AUDIT REPORT

Audit NRC's Material Control and
Accounting Security Measures
for Special Nuclear Materials
at Fuel Cycle Facilities

OIG-09-A-19 September 30, 2009

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

OFFICE OF THE
INSPECTOR GENERAL

September 30, 2009

MEMORANDUM TO: R. William Borchardt
Executive Director for Operations

FROM: Stephen D. Dingbaum **/RA/**
Assistant Inspector General for Audits

SUBJECT: AUDIT OF NRC'S MATERIAL CONTROL AND ACCOUNTING SECURITY MEASURES FOR SPECIAL NUCLEAR MATERIALS AT FUEL CYCLE FACILITIES (OIG-09-A-19)

Attached is the Office of the Inspector General's (OIG) report, *Audit of NRC's Material Control and Accounting Security Measures for Special Nuclear Materials at Fuel Cycle Facilities.*

The report presents the results of the subject audit. Agency comments provided during and subsequent to an August 26, 2009, exit conference have been incorporated, as appropriate, into this report.

Please provide information on actions taken or planned on each of the recommendations within 30 days of the date of this memorandum. Actions taken or planned are subject to OIG follow-up as stated in Management Directive 6.1.

We appreciate the cooperation extended to us by members of your staff during the audit. If you have any questions or comments about our report, please contact me at 415-5915 or Beth Serepca, Team Leader, Security and Information Management Audit Team, at 415-5912.

Attachment: As stated

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EXECUTIVE SUMMARY

BACKGROUND

The U.S. Nuclear Regulatory Commission (NRC) is authorized to grant licenses for the possession and use of special nuclear material (SNM) and establish regulations to govern the possession and use of those materials. SNM is used for such purposes as (1) fuel for nuclear reactors; (2) industrial, academic, and medical applications; and (3) the manufacture of industrial gauging devices.

NRC's regulations require that SNM license holders have material control and accounting (MC&A) systems to protect against the loss or misuse of SNM. Licensees must allow NRC to inspect the materials, controls, and premises where SNM is used or stored. The primary goal of the NRC MC&A inspection program at fuel cycle facilities is to ensure that licensee systems adequately detect and protect against the loss, theft, or diversion of SNM in the licensee's possession.

The Office of Nuclear Material Safety and Safeguards (NMSS) is currently responsible for the MC&A Inspection Program. The inspection program staff is composed of one fully qualified inspector and three inspectors who are at various stages in their 2-year training and qualification program. This current staff is split between NRC headquarters in Rockville, Maryland, and NRC's Region II office in Atlanta, Georgia.

NRC requires MC&A inspections at Category I fuel cycle facilities twice per calendar year, and these inspections require approximately 128 hours per site. Upon completion of an inspection, staff return to their assigned offices and write an inspection report. The NMSS MC&A Branch Chief reviews and approves the report.

PURPOSE

The purpose of this audit was to assess the effectiveness of NRC's MC&A inspection program over the accounting and control of SNM at Category I fuel cycle facilities.

RESULTS IN BRIEF

The primary goal of NRC's MC&A inspection program is to ensure that licensee MC&A systems adequately detect the loss, theft, or diversion of SNM. However, the Office of the Inspector General (OIG) found that the MC&A Inspection Program is at risk from the following conditions:

- Procedures lack prioritized direction and detailed sampling instruction.

- Qualified staff are limited.

- Specialized training that could enhance management knowledge has not been taken.

Procedures Lack Prioritized Direction and Detailed Sampling Instruction

NRC requires up-to-date, detailed procedures that provide guidance on setting inspection priorities. Currently, inspectors must choose their MC&A inspection activities without the benefit of prioritized procedures containing detailed sampling instruction. Management stated that they had not been made aware of any need for procedure revisions by the inspectors. The result is that there is no assurance that MC&A inspections are conducted in a consistent, thorough manner.

Qualified Staff Are Limited

Management is responsible for ensuring that NRC's workforce has the skills necessary to achieve the agency's goals. The MC&A inspection program is currently operating with only one fully qualified inspector. In addition to conducting inspections and writing inspection reports, this inspector provides on-the-job training to three inspectors-in-training. Limited availability of required Department of Energy MC&A classes restricts the ability of NRC MC&A inspectors-in-training to complete their qualifications within the required 2-year timeframe. The result of these training delays is an inspection program that does not have a sufficient number of qualified inspectors to assure that inspections are conducted in a consistent, thorough manner. However, no deficiencies were observed.

