

April 13, 1998

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| FOR:     | The Commissioners   |
| FROM:    | L. Joseph Callan /s/<br>Executive Director for Operations   |
| SUBJECT: | PREPARATION FOR SENIOR MANAGEMENT MEETINGS FOR FUEL<br>CYCLE FACILITIES AND HIGHER-RISK MATERIALS LICENSEES |

**PURPOSE:**

To respond to the Commission's direction in Staff Requirements Memoranda (SRMs) dated June 30, 1997, and February 10, 1998, about development of a more formal approach for reviewing the performance of fuel cycle facilities and higher-risk materials licensees in preparation for Senior Management Meetings (SMMs).

**BACKGROUND:**

A study<sup>(1)</sup> by U.S. Nuclear Regulatory Commission consultant Arthur Andersen analyzed the process for preparing for, and discussing, operating commercial nuclear power reactor licensee performance at the SMM. The study did not specifically address the SMM process devoted to fuel cycle facilities and materials licensees. However, many of the study's recommendations have some applicability beyond reactor licensees, regarding the need for using a more structured and objective assessment process for identifying licensees to be discussed at SMMs.

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Staff briefed the Commission on April 24, 1997, regarding its plan to improve the SMM process, in light of the Andersen study's recommendations. The Commission subsequently approved the staff's plan to improve the SMM process and, in an SRM dated June 30, 1997, extended the action to include fuel cycle and materials licensees, by requesting the staff to "...determine the appropriate threshold, evaluation methods and criteria, and categorization schemes for discussing fuel cycle facilities and higher-risk<sup>(2)</sup> material licensees at the Senior Management Meetings." During a staff briefing to the Commission on January 21, 1998, on the results of the January 6-7, 1998, SMM, the Commission also raised the concern of how fuel cycle facilities and materials licensees are addressed in the SMM process. The February 10, 1998, SRM provided additional direction to the staff on considerations for the fuel cycle facilities and materials licensees screening process.

The staff has reviewed the Andersen study to determine its applicability to fuel cycle and materials regulation, as the Office of Nuclear Material Safety and Safeguards (NMSS) considers ways it can better prepare for the SMM. The staff has concluded that some of the study's recommendations offer important insights into how NMSS can improve the process for evaluating licensee performance, and how it prepares for the SMM.

The following discussion outlines the staff's response to the SRMs dated June 30, 1997, and February 10, 1998, with respect to fuel cycle and materials licensees.

**DISCUSSION:**

It is recognized that the Commission may eventually want a uniform process for evaluating all

facilities, whether they are commercial nuclear power plants or fuel cycle facilities and materials licensees. To that end, the staff attempted to apply the principles of the Anderson study's recommendations to evaluate fuel cycle facilities and materials licensees. The results of the staff's considerations of the Anderson study are documented in Appendix 2-3 of attachment 2. In this evaluation, the staff concluded that for fuel cycle facilities and material licensees, the sparseness and inconsistency of the available data (and in the specific case of fuel cycle licensees, the small number and uniqueness of facilities) would not permit a classical statistical analysis of performance indicators, or yield consistent performance indicators. Notwithstanding the difficulty the staff had in interpreting the available performance indicators to correspond with subjectively determined levels of performance, the staff sought to determine whether some combination of performance indicators, using appropriate weighting factors, could be derived to serve as a reliable performance index. The staff experimented with several combinations of performance indicators with weighting factors to reflect the relative importance of the indicators in determining good performance. None of the sets of weighting factors yielded a promising performance index. This, again, is most likely because of the inconsistency in the underlying data. The staff determined that it was impractical for NRC to formally characterize, compare, or rank fuel cycle or materials licensees using a performance index for purposes of recommending them for discussion at the SMM.

The staff has determined that better objectivity could be obtained by presenting the available performance indicators at NMSS screening meetings for the SMM but without combining them into an index to produce a ranking. Although the lack of large numbers of reportable events or other indicators limits a meaningful statistical interpretation, the small numbers do present an offsetting advantage. Namely, the staff can consider individual events, enforcement actions, or other relevant occurrences in detail to draw conclusions about licensee performance. In fact, these are the types of considerations that go into the current fuel cycle Licensee Performance Review program and specific performance-monitoring efforts for materials facilities, which form the basis of the NMSS SMM screening process described below.

#### **Performance Assessment for Fuel Cycle Facility and Materials Licensees**

For the fuel cycle facilities and materials licensees, the SMM process is mainly informational, and is not the primary process for determining action steps to address poorly performing licensees. NMSS continually monitors the performance of fuel cycle facility and materials licensees, and takes appropriate levels of actions in response to changes in licensees' performances as they occur. Such performance changes become apparent through implementation of NMSS' routine inspection program for the facility, or from reactive inspections and analyses after significant events. Also, periodically, the performance of each fuel cycle facility licensee is assessed through a Licensee Performance Review (LPR) process, in conformance with Inspection Manual Chapter 2604 (Attachment 1). This process informs senior NRC management and provides feedback to licensees about NRC expectations and observations on licensee performance.

The identification of performance problems at a fuel cycle or materials licensed facility very seldom results in the need for significant reallocation of NRC resources or for NRC organizational changes requiring Commission action. Consequently, the SMM has not been the focus of NMSS decision-making regarding poorly performing licensees. The fuel cycle facilities and materials licensees portion of the SMM generally focuses on significant technical and policy issues that may require Commission action over a longer time frame, but most actions required

for dealing with a poorly performing licensee are likely to have been implemented through existing NMSS programs well before the facility would have been discussed at the SMM. Consequently, the issues pertaining to the licensee performance assessment process, evaluation criteria, performance indicators, and thresholds for determining whether a fuel cycle facility or a materials licensee warrants increased NRC attention revolve more around NMSS routine regulatory activities than around the SMM process, and are discussed below, in that context. NMSS, however, has recently established a more formalized SMM screening process, which builds on the existing, and recently enhanced, programs for routinely monitoring licensee performance. A pilot program for this new process was tested in the fall of 1997, in preparation for the January 1998 SMM. The NMSS Director held screening meetings with each Regional Administrator, to review the performance of fuel cycle facility and the materials licensees. A screening information package for each of the facilities was assembled, using new standardized performance evaluation templates, one for fuel cycle facilities, and another for materials licensees. These templates were adapted for use with fuel cycle facilities and materials licensees, from similar templates used for power reactors. A more complete description of the NMSS process for conducting screening meetings and selecting licensees for discussion at the SMM appears in Attachment 2.

The resources required to implement the program for monitoring fuel cycle facility and materials licensee performance are incorporated in the total resources provided for fuel facility and materials inspections, and event follow-up and evaluations.

The following discussion describes the risk environment for the different types of fuel cycle facility and materials licensees regulated by NMSS. It also describes the current processes, performance indicators, and criteria used both for evaluating the performance of fuel cycle facilities and materials licensees, and for taking appropriate regulatory actions in response to either positive or negative performance trends.

### **Controlling Risks at Fuel Cycle and Materials Facilities**

The potential widespread public health and safety consequences of possible poor performance by a fuel cycle facility or materials licensee are, in many respects, both much smaller and much different than for a power reactor. However, significant health, safety, and safeguards risks are associated with fuel cycle facility and materials licensee activities, especially regarding worker safety, potential theft of strategic special nuclear material, and environmental concerns. The fuel cycle and materials facility risks differ in many fundamental ways from power reactors. Nuclear material is handled in solid, liquid, and gaseous states, multiple chemical forms, and with changing physical consistencies, generally while outside the protection provided by the substantial containment of reactor cores or fuel casks.

Historically, inadvertent criticality excursions have occurred at fuel cycle facilities,<sup>(3)</sup> in both laboratory and commercial settings, and, in a few cases, have caused fatalities and personal injuries. In recent years, through better regulation and better techniques for controlling criticality, there have been limited criticality-related incidents at licensed fuel cycle facilities. These have involved only loss of controls and parameters, rather than actual criticality excursions. But, controlling these and other types of safety and safeguards risks at fuel cycle facilities (e.g., the rupture of a liquid-filled uranium hexafluoride cylinder, which also resulted in a fatality at Sequoyah Fuels in 1986) continues to require a diligent fuel cycle facility regulatory program. With regard to the use of licensed byproduct materials, serious accidents are infrequent and would generally involve relatively small radiation doses to a few people located in small areas.

However, there have been accidental radiation over exposures that have caused fatalities and personal injuries. This continues to require a high level of NRC vigilance.

### **Evaluation Criteria and Regulatory Action Steps in Response to Licensee Performance Trends**

The primary tools for monitoring licensee fuel cycle facility and materials licensee performance are a program of routine periodic inspections and analyses of events. Though there have been no strict documented threshold criteria established for focusing increased NRC attention on poorly performing licensees, it has been NMSS practice to increase its scrutiny of a licensee when: (1) violations occur at Severity Level 3, or above; (2) when they become the subject of multiple substantiated allegations; (3) after one or more serious events occur; (4) when serious financial difficulties arise; or (5) when the licensee's corrective actions or self-assessment programs are determined to require significant improvement. For materials facilities, the inspection program (Inspection Manual Chapter 2800) specifically includes consideration of adjustment in inspection frequency based on inspection findings.

