

# AUDIT REPORT

Audit of NRC's Physical Security  
Inspection Program for Category I  
Fuel Cycle Facilities

OIG-10-A-01 November 3, 2009



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

OFFICE OF THE  
INSPECTOR GENERAL

November 3, 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 PHYSICAL SECURITY INSPECTION  
PROGRAM FOR CATEGORY I FUEL  
CYCLE FACILITIES (OIG-10-A-01)

Attached is the Office of the Inspector General's (OIG) audit report titled, *Audit of NRC's Physical Security Inspection Program for Category I 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 followup 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, at 415-5911.

Attachment: As stated

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## **EXECUTIVE SUMMARY**

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### **BACKGROUND**

The Nuclear Regulatory Commission (NRC) oversees security programs at facilities that manufacture fuel for nuclear reactors. These fuel cycle facilities use “special nuclear materials” in the manufacturing process. NRC classifies special nuclear materials and the facilities that possess them into three categories based upon the materials’ potential for use in nuclear weapons, or “strategic significance.” The three categories are:

- Category I: High strategic significance.
- Category II: Moderate strategic significance.
- Category III: Low strategic significance.

Two fuel cycle facilities in the United States process Category I materials into nuclear fuel for the Federal Government. The U.S. Navy, in particular, uses this fuel in nuclear powered ships and submarines. There are no Category II fuel cycle facilities operating in the United States as of June 2009, and Category III facilities are subject to a different NRC physical security inspection regime than Category I facilities because these materials present less risk to public safety and security.

The main objective of NRC’s oversight program for Category I fuel cycle facilities is to ensure that these facilities operate safely and securely in accordance with NRC requirements. Since the terrorist attacks of September 11, 2001, NRC has issued licensees new requirements and guidance to enhance security at Category I fuel cycle facilities against sabotage and theft of nuclear materials.

### **PURPOSE**

The objective of this audit was to assess the effectiveness of the NRC’s physical security inspection program over the protection and control of special nuclear material at Category I fuel cycle facilities.

## **RESULTS IN BRIEF**

The Office of Nuclear Security and Incident Response fulfills its responsibility to conduct physical security inspections at Category I fuel cycle facilities. However, the inspection program faces the following two challenges:

- Need to provide physical security training for supervisors without previous security experience to enhance management oversight of inspections.
- Inspection guidance has not undergone periodic review to ensure that it aligns with current NRC security guidance and requirements.

## **RECOMMENDATIONS**

This report makes two recommendations to improve the agency's physical security 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 the Office of the Inspector General's (OIG) consideration. On September 1, 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 of the agency's suggestions.

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

## **ABBREVIATIONS AND ACRONYMS**

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NRC	Nuclear Regulatory Commission
NSIR	Office of Nuclear Security and Incident Response
OIG	Office of the Inspector General

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## I. BACKGROUND

### Category I Fuel Cycle Facility Inspections

The Nuclear Regulatory Commission (NRC) oversees security programs at facilities that manufacture fuel for nuclear reactors. These fuel cycle facilities use “special nuclear materials” in the manufacturing process. NRC classifies special nuclear materials and the facilities that possess them in three categories, based upon the materials’ potential for use in nuclear weapons, or “strategic significance. The three categories are:

- Category I: High strategic significance.
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Two fuel cycle facilities in the United States process Category I materials into nuclear fuel for the Federal Government. The U.S. Navy, in particular, uses this fuel in nuclear powered ships and submarines. There were no Category II fuel cycle facilities operating in the United States as of June 2009, and Category III facilities are subject to a different NRC physical security inspection regime than Category I facilities because these materials present less risk to public safety and security. This report focuses on NRC’s oversight of Category I fuel cycle facilities.



Figure 1: Fuel cycle facility personnel processing uranium.

