relate the regulatory and safety significance. If the answer to all questions is "no," the finding normally should not be documented.

In determining the significance of positive findings or for licensee improvements, similar thresholds of significance should apply. The inspector should ask questions similar to the following: Has this licensee improvement had an actual positive impact on safety? Has the licensee's efforts to effect change in this area resulted in programmatic improvements to safety or regulatory performance? Has this upgrade resulted in improved equipment or system reliability or improved human performance? Has this information provided useful equipment, system, or human performance insights? Has this licensee action significantly reduced the probability of a particular event? Will this information be useful in assessing the long-term performance of this licensee program or functional area? Does this finding have potential generic issues? If the answer to any one of these questions is "yes," the finding should be documented in the inspection report. If the answer to all questions is "no," the finding normally should not be documented. NOTE: Inspectors should use care in giving credit or making strong positive statements for a proposed licensee action that has not yet been implemented or is in early stages of implementation.

As a general rule, "neutral" assessments should be described in less detail than positive or negative findings. Sufficient detail may be given simply by concluding that the licensee's program met certain expected criteria. That is, if no safety significance or noncompliance issues were identified, then all that is needed is a succinct characterization of the activities observed, and any supportable finding on program adequacy.

Guidance on enforcement-related findings, with regard to significance and supporting details to be documented, is provided in the Enforcement Policy and Enforcement Manual. The documentation for any described violation or deviation must include sufficient information to support the conclusion that the finding is more than minor and is a violation of regulatory requirements. At a minimum the inspection report will address the following questions: What requirement was violated? How the violation occurred? When the violation occurred and how long it existed? When the violation was identified? Are there any actual or potential safety consequence? What are the root cause(s) or apparent root cause(s) at the time of report writing (if identified)? What corrective actions have been taken or planned?

Apparent violations that are associated with potential escalated enforcement actions should also address the following if available at the time of documentation: What is the significance attributed to the finding by the licensee? If the significance is different than that determined by the NRC, then describe the

assumptions used by the licensee, and identify what the licensee considered applicable to its determination that the NRC did not. What is the licensee's position on the NRC's determination that a requirement has been violated? If appropriate, what are the licensee's compensatory measures, which are in place while the licensee's implementing its long-term corrective measures?

**CAUTION:** Do not make direct statements regarding safety significance in the inspection report when the Agency has not yet reached a conclusion in accordance with the Enforcement Policy and Enforcement Manual.

Inspection follow-up items (IFIs) are issues, which merit additional inspection. IFIs include unresolved items, violations, non-cited violations, and deviations. IFIs should only be initiated for issues that, if substantiated, would clearly rise above the thresholds of significance to be documented as discussed above, and for issues when some specific licensee action is pending, or when needed information is not available at the time of the inspection. When the inspector finds that the additional information may reveal the issue to be a matter of noncompliance, an unresolved item should be initiated. A potential issue or noncompliance should not be identified as unresolved if it likely results in a minor violation. For an unresolved item, the report should identify the actions or additional research needed to resolve the issue. The NRC Enforcement Manual also provides additional guidance on tracking and following up issues of noncompliance. NCVs will normally be opened and closed in the initiating inspection report. The issue description should provide enough background information that a different inspector, using that information, would be equipped to perform the follow-up inspection.

The inspector should make every effort to understand and fairly characterize the licensee's perspective. The inspector's assessment of a finding's significance should be validated through discussion with other NRC research and test reactor personnel and NRC management.

3. Conclusions are general statements of assessment that relate one or more findings to the broader context of the licensee program or functional area inspected. The scope of the conclusions must match what the inspection findings will support. In essence, the conclusion should be compiled by scanning each report section and writing a crisp, short summary sentence for each issue of note--noncompliance or significant findings. As a minimum, the conclusion should include a general assessment statement on the acceptability of each program area in which significant inspection was performed. Conclusions should focus on the capability of the program or activity to accomplish its design basis function. In assessing this capability, the conclusion statements may take various forms, but they should in all cases be concrete and supportable.

Unresolved items and inspection follow-up items (i.e., where more information is needed to reach a finding or conclusion) should not be discussed in the conclusion. NCVs need not be discussed.

