

# AUDIT REPORT

**Audit of NRC's Safety Training and Development for Technical Staff**

**OIG 13-A-14 March 14, 2013**



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

**OFFICE OF THE  
INSPECTOR GENERAL**

March 14, 2013

**MEMORANDUM TO:** R. William Borchardt  
Executive Director for Operations

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

**SUBJECT:** AUDIT OF NRC'S SAFETY TRAINING AND  
DEVELOPMENT FOR TECHNICAL STAFF  
(OIG-13-A-14)

Attached is the Office of the Inspector General's (OIG) audit report titled *Audit of NRC's Safety Training and Development for Technical Staff*.

The report presents the results of the subject audit. Agency comments provided at the March 4, 2013, 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 Sherri Miotla, Team Leader, Nuclear Materials and Waste Safety Team, at 415-5914.

Attachment: As stated

## EXECUTIVE SUMMARY

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### BACKGROUND

The Nuclear Regulatory Commission (NRC) licenses individuals and organizations to use radioactive materials and strives to ensure that licensees perform at acceptable safety levels. NRC's workforce is responsible for overseeing licensee performance and needs to be properly trained to carry out this important safety function. NRC provides safety training for its workforce through the Training and Development organization, within the Office of the Chief Human Capital Officer (Human Capital Office).

### Systems Approach to Safety Training

NRC's *Training and Development Strategic Plan* states that the agency conducts training programs in accordance with the five elements of the systems approach to training (Analysis, Design, Development, Implementation, and Evaluation). The systems approach model, known as ADDIE, is commonly used by many training organizations. The ADDIE model describes a structured methodology to help ensure that training investments achieve desired performance outcomes. Well-designed training and development programs are linked to goals and to the skills and competencies needed for effective job performance. Identifying training program needs is the first step to planning and implementing an effective training program.

### Training Needs Assessments

The Office of Personnel Management provides direction and guidance on identifying training needs through training assessments. A training needs assessment is the process of identifying the "gap" between performance required and current performance. An *Occupational Training Needs Assessment* examines the skills, knowledge, and abilities required for affected occupational groups. Occupational assessments identify how and which occupational gaps exist. The assessment also examines new ways to perform work that can eliminate the gaps.

## **OBJECTIVE**

The audit objective was to determine if NRC's process for identifying safety training needs efficiently and effectively prepares staff to perform oversight activities to assure protection of public health and safety and the environment.

## **RESULTS IN BRIEF**

### **Occupational Training Needs Assessments Rarely Conducted**

NRC rarely conducts occupational training needs assessments for staff positions responsible for performing safety oversight activities, and the existing needs assessments are not formally reviewed on a defined basis. Federal regulations require occupational training needs assessments; however, the agency does not have defined procedures identifying when and how to perform new or review existing occupational training needs assessments. Therefore, NRC is not able to fully assure that its overall training process efficiently and effectively prepares staff to perform safety oversight activities.

## **RECOMMENDATIONS**

This report makes two recommendations to improve the efficiency and effectiveness of the agency's safety related training.

## **AGENCY COMMENTS**

An exit conference was held with the agency on March 4, 2013. At this meeting, agency management provided supplemental information that has been incorporated into this report as appropriate. As a result, agency management stated their general agreement with the finding and recommendations in this report and opted not to provide formal comments for inclusion in this report.

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## I. BACKGROUND

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The Nuclear Regulatory Commission's (NRC) primary mission is to license and regulate the use of radioactive materials for civilian purposes to ensure adequate protection of public health and safety and the environment. NRC licenses individuals and organizations to use radioactive materials and strives to ensure that licensees perform at acceptable safety levels. NRC's workforce is responsible for overseeing licensee performance and needs to be properly trained to carry out this important safety function.

### Safety Training at NRC

NRC provides safety training<sup>1</sup> for its workforce through the Training and Development organization, within the Office of the Chief Human Capital Officer (Human Capital Office). Training and Development staff also manage the Technical Training Center in Chattanooga, Tennessee, and the Professional Development Center at NRC headquarters in suburban Maryland, just outside of Washington, DC.<sup>2</sup> NRC staff attend safety training at these locations. Staff also attend safety training at locations other than NRC depending on the availability and the determined need for the training courses offered at other venues.