Specialized Training That Could Enhance Management Knowledge Has Not Been Taken

NRC branch chiefs play an important role in overseeing inspection activities and should have a level of MC&A understanding that enables them to ensure effective performance of their branch. However, the branch chief responsible for approving MC&A fuel cycle facility inspection reports lacks specialized classroom training in this area. Specialized MC&A training is not required as a prerequisite to meet the qualifications to become an NMSS MC&A branch chief. However, without specialized

classroom training, NRC lacks assurance that its branch chief has expertise for thorough and independent assessment of inspectors' work, increasing the risk that inspector errors will go undetected.

RECOMMENDATIONS

This report makes three recommendations to improve the agency's MC&A inspection program at Category I fuel cycle facilities. A consolidated list of these recommendations appears in Section V of this report.

AGENCY COMMENTS

At an August 26, 2009, exit conference, agency senior executives agreed to provide suggested revisions to the discussion draft report for OIG's consideration. On September 3, 2009, NRC provided suggested report revisions, which served as a basis for further discussions between the agency and OIG. This final report incorporates revisions made, where appropriate, as a result the agency's suggestions.

On September 25, 2009, the Executive Director for Operations provided a formal response to this report (Appendix B). No changes were made to the report based on the agency's formal response. OIG's response to the agency's formal comments is presented as Appendix C.

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ABBREVIATIONS AND ACRONYMS

DOE	Department of Energy
MC&A	Material Control and Accounting
NMSS	The Office of Nuclear Material Safety and Safeguards
NRC	Nuclear Regulatory Commission
NSIR	The Office of Nuclear Security and Incident Response
OIG	Office of the Inspector General
SNM	special nuclear material

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TABLE OF CONTENTS

EXECUTIVE SUMMARY i

ABBREVIATIONS AND ACRONYMS v

I. BACKG ROUND 1

II. PURP OSE 3

III. FINDI NGS 4

A. P ROCEDURES LACK PRIORITIZED DIRECTION AND DETAILED SAMPLING INSTRUCTION 4

B. Q UALIFIED STAFF ARE LIMITED 8

C. S PECIALIZED TRAINING THAT COULD ENHANCE MANAGEMENT KNOWLEDGE HAS NOT BEEN TAKEN 11

IV. AGENCY COMMENTS 14

V. CONSOLIDATED LIST OF RECOMMENDATIONS 15

APPENDICES

A. SCOPE AND METHODOLOGY 17

B. FORMAL AGENCY COMMENTS 19

C. OIG RESPONSE TO FORMAL AGENCY COMMENTS 21

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I. BACKGROUND

The U.S. Nuclear Regulatory Commission (NRC) is authorized to grant licenses for the possession and use of special nuclear material (SNM)[1] and establish regulations to govern the possession and use of those materials. SNM is used for such purposes as (1) fuel for nuclear reactors; (2) industrial, academic, and medical applications; and (3) the manufacture of industrial gauging devices.

NRC's regulations require that SNM license holders have material control and accounting (MC&A) systems to protect against the loss or misuse of SNM. Licensees, such as fuel cycle facilities,[2] have the primary responsibility to maintain the security and accountability of the radioactive material in their possession. Licensees must allow NRC to inspect the materials, controls, and premises where SNM is used or stored. These inspections are required to occur cyclically as prescribed by NRC procedures.

Today's threat environment differs from the pre-September 11, 2001, environment. In the current threat environment, safeguards programs should be designed to better ensure protection against the diversion or theft of material that could be used malevolently.

The MC&A Inspection Program

The primary goal of the NRC MC&A inspection program at fuel cycle facilities is to ensure that licensee systems adequately detect and protect against the loss, theft, or diversion of SNM in the licensee's possession. A secondary goal, if loss, theft, or diversion does occur, is to ensure that the licensee systems trigger timely detection response and recovery operations.