The inspection observations and findings must be sufficient to substantiate the conclusion. A broad negative conclusion should be based on specific findings of unsafe practices, ineffective programs or activities, operator or supervisory oversights, significant procedural inadequacies, etc. When negative findings are included in the conclusion, concisely state the root cause(s) (if the root cause(s) have been determined). Conversely, a broad positive conclusion should be supported by findings

of sustained safe performance, innovations to improve safety and reliability, efficient execution of complex tasks, programmatic upgrades that improve safety or correct previous issues, etc. Frequently, the findings in a given program area will be mixed (positive and negative), or the limited scope of inspection in a particular area will only support a correspondingly limited conclusion. In such cases, the inspector should neither "force-fit" a broad conclusion nor restrict the conclusion scope to a simple restatement of the findings. Where applicable, the conclusion should account for both negative and positive findings.

For inspections of hardware components or systems, conclusions should seek to answer questions such as the following: Is the component or system capable of performing the safety functions required by either its design or licensing basis? Is maintenance and post-maintenance testing adequate to demonstrate that the component or system would perform all of the safety functions required? Is training adequate to ensure proper operation and maintenance of the component or system? Are control functions effective and reliable? Are human factors considerations relating to the component or system (e.g., accessibility and labeling of components) adequate to ensure proper system operation? Are system procedures adequate to ensure proper system operation under normal and accident conditions? Additional, similar questions may be developed based on the applicable inspection procedure.

Conclusions can also document improving or declining performance in the particular area inspected. Violations, deviations, issues or findings may indicate a trend in licensee performance. Since the NRC inspection program only samples a portion of licensee activities, inspectors should be careful in making statements about a perceived trend, to ensure: (1) that the focus of the statement is accurate in scope (i.e., not overly broad) and is based on an adequate sample of observations; (2) that a perceived improvement or decline does not simply reflect a lack of earlier observation in the area of focus; and (3) that the comparison of past and present performance involves the same specific licensee program area. The conclusion statements should note any noncompliance described in that section of the report.

NOTE: In reaching a conclusion, the inspector sometimes considers and integrates related information from a previous inspection report. In such a case, the inspector should briefly summarize the previous inspection information or reference the previous inspection report.

c. Inspector Follow-up Item(s). This section should include:

1. The IFI number.
2. Next to the number whether the item will remain open or closed.
3. Brief description of the issue. Include a reference to the regulatory criteria, root cause(s), licensee's corrective action(s). NOTE: A statement of regulatory criteria or root cause(s), need not be included for less significant issues or when the follow-up results are routine and straightforward.
4. Brief description of the actions the inspector took to verify resolution of the issue.

The level of detail devoted to closing open items depends on the nature and significance of the additional information identified. For example, in closing out a

violation, if the licensee's "Response to a Notice of Violation" already has given an accurate description of the root cause, corrective actions taken, and other aspects, and the inspector identifies no other instances of the violation, the close-out description should be correspondingly brief. The closure of an unresolved item or IFI should, at a minimum, summarize the topic, summarize the inspector's follow-up actions, evaluate the adequacy of the licensee's corrective actions, determine if a violation has occurred, and include enough detail to justify the inspector's conclusion. NOTE: An inspection follow-up item may be closed simply by administrative action, when NRC management decides not to expend the effort originally envisioned when the IFI was opened.

d. Exit Meeting Summary. This summary normally should include the following elements:

1. If the licensee disagrees with an inspection finding, this position may be characterized by the licensee in their formal response to the inspection report, if applicable. Generally, this section should only confirm that the licensee acknowledges their understanding of the findings and conclusions. Specific items discussed elsewhere in the report should not be described in this section in detail.
2. At the exit meeting, the inspectors should verify whether or not the licensee considers any materials provided to or reviewed by the inspectors to be proprietary. If the licensee did not identify any material as proprietary, include a sentence to that effect. If the report includes proprietary material discuss control with NRC management. NOTE: When an inspection is likely to involve proprietary information (i.e., given the technical area or other considerations of inspection scope), handling of proprietary information should be discussed at the entrance meeting.
3. The inspector should briefly discuss any significant contacts between the inspectors and licensee staff or management that occur after the exit meeting (e.g., to discuss new information relevant to an inspection finding). In addition, if the NRC's position on an inspection finding changed significantly after the exit meeting, that change should be discussed with the licensee before the report is issued.
4. Do not attempt to characterize or interpret any oral statements the licensee makes, at the exit meeting or at any other time during the inspection, as a commitment. Oral statements made or endorsed by a member of licensee management authorized to make commitments are not regulatory commitments unless they are documented as such by the licensee. Licensee commitments are documented by licensee correspondence, after which they may be referenced in the inspection report. Because regulatory commitments are a sensitive area, ensure that any reporting of licensee statements are paraphrased accurately, and contain appropriate reference to the licensee's document.

e. Report Attachments

1. Partial List of Persons Contacted. List by name and title, those individuals who furnished relevant information or were key points of contact during the inspection (except in cases where there is a need to protect the identity of an individual). The list should not be exhaustive but should identify those individuals who provided information related to developing and understanding findings. The alphabetized list includes the most senior licensee manager present at the exit meeting and NRC technical personnel who were involved in the inspection if they are not listed as inspectors on the cover page.