### Systems Approach to Safety Training

NRC's *Training and Development Strategic Plan* states that the agency conducts training programs in accordance with the five elements of the systems approach to training. The systems approach model, known as ADDIE, is commonly used by many training organizations. The ADDIE model describes a structured methodology to help ensure that training

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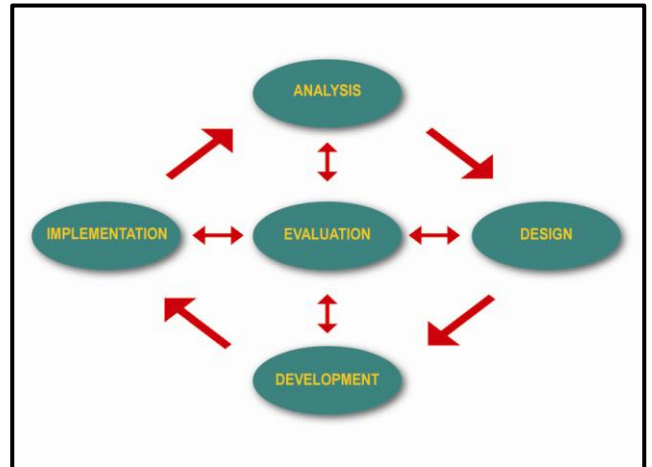
<sup>1</sup> For this audit, OIG has defined safety training as training that prepares NRC staff to ensure the adequate protection of public health and safety and the environment in accordance with NRC regulations.

<sup>2</sup> Staff at the Technical Training Center manage technical training to meet needs defined by formal qualification and training programs. Staff at the Professional Development Center typically manage professional training in such areas as communications, computer applications, equal employment opportunity, management, supervision, acquisition, and financial management.

investments achieve desired performance outcomes. The model's five elements are as follows:

- (1) **Analyzing** skill or competency gaps to identify learning objectives and performance outcomes.
- (2) **Designing** the training to cover the learning objectives to achieve the performance outcomes.
- (3) **Developing** the training modules and materials.
- (4) **Implementing** the course or program.
- (5) **Evaluating** the training to ensure that it is both effective and efficient and achieves the desired results.

Figure 1: **ADDIE model**



Source: OIG generated

Well-designed training and development programs are linked to goals and to the skills and competencies needed for effective job performance.

Identifying training program needs is the first step to planning and implementing an effective training program. A properly executed "Analysis" element of the ADDIE model identifies training needs and facilitates a smooth transition through the remaining elements.

### Training Needs Assessments

The Office of Personnel Management (OPM) provides Federal agencies with guidance and tools that assist agencies in achieving their strategic goals and creating a highly trained workforce. OPM provides direction and guidance on identifying training needs through training assessments. Training needs assessments identify performance requirements and the

knowledge, skills, and abilities needed by an agency's workforce to achieve the requirements. A training needs assessment is the process of identifying the "gap" between performance required and current performance. When a difference exists, the assessment explores the causes and reasons for the gap and methods for closing or eliminating the gap.

OPM identifies three levels of training needs assessments (Organizational, Individual, and Occupational).

- An *Organizational Assessment* evaluates the level of organizational performance. An assessment of this type will determine what skills, knowledge, and abilities an agency needs. It determines what is required to alleviate the problems and weaknesses of the agency as well as to enhance strengths and competencies.
- An *Individual Assessment* analyzes how well an individual employee is performing a job and determines the individual's capacity to do new or different work. An individual assessment provides information on which employees need training and what kind.
- An *Occupational Training Needs Assessment* examines the skills, knowledge, and abilities required for affected occupational groups. Occupational assessments identify how and which occupational gaps exist. The assessment also examines new ways to perform work that can eliminate the gaps.

Occupational training needs assessments occur during the "Analysis" element of the ADDIE model.