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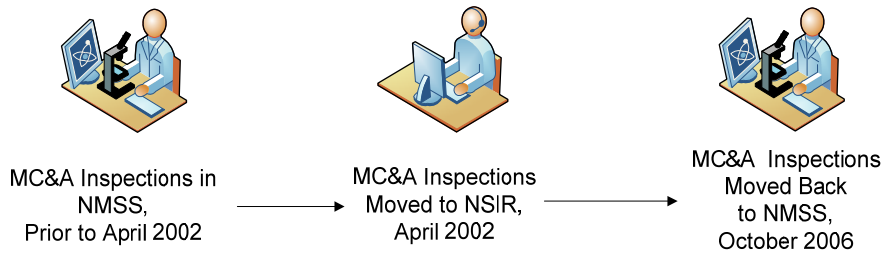
[1] Special nuclear material is mildly radioactive, but includes uranium-233, uranium-235, and plutonium-239 -- which, in concentrated form, can be the primary ingredients of nuclear explosives. These materials, in amounts greater than formula quantities, are defined as "strategic special nuclear material." The uranium-235 content of low-enriched uranium can be concentrated (i.e., enriched) to make highly enriched uranium, the primary ingredient of an atomic bomb.

[2] A fuel cycle facility is a facility involved in the processing and fabrication of uranium ore into reactor fuel.

NRC's inspection program distinguishes different categories of fuel facilities for inspection. NRC conducts MC&A inspections at Category I facilities and Category III facilities.[3] Categorization of facilities is based on type and enrichment of material.[4]

The Office of Nuclear Material Safety and Safeguards (NMSS) is currently responsible for the MC&A inspection program, although responsibility has moved from NMSS to the Office of Nuclear Security and Incident Response (NSIR) and back to NMSS in recent years. A recent office history of the MC&A Fuel Cycle Facility inspection program is depicted below:



The inspection program staff is composed of one fully qualified inspector[5] and three inspectors who are at various stages in their 2-year training and qualification program. Previously the inspection program staff was supplemented by other fully qualified inspectors from within NMSS and NSIR. This current staff is split between NRC headquarters in Rockville, Maryland, and NRC's Region II office in Atlanta, Georgia. The NMSS MC&A Branch Chief supervises the one fully qualified inspector and one of the inspectors-in-training out of headquarters. The two other inspectors-in-training operate out of Region II and are supervised by a Branch Chief in Region II's Division of Fuel Facility Inspection.

[3] There are no Category II fuel cycle facilities currently operating in the United States.

[4] Category I fuel cycle facilities are authorized to possess highly enriched uranium, and Category III fuel cycle facilities are authorized to possess low enriched uranium. Highly enriched uranium is fuel in which the weight percent of U-235 in the uranium is 20 percent or greater. Low enriched uranium is fuel in which the weight percent of U-235 in the uranium is less than 20 percent.

[5] Full Inspector Qualification indicates that the individual has completed all Basic-Level and Proficiency-Level inspector training and qualification activities. Achieving Full Inspector Qualification allows an individual to be assigned the full scope of inspection-related activities to be independently performed with routine oversight and supervision.

MC&A Inspections

NRC requires MC&A inspections at Category I fuel cycle facilities twice per calendar year, and these inspections require approximately 128 hours per site. MC&A inspections typically require 1 week of planning and pre-work, 1 week of onsite inspection time, and 1 week of report writing and post-inspection work. Prior to each inspection, inspectors prepare an inspection plan detailing which procedures and activities within the procedures are to be accomplished during the inspection. Inspectors typically review and test the licensee's performance in areas such as:

- Accounting and Internal Controls.
- Item Monitoring.
- Management Structure and Personnel Training and Qualification.
- Measurement Systems and Control.
- Physical Inventory.
- Process Monitoring.

Inspectors also set aside time to follow up on issues noted during previous inspections. Upon completion of an inspection, staff return to their assigned offices and write an inspection report. The NMSS MC&A Branch Chief reviews and approves the report.

II. PURPOSE

The purpose of this audit was to assess the effectiveness of NRC's MC&A inspection program over the accounting and control of SNM at Category I fuel cycle facilities.

See Appendix A for a description of the audit scope and methodology.

III. FINDINGS

The primary goal of NRC's MC&A inspection program is to ensure that licensee MC&A systems adequately detect the loss, theft, or diversion of SNM. However, the Office of the Inspector General (OIG) found that the MC&A Inspection Program is at risk from the following conditions:

- Procedures lack prioritized direction and detailed sampling instruction.
- Qualified staff are limited.
- Specialized training that could enhance management knowledge has not been taken.