2. List of Inspection Procedures Used. The report should list, by procedure number and title, the inspection procedures used. In some cases, the inspector may wish to include other significant activities inspected (e.g., TIs completed).
3. List of Items Opened, Closed, and Discussed. The report should provide a quick-reference list of items opened and closed, including the item number, the IFS code for the item, and a brief phrase (10 words or less) describing the item. Open items that were discussed (but not closed) should also be included in this list.
4. List of Acronyms. Reports of significant length (i.e., in which the report details section exceeds 10 pages) should generally include a list of acronyms as an attachment.

## 06xx-06 INSPECTION REPORT ADMINISTRATION

06.01 Inspection Report Numbers. Office Instruction No.: OVRST 101, "Procedures for Tracking Inspection Reports for Inspections Conducted by NRR Headquarters Staff," provides guidance on obtaining and using inspection report numbers.

### 06.02 Report Timeliness.

- a. Timeliness. Routine inspection reports should be issued no later than 45 calendar days after inspection completion. Reactive inspection reports should be issued no later than 30 calendar days after inspection completion. Inspection completion is the day of the exit meeting. Timeliness goals should be accelerated for inspection reports covering potential escalated enforcement actions. For specific enforcement timeliness goals, see the NRC Enforcement Manual.
- b. Significant or Immediate Health and Safety Issue. Whenever an inspector identifies an issue involving significant or immediate public health and safety concerns, the first priority is facility and public safety; issues of documentation or enforcement action are secondary. Based on the circumstances of the case, an expedited inspection report may be prepared that is limited in scope to the issue, or expedited enforcement action may be taken before the inspection report is issued. The NRC Enforcement Manual provides additional guidance on matters of immediate public health and safety concern.

06.03 IFI tracking and numbering. IFIs will be tracked by the originating or assigned inspector. Each IFI will be numbered in the inspection report. The number will consist of three letter designation for the type of item (e.g., violation (VIO), non-cited violation (NCV), deviation (DEV), unresolved item (URI), or other findings that merit follow-up (IFI)), followed by the docket number, a "/", the inspection report number, a "-", and a sequence number (e.g., VIO 05000999/2004-001-01). The sequence number will start with 01 at the beginning of the report for the first item identified. Each new item identified on subsequent pages will be numbered in sequence, regardless of type. In a report covering only one facility, each item will be tracked separately. Items common to two or more facilities will have the same sequence number for each unit; the docket number and the associated inspection report number will distinguish the unit to which the open item applies. When an inspection involves multiple violations (or multiple examples of a single violation), there must be an one-to-one correlation between the number of the IFI and the number of "contrary to" statements in the accompanying notice of violation.

## 06xx-07 GUIDANCE - INSPECTION REPORT STYLE

07.01 The NRC Enforcement Manual provides specific guidance and boilerplate for writing associated with enforcement actions.

07.02 The U.S. Government Printing Office (GPO) Style Manual is a reference on government writing style, covering a range of topics from capitalization to compound words.

07.03 NUREG-1379, the NRC Style Guide, establishes specific guidance for the agency on the use of abbreviations, capitalization, punctuation, in-text references, and so forth. The NRC Style Guide is consistent with the GPO Style Manual on most matters.

07.04 The narrative sections of a report should be written in the third person, in the past or past perfect tense, in predominately active voice.

- a. Grammatical Person, Tense, and Voice. Always write in the third person. For example, "The inspector watched the operator startup the reactor."

In general, use the past or past perfect tense. For example, "The facility director stated that the safety review committee met quarterly." NOTE: As a rule of thumb, use the past tense (e.g., "the pump cavitated ..." OR "the pump was cavitating ...") when writing about events that occurred during the inspection. Use the past perfect tense (e.g., "the pump had cavitated ..." OR "the pump had been cavitating ...") when writing about events that occurred before the inspection. EXCEPTION: When quoting or paraphrasing existing documents, the present tense may be used (e.g., "10 CFR 50.71 states ..."). When quoting a licensee document, give the date and/or revision number of the document from which the quote was taken).