## II. OBJECTIVE

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The audit objective was to determine if NRC's process for identifying safety training needs efficiently and effectively prepares staff to perform oversight activities to assure protection of public health and safety and the environment.<sup>3</sup>

## III. FINDING

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NRC has made efforts to prepare its workforce to perform oversight activities to assure protection of public health and safety and the environment. However, NRC can provide safety training to staff in a more efficient and effective way by conducting occupational training needs assessments on a defined basis.

NRC rarely conducts occupational training needs assessments for staff positions responsible for performing safety oversight activities, and the existing needs assessments are not formally reviewed on a defined basis. Federal regulations require occupational training needs assessments; however, the agency does not have defined procedures identifying when and how to perform new or review existing occupational training needs assessments. Therefore, NRC is not able to fully assure that its overall training process efficiently and effectively prepares staff to perform safety oversight activities.

### **Federal Regulation and Standards**

Federal agencies have the primary responsibility for establishing, operating, maintaining, and evaluating their training programs in support of achieving their missions and goals. OPM specifies that agency employee developmental plans and programs should be designed to build or support an agency workforce capable of achieving agency mission and

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<sup>3</sup> The original objective for the audit, as noted in OIG's fiscal year 2012 *Annual Plan*, was to determine if NRC's overall training process adequately and efficiently prepares staff to perform oversight activities to assure protection of public health and safety and the environment. This objective was revised during audit fieldwork to focus on the implementation of the "Analysis" element of the ADDIE model.

performance goals and facilitating continuous improvement of employee and organizational performance.

### Federal Regulation

Federal regulation<sup>4</sup> requires agencies to develop and maintain plans and programs that:

- Identify mission-critical occupations and competencies.
- Identify workforce competency gaps.
- Include strategies for closing competency gaps.

The regulation also requires that agencies plan, program, and evaluate training for both short- and long-range program needs by occupations, organizations, or other appropriate groups.

### Federal Standards

The Government Accountability Office's *Standards for Internal Control in the Federal Government*<sup>5</sup> state that management should ensure 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. Additionally, the standards state that management needs to identify appropriate knowledge and skills needed for various jobs and provide the needed training.

## **Occupational Training Needs Assessments Rarely Conducted**

NRC rarely conducts new or reviews existing occupational training needs assessments on a defined basis for staff positions responsible for performing safety oversight activities. Human Capital Office management asserts that NRC program offices conduct some form of training needs assessments for mission-critical positions; however, NRC management

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<sup>4</sup> Title 5, Code of Federal Regulations, Part 410, *Training*.

<sup>5</sup> GAO/AIMD-00-21.3.1, November 1999.

and staff were able to provide documentation supporting only two assessments.

### Occupational Needs Assessments at NRC

NRC management and staff provided two occupational training needs assessments in response to Office of the Inspector General (OIG) requests. One of the assessments, an update to an earlier assessment, focused on the Reactor Oversight Process.<sup>6</sup> NRC's implementation of the revised Reactor Oversight Process significantly changed the jobs of the site-based and regional office-based reactor inspectors. A variety of tasks were eliminated while other tasks remained but were modified. In early 2000, a contractor<sup>7</sup> updated the inspector task lists from the existing needs assessment. The updated lists reflected changes to those positions resulting from implementation of the Reactor Oversight Process. This reactor inspector occupational needs assessment was completed in 2001 and has not been formally reviewed since. Completed in 2006, the other needs assessment provided to OIG auditors was for a supervisory curriculum course design (not specifically for safety related training).

Figure 2: **Indian Point Nuclear Power Plant, Buchanan, New York**



Source: NRC

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<sup>6</sup> NRC's Reactor Oversight Process is the agency's program to inspect, measure, and assess the safety and security performance of commercial nuclear power plants and to respond to any decline in performance.

<sup>7</sup> Los Alamos National Laboratory.

NRC has not conducted occupational training needs assessments for staff positions responsible for performing safety oversight activities of nuclear materials. Multiple agency offices have responsibility for a diverse array of regulated activities.<sup>8</sup> A senior manager stated that office staff do not conduct needs assessments because staff are already aware of the knowledge gaps in the program area. The manager added that staff intuitively identify training needs.