A. Procedures Lack Prioritized Direction and Detailed Sampling Instruction

NRC requires up-to-date, detailed procedures that provide guidance on setting inspection priorities. Currently, inspectors must choose their MC&A inspection activities without the benefit of prioritized procedures containing detailed sampling instruction. Management stated that they had not been made aware of any need for procedure revisions by the inspectors. The result is that there is no assurance that MC&A inspections are conducted in a consistent, thorough manner.

Figure 1. Fuel cycle facility processing uranium.

Source: Babcock and Wilcox Nuclear Operations Group

MC&A Inspection Program Requirements

NRC requires MC&A inspection program procedures to be current and detailed. The inspection program inspects and tests licensee MC&A system capabilities for detecting and triggering timely response to any unauthorized use or significant loss of SNM. The selection of a sample of records for verification is required as part of the testing. A brief explanation of relevant inspection program and sampling requirements follows.

Program Performance

NRC Inspection Manual Chapter 2683, *MC&A Inspection of Fuel Cycle Facilities,* establishes the inspection requirements for MC&A systems for fuel cycle licensees. It states that an objective of the MC&A inspection program is to provide guidance on setting inspection priorities, commensurate with relative risk, for efficient and effective inspections.

NMSS Policy and Procedures Letter 1-76, *Procedures for Processing Inspection Manual Chapters and Inspection Procedures,* requires that all inspection manual chapters and inspection procedures under NMSS purview will be reviewed at least once every 3 years and revised as necessary.

Sampling Requirements

The book, *Statistical Methods for Nuclear Material Management,* sponsored by NRC's Office of Nuclear Regulatory Research, maintains that for sampling to be effective, the universe to be sampled must be known and all items in the universe must have a chance of being selected. Agreeing with the above statement, an agency statistician added that it is important to at least consider all items because of the risk of "trickle loss."[6]

Procedures Lack Prioritized Direction and Detailed Sampling Instruction

NRC's MC&A inspection procedures lack both prioritized direction and detailed sampling instruction. Professional judgment by the MC&A inspection staff is typically used to determine which inspection activities are conducted, despite concerns from three of the four current MC&A inspectors that

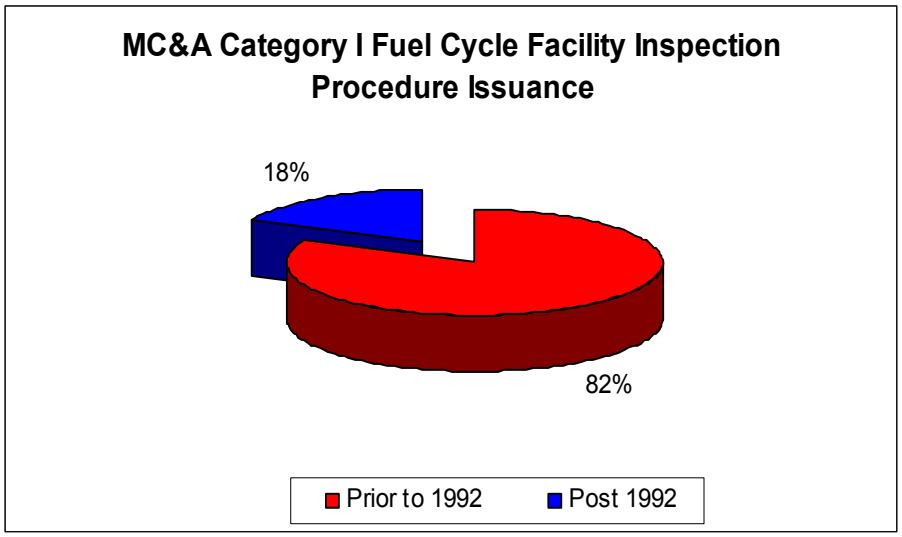
[6] Trickle loss is when numerous small items are diverted (stolen) with the hope that the theft will not be detected because small items are not under as much scrutiny.

procedures are not detailed enough to determine what activities are to be completed. Additionally, the staff has established an "unwritten procedure" or practice of limiting sample selection size in favor of expediency, regardless of the size of the universe to be reviewed.

Activity Selection

NRC's MC&A Inspection Program for Category I fuel cycle facilities is composed of 11 inspection procedures. Nine of the procedures (approximately 82 percent) were issued prior to 1992 (see Figure 2, below). Each of the MC&A inspection procedures contain numerous activities. A review by OIG staff confirmed that these procedures lack prioritized direction, instead relying primarily on the professional judgment of the inspection staff to determine which activities within the procedures are to be completed.