Use predominately active voice (subject-verb-object). For example, "The operator reported that pool water level was rising." The inspection report should clearly identify the subject, or the performer of the action, which could be important in evaluating the significance of the observation.

- b. Words or Phrases with Unspecific Connotations or Hidden Implications. Avoid words or phrases that have unspecific connotations or hidden implications, such that a reader might misconstrue the meaning. Avoid words and phrases which are imprecise, e.g., wonderful or awful. These words and others are imprecise and unsupported. A more concrete description, detailing those aspects and attributes of the finding are more appropriate. For example, a program exceeded or failed to meet requirements or standards on timeliness. "Willful," and "deliberate" activities represent agency conclusions with specific NRC Enforcement Policy connotations, and should not be used in a report narrative unless they represent a formal Agency conclusion. For further discussion on willfulness and related topics, refer to the NRC Enforcement Manual.
- c. Technical, Legal, and Local Jargon. Because of the specialized technical and legal aspects of NRC regulation, inspectors must maintain sensitivity to the use of specialized vocabulary in inspection reports. The use of technical and legal jargon is expected and necessary; however, inspectors should avoid the use of "local jargon," terms or phrases that have specific meaning for a particular facility or but are not widely understood. Examples include terms and phrases such as "tailgate" (when used to refer to an informal meeting), "work-around," and "command and control." Because these labels are used routinely by a localized group, inspectors may become accustomed to their use and assume that they have a consistent, widely understood meaning. To reduce the potential for miscommunication, inspectors should define such terms and phrases whenever used or, if

possible, use an alternate word that has a clear, dictionary-defined meaning. For example, consider the following usage of the term "work-around": "The licensee's failure to resolve longstanding concerns has contributed to an excessive reliance on an operator "work-around." The term "work-around," as used in this report, refers to non-routine actions performed by the operating crew to compensate for equipment not functioning as designed." In this case, the inspector chose to use local jargon by including the term "work-around." By defining the term immediately after its initial use in the report, however, the inspector avoided the possibility of vagueness or an incorrect interpretation for a reader not familiar with the term. As an alternative, the inspector may choose not to use the term at all: "The licensee's failure to resolve longstanding concerns has contributed to an excessive reliance on the performance of non-routine actions by the operators, to bypass or compensate for equipment not functioning as designed."

#### 06xx-08 RELEASE AND DISCLOSURE OF INSPECTION REPORTS

- a. General Public Disclosure and Exemptions. Except for report enclosures containing exempt information, all final inspection reports will be disclosed routinely to the public. IMC 0620, "Inspection Documents and Records," gives guidance on acquiring and controlling NRC records, including inspection-related documents. Safeguards information or related sensitive information should not be released per current Agency policy. Any questions regarding this policy should be referred to the program office.
- b. Release of Investigation-Related Information. When an inspector accompanies an investigator on an investigation, the inspector must not release either the investigation report or his or her individual input to the investigation report. This information is exempt from disclosure by 10 CFR 9.5, and must not be circulated outside the NRC without specific approval of the Chairman (refer to OI Policy Statement 23).

#### 06xx-09 TREATMENT OF THIRD PARTY REVIEWS

Detailed NRC reviews of National Organization of Test, Research and Training Reactor (TRTR) evaluations, reports, findings, recommendations, and corrective actions, or other third party reviews with similar information are not referenced in NRC inspection reports, tracking tools, or other Agency documents unless the issue is of such safety significance that no other reasonable alternative is acceptable. TRTR findings, recommendations and associated licensee corrective actions are not normally tracked by the NRC. If a finding warrants tracking, it should be independently evaluated, documented, and tracked as an NRC finding. Include a short statement in the inspection report to document that a review of a specified TRTR evaluation or report was completed. Do not include a recounting or listing of TRTR findings or reference a final TRTR conclusions when documenting an TRTR evaluation or accreditation report review. Discuss the specifics of any significant differences between NRC and TRTR perceptions with management.

END

# NRC INSPECTION MANUAL<sub>RNRP</sub>

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## MANUAL CHAPTER 2545

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### 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 known 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 06xx) 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 06xx

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:

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
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 Reactors" 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	≥5 kg	<5 kg & > 1 kg	≤1 kg & >15 g
	<20% & ≥10%		≥10 kg	<10 kg & >1 kg
	<10% & >natural			≥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:

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:

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 triennially. Completion of this portion of the program involves the conduct of the following inspection procedures:

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