The level of scrutiny a licensee's operations are subjected to in the case of routine or reactive inspections is guided by the inherent risks of the operations and previous levels of licensee performance. The inspection program for fuel cycle licensees, in particular, is integrated over the regions and Headquarters through a Master Inspection Plan (MIP). The MIP is used to adjust the number of planned onsite hours of routine inspection in 14 different functional areas, in response to performance trends delineated in periodic LPRs. This process, in concert with enforcement actions, generally provides adequate feedback to licensees on NRC's perspective of the licensee's performance in specific functional areas. In the materials area, inspection frequency is determined by the type of activities conducted, modified by licensee performance, as described in the preceding paragraph.

Should a fuel cycle facility or materials licensee exhibit a level of performance that threatens severe or immediate safety or safeguards consequences to workers or the public, NMSS would take immediate actions, some of which would involve concurrent notification to the Commission, others of which would require prior Commission notice. The more serious actions include orders to cease or modify operations to ensure safety; license suspensions or revocations; or imposition of civil penalties. In cases involving possible wrongdoing, NMSS would coordinate with, and support, the Office of Investigation, which may refer cases to the Department of Justice, for criminal prosecution, as appropriate. In addition to the prescribed enforcement actions, NMSS might arrange senior level management meetings with the licensee, or issue Demands for Information or Confirmatory Action Letters, as the situations and technical issues dictate.

### **Future Actions**

As NRR and the Office of Nuclear Regulatory Research develop additional tools for, and insights into, uses of new types of performance indicators, NMSS will determine the usefulness of the new approaches for assessing fuel cycle facilities and materials licensees performance, and modify, as appropriate, NMSS licensee performance assessment programs. This would include NMSS participating in NRR training opportunities that NMSS might also find useful, and sharing other NRR resources (e.g., expertise) NRR might devote to properly interpreting new types of performance indicators.

### **COORDINATION:**

The Office of the General Counsel has reviewed this paper and has no legal objection.

L. Joseph Callan  
Executive Director for Operations

Attachment 1. [Inspection Manual Chapter 2604, "Licensee Performance Review"](#)  
s: 2. ["NMSS Programs for Monitoring the Performance of Fuel Cycle and Materials Licensees and Preparing for Senior Management Meetings."](#)

**ATTACHMENT 1**  
**INSPECTION MANUAL CHAPTER 2604**  
**LICENSEE PERFORMANCE REVIEW**

ATTACHMENT 1  
NMSS  
Issue Date: 08/26/1996

**NRC INSPECTION MANUAL**

MANUAL CHAPTER 2604  
LICENSEE PERFORMANCE REVIEW

2604-01 PURPOSE

This chapter describes a simple and streamlined process for conducting reviews of a licensee's performance relative to the key functional areas covered by the licensing and inspection program for fuel cycle facilities. The result of such a review should provide a panoramic, or "big picture," view of licensee performance to senior U. S. Nuclear Regulatory Commission (NRC) management, and provide a basis for adjusting the fuel cycle facility inspection program, including such areas as inspection focus, frequency, and resources. It also will provide valuable feedback to licensees regarding how NRC management perceives their performance in protecting public health and safety.

2604-02 OBJECTIVES

02.01 To describe a simple and streamlined process by which NRC management and staff shall conduct the review of a fuel cycle facility licensee's performance in protecting public health and safety, and

02.02 To ensure the consistency of the review process from one facility to another, and among different NRC Regional Offices.

2604-03 DEFINITIONS

03.01 Bullet-Style Format. For purposes of this program, this indicates an outline type of format where licensee performance information is presented in concise terms for each functional area, in terms of program strengths, program elements needing improvement, and program elements for which challenges to performance are expected during the next review period. Under each of these categories, items of information are indicated with "bullets" (e.g., "●"). Where further details are to be specified, items of information are indicated by hyphens (e.g., "-"). An example of the required bullet-style format is provided in Enclosure 1, "Sample Licensee Performance Review Report Format."

03.02 Functional Areas. The following definitions describe the four main program areas that form the basis for the Licensee Performance Review. Each functional area is composed of combinations of fuel cycle inspection program areas for which one or more specific inspection procedures from IMC 2600 have been identified in parentheses (by number). A fifth functional

area, "Special Topics," is reserved for other licensee performance issues that arise only occasionally.

- a. Safety Operations. Operations involving nuclear criticality safety, chemical process safety, plant operations, and fire protection.
  1. Chemical Process Safety. Ensuring adequate protection of the workers, public and environment from hazardous chemicals that could adversely affect radiological safety or could be released from the processing of licensed radioactive material. (88056-88066)
  2. Criticality Safety. Ensuring that the licensee has implemented adequate controls to prevent an inadvertent nuclear criticality. (88015, 88020)
  3. Plant Operations. Ensuring that the licensee has instituted effective programs to provide for safe operation of the facility during both routine and upset conditions, to recognize and report non-routine events affecting safety, and to identify and execute corrective actions to return the plant to a safe condition after possible upsets. (88020)
  4. Fire Protection. Ensuring that potential fires would not occur or would be limited in such manner that the safe handling and storage of nuclear material could be maintained. (88055)
  5. Management Organization and Controls. Ensuring that the licensee provides appropriate management and control systems such as internal reviews and audits, safety committees, and quality assurance programs, to maintain effective management oversight of facility operations. (88005)
- b. Safeguards. Material control and accounting, and physical protection of special nuclear material.
  1. Material Control and Accounting. Ensuring that the licensee maintains an effective system for verifying the quantity, status, and location of all special nuclear material under the licensee's control. (85401-85408)
  2. Physical Protection. Ensuring that the licensee maintains an effective program to protect against malevolent acts of theft, diversion, or dispersal of licensed radioactive material. (81910-81935, etc.)
- c. Radiological Controls. Radiation protection, environmental protection, waste management, and transportation.
  1. Radiation Protection. Ensuring that the licensee has established and implemented a radiation protection program adequate to protect the radiological health and safety of the plant's workers, vendors, and visitors. (83822)
  2. Environmental Protection. Ensuring that the licensee has established an effective program to measure and quantify offsite releases. (88045)
  3. Waste Management. Ensuring that the licensee has established an effective program to manage low-level radioactive waste. (84850, 88035)

4. Transportation. Ensuring that the licensee has established an effective program for preparing licensed nuclear materials for shipment, shipping the materials, and for the safe opening of licensed materials received at the facility. (86740)
- d. Facility Support. Programs and systems that support safe operations throughout the facility, including maintenance, surveillance testing, engineering, management organization and controls, training, and emergency preparedness.
  1. Maintenance/Surveillance. Ensuring that the licensee has established an effective program of both corrective and preventive maintenance, configuration management, and surveillance testing activities, that cover all facility structures, systems, and components with safety significance. (88025)
  2. Training. Ensure the qualification and training of personnel relied on to perform functions necessary for adequate safety and safeguards. (88010)
  3. Emergency Preparedness. Ensuring that the licensee has established an effective emergency management program to protect the workers, public, and the environment in the event of reasonably postulated events that could threaten the facility. (88050)
- e. Special Topics. These are issues that may typically arise on an occasional basis, but are not included in the review on a routine basis unless the significance of the issue rises to a level that is perceived to affect the quality of licensee performance. Examples include clarification of licensing conditions or commitments, misunderstandings of license requirements, deviations from commitments in confirmatory action letters, licensing of new processes at an existing facility, and labor difficulties.

03.03 Major Fuel Cycle Facility. A facility in the fuel cycle safety inspection program selected to be included in this program, in consideration of the significance of the risks to public health and safety posed by the facility's operations.

#### 2604-04 RESPONSIBILITIES AND AUTHORITIES

##### 04.01 Director, Office of Nuclear Material Safety and Safeguards (NMSS)

- a. Receives briefing from staff on licensee performance.
- b. Optionally, meets with licensee senior management, after being briefed by staff, to discuss licensee performance.

##### 04.02 Regional Administrator for responsible region

- a. Receives briefing from staff on licensee performance.
- b. Sends final Licensee Performance Review Letter Report to licensee, on concurrences by Directors of NMSS, and the Division of Fuel Cycle Safety and Safeguards (DFCSS), and the responsible regional Director, Division of Nuclear Material Safety (DNMS).
- c. Optionally, meets with licensee senior management, after being briefed by staff, to discuss results of review.