Figure 2.



During interviews with management and staff, OIG asked how staff determine which activities are to be conducted, and were told that inspectors base decisions on individual professional judgment. One inspector relayed struggling all the time to decide which activities to complete while another inspector conveyed feeling uneasy about prioritizing what actually needs to be done without detailed instructions in the inspection procedures.

Sampling Selection

Staff have established an "unwritten procedure" or practice of limiting sample selection size in favor of expediency, regardless of the size of the universe to be reviewed. MC&A inspection procedures state that a random sample of SNM items should be examined by the inspector to confirm that they are in their designated locations and that they are properly identified. To accomplish this, the inspector selects a sample (typically 30 items) from categories based on the inspector's vulnerability assessment. The 30 items, along with a selection of adjacent items, are then verified back to a listing provided by the licensee.[7] This method does not ensure that the entire SNM universe is at least considered in the sample, whereas a true random sample would.

Management Not Aware of Inspector Concerns

Management was unaware of MC&A inspector's concerns regarding lack of detailed direction. However, the branch chief did confirm that the selection of 30 items for verification is based on limited time to conduct the work.

No Assurance MC&A Inspections Are Consistent and Thorough

No assurance can be made that MC&A inspections are consistent and thorough because the program currently functions with inspection procedures that lack both prioritized direction and detailed sampling instruction. NRC's relatively inexperienced inspection staff struggles to prioritize which inspection activities to complete. This creates a risk that staff may overlook an inspection activity or rush through an inspection to meet scheduling demands, although no deficiencies were observed.

Recommendations

OIG recommends that the Executive Director for Operations:

1. Review and revise MC&A procedures as required by NMSS Policy and Procedures Letter 1-76.

[7] A minimum of 30 and a maximum of 57 initial sample items for verification have been selected over the past 2 years of MC&A inspections at Category I fuel cycle facilities, while a minimum of 17 and a maximum of 34 adjacent items have also been selected.

B. Qualified Staff Are Limited

Management is responsible for ensuring that NRC's workforce has the skills necessary to achieve the agency's goals. The MC&A inspection program is currently operating with only one fully qualified inspector. In addition to conducting inspections and writing inspection reports, this inspector provides on-the-job training to three inspectors-in-training. Limited availability of required Department of Energy (DOE) MC&A classes restricts the ability of NRC MC&A inspectors-in-training to complete their qualifications within the required 2-year timeframe. The result of these training delays is an inspection program that does not have a sufficient number of qualified inspectors to assure that inspections are conducted in a consistent, thorough manner. However, no deficiencies were observed.

Human Capital and Training Requirements

Management is responsible for effective human capital management of an organization's workforce. Management should ensure that skill needs are continually assessed and that the organization is able to obtain a workforce that has the required skills that match those necessary to achieve organizational goals.

To qualify as an MC&A inspector, employees must successfully complete three qualification journals and a qualification board.[8] Seven DOE classes (169 hours) and eight on-the-job training activities (168 hours) are part of this required training. NRC procedures require that on-the-job training activities are to be performed concurrent with an inspection at an operational fuel facility under the direction of a qualified inspector. Staff assigned to independently perform inspections must successfully complete all training activities and qualification requirements prior to becoming inspector qualified.[9]

[8] The three qualification journals are Basic-Level, General Proficiency-Level, and Technical Proficiency-Level. Basic-Level activities are designed to develop an inspector's awareness of their role as an inspector and the technology they will be inspecting. General Proficiency activities are designed to develop an inspector's interpersonal and inspection skills, while Technical Proficiency activities are designed to develop technical expertise. A Qualification Board is given to ensure that inspectors have a sufficiently integrated understanding of the role of the agency, the inspection program, and their role as an inspector to act independently in the field.

[9] The Division Director has the authority to accept previous experience and training as an alternate method for meeting the training and qualification requirements.

Qualified Staff Are Limited

NRC is currently conducting onsite MC&A inspections using one fully qualified inspector for 32 hours, supplemented by inspectors-in-training. NRC Core Inspection Requirements estimate that 64 hours are required to complete an MC&A inspection at a Category I fuel cycle facility.

Figure 3. Fuel cycle facility personnel with a research test reactor fuel assembly.