Source: Babcock and Wilcox Nuclear Operations Group

The main objective of NRC's oversight program for Category I fuel cycle facilities is to ensure that these facilities operate safely and securely in accordance with NRC requirements. Since the terrorist attacks of September 11, 2001, NRC has issued new requirements and guidance to licensees to enhance security at Category I fuel cycle facilities against sabotage and theft of nuclear materials. NRC employs resident inspectors at each Category I fuel cycle facility for general day-to-day oversight, while NRC regional physical security inspectors conduct inspections during routine site visits.

### Inspection Process

NRC's physical security inspection program requires three areas to be reviewed annually at each Category I fuel cycle facility.<sup>1</sup> These areas, arranged by inspection procedure groupings called "suites," are (1) Access Controls (2) Alarms and Barriers and (3) Other Security Areas.<sup>2</sup> The three suites are composed of 34 separate inspection procedures, which NRC staff use as guidance for conducting physical security inspections at Category I fuel cycle facilities. Each inspection procedure suite prescribes a specific number of hours to be worked during each annual or triennial inspection cycle. For instance, NRC inspectors plan to spend 40 hours over a 12-month period assessing access controls, while transportation security is allocated 8 hours of inspection work over a 36-month period. Inspections are intended to evaluate security and compliance, identify deficiencies and determine their



Figure 2: Armed security officers safeguard fuel cycle facilities and are trained according to standards specified in Federal Government regulations.

Source: Babcock and Wilcox Nuclear Operations

<sup>1</sup> Category I fuel cycle facilities undergo a triennial transportation security inspection conducted by NRC with the assistance of local law enforcement. In addition, NRC conducts triennial force-on-force inspections at these facilities. This audit did not examine force-on-force inspections at Category I fuel cycle facilities.

<sup>2</sup> This includes inspections of security plans and implementing procedures, and personnel training and qualifications.

significance, assess licensee corrective actions, and document results. NRC reports the results of Category I facility inspections to Congress on an annual basis in accordance with the 2005 Energy Policy Act, and the licensees are given a copy of each inspection report after the inspection has occurred.

### **Program Staffing and Resource Requirements**

The Office of Nuclear Security and Incident Response (NSIR) manages the fuel cycle facility physical security inspection program and is primarily responsible for reviewing and developing inspection guidance. Staff based in NRC's Region II office conduct inspections, with one branch chief supervising two physical security inspectors.<sup>3</sup> Physical security inspections at Category I facilities averaged approximately 1,057 hours of work per calendar year from 2007 to 2009.<sup>4</sup>

## **II. PURPOSE**

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The audit objective was to assess the effectiveness of the physical security inspection program over the protection and control of special nuclear materials at Category I fuel cycle facilities. Appendix A contains information on the audit scope and methodology.

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<sup>3</sup> Triennial force-on-force inspections are managed by headquarters-based NSIR staff.

<sup>4</sup> The average was based on projections for the remainder of FY 2009. Time spent includes inspection preparation and documentation work, in addition to onsite inspection hours.

### **III. FINDINGS**

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NSIR fulfills its responsibility to conduct physical security inspections at Category I fuel cycle facilities. However, the inspection program faces the following two challenges:

- Need to provide physical security training for supervisor without previous security experience to enhance management oversight of inspections, and
- Inspection guidance has not undergone periodic review to ensure that it aligns with current NRC security guidance and requirements.

#### **A. Security Training Would Enhance Management Oversight**

Federal Government internal control guidance recommends that agencies staff positions with qualified personnel and provide appropriate training. NRC branch chiefs play an important role in overseeing inspection activities; however, the branch chiefs responsible for fuel cycle facility physical security inspections are not required to have background experience or undergo training in this area. NRC opens branch chief positions to generalists to increase the pool of potential job candidates, and staff said that branch chiefs can learn through on-the-job training and that branch chiefs rely on inspectors for technical expertise. In addition, NRC seeks candidates who exhibit leadership and supervisory skills, as well as programmatic and regulatory knowledge.