### How NRC Staff Identify Training Needs

Instead of performing required occupational training needs assessments, Human Capital Office managers identify training needs through dialogue with NRC program office management and staff. The Human Capital Office responds to training requests from program offices, rather than systematically performing training needs assessments to identify the gaps between required and current performance. Training and Development staff and program office technical staff typically identify training needs through dialogue with each other. Management also believes that this informal dialogue is more efficient given the size of NRC. Human Capital Office management confirmed that, typically, these discussions are not formally documented.

### The Importance of Staff Receiving the Appropriate Training

A properly trained workforce is essential for the oversight of licensee safety performance. On the most recent 2012 OIG Safety Culture and Climate Survey<sup>9</sup> results, NRC's workforce gave high marks on training for preparing staff to do their jobs. Additionally, there was high agreement that staff have sufficient opportunities to receive training to improve the skills needed for their current jobs. However, a senior NRC manager noted that, if asked, most staff



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<sup>8</sup> NRC regulates nuclear materials used for medical, industrial, and academic uses. NRC also regulates source material facilities, uranium recovery facilities, and fuel cycle facilities.

<sup>9</sup> Since 1998, OIG has worked with a contractor to conduct a survey approximately every 3 years of NRC's workforce to (1) measure the NRC's safety culture and climate, (2) compare results to previous surveys of NRC employees, and (3) compare results to U.S. Government and national benchmarks.

would agree that more training is better. The manager cautioned that receiving more training is not always the answer, adding that NRC must determine whether employees receive the appropriate training needed to perform their jobs. The manager continued that opportunity costs exist with all training. The manager explained that while away at training courses, employees' work is either transferred to another employee or delayed.

Human Capital Office staff confirmed the manager's view on the importance of staff receiving the appropriate training by providing an example of the problems encountered with a recently developed civil engineering codes course. The intent of the course was to reinforce the necessary understanding of general codes and standards commonly used during civil/structural construction activities to new construction inspectors. However, students gave the course mixed reviews – more negative than positive. When the course was first developed, the Human Capital Office confirmed that quite a bit of unnecessary information was included. Staff met with the program office and revised the course, removing items not related to civil engineering codes for new reactor construction from the curriculum. A Human Capital Office manager stated that a formal occupational training needs assessment would have probably helped prevent the problems with the course. The manager added that there are always concerns that something is being left out of the training and the tendency is to put more information in than is needed. The revised course is now presented over 1 week rather than 2 weeks.

### Technological Advances

As technology advances, NRC must be able to keep pace. Rapidly advancing nuclear technologies affect how NRC regulates licensees. Laser enrichment, digital instrumentation and controls, and mixed oxide fuel<sup>10</sup> fabrication are examples of new and evolving technologies that NRC is responsible for regulating. In these cases, NRC must ensure that staff who review and inspect licensees using new technologies are fully prepared to perform their duties. Occupational needs assessments, rather than dialogue, are an essential tool when determining occupational training needs for advancing technologies.

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<sup>10</sup> Mixed oxide fuel is a blend of uranium and plutonium oxides.

## Procedures

Existing operating procedures do not identify when and how to perform new or review existing occupational training needs assessments. For example, a Human Capital Office procedure<sup>11</sup> states that training courses at NRC are developed and maintained using a systems approach to training. However, this procedure begins at the point where a training need has already been identified and does not mention any form of occupational training needs assessment as a means to identify training needs, knowledge, skills, abilities, and gaps.

During the course of this audit, Human Capital Office management approved a new procedure<sup>12</sup> that describes a systematic approach to training and cites ADDIE as the process to use. The procedure identifies skills, knowledge, and abilities, but does not explain how the analysis is to be conducted to identify the skills, knowledge, and abilities and identify gaps.

The procedure also does not establish a standard to which the analysis must be done.