##### 04.03 Director, DFCSS

- a. Determines which facilities will be considered major fuel cycle facilities subject to this program.
- b. Provides for the appropriate branch level personnel at Headquarters to participate in licensee performance reviews of the major fuel cycle facilities within each region, in coordination with the regional staff conducting each review.
- c. Optionally, participates in Licensee Performance Review Meeting for subject facilities.
- d. Reviews and concurs in draft Licensee Performance Review Report (in form of briefing materials), before presentation to NRC senior management (i.e., Director, NMSS, and responsible Regional Administrator).
- e. Reviews and concurs in final Licensee Performance Review Letter Report, before its being sent to the licensee.
- f. Determines, after consultation with regional Director, DNMS, the approximate interval between licensee performance reviews for each facility, within a range from 12 to 24 months, based on previous licensee performance and the safety risk of the facility.
- g. Determines and implements modifications to the program, as necessary, after consultation with Regional Directors, DNMS.

#### 04.04 Regional Director, DNMS, for responsible region

- a. Provides for the appropriate branch level personnel in the region to conduct licensee performance reviews of the major fuel cycle facilities within the region, in coordination with the Operations, Licensing, and other responsible branches in DFCSS.
- b. Optionally, participates in Licensee Performance Review Meeting for subject facilities.
- c. Reviews and concurs in draft Licensee Performance Review Report (in form of briefing materials), before presentation to NRC senior management (i.e., Director, NMSS, and responsible Regional Administrator).
- d. Arranges for open meeting with licensee senior management, after briefing of NRC senior management.
- e. Makes available, to the Public Document Room, copies of NRC Licensee Performance Review Letter Report to licensee, and appropriate information presented by licensee, relevant to licensee performance, after meetings with licensee senior management.

#### 04.05 Chief, Operations Branch, DFCSS

- a. Coordinates scheduling of licensee performance reviews to minimize impact of the program on schedules for other programs.
- b. Monitors and reviews the Licensee Performance Review program, and recommends modifications to the program, as necessary, to Director, DFCSS.

#### 2604-05 PROGRAM OVERVIEW

Senior NRC management needs to know the general character of a licensee's performance in protecting public health and safety. This program provides a framework for review of licensee



performance for major fuel cycle facilities. The streamlined process described in this manual chapter is designed to provide the requisite information to NRC management regarding licensee performance, while minimizing staff effort beyond that required for routine fuel cycle facility licensing and inspection activities. The information is also provided to the licensee's senior management in a public meeting, to apprise them of performance issues that may require their attention.

#### 2604-06 PROGRAM DESCRIPTION

The review of each major fuel cycle licensee's performance will be conducted at the Branch level under the direction of the DNMS in the region responsible for the subject facility. The region will request key Headquarters and Regional staff responsible for licensing and inspecting the facility to submit information in concise form (i.e., bullet-style format) that characterizes the licensee's performance during the review period. This information should be in a format that relates to the several specified major functional areas covered by the NRC fuel facility licensing and inspection program, as described herein.

The key staff will then meet at the Branch level to discuss and summarize the licensee's performance in terms of the quality of the licensee's program, identified trends, and continuing and future challenges to maintaining safe operation of the facility. The meeting may be facilitated through the use of telephone conferencing, or other communications technology, to ensure full participation by the appropriate personnel.

The region will subsequently assemble the information, conclusions, and recommendations generated at the meeting into a form suitable for presentation to senior NRC management, with the concurrence of participating branch chiefs.

On concurrence by the Directors, DFCSS, and DNMS for the appropriate region, and on signature of the Regional Administrator for the appropriate region, the Licensee Performance Review Report shall be conveyed to the licensee's senior management. A meeting shall be arranged between senior NRC and licensee management at which the results of the review shall be discussed. The purpose of the meeting will be to heighten the licensee's awareness of areas where improvements or changes in its safety and safeguards programs are needed.

The results of the review may be used to support changes in the inspection program for the subject facility so that inspection resources may be focused where most needed. The changes will be incorporated into the facility's Individualized Master Inspection Plan, which specifies the prescribed intervals between inspections and specific issues or operations requiring focus or emphasis for each functional area during planned inspections. The results may also be used cumulatively to identify needed modifications to the NRC licensing and inspection program, to improve its effectiveness.

#### 2604-07 PERFORMANCE REVIEW SCHEDULING

The time span covered by the Licensee Performance Review process should normally be approximately 15 weeks, from the time staff is initially requested to provide assessment information until NRC and licensee senior management meet to discuss the results of the review. A sample generic schedule of the process is provided in Enclosure 2, "Generic Schedule for Licensee Performance Review."

07.01 A performance review shall be conducted for each active fuel cycle facility every 12 to 24 months, depending on the facility's safety risk and previous safety and safeguards performance.

07.02 The Chief, Fuel Cycle Operations Branch (FCOB), shall coordinate the scheduling of licensee performance reviews through use of a Master Inspection Schedule encompassing all

performance reviews and inspections across the regions and Headquarters. Reviews shall be scheduled in consultation with the regions to minimize undue impacts on the workloads of the participating organizational units.

07.03 The region responsible for the subject facility shall notify participants of the review schedule (e.g., as in Enclosure 3, “Sample Licensee Performance Review Notification Memo”) and request that they provide their assessment information within 4 weeks. The staff should document their views, where appropriate, with references to specific incidents or inspection findings. The Licensee Performance Review Meeting should be announced at the same time, and be scheduled to be held approximately 3 weeks after the assessment information is due to be received. After receipt of the assessment information, the region shall send copies of the collected information to all participants so that it is available for their review approximately 1 week before the meeting is held.

07.04 The Licensee Performance Review Meeting should be attended by all invited staff, either in person, or through electronic means. It shall be chaired by the Branch Chief in the region in which the subject facility is located, or by whomever the regional Director, DNMS, designates. Representatives from the Division level of management may participate in the review process, but their attendance is not mandatory. The review meeting should proceed by having the responsible staff members present their views on the licensee’s performance for the functional areas for which they are responsible, generally covering the aspects of the facility program indicated in Enclosure 4, “Sample Licensee Performance Review Guide.” Conclusions regarding the various aspects of licensee performance shall be reached by consensus of those attending. Where divergent opinions are expressed, and no clear consensus on a particular issue can be reached, the diverging opinions should be summarized and documented, and presented together with the other results of the review meeting.

07.05 The region shall assemble the information, conclusions, and recommendations generated at the Licensee Performance Review Meeting into a concise report (e.g., bullet-style format) suitable for presentation to senior NRC management. After the draft report is circulated for review and comment by the participating branch chiefs and division directors, the results of the review will be presented to senior NRC management, generally within 6 weeks after the Licensee Performance Review Meeting.

07.06 The Licensee Performance Review Letter Report will generally be prepared for review and approval by NRC senior management at the time they are briefed, and sent to the licensee shortly afterwards. After conveyance of the report to the licensee, the meeting between the senior management of NRC and the licensee should be held as soon as practicable, generally within 2 weeks after the licensee receives the report.

#### 2604-08 REVIEW PROCESS

08.01 Participants in the Licensee Performance Review Meeting shall briefly discuss facility activities, quality of performance, and trends during the review period for the specific functional areas within their responsibility. The relevant functional areas are listed in Section 04-09. Participants should be mindful that observed performance trends may be open to wide interpretation. Therefore, identification of any performance trends should be buttressed by specific references to the dates of incidents, or inspection findings, distributed over the review period, that led to identification of the trend.

08.02 For each functional area, participants should evaluate licensee performance relative to criteria appropriate for the given functional area. Some of these criteria may be similar for many

functional areas, whereas others may be specific to just one area. For consistency, the same criteria should be applied in successive performance reviews.

However, criteria may be modified, from time to time, through a coordinated process that ensures all forthcoming reviews use the new criteria. A sample set of review criteria is described in Section 04-10.

08.03 The regional Branch assigned to conduct the review shall document the conclusions and recommendations reached at the licensee performance review meeting, relevant supporting data presented, and any other results of the review process. The documentation should be in a form suitable for presentation to senior NRC management, such as in “bullet-style” charts. The report should separately address performance in each of the functional areas, as well as discuss overall trends and patterns in performance that may affect multiple areas. Both program strengths and aspects of the licensee’s programs needing improvement should be highlighted in the report. The report also should describe factors that may represent challenges to the quality of licensee performance in the upcoming review period. A recommendation should be included for NRC to continue the current inspection program for the facility without changes, or modify it in specified ways, with reference to the results of the review.

08.04 The results of the review shall be presented to the Directors, DFCSS, and the appropriate regional DNMS, for review and concurrence, after concurrence by the participating Branch Chiefs.

08.05 The results of the review then shall be presented jointly to the Director, NMSS, and the appropriate Regional Administrator. As part of the preparation for this briefing, a draft Licensee Performance Review Letter Report shall be prepared for eventual transmission to the licensee, and for public dissemination. (The Director, DFCSS, and the appropriate regional Director, DNMS, shall review and concur on the letter report before the briefing.) The Letter Report shall be in the form of a brief cover letter containing a summary of the significant results of the review, with an attachment, in “bullet-style” format, that presents the more detailed results of the review, with references to specific inspection findings and incident reports that support the results of the review. A sample of the appropriate bullet-style format is provided in Enclosure 1. The letter report may describe licensee program areas that may be candidates for changes in the NRC inspection program, including possible changes in focus, emphasis, or inspection frequency. However, the report should not commit to making specific changes in the inspection program in quantitative terms, pending a broader consideration of safety risk and licensee performance at other facilities, and of overall use of NRC inspection resources.