Without providing job-specific training to branch chiefs, NRC faces increased risk that branch chiefs might not be able to fulfill duties such as training new inspectors and reviewing inspection reports.

#### **Branch Chiefs Should Have Working Knowledge of Physical Security**

As a best practice, branch chiefs should have a working knowledge of physical security that enables them to ensure effective performance of their branch. This includes a thorough understanding of security planning, procedures, and equipment, and the employment of security personnel in safeguarding

Category I fuel cycle facilities. Understanding these issues is essential for inspectors as well as their branch chief supervisors to uphold NRC's physical security oversight role.

### **Physical Security Experience and Training Not Required of Branch Chiefs**

Although branch chiefs play an important supervisory role, branch chiefs who oversee physical security inspections at Category I fuel cycle facilities are not required to have security experience as a prerequisite or to undergo physical security training. According to the job description, branch chiefs are responsible for a range of tasks, including assessing employee performance, training new inspectors, reviewing and approving work products, and informing regional and division management of significant issues. In addition, branch chiefs are expected to manage the branch's technical experts, endorse inspection findings, and make recommendations to senior management for dealing with compliance issues and for revising NRC rules, regulations, and procedures. The current branch chief is a qualified reactor inspector and has NRC experience in licensing and incident response but has not worked on or undergone training in physical security at NRC.<sup>5</sup> This branch chief relies on experienced senior staff, including the inspectors he supervises, for technical expertise. Senior staff said this is standard NRC practice, and that branch chiefs are selected primarily for their leadership and management skills, as well as their fluency in NRC's regulatory process.

### **Human Resource Practices Do Not Emphasize Security Experience and Training for Managers**

The lack of security-specific experience and training required for fuel cycle facility security branch chiefs is attributable to NRC hiring and staff development practices. When soliciting vacancy announcements to fill open branch chief positions, NRC does not list experience or expertise in physical security as a prerequisite or recommended skill set. NRC reportedly does this, in part, to increase the number of potential job candidates and to emphasize branch chiefs' primary supervisory responsibilities and duties. Once hired, branch chiefs responsible for fuel cycle facility security

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<sup>5</sup> The current branch chief's predecessor also had extensive experience at NRC, but not in physical security.

are not required to undergo physical security training unlike those at nuclear plants.<sup>6</sup> Senior regional managers told auditors that this situation was not problematic because they rely on branch chiefs mainly for their leadership and management skills. In addition, one manager said the branch chiefs are primarily responsible for supervising and advising staff and, therefore, must be familiar with NRC's regulatory processes.

### **Security Training for Branch Chiefs Would Enhance Management Oversight**

Although OIG found no evidence that the branch chiefs' lack of security related experience and training has compromised security inspections at fuel cycle facilities, this situation presents two potential internal control challenges. First, if branch chiefs rely on the inspectors they oversee for technical expertise, this raises questions about their capacity to evaluate inspector performance and independently review and approve inspection reports. Second, one senior regional manager cited knowledge management as a primary concern, stating that loss of the senior physical security inspector assigned to fuel cycle facilities would pose a significant problem. Third, branch chiefs cannot reasonably be expected to train and advise physical security inspectors without possessing some degree of job-specific skills and knowledge. Staff told auditors that that branch chiefs can develop security expertise through on-the-job training. However, personnel turnover trends militate against this; five individuals have held the branch chief position over the past 7 years,<sup>7</sup> and none of these individuals has served more than 22 months in the position.

### **Recommendation**

OIG recommends that the Executive Director for Operations:

1. Provide appropriate security training for non-security personnel who have management responsibilities for physical security inspections at fuel cycle facilities.

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<sup>6</sup> Branch chiefs responsible for security oversight at nuclear power plants are required to take courses in physical security. NRC adopted this policy in response to an OIG audit recommendation that NRC develop and provide a security training program for non-security personnel with security oversight responsibilities. See OIG-06-A-21, *Audit of NRC's Baseline Security and Safeguards Inspection Program*.