## Opportunities Missed for Efficient and Effective Training

NRC may not be fully aware of gaps between required performance and current performance for staff that perform safety oversight activities. By not conducting occupational training needs assessments, NRC risks not identifying gaps in knowledge, skills, and abilities. Inefficient and ineffective training can be the result of not successfully identifying these gaps.

NRC is currently in a flat budget environment that is likely to continue. As a result, NRC will be challenged to use its training budget efficiently and effectively. In fiscal year 2012, NRC used approximately \$15.2 million and

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<sup>11</sup> Human Resources Training and Development Operating Procedure No. 0406, *Training Program Development Process*, dated September 9, 2009.

<sup>12</sup> Human Resources Training and Development Operating Procedure No. 0406a, Revision 0, *Systematic Training Program Development Process*, dated September 28, 2012.

50 full-time equivalent staff to administer training. Without a structured methodology that includes identification of training needs before programs are developed, there is the potential for resources to be wasted on the wrong training – be it too much or not enough. Additionally, while dialoguing is a way to identify training needs, it should not take the place of conducting a training needs assessment. By not documenting training discussions, knowledge and experience may be lost because no history or timeline exists.

### **Recommendations**

OIG recommends that the Executive Director for Operations:

1. Develop and implement procedures to identify when and how to perform occupational training needs assessments for safety related positions.
2. Develop and implement procedures to formally review existing occupational training needs assessments for safety related positions on a defined basis.

### **Summary/Conclusion**

Identifying competencies, skills, knowledge, abilities, and gaps in training needs in a holistic manner provides a basis for delivering a more efficient, comprehensive, and effective training program. As the agency identifies competency gaps through occupational needs assessments, it can revise and update training to provide the needed competencies. This audit focused on the implementation of the “Analysis” element of the ADDIE model. The Analysis element is only the first step of a structured methodology to ensure that training investments achieve desired performance outcomes. The agency must remain committed to conducting training programs in accordance with all five elements of the systems approach to training. The report’s recommendations specifically focus on safety training for technical staff. However, OIG contends that implementing the recommendations for all training at NRC could increase the efficiency and effectiveness of NRC’s overall training program.

## **IV. AGENCY COMMENTS**

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An exit conference was held with the agency on March 4, 2013. At this meeting, agency management provided supplemental information that has been incorporated into this report as appropriate. As a result, agency management stated their general agreement with the finding and recommendations in this report and opted not to provide formal comments for inclusion in this report.



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## OBJECTIVE, SCOPE, AND METHODOLOGY

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### OBJECTIVE

The audit objective was to determine if NRC's process for identifying safety training needs efficiently and effectively prepares staff to perform oversight activities to assure protection of public health and safety and the environment.

### SCOPE

This audit focused on how NRC identifies training needs. Specifically, the audit concentrated on NRC's implementation of the "Analysis" element of the ADDIE model which is used to identify training needs. We conducted this performance audit at NRC headquarters (Rockville, Maryland) from August 2012 through December 2012. Internal controls related to the audit objectives were reviewed and analyzed. Throughout the audit, auditors were aware of the possibility or existence of fraud, waste, or misuse in the program.

### METHODOLOGY

The audit team reviewed relevant criteria, including Executive Order 11348, *Providing for the further training of Government employees*; Code of Federal Regulations, Title 5, Part 410, *Training*; and OPM training requirements for Federal agencies. The team reviewed *NRC's Strategic Human Capital Plan Fiscal Year 2010-2014*, planning documents, OIG and Government Accountability Office reports, NRC office Operating Procedures, and NRC Inspection Manual Chapters. Staff reviewed best practices for identifying training needs.

At NRC headquarters, auditors interviewed staff and management (including Technical Training Center management) to gain an understanding of their roles and responsibilities related to identifying safety training at NRC. Additionally, OIG interviewed program office directors with safety oversight responsibilities and each of the four Regional Administrators.

We conducted this performance audit 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 audit work was conducted by Sherri Miotla, Team Leader; Robert Woodward, Audit Manager; Levar Cole, Audit Manager; Maxinne Lorette, Senior Auditor; and Kevin Nietmann, Senior Technical Advisor.