#### 2604-09 FUNCTIONAL AREAS

09.01 The licensee performance review shall consider the licensee's performance in each of the following four functional areas. For each of the functional areas, corresponding inspection programs and organizations primarily responsible for addressing each area at the licensee performance review meeting are listed. A fifth optional area, “Special Topics,” is reserved for any relevant licensing or other issues that may exist, but need not be included in the review if there are no contributions received from the participants.

| <b>FUNCTIONAL AREA</b>   | <b>DISCUSSION LEAD</b> |
|--------------------------|------------------------|
| <u>Safety Operations</u> |                        |

|                         |                          |
|-------------------------|--------------------------|
| Chemical Process Safety | Operations Branch, DFCSS |
| Criticality Safety      | Operations Branch, DFCSS |
| Fire Protection         | Regional Branch, DNMS    |
| Plant Operations        | Regional Branch, DNMS    |

Safeguards

|                                 |                          |
|---------------------------------|--------------------------|
| Material Control and Accounting | Operations Branch, DFCSS |
| Physical Protection             | Regional Branch, DNMS    |

Radiological Controls

|                          |                       |
|--------------------------|-----------------------|
| Radiation Protection     | Regional Branch, DNMS |
| Environmental Protection | Regional Branch, DNMS |
| Waste Management         | Regional Branch, DNMS |
| Transportation           | Regional Branch, DNMS |

Facility Support

|                                       |                       |
|---------------------------------------|-----------------------|
| Maintenance/Surveillance              | Regional Branch, DNMS |
| Management Organization and Controls. | Regional Branch, DNMS |
| Training                              | Regional Branch, DNMS |
| Emergency Preparedness                | Regional Branch, DNMS |

Special Topics

|                          |
|--------------------------|
| Operations Branch, DFCSS |
| Licensing Branch, DFCSS  |
| Regional Branch, DNMS    |

Each of these functional areas is defined in Section 03.02. These areas are intended to closely parallel the corresponding inspection programs.

2604-10 EVALUATION CRITERIA

10.01 Fuel facility licensee performance will be assessed, as applicable, in the functional areas noted in Section 09.01, using a common set of review criteria. A suggested set of review criteria appears below:

- a. Management involvement and control;
- b. Approach to identification and resolution of technical issues from a safety and safeguards perspective;
- c. Response to operational events (including timeliness, analysis, reporting, corrective actions, and recognition of generic issues within the facility);
- d. Staffing (considering experience, expertise, and availability of staff and management);
- e. Aspects of performance that may reflect on the effectiveness of training and qualification programs relative to the specific functional area; and
- f. Evidence of positive or negative performance trends.

10.02 Headquarters and regional Branch Chiefs will confer occasionally to consider the suitability of the current review criteria and suggest any necessary changes. The Branch Chief,

FCOB, accordingly, will issue revised evaluation criteria for use during subsequent reviews.

END

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| Enclosure 1. | <a href="#">Sample Licensee Performance Review Report Format</a>        |
| s:           | 2. <a href="#">Generic Schedule For Licensee Performance Review</a>     |
|              | 3. <a href="#">Sample Licensee Performance Review Notification Memo</a> |
|              | 4. <a href="#">Sample Licensee Performance Review Guide</a>             |

ENCLOSURE 1

(SAMPLE LICENSEE PERFORMANCE REVIEW REPORT FORMAT)

Following is the standardized format for attachments to Licensee Performance Review Letter Reports:

Safety Operations

Program Strengths

- Item of information xxxxxxxx xxxxxxxx xxxxxx xxxxxx xxxxxxxx xx xxxxxxxx xxxxxxxxxxxx xx xxxxxx  
xxxxx.

- Detail xxxx xxxxxxxx xxx xxxxxxxxxxxx xx  
xxxxxx xxxxxxxxxxxx xxxxxxxxxxxxxx xx xx xxxxx  
xxx x xxxxx.

- Further detail (if necessary) xxxx xxxxx  
xxxxxxxxxx xx x xxxxxx  
xxx xxxxxx xxxxx.

- Further detail (if necessary)

- Detail

- Item of information

- Detail

- Detail

Program Areas Needing Improvement

- Item of information

- Detail

- Detail

Projected Challenges to Performance

- Item of information

- Detail

- Detail

Safeguards

- Item of information
- Item of information

Radiological Controls

- Item of information
- Item of information

Facility Support

- Item of information
- Item of information

Special Topics (if necessary)

- Item of information

ENCLOSURE 2

GENERIC SCHEDULE FOR LICENSEE PERFORMANCE REVIEW

| <b>Time Since Review Was Initiated</b> | <b>Action</b>  |
|--|--|
| Start                                  | Region requests staff to provide assessment information within 4 weeks, and announces Licensee Performance Review Meeting, to be held in approximately 7 weeks |
| 4 weeks                                | Information received by region from staff  |
| 6 weeks                                | Collected information organized and distributed (with final meeting agenda) to participating staff for consideration at staff meeting                          |
| 7 weeks                                | Region holds LPR Meeting for staff to develop consensus on licensee performance.   |
| 9 weeks                                | Region completes preparation of draft LPR presentation materials and distributes them to participating Branch Chiefs, for concurrence                          |

|          |   |
|----------|---|
| 10 weeks | Branch Chiefs concur on draft presentation materials; distribution of draft presentation materials to Directors of DFCSS and DNMS, for concurrence  |
| 11 weeks | Directors, DFCSS and DNMS, comment and concur on final draft presentation materials.  |
| 13 weeks | Joint briefing of Director, NMSS, and responsible Regional Administrator, by Division Directors, DFCSS and DNMS.<br><br>Regional Administrator arranges for meeting of NRC senior management with licensee senior management. |
| 15 weeks | Meeting of NRC senior management with licensee senior management.   |

ENCLOSURE 3

(SAMPLE LICENSEE PERFORMANCE REVIEW NOTIFICATION MEMO)

MEMORANDUM [REGIONAL AND HEADQUARTERS SECTION CHIEFS]  
TO:  
FROM: [DIRECTOR, Division of Nuclear Material Safety, REGION X]  
SUBJECT: FUEL FACILITY LICENSEE PERFORMANCE REVIEW

The Licensee Performance Review (LPR) Meeting for [Fuel Facility Name] is scheduled for [Date] , at [Time] o'clock (EST), in room [Room #] at [Building Name] . An agenda and relevant facility background data are enclosed. Resident Inspectors (as appropriate), project inspectors, project manager, and license reviewers (if appropriate) for the facility should be available, by telephone conference call, if necessary, to participate in this meeting. A bridge phone number will be provided before the meeting.

In preparation for this meeting, you are requested to provide concise statements of your assessment of the licensee's performance relative to each of the functional areas (described in IMC 2604, paragraph 09.01) for which you have responsibility. These statements should be based on your personal knowledge of the licensee's performance, during the review period, in the functional areas for which you have responsibility, and be supported by specific information, inspection findings and events. Where trends in performance are indicated, the dates of the activity, specific inspection findings or incidents that occurred during the current or previous review periods should also be provided.

Participants should be prepared to discuss their assessments, and their recommendations for modifying the NRC inspection program at each facility. The review will cover the period from [Date Start] to [Date End] .

- Enclosures
1. Agenda
  2. LPR Guide
  3. Current Evaluation Criteria
  4. Facility Background Information

ENCLOSURE 4

(SAMPLE LICENSEE PERFORMANCE REVIEW GUIDE)

Considering the current set of evaluation criteria (as described in Section 10.01 of IMC 2604, or as amended thereafter, and attached), please review the following aspects of licensee

performance for the subject facility. Then, submit a brief, bullet-style summary of your understanding of the quality of the licensee's performance for each functional area (ref. IMC 2604, 09.01) within your responsibility.

1. Overall plant status relative to functional area;
2. Enforcement history during the period, including pending enforcement, and incomplete escalated enforcement actions from prior review periods;
3. Open items and inspection follow-up items that arose during the review period;
4. Facility events or conditions that resulted in special or reactive inspections conducted during the review period;
5. Licensee activities or conditions that might challenge, stress, or alleviate stress on, the licensee's programs for maintaining safe operations (e.g., new processes, increased throughput, higher enrichment, new kinds of nuclear material or hazardous chemicals, etc);
6. Licensee performance trends (provide dates and descriptions of specific activities, inspection findings or incidents); and
7. Recommended changes in NRC inspection effort (e.g., focus, emphasis, resources, frequency) for each functional area (as listed in Section 09.01 of IMC 2604) within your responsibility.