<sup>7</sup> From July 2002 to July 2009.

## **B. NRC Has Not Conducted Timely Reviews of Inspection Guidance**

NRC guidance requires staff to review inspection policies and procedures at least once every 3 years and to revise them as necessary. However, guidance for fuel cycle facility security inspections has not undergone routine review and has not been revised to ensure that it is up to date. Inspection guidance reviews and revisions have not occurred because NRC has not dedicated resources for this work and the agency has reportedly deferred some guidance revision pending an ongoing security rulemaking. As a consequence, NRC lacks assurance that physical security inspections are conducted in accordance with current regulations and requirements, which has the potential to compromise the agency's oversight function.

### **Inspection Guidance Should Undergo Periodic Review**

NRC guidance advises staff to review inspection policies and procedures at least once every 3 years and to revise them as necessary. NSIR is the program office that manages security inspections at fuel cycle facilities and has primary responsibility for updating inspection guidance. Regional offices are to provide technical experts to help review and revise the guidance.

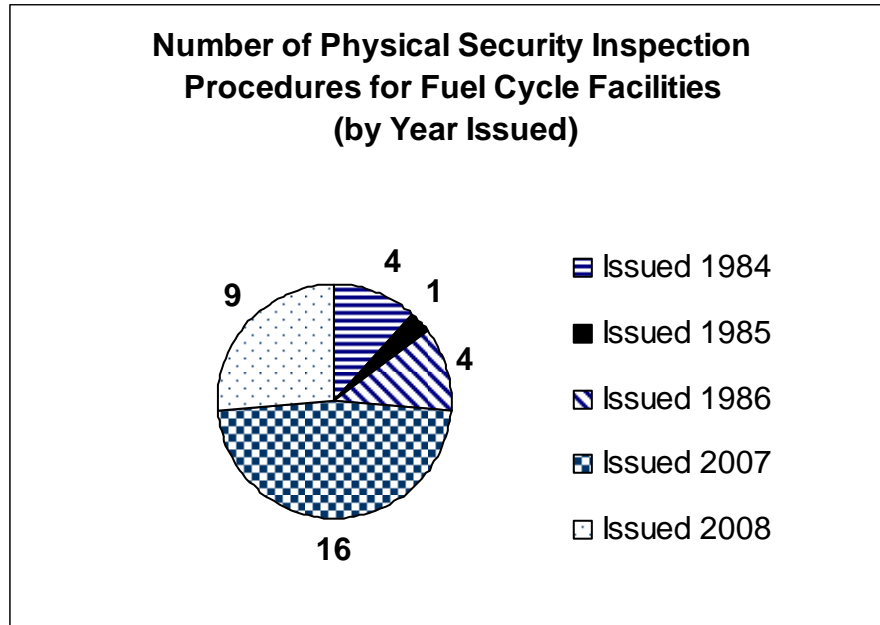
### **Inspection Guidance Not Routinely Reviewed and Updated**

Guidance for fuel cycle facility physical security inspections has not undergone routine review and has not been revised to ensure that the guidance is up to date. Physical security inspectors and headquarters-based NSIR staff said there have been some efforts to revise inspection guidance, but acknowledged that this has not occurred in a systematic way. For example, 9 of 34 of the applicable inspection procedures were issued before 1987 and have not been updated.

Moreover, staff recommended that reviews should address content gaps and overlaps among some inspection manual chapters and inspection procedures applicable to the program. Figure 1 shows the number of applicable inspection procedures by year of issuance.