Source: Babcock and Wilcox Nuclear Operations Group

There are currently three inspectors in various stages of the 2-year MC&A inspector training program. Management explained that additional inspectors may be needed as new enrichment facilities become operational. Two of the three inspectors-in-training are "Basic Inspector Certified."[10] The three inspectors-in-training accompany the program's one fully qualified inspector on fuel cycle facility inspections to complete the on-the-job training tasks that are required as part of the technical proficiency-level qualification.[11] In addition to conducting inspections, the fully qualified inspector also provides on-the-job training to the inspectors-in-training during these inspections.

[10] Basic Inspector Certification is a certification made by the individual's supervisor that signifies that the individual has successfully completed all basic level inspector training and qualification activities. Achieving Basic Inspector Certification allows an individual to perform limited scope inspection activities. In this case, inspection activities will be specifically assigned and are to be performed with an appropriate degree of detailed supervision.

[11] Technical Proficiency-Level training consists of training courses, study guides, and on-the-job training activities.

Training Delays Limit Qualified Staff

Delays in DOE-provided MC&A training has limited the number of qualified MC&A inspectors. As part of the MC&A training program, NRC relies heavily on DOE-sponsored training. Management explained that it would not be financially prudent to develop in-house MC&A training classes for such a small group of people when specialized training is already offered by DOE.

NRC management and all three inspectors-in-training expressed difficulty scheduling the required seven DOE MC&A classes. OIG confirmed that none of the required instructor-led DOE classes were/will be held more than once during 2008 and 2009. Additionally, OIG confirmed that two of the required instructor-led classes were not/will not be held during 2008 and 2009. DOE requires a minimum number of students to hold a class.[12]

No Assurance MC&A Inspections Are Consistent and Thorough

With the MC&A inspection program currently operating with one fully qualified inspector, there can be no assurance that inspections are conducted in a consistent, thorough manner, although no deficiencies were observed. In addition to conducting inspections, this inspector provides on-the-job training to three inspectors-in-training while conducting fuel cycle facility MC&A inspections. This additional responsibility encumbers the only fully qualified inspector, preventing the inspector from focusing solely on conducting inspections.

Recommendation

OIG recommends that the Executive Director for Operations:

2. Establish an alternative to DOE-sponsored MC&A inspector training to be used as needed.

[12] OIG obtained documentation showing that an inspector-in-training had been registered for two DOE classes that were cancelled because not enough students registered.

C. Specialized Training That Could Enhance Management Knowledge Has Not Been Taken

NRC branch chiefs play an important role in overseeing inspection activities and should have a level of MC&A understanding that enables them to ensure effective performance of their branch. However, the branch chief responsible for approving MC&A fuel cycle facility inspection reports lacks specialized classroom training in this area. Specialized MC&A training is not required as a prerequisite to meet the qualifications to become an NMSS MC&A branch chief. However, without specialized classroom or equivalent training, NRC lacks assurance that its branch chief has expertise for thorough and independent assessment of inspectors' work, increasing the risk that inspector errors will go undetected.

Figure 4. Fuel cycle facility employee processing uranium.

Source: Babcock and Wilcox Nuclear Operations Group

Internal Control and Training Requirements

As a best practice, branch chiefs should have a level of MC&A understanding that enables them to ensure effective performance of their branch. This includes a thorough understanding of item monitoring, process monitoring, measurement systems and control, and accounting and internal control as it relates to MC&A at Category I fuel cycle facilities. Understanding these issues is essential for inspectors as well as their branch chief supervisors to uphold NRC's MC&A oversight role.

Specialized Training That Could Enhance Management Knowledge Has Not Been Taken

OIG found that the branch chief who is responsible for approving MC&A inspection reports and supervising inspection staff has not taken any specialized classroom MC&A training and is not inspector qualified.

The branch chief is responsible for a range of tasks, including assessing employee performance, training new inspectors, and reviewing and approving work products. In addition, the branch chief is expected to manage technical staff who perform reviews of MC&A plans submitted by licensees to ensure SNM possession poses no undue risk to national security, direct development and implementation of MC&A inspection guidance, and recommend enforcement action for violation(s) of agency regulatory requirements.