On submission of the assessments, the Division of Nuclear Material Safety, for Region [#], will summarize them, and distribute copies to all participants one week before the Licensee Performance Review Meeting for the subject facility.

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ATTACHMENT 2

## **NMSS PROGRAMS FOR MONITORING THE PERFORMANCE OF FUEL CYCLE AND MATERIALS LICENSEES AND PREPARING FOR SENIOR MANAGEMENT MEETINGS**

### **1. INTRODUCTION**

The Office of Nuclear Material Safety and Safeguards (NMSS) has programs for continually monitoring the performance of fuel cycle facility and materials licensees. Licensees are monitored through an ongoing program of frequent U.S. Nuclear Regulatory Commission Headquarters and regional inspections (in accordance with Inspection Manual Chapter (IMC) 2600 and IMC 2800). The inspections focus on the dominant risk activities at each facility, and are adjusted to provide appropriate attention after considering previous licensee performance.



Staff also maintains close contact with licensees through the active, ongoing, licensing and amendment process. Four major fuel cycle facilities (BWX Technologies in Lynchburg, Virginia; Nuclear Fuel Services, in Erwin, Tennessee; and the gaseous diffusion plants at Portsmouth, Ohio and Paducah, Kentucky) have onsite Resident Inspectors.

## **2. FUEL CYCLE LICENSEE PERFORMANCE REVIEW PROGRAM**

NMSS initiated a pilot program in, 1995, to periodically review fuel cycle licensee performance. The Licensee Performance Review (LPR) Program was extended to all fuel cycle facilities in mid-1996, and established in IMC 2604. Its objectives are to provide senior NRC management with a “Big-Picture” view of licensee performance; provide a basis for adjusting the fuel cycle inspection program in response to changes in risk or performance; and provide feedback to licensees. The frequencies of reviews depend on the risks and types of materials (e.g., high-enriched uranium, low-enriched uranium, or source material) possessed at the facilities. The Fuel Cycle LPR Program addresses licensee performance strengths, areas needing improvement, and future challenges to performance. These aspects of performance are addressed in four major functional areas: Operational Safety, Facility Support, Radiological Protection, and Safeguards. Special issues, such as licensing, are also addressed occasionally, if relevant to performance. The decision-making process for the reviews involves NMSS managers and staff using their individual judgments and experiences, based on the specific inspection findings in the areas with which each is most familiar. Judgment on the licensee’s performance in the major functional areas is then determined through an informal consensus process at a conference conducted at the Branch or Division level. General criteria for determining whether aspects of a licensee’s program represent a performance strength, or an area needing improvement, are discussed in IMC 2604, and include the following:

- a. Management involvement and control;
- b. Approach to identification and resolution of technical issues from a safety and safeguards perspective;
- c. Response to operational events (including timeliness of analysis, reporting, corrective actions, and recognition of generic issues within the facility);
- d. Staffing (considering experience, expertise, and availability of staff and management);
- e. Aspects of performance that may reflect on the effectiveness of training and qualification programs relative to the specific functional area; and
- f. Evidence of positive or negative performance trends.

## **3. MATERIALS LICENSEE PERFORMANCE REVIEW**

NMSS and regional staff are aware of materials licensees requiring any special or focused monitoring, through ongoing reviews of inspection findings, licensing actions, performance improvement plans, and programs of long-term followup for licensees with persistent problems; and through reviews of responses to Confirmatory Action Letters and Demands for Information. Inspection Manual Chapter 2800, “Materials Inspection Program,” establishes inspection frequencies based on staff’s assessment of the hazards of the operations and materials authorized by the license. The frequencies of inspections are then adjusted on an individual basis, based on inspection findings. The inspection program is performance-based, giving licensees credit for

good performance by extending the interval before the next inspection, and requiring poor performers to be inspected more frequently. The manual chapter also requires inspectors to document inspections and to discuss the results of each inspection with a supervisor, to alert management to significant enforcement, safety, or regulatory issues.

As part of the NMSS Generic Issues Program, all event reports and other operational data are screened to identify generic issues. This involves daily conference calls with the regions, and a weekly review by the Division of Industrial and Medical Nuclear Safety Generic Assessment Panel. This screening can identify when an individual licensee is involved in a series of events, or whether an event is being experienced by a class of licensees. It also can lead to increased attention to an individual licensee, or a class of licensees.

#### **4. PREPARATION FOR SENIOR MANAGEMENT MEETINGS**

NMSS screening meetings with the Regional Administrator are held for each region, to discuss the performance of each fuel cycle licensee and selected materials licensees in the region. The staff has established criteria to screen and identify fuel cycle and materials licensees and performance issues that should be considered for discussion at NMSS screening meetings in preparation for the Senior Management Meeting (SMM). The criteria focus on overall operations and performance, reportable events, inspection history, operational events, escalated enforcement actions, allegations, and decommissioning funding.

Screening packages are generated for each facility, with the objective of enabling the staff to identify facilities with poor performance or adverse performance trends. These packages also aim at identifying generic issues that could lead to performance degradations at multiple facilities.

This is especially important for materials licensees, for which the NMSS Generic Issues Program is employed to screen all event reports and other operational data, to identify generic issues.

The SMM screening packages covering fuel cycle facilities include the results of recent Licensee Performance Reviews (LPRs), including a matrix of performance data (or indicators) for each facility (e.g., reportable events and followup reactive inspections, escalated enforcement actions, allegation cases, personnel exposures, and environmental releases). LPRs are conducted for fuel cycle facility licensees in conformance with IMC 2604. The screening packages for higher-risk materials licensees consider reportable events, reactive inspections, escalated enforcement actions, and allegation cases. For both types of licensees, standard formats (or performance evaluation templates) have been developed to provide guidance on how to structure narrative performance overviews. Appendix 2-1 provides the “Standard Format for Presenting Fuel Cycle Licensee Information at NMSS Screening Meetings for the SMM” (similar to Exhibit 1 of the Handbook for Management Directive 8.14, which addresses reactors). Appendix 2-2 presents a similar format for materials licensees.

The formats, or templates, do not specify numerical thresholds or criteria to select or categorize facilities for discussion at the SMM. This is consistent with NRC Management Directive 8.14, which indicates that managers rely on their experiences and judgments during the plant performance discussions, while being guided by the concepts outlined in the performance evaluation templates. NMSS is considering appropriate further changes to the NMSS screening meeting process, to include more, or refined indicators of the types that the Andersen study suggested would be more likely to serve as precursors for degraded performance.

The factors used in determining which facilities or issues receive more attention during the NMSS SMM Screening Process are similar to those addressed in the screening process for nuclear power reactors. However, in consideration of the small number and uniqueness of fuel

cycle facilities and the different activities conducted by materials licensees, there is no categorization of facilities. Similar to the case for reactors, there are no specific numerical thresholds or numerical decision criteria used, but the screening process is guided by the factors described in the performance evaluation templates.

In recommending a more objective approach to the SMM process, the Andersen study stressed the use of performance indicators. The Andersen study's recommendations on the use of performance indicators have limited applicability to fuel cycle and materials licensees, because of the sparse database for fuel cycle and materials facility performance indicators. Accordingly, NMSS does not use performance indicators in the same way they are used for reactors. Appendix 2-3 describes the way NMSS has considered the recommendations of the Andersen study and adapted them, where appropriate, to the differing types of risks and regulatory frameworks pertaining to fuel cycle facilities and materials licensees. It also discusses future actions that might be taken to improve the SMM process for fuel cycle facilities and materials licensees. Two charts, one summarizing the performance indicators for fuel cycle facilities, the other for selected higher-risk materials licensees, are prepared for the screening meetings for purposes of comparison. The significance of the performance indicators for each facility under discussion is discussed for clarification purposes, in the context of specific events, problems, or other characteristics of the facility. (The charts appear as Tables 4 and 5 in Appendix 2-3.)

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#### APPENDIX 2-1

#### STANDARD FORMAT FOR PRESENTING

#### FUEL CYCLE LICENSEE INFORMATION AT NMSS SCREENING MEETINGS FOR THE

#### SENIOR MANAGEMENT MEETING

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#### STANDARD FORMAT FOR PRESENTING FUEL CYCLE LICENSEE INFORMATION AT NMSS SCREENING MEETINGS FOR THE SENIOR MANAGEMENT MEETING

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#### SENIOR MANAGEMENT MEETING FUEL CYCLE FACILITY SUMMARY

(The following outlines the summary information to be assembled for each fuel cycle facility for discussion at NMSS screening meetings, in preparation for Senior Management Meetings (SMMs). A similar, but more condensed, version of this summary should be prepared for a facility selected for discussion at the SMM, after the NMSS screening meetings.)