**Figure 1:** Physical Security Inspection Procedures Issued from 1984 to 2008.



### Resource Constraints Hinder Guidance Review

NRC's efforts to review and update inspection guidance have been limited by resource constraints. Regional inspectors have reviewed some guidance as a collateral duty, but have little time to devote to this work apart from their inspection responsibilities. NRC has reportedly not committed more personnel to inspection guidance revision because of a pending rulemaking that could have a major impact on fuel cycle facility oversight. However, NSIR planned to commit one staff member to conduct a guidance review at the Region II office during summer 2009.<sup>8</sup>

### No Assurance That Inspection Guidance Reflects Current NRC Standards

Without updating and revising physical security inspection guidance for Category I fuel cycle facilities, NRC lacks assurance that its inspections are conducted in accordance with current regulations

<sup>8</sup> According to NSIR staff, nearly all fuel cycle facility security inspection procedures have been updated as of September 1, 2009, and are undergoing administrative review prior to issuance. In addition, NRC has undertaken a broad-reaching revision of the Fuel Cycle Oversight Process, which will require a future update of security inspection guidance.

and requirements. NRC has issued new guidance and security orders to licensees since the terrorist attacks of September 11, 2001, to reflect changing security conditions. Relying on outdated inspection guidance for agency staff creates the potential that physical security inspectors might overlook deficiencies in licensees' security programs or licensees' failure to comply with current NRC regulations and requirements, thereby compromising the agency's oversight function.

**Recommendation**

OIG recommends that the Executive Director for Operations:

2. Review physical security inspection guidance periodically, and revise as necessary with an emphasis on currency and consistency.

## **IV. AGENCY COMMENTS**

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At an August 26, 2009, exit conference, agency senior executives agreed to provide suggested revisions to the discussion draft report for the Office of the Inspector General's (OIG) consideration. On September 1, 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 of the agency's suggestions.

On September 25, 2009, the Executive Director for Operations provided a formal response to this report (see 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 in Appendix C.

## **V. CONSOLIDATED LIST OF RECOMMENDATIONS**

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OIG recommends that the Executive Director for Operations:

1. Provide appropriate security training for non-security personnel who have management responsibilities for physical security inspections at fuel cycle facilities.
2. Review physical security inspection guidance periodically, and revise as necessary with an emphasis on currency and consistency.

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## **SCOPE AND METHODOLOGY**

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The audit objective was to assess the effectiveness of NRC's physical security inspection program over the protection and control of special nuclear material at Category I fuel cycle facilities.

Auditors reviewed and analyzed pertinent laws, regulations, authoritative guidance, NRC policies and procedures, and prior relevant NRC OIG reports. Guidance reviewed included the following:

- GAO Standards for Internal Control in the Federal Government.
- Inspection Manual Chapter 2600.
- Inspection Manual Chapter 2681.

OIG interviewed headquarters NSIR staff and conducted interviews at Region II, both in person and over the telephone to gain an understanding about the qualifications of the inspectors and management staff over physical security inspections.

OIG observed physical security inspections at two Category I fuel cycle facilities: Nuclear Fuel Services, in Erwin, TN, and B&W Nuclear Operations Group in Lynchburg, VA. OIG interviewed both security inspectors as part of the observations.

OIG conducted this audit between January 2009 and August 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 objective. 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; Paul Rades, Audit Manager; Rob Woodward, Senior Auditor; and James McGaughey, Senior Analyst.

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## 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 *R.W. Borchardt*  
Executive Director for Operations

SUBJECT: RESPONSE TO AUDIT OF NRC'S SPECIAL NUCLEAR  
MATERIALS PHYSICAL SECURITY INSPECTION PROGRAM  
FOR FUEL CYCLE FACILITIES

The report regarding NRC's Special Nuclear Materials Physical Security Inspection Program for 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 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 based on their understanding of NRC's regulatory mission, functions, and processes, as well as continually developing leadership skills.

The report states that, "As a best practice, branch chiefs should have a working knowledge of physical security that enables them to ensure effective performance of their branch" and recommends that the EDO "provide appropriate security training for non-security personnel who have management responsibilities for physical security 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 a 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



S. Dingbaum

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filling supervisory positions, managers are responsible for identifying needed skills, technical 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.

## **OIG RESPONSE TO FORMAL AGENCY COMMENTS**

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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 to enter a field having no prior professional experience or formal training in that field.