While 2 years of specialized training is required to become a fully qualified MC&A inspector, the branch chief asserts that graduate coursework, coupled with experience, self study, and attendance at technical conferences is adequate training to oversee MC&A inspection activities.[13] When asked how branch chiefs with no specialized MC&A training are able to assess that the inspection reports they are approving are correct, the Deputy Director responsible for the MC&A inspection program stated that the branch chief must rely on the technical expertise of the staff.

Specialized Training Not Required

NMSS does not require specialized MC&A training as a prerequisite to meet the qualifications to become a Branch Chief of the NMSS MC&A Branch. NRC seeks candidates for branch chief positions who exhibit leadership and supervisory skills, as well as programmatic and regulatory knowledge. However, OIG asserts that this training is essential because it involves the MC&A of SNM as it goes through manufacturing processes at fuel cycle facilities. MC&A inspections at fuel cycle facilities vary greatly from MC&A inspections at commercial power reactors, which focus on the control and accounting of discrete items.

[13] The branch chief does not, on a regular basis, accompany MC&A inspectors on fuel cycle facility inspections. Although the branch chief does have considerable NRC experience, very little of the experience specifically focuses on MC&A fuel cycle facility inspections.

Specialized Training Would Enhance Internal Controls

Although classes and experience provide the branch chief with a solid foundation, OIG concludes that specialized classroom MC&A training, focused on real world scenarios, is vital to gaining a thorough understanding of the MC&A program. MC&A fuel cycle facility inspection reports are currently approved by a branch chief who has not received any specialized classroom MC&A training, is not inspector qualified, and has not been on any recent MC&A inspections. This brings into question the branch chief's ability to perform an independent assessment of inspectors' work, when the branch chief must rely on staff for technical expertise. Because of this, NRC lacks assurance that its branch chief has an appropriate level of MC&A inspection expertise, increasing the risk that inspector errors or inadequate reviews will go undetected.

Recommendation

OIG recommends that the Executive Director for Operations:

3. Provide appropriate MC&A training for managers without MC&A backgrounds responsible for MC&A inspections at fuel cycle facilities.

IV. AGENCY COMMENTS

At an August 26, 2009, exit conference, agency senior executives agreed to provide suggested revisions to the discussion draft report for OIG's consideration. On September 3, 2009, NRC provided suggested report revisions, which served as a basis for further discussions between the agency and OIG. This final report incorporates revisions made, where appropriate, as a result the agency's suggestions.

On September 25, 2009, the Executive Director for Operations provided a formal response to this report (Appendix B). No changes were made to the report, based on the agency's formal response. OIG's response to the agency's formal comments is presented as Appendix C.

V. CONSOLIDATED LIST OF RECOMMENDATIONS

OIG recommends that the Executive Director for Operations:

1. Review and revise MC&A procedures as required by NMSS Policy and Procedures Letter 1-76.

2. Establish an alternative to DOE-sponsored MC&A inspector training to be used as needed.

3. Provide appropriate MC&A training for managers without MC&A backgrounds responsible for MC&A inspections at fuel cycle facilities.

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Appendix A

SCOPE AND METHODOLOGY

The objective of this audit was to assess the effectiveness of NRC's MC&A inspection program over the accounting and control of SNM at Category I fuel cycle facilities.

In order to accomplish the objective of this audit, OIG obtained and analyzed pertinent laws, regulations, authoritative guidance, NRC policies and procedures, and prior relevant NRC OIG reports to identify Federal and agency requirements relevant to MC&A operations.

Additionally, OIG reviewed inspection reports, training and human resource documents, and internal communications and conducted interviews with current and former staff to:

- Gain an understanding of NRC's MC&A inspection program.
- Determine current issues, problems, and known deficiencies.
- Assess internal controls.

OIG also observed two MC&A inspections at Category I fuel cycle facilities in Region II.

Internal controls related to the audit objective were reviewed and analyzed. Throughout the audit, auditors were aware of the possibility or existence of fraud, waste, or misuse in the program.

The work was conducted from January to June 2009 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The work was conducted by Beth Serepca, Team Leader; Terri Cooper, Audit Manager; Robert Woodward, Senior Auditor; and James McGaughey, Senior Analyst. We performed the audit work at NRC Headquarters in Rockville, Maryland; Region II offices in Atlanta, Georgia; and at Category I fuel cycle facilities in Region II.