**Region:**

**Name of Facility:**

**Basic Facility Description:** (e.g., Fuel Fabrication, Conversion, etc.)

**Licensee Performance Review (LPR) Period:** Month/Day/Year through Month/Day/Year

**Performance Overview:**

Discuss the overall performance of the facility during the LPR period (include updated information for the most recent months if the LPR was completed more than 6 months before this overview is prepared). Address problem areas occurring in multiple LPR function areas that do not fit well in a particular functional area.

As applicable, discuss performance as it relates to the five major areas outlined in the SMM Fuel Cycle Facility Evaluation Template (presented below). Briefly describe why the facility is being discussed, referring to events, weaknesses, declining trends, or other information that supports the basis for concern. Provide a causal analysis to explain the facility's departure from the previous level of performance.

### **Licensee Performance Review Summary (LPR period):**

Significant Areas Needing Improvement

Significant Projected Challenges to Future Performance

Areas of Strength

LPR Highlights

### **Major Issues Matrix:**

Prepare a matrix summarizing the major issues that have arisen in conjunction with events, enforcement actions, inspections, licensing actions, or other interactions between NRC and the licensee. The format for this matrix is:

- Date of Occurrence (if applicable)
- Type of Issue (e.g., violation, enforcement action, civil penalty, non-cited violation)
- Description

### **Table of Fuel Cycle Facility Performance Indicators:**

The indicators should be presented for all fuel cycle facilities in a single table, and include the following:

- Reportable events
- Reactive inspections
- Severity Level 4 violations
- Escalated enforcement actions
- Civil Penalties (number and amounts)
- Allegation cases
- 10 CFR Part 2.206 Petitions
- Financial Health (Assurance & Bankruptcy, etc.)

### **SMM FUEL CYCLE FACILITY PERFORMANCE EVALUATION TEMPLATE**

The following questions are adapted from those addressing nuclear power plants, as listed in Exhibit 1 of the SMM Handbook (Management Directive 8.14). The questions presented in this fuel cycle version of the template are structured to provide guidance in preparing the narrative Performance Overview for inclusion in the SMM Fuel Cycle Facility Summary (outlined previously). The responses to these questions are intended to help summarize the root causes of possible inadequate performance. The staff should ensure that factors germane to each facility are addressed, and that the content of the resulting summary includes references to supporting information (e.g., LPRs).

#### **I. Effectiveness of Licensee Self-Assessment**

Does the licensee effectively document problems?

Are safety issues identified to the appropriate level of management before they result in reportable events? Does management take the initiative to identify problems and determine their root causes?

Are deficiencies predominantly identified by the licensee or by NRC (or other external entities), or are they self-revealed?

Does the licensee effectively determine the root causes of identified deficiencies and the extent of degraded conditions?

Are the licensee's corrective actions effective in correcting the root causes of degraded and/or

non-conforming conditions?

Are corrective actions timely, and do they include sufficient measures to prevent recurrence of problems?

What is the trend of the plant's corrective action backlog? How does this backlog impact operational safety?

How effectively does the licensee employ industry experience, or other pertinent information from outside sources, in its self-assessments?

Is the licensee responsive to self-assessment findings?

Does the licensee have effective corporate management oversight and involvement in problem resolution?

## **II. Operational Performance**

How do facility performance indicators for events compare with industry averages?

What insights into operational safety are provided by the number and safety significance of events or other abnormal occurrences?

Does the licensee staff operate the plant in a conservative, safe, and professional manner?

How effectively does the operations staff control plant activities?

Does licensee management demonstrate awareness of day-to-day operational safety concerns?

Does the licensee tolerate conditions that have the potential to challenge plant operational safety, as demonstrated by the existence of operator work-arounds, temporary procedure changes, and nuisance alarms?

Are the licensee's operability determinations conservative, timely, and based on safety considerations?

## **III. Human Performance**

To what extent have human performance problems contributed to reportable events?

How do human performance problems contribute to malfunctions, abnormal conditions, or other activities that may adversely impact safety?

Do licensee staff members demonstrate conservatism and an appropriate appreciation of safety when planning and performing activities?

Is the licensee's staff appropriately qualified and properly trained?

Are the licensee's procedures adequate and properly used?

Are management expectations clearly articulated to, and understood by, licensee staff?

## **IV. Material Condition (Safety system Reliability/Availability)**

How do licensee performance indications for safety system failures, safety system actuations, and significant events compare with industry averages and the plant's peer group?

What are the performance trends of facility equipment, including, but not limited to, availability and failure and rework rates?

What is the trend, and impact on operational safety, of the plant's corrective maintenance backlog?

Has the licensee implemented comprehensive and effective plant maintenance, surveillance testing, and test programs?

Are work activities prioritized with appropriate consideration of importance to safety?

## **V. Engineering and Design**

How many reportable events over the last year have been attributed to design-related concerns ?

How effectively does the licensee's engineering function support facility reliability and operational safety?

Do design, construction, and equipment deficiencies exist?  
Does the licensee's engineering function effectively solve problems without recurrence?  
Have human-system interfaces resulted in problems that challenge facility safety?

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## APPENDIX 2-2

### **STANDARD FORMAT FOR PRESENTING MATERIALS LICENSEE INFORMATION AT NMSS SCREENING MEETINGS FOR THE SENIOR MANAGEMENT MEETING**

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### **STANDARD FORMAT FOR PRESENTING MATERIALS LICENSEE INFORMATION AT NMSS SCREENING MEETINGS FOR THE SENIOR MANAGEMENT MEETING**

#### **SENIOR MANAGEMENT MEETING MATERIALS LICENSEE SUMMARY**

(The following is an outline of the summary information to be assembled for each materials licensee to be discussed at NMSS screening meetings, in preparation for Senior Management Meetings (SMM's). A similar, but more condensed, version of this summary should be prepared for a facility selected for discussion at the SMM, after the NMSS screening meetings.)

**Region:**

**Name of Licensee:**

**Basic Facility Description:**

**Period:** Month/Day/Year through Month/Day/Year

**Performance Overview:**

Discuss the overall performance of the licensee during the period. As applicable, discuss performance as it relates to the five major areas outlined in the SMM Materials Licensee Performance Evaluation Template. Address problems occurring in multiple areas that do not fit well in a particular functional area. Briefly describe why the licensee is being discussed. Describe events, weaknesses, declining trends, or other information that supports the basis for concern. Provide a causal analysis of these data and evaluate the licensee's departure from previous performance.

**Licensee Performance Summary:**

Significant Areas Needing Improvement

Significant Projected Challenges to Future Performance

Areas of Strength

**Major Issues Matrix:**

Prepare a matrix summarizing major issues that have arisen with respect to events, enforcement actions, inspections, licensing actions, or other interactions between NRC and the licensee. The format for this matrix is: Date of Occurrence (if applicable); Type of Issue (violation, enforcement action, civil penalty, non-cited violation, observation, weakness, or strength); Narrative Description of Issue.

**Table of Materials Licensee Performance Indicators:**

The indicators should be presented for selected materials licensees in a single table, and include the following:

- Reportable Events
- Reactive Inspections
- Orders
- Escalated Enforcement Actions

- Allegations Cases
- Totals (of above)

### **SMM Materials Licensee Performance Evaluation Template**

The following questions are adapted from those addressing nuclear power plants, as listed in the Senior Management Meeting Handbook, Management Directive 8.14, Exhibit 1. The questions presented in this materials version of the template are structured to provide guidance in preparing the narrative Performance Overview, for inclusion in the SMM Materials Licensee Summary (outlined above). The responses to these questions are intended to help summarize the root causes of possible inadequate performance. The staff should ensure that factors germane to each licensee are addressed, and that the content of the resulting summary includes references to supporting information. Questions that are not applicable to the licensee need not be addressed.

#### **I. Effectiveness of Licensee Self-Assessment**

Does the licensee effectively document problems?

Are safety issues identified to the appropriate level of management before they result in reportable events? Does management take the initiative to identify problems and determine their root causes?

Are deficiencies predominantly identified by the licensee or by NRC (or other external entities), or are they self-revealed?

Does the licensee effectively determine the root causes of identified deficiencies and the extent of degraded conditions?

Are the licensee's corrective actions effective in correcting the root causes of degraded and/or non-conforming conditions?

Are corrective actions timely, and do they include sufficient measures to prevent recurrence of problems?

How effectively does the licensee employ industry experience, or other pertinent information from outside sources, in its self-assessments?

Is the licensee responsive to self-assessment findings?

Does the licensee have effective corporate management oversight and involvement in problem resolution?

#### **II. Operational Performance**

What insights into operational safety are provided by the number and safety significance of events or other abnormal occurrences?

Does the licensee staff operate in a conservative, safe and professional manner?

How effectively does the operations staff control activities?

Does licensee management demonstrate awareness of day-to-day operational safety concerns?

Does the licensee tolerate conditions that have the potential to challenge operational safety, as demonstrated by the existence of

operator work-arounds, temporary procedure changes and nuisance alarms?

Are the licensee's operability determinations conservative, timely, and based on safety considerations?

#### **III. Human Performance**

To what extent have human performance problems contributed to reportable events?

How do human performance problems contribute to malfunctions, abnormal conditions, or other activities that may adversely impact safety?

Do licensee staff members demonstrate conservatism and an appropriate appreciation of safety

when planning and performing activities?

Is the licensee's staff appropriately qualified and properly trained?

Are the licensee's procedures adequate and properly used?

Are management expectations clearly articulated to, and understood by, licensee staff?

#### **IV. Facility Condition (Safety System Reliability/Availability)**

What are licensee performance trends for safety system failures, safety system actuations, and significant events?

What are the performance trends of facility equipment, including, but not limited to, availability and failure and rework rates?

Has the licensee implemented comprehensive and effective maintenance, surveillance testing, and test programs?

Are work activities prioritized with appropriate consideration of importance to safety?

#### **V. Engineering and Design**

How effectively does the licensee's engineering function support facility reliability and operational safety?

Do design, construction, and equipment deficiencies exist?

Does the licensee's engineering function effectively solve problems without recurrence?

Have human-system interfaces resulted in problems that challenge facility safety?

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### **APPENDIX 2-3**

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## **NMSS CONSIDERATION OF ARTHUR ANDERSEN STUDY ON IMPROVING THE NRC SENIOR MANAGEMENT MEETING PROCESS**

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## **NMSS CONSIDERATION OF ARTHUR ANDERSEN STUDY ON IMPROVING THE NRC SENIOR MANAGEMENT MEETING PROCESS**

### **1. INTRODUCTION**

A study by U. S. Nuclear Regulatory Commission consultant Arthur Andersen analyzed the process for preparing for, and discussing, operating commercial nuclear power reactor licensee performance at Senior Management Meetings (SMMs). The study did not specifically address the SMM process devoted to fuel cycle facilities and materials licensees. However, many of the Andersen study recommendations have some applicability beyond reactor licensees, regarding the need for using a more structured and objective assessment process for identifying licensees to be discussed at SMMs. This appendix discusses several of the Andersen study's recommendations, as they may apply to fuel cycle facility and materials licensees.

### **2. EXAMINATION OF PERFORMANCE INDICATORS FOR NON-REACTOR LICENSEES**

The Andersen study focused heavily on performance indicators. Because of differences between the regulation of nuclear power reactors, and the regulation of fuel cycle and materials facilities, there is a much smaller body of data available for selecting performance indicators for the non-reactor facilities.

An important feature of the Andersen study was a technical study "... to perform a statistical analysis of possible performance indicator correlation to poor performance." For fuel cycle licensees, the staff assembled what sparse performance data were available, and experimented with several formulae for combining the obvious available performance indicators. The indicators included reportable events and followup reactive inspections, violations and escalated



enforcement actions, the number and amounts of civil penalties, and allegation cases. (Examples of applying such a formula are shown in Tables 1 and 2 at the end of this appendix.) None of the formulae showed a correspondence between the quantitative licensee performance indicators and the more subjective staff assessments of overall licensee performance. Further discussion disclosed that some performance indicators differed in their connotations at different facilities, because of the disparate characteristics, and, in some cases, the changing missions, of the facilities. With respect to materials licensees, data were assembled on reportable events, reactive inspections, orders, escalated enforcement actions, and allegation cases. Comparison of the numbers from these indicators, for the top 10 scorers, also failed to yield a useful index. The staff concluded that for fuel cycle facilities and materials licensees, the sparseness and inconsistency of the available data, and in the case of fuel cycle licensees, the small numbers and uniqueness of facilities, would not permit a classical statistical analysis of performance indicators, or yield consistent performance indicators, similar to that which was being done for the power reactors.

Notwithstanding the difficulty the staff had in interpreting the available performance indicators to correspond with subjectively determined levels of performance, the staff sought to determine whether some combination of performance indicators, using “appropriate” weighting factors, could be derived to serve as a reliable “performance index.” The staff experimented with several combinations of performance indicators with weighting factors to reflect the relative importance of the indicators in determining good performance. (An example of the effort to apply weighting factors is shown in Table 3 at the end of this appendix.) None of the sets of weighting factors yielded a promising performance index. This, again, is most likely because of the inconsistency of the underlying data. The staff determined that it was impractical for NRC to formally characterize, compare, or rank fuel cycle or materials licensees using a “performance index” for purposes of recommending them for discussion at the SMMs.

The staff has determined that better objectivity could be attained by presenting the available performance indicators at Office of Nuclear Material Safety and Safeguards (NMSS) screening meetings for the SMM, without combining them into an index to produce a ranking. (Examples of charts presenting the performance indicators for fuel cycle facilities and for selected materials licensees for presentation at the SMM are shown in Tables 4 and 5 at the end of this appendix.) However, if the lack of large numbers of reportable events or other indicators limits a meaningful statistical interpretation, then the small numbers do present an offsetting advantage. That is, the staff can consider individual events, enforcement actions, or other relevant occurrences in detail to draw conclusions about licensee performance. In fact, these are the types of considerations that go into the fuel cycle Licensee Performance Review (LPR) program and specific performance-monitoring efforts for materials facilities, which form the basis of the NMSS SMM screening process.

### **3. PERFORMANCE TREND MODELS FOR FUEL CYCLE AND MATERIALS LICENSEES**

The Andersen study recommended that a “Performance Trend Model” be used to systematically track poorly performing power reactor plants. Specific criteria were suggested for taking various action steps (e.g., for being discussed at a SMM, for heightened action, or for removal from the discussion list). The suggested criteria included “...two consecutive periods without any improvement; ... twice the mean of all plants in a single period,” etc. In examining the SMM process for reactors, NMSS observed that the Andersen study presumes both an intensity of

interaction with licensees and a large amount of consistent, integrated data that, in reality, does not exist for either fuel cycle or materials licensees.

For fuel cycle facilities, a similar, but less detailed, less formal, model is already in place, based on the results of the fuel cycle LPRs. Criteria for taking action steps include a) failure to improve in a functional area indicated as needing improvement (from one LPR to the next); or b) indications of needs for improvement in multiple functional areas during one LPR. Significantly increased regulatory attention is also focused on a licensee, between LPRs, in response to a serious event, or a sequence of less serious events occurring within a relatively short period of time, especially where there is a commonality of root cause.

Fuel cycle licensees that meet the above action criteria are subject to action steps which include: a) conducting team inspections at greater frequencies than are specified for the core fuel cycle facility inspection program in Inspection Manual Chapter 2600; b) increasing the resources applied to routine inspections; and c) giving increased consideration to conducting reactive inspections in response to events, etc. Licensees who exhibit superior performance (indicated by recognition of multiple areas of program strength, and lack of programmatic areas needing significant improvement) are subjected to only the core inspection program.

For materials licensees, NMSS identifies and takes action on licensees whose performance is declining or inadequate, based on facility inspections. NMSS examines inspection findings over two previous inspection periods, including performance evaluation factors related to management and resource allocation. Measures taken include reactive inspections; enforcement actions; greater inspection frequencies (based on criteria in Inspection Manual Chapter 2800); monitoring licensees' long-term corrective actions; and "get-well" plans.

Required action steps for fuel cycle facility and materials licensees are normally taken independently of the SMM process, since they generally are accomplished within the scope of existing inspection program resources, and rarely require overall changes in NMSS resources or organization. The method for making decisions relative to the action steps is mainly one of the NMSS managers applying judgment and experience, similar to the decision-making process for the performance trend model underlying the SMM process for reactors.

#### **4. FUTURE ACTIONS TO DEVELOP PRECURSORS FOR POOR PERFORMANCE**

The Andersen study indicates that certain management, operations, and economic stress factors should be promising precursors for poor performance. It recommended that NRC should hire experts in, or train individuals to be competent in, evaluating management performance and changes, to be able to assess plant performance proactively. In this area, the staff anticipates that some of what is found to apply to power reactor and utility organizations may also be found applicable, in varying degrees, to non-reactor facility organizations. NMSS will learn from the Office of Nuclear Reactor Regulation's (NRR's) experiences in assessing these factors, by taking advantage of research findings and participating in new training programs NRR may establish to meet the stated objectives. NMSS would then enhance its own programs, accordingly. The fuel cycle LPR process already includes consideration of some management and economic stress factors. This is generally covered in the LPR subheading, "Challenges to Performance."

The adequacy of financial strength/viability is addressed for both fuel cycle and materials licensees, under the topics of decommissioning and financial assurance. In the fuel cycle and materials licensing and inspection programs, NMSS has always been alert to the possible impacts certain economic indicators could have on licensee performance, including changes in management structure and capabilities associated with "downsizing;" changes in ownership; loss

of business; difficulties with other Federal or State regulatory bodies; and other indicators; to ensure that the licensee's safety programs are not adversely affected when such changes occur. As NRR and the Office of Nuclear Regulatory Research develop additional tools for, and insights into, use of new types of performance indicators, NMSS will determine the usefulness of the new approaches for assessing non-reactor licensee performance, and incorporate what is learned into NMSS licensee performance assessment programs. This would include NMSS participating in NRR training opportunities that NMSS might also find useful, and sharing other NRR resources (e.g., expertise) NRR might devote to properly interpreting new types of performance indicators.