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Appendix B

FORMAL AGENCY COMMENTS

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 25, 2009

MEMORANDUM TO: Stephen D. Dingbaum
Assistant Inspector General for Audits
Office of the Inspector General

FROM: R. W. Borchardt
Executive Director for Operations

SUBJECT: RESPONSE TO AUDIT OF NRC'S MATERIAL CONTROL AND ACCOUNTING SECURITY MEASURES FOR SPECIAL NUCLEAR MATERIALS AT FUEL CYCLE FACILITIES

The report regarding NRC's Material Control and Accounting Security Measures for Special Nuclear Materials at Fuel Cycle Facilities may be read to imply that NRC should ensure that supervisors have or receive technical training very similar to that of the staff supervised in order to ensure that they possess adequate technical expertise to oversee functions under their purview. The agency's responsibilities for protecting the public health and safety, security, and the environment are best served by selecting and developing supervisors and managers with broad technical competencies, a thorough understanding of the regulatory process and NRC policies and activities, and leadership competencies needed to help employees work effectively. NRC selects first-line supervisors based on their technical competencies as well as leadership competencies and expects supervisors to engage in continual learning and development. NRC does not limit supervisory selections to employees with expertise in the specific, narrow technical activity to be supervised, or develop supervisors as though their primary function were to perform rather than supervise such activities. Such an approach would (1) be detrimental to the breadth, diversity, and quality of candidates eligible for consideration, and (2) undermine NRC's program for developing fungible supervisors and managers capable of leading different agency programs effectively based on their understanding of NRC's regulatory mission, functions, and processes, as well as continually developing leadership skills.

The report states that "OIG concludes that specialized classroom MC&A training, focused on real world scenarios, is vital to gaining a thorough understanding of the MC&A program" and recommends that the EDO "provide appropriate MC&A training for managers without MC&A backgrounds responsible for MC&A inspections at fuel cycle facilities." Of course, a branch chief plays an important role in overseeing the functions of that branch, and it is essential for supervisors to have the capability to understand the work overseen. However, requiring a supervisor to take technical training similar to what the first-line technical staff take would run contrary to what we need and expect of our first-line managers. Consistent with current organizational thinking, we expect first-line managers to lead, coach, and develop employees and programs, and help staff use their technical expertise effectively, not mirror such technical expertise. The strong technical expertise is expected to reside with senior staff.

When selecting first-line supervisors, NRC carefully weighs the technical competencies and qualifications needed as well as the leadership competencies needed and selects the individual it deems best qualified for and capable of performing successfully in the specific position. When filling supervisory positions, managers are responsible for identifying needed skills, technical

S. Dingbaum -2-

background, and leadership competencies. Although a supervisor of technical work is typically an experienced engineer, physical scientist, or, as appropriate, security specialist, it is rarely necessary that the individual's experience and training have been in precisely the same activity as the work to be supervised. NRC consciously seeks breadth of understanding and experience across organizations and functions in all levels of staff. It is especially important that we continue to develop a cadre of current and future leaders with broad technical and regulatory understanding as well as the leadership competencies needed to help staff perform their functions effectively and successfully. For many specialized functions, few candidates would possess experience and training in the specific activity, and employees would tend to move up the organizational ranks in a "stovepiped" manner if selected based on narrow background.

NRC's practice of carefully selecting and developing supervisors has contributed positively to our ability to execute NRC's mission. The report notes that no deficiencies were observed. Surveys of NRC employees consistently reflect that NRC's selection and development practices result in a high level of confidence in first-line supervisors. While I believe our current selection and development practices are successful, we continue to strive to improve them. In this regard, the staff has already initiated identifying specific competencies for all NRC positions and establishing a more formalized process to guide managers in their responsibilities.

I will expect the subject office to explore the possibility that the supervisor in this instance may benefit from additional development in the subject matter supervised. To the extent that further development of the supervisor's subject matter knowledge would be beneficial to both the organization and the individual, I will expect the office to explore and select from among the various methods, including but not limited to classroom training, for deepening that knowledge. I note that there are many effective methods of training and development, including on-the-job activities, independent reading, and work with an expert in the field as well as formal classroom training.

Appendix C

OIG RESPONSE TO FORMAL AGENCY COMMENTS

OIG does not deny the importance of management skills in selecting management candidates, nor does the report recommend that managers be selected solely on the basis of technical skills. Rather, OIG asserts that it is reasonable to expect managers to have a working knowledge of job-specific subject matter, and that NRC should provide appropriate training to managers who enter a field without prior professional experience or formal training in that field.