**Table 1. Trial Performance Index #1: Mixing Numbers and Z-Scores  
Fuel Cycle Facility Performance Indicators for Period 1/1/95 - 5/31/97**

| <b>Performance Indicators</b>                                       | <b>Licensee A</b> | <b>Licensee B</b> | <b>Licensee C</b> | <b>Licensee D</b> | <b>Licensee E</b> | <b>Licensee F</b> | <b>Licensee G</b> | <b>Licensee H</b> |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| <b>Reportable Events (Z-Score) (Number)</b>                         | 0.20              | -0.26             | 2.5               | -0.26             | -0.26             | -0.72             | -0.26             | -0.95             |
|   | 6                 | 4                 | 16                | 4                 | 4                 | 2                 | 4                 | 1                 |
| <b>Reactive Inspections (Number)</b>                                | 6                 | 3                 | 4                 | 1                 | 2                 | 0                 | 3                 | 2                 |
| <b>Escalated Enforcement Actions (Number)</b>                       | 1                 | 2                 | 1                 | 1                 | 2                 | 0                 | 0                 | 2                 |
| <b>Allegation Cases (Z-Score) (Number)</b>                          | -1.61             | 2.18              | 1.42              | -0.09             | 0.66              | -0.09             | -0.85             | -1.61             |
|   | 0                 | 5                 | 4                 | 2                 | 3                 | 2                 | 1                 | 0                 |
| <b>10 CFR Part 2.206 Petitions (Number)</b>                         | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 |
| <b>Financial Health*<br/>- Assurances<br/>- Bankruptcy (Number)</b> | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 | 0                 |
| <b>Trial Performance Index**</b>                                    | 5.59              | 6.92              | 8.92              | 1.65              | 4.40              | -0.81             | 1.89              | 1.44              |

\* For Financial Health, column value would be 2 if non-compliant with financial assurance requirements, and 4 if there is a Ch. 7 or Ch. 11 bankruptcy.

\*\* Sums of columns, for two rows, add Z-scores - for others, add numbers,

$$\text{Z-score} = \frac{(\# \text{ reported}) - (\text{National Average of } \# \text{ Reported})}{\text{Sigma}} \quad \text{Sigma} = \frac{\text{SQRT}(\text{Sum of Squares of Differences from Average})}{\text{Number of Facilities}}$$

NOTE: Enforcement actions necessarily trail events/inspections; enforcement actions shown may not correspond to same time period.

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**Table 2. Trial Performance Index #2: Mixing Numbers and Z-Scores  
Fuel Cycle Facility Performance Indicators for Period 1/1/95 - 5/31/97**

| Performance Indicators                                     | Licensee A | Licensee B   | Licensee C | Licensee D | Licensee E   | Licensee F |
|--|------------|--------------|------------|------------|--------------|------------|
| <b>Reportable Events<br/>(Z-Score)<br/>(Number)</b>        | 0.20       | -0.26        | 2.50       | -0.26      | -0.26        | -0.72      |
|  | 6          | 4            | 16         | 4          | 4            | 2          |
|  |            |              |            |            |              |            |
| <b>Reactive Inspections</b>                                | 6          | 3            | 4          | 1          | 2            | 0          |
| <b>Severity Level 4<br/>Violations</b>                     | 11         | 23           | 11         | 12         | 8            | 12         |
| <b>Escalated<br/>Enforcement Actions</b>                   | 1          | 2            | 1          | 1          | 2            | 0          |
| <b>Civil Penalties<br/>[Total \$ Amount]</b>               | 0          | 1<br>[12.5K] | 0          | 0          | 1<br>[12.5K] | 0          |
| <b>Allegation Cases<br/>(Z-Score)<br/>(Number)</b>         | -1.61      | 2.18         | 1.42       | -0.09      | 0.66         | -0.09      |
|  | 0          | 5            | 4          | 2          | 3            | 2          |
|  |            |              |            |            |              |            |
| <b>10 CFR Part 2.206<br/>Petitions</b>                     | 0          | 0            | 0          | 0          | 0            | 0          |
| <b>Financial Health*<br/>- Assurances<br/>- Bankruptcy</b> | 0          | 0            | 0          | 0          | 0            | 0          |
| <b>Trial Performance<br/>Index**</b>                       | 16.59      | 30.92        | 19.92      | 13.65      | 13.40        | 11.19      |

\* For Financial Health, column value would be 2 if non-compliant with financial assurance requirements, and 4 if there is a Ch. 7 or Ch. 11 bankruptcy.

\*\* Sums of columns, for two rows, add Z-scores - for others, add numbers,

$$Z\text{-score} = \frac{(\# \text{ reported}) - (\text{National Average of } \# \text{ Reported})}{\text{Sigma}}$$

$$\text{Sigma} = \frac{\text{SQRT}(\text{Sum of Squares of Differences from Average})}{\text{Number of Facilities}}$$

NOTE: Enforcement actions necessarily trail events/inspections; enforcement actions shown may not correspond to same time period.

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**Table 3. Trial Performance Index #3: Using Weight Factors**

**Fuel Cycle Facility Performance Indicators for Period 1/1/95 - 5/31/97**

| Performance Indicators* (PI <sub>i</sub> ) | Weight Factor (W <sub>i</sub> ) | Licensee A | Licensee B | Licensee C | Licensee D | Licensee E | Licensee F |
|--|---------------------------------|------------|------------|------------|------------|------------|------------|
| Reportable Events                          | x 1                             | 6          | 4          | 16         | 4          | 4          | 2          |
| Reactive Inspections                       | x 5                             | 6          | 3          | 4          | 1          | 2          | 0          |
| Severity Level 4 Violations                | x 10                            | 11         | 23         | 11         | 12         | 8          | 12         |
| Escalated Enforcement Actions              | x 15                            | 1          | 2          | 1          | 1          | 2          | 0          |
| Civil Penalties [Total \$ Amount]          | x 20                            | 0          | 1 [12.5K]  | 0          | 0          | 1 [12.5K]  | 0          |
| Allegation Cases                           | x 1                             | 0          | 5          | 4          | 2          | 3          | 2          |
| <b>Trial Performance Index**</b>           |                                 | 161        | 304        | 165        | 146        | 147        | 124        |

\* Column numbers for each facility are actual numbers

\*\* Performance index =  $\sum PI_i \times W_i$ ; weighting factors chosen to indicate relative importance based on subjective judgements

NOTE: Enforcement actions necessarily trail events/inspections; enforcement actions shown may not correspond to same time period.

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**Table 4. Fuel Cycle Facility Performance Indicators for SMM for Period 1/1/95 - 5/31/97**

| Performance Indicators | Licensee A | Licensee B | Licensee C | Licensee D | Licensee E | Licensee F |
|------------------------|------------|------------|------------|------------|------------|------------|
|------------------------|------------|------------|------------|------------|------------|------------|



|                                      |    |                          |            |        |            |            |                          |            |    |   |
|--------------------------------------|----|--------------------------|------------|--------|------------|------------|--------------------------|------------|----|---|
| <b>Escalated Enforcement Actions</b> | 0  | 1<br>(SL2)<br>2<br>(SL3) | 1<br>(SL3) | 5(SL3) | 2<br>(SL3) | 3<br>(SL3) | 1<br>(SL2)<br>2<br>(SL3) | 2<br>(SL3) | 0  | 0 |
| <b>Allegation Cases</b>              | 51 | 8                        | 9          | 12     | 20         | 4          | 9                        | 4          | 7  | 2 |
| <b>Totals</b>                        | 75 | 71                       | 54         | 55     | 37         | 24         | 22                       | 15         | 12 | 2 |

1. "Recommendations to Improve the Senior Management Meeting Process," Arthur Andersen, December 30, 1996.
2. Staff considers that higher-risk facilities are those facilities warranting increased attention on the basis of the conduct of their programs -- operational performance and compliance with requirements -- not necessarily solely on the basis of their inventories of material or the types of operations.
3. Some examples are:  $1.3 \times 10^{18}$  fissions at Oak Ridge Y-12 Plant, 1958;  $2.2 \times 10^{17}$  fissions at Los Alamos National Laboratory, 1958, 1 fatality;  $10^{17}$  fissions at Idaho Chemical Engineering Plant, 1959;  $6 \times 10^{17}$  fissions at Idaho Chemical Processing Plant, 1961;  $8 \times 10^{17}$  fissions at Hanford Works, 1962;  $1.3 \times 10^{17}$  fissions at Wood River Junction, 1964, 1 fatality; and  $2.7 \times 10^{18}$  fissions at Idaho Chemical Processing Plant, 1978.