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AUDIT REPORT



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THE SRA PROGRAM
COULD PROVIDE MORE BENEFITS

OIG/99A-03 May 26, 1999

AUDIT REPORT



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REPORT SYNOPSIS

The Nuclear Regulatory Commission (NRC) is shifting to a risk-informed, performance-based regulatory approach. One important aspect of this transition is the Senior Reactor Analyst (SRA) program which is comprised of a core of individuals in headquarters and regional offices that NRC has dedicated to performing risk-informed related activities. SRAs contribute to NRC's mission by analyzing events and providing risk assessments in important areas such as enforcement and inspection. SRAs add value to agency operations by providing NRC staff with better risk insights. The Office of the Inspector General found that NRC can further enhance the SRA program to attain more benefits by revisiting SRA program objectives. NRC should ensure the objectives are properly integrated into the agency's regulatory approaches and provide greater headquarters focus so that the best SRA practices are identified and used consistently.

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INTRODUCTION

Since the early 1980s, the Nuclear Regulatory Commission (NRC) has considered approaches to introduce risk-informed, performance-based philosophies to its regulatory decision-making processes. A risk-informed approach represents a philosophy whereby risk insights are considered, together with other factors, to better focus NRC and licensee attention on issues commensurate with their importance to public health and safety. A performance-based regulatory approach establishes performance and results as the primary basis for decision-making. In the broadest sense, the outcome of a performance-based approach to regulatory oversight will be to focus more attention and NRC resources on those licensees whose performance is declining or less than satisfactory.

One initiative to introduce risk-informed approaches is NRC's effort to train Senior Reactor Analysts (SRAs) in the use of probabilistic risk assessment (PRA).⁽¹⁾ The SRA program is comprised of a core of individuals that the NRC has dedicated to performing risk-informed activities. The objective of our review was to determine whether SRAs could be more effective in providing NRC staff with better insights on safety and risk issues. See Appendix I for more details on our objective, scope, and methodology.

BACKGROUND

In July 1994, NRC staff informed the Commission⁽²⁾ of a proposed training program for SRAs. The proposal suggested that the SRA position would be a possible career path for Senior Resident Inspectors and a way to implement PRA methodology in inspection activities.

SRAs are expected to complete a 12 to 18 month qualification program incorporating PRA training and rotational details. In addition, each SRA is required to become qualified in both boiling water reactor and pressurized water reactor technology, and to maintain the qualifications through participation in refresher training. SRAs are required to complete two rotational details, ranging from 4 to 6 months, to obtain experience in the application of PRA techniques and familiarize themselves with individual plant examinations. NRC certified the first SRAs in the summer of 1997.

¹ PRA is an analytical process that estimates the potential risk to public health and safety of different plant operating conditions using the operational and maintenance practices of a plant.

² SECY-94-181, dated July 8, 1994, "Implementation of Changes to the Resident Inspector Program Resulting from a Staff Study of the Program."

Currently there are eight certified SRAs and two SRAs-in-training who are expected to be certified by June 1999. Two SRAs are assigned to each regional office and two assigned to headquarters. Regional office SRAs are an important resource in implementing risk-informed, performance-based regulations because they are among the most knowledgeable of regional office staff with expertise in risk analysis. They are responsible for conducting risk evaluations of nuclear power plant events and determining the impact of plant operations on safety risk. SRAs are also active in areas such as reviewing NRC inspection reports to determine weaknesses in licensee performance as related to risk significance, determining whether plant safety systems perform as designed, and providing risk insights to regional office staff regarding proposed escalated enforcement actions. Regional office SRAs are assigned to the Division of Reactor Safety.

The two SRAs in headquarters work in different branches of the Office of Nuclear Reactor Regulation (NRR) and provide support to SRAs in the regions. For example, headquarter's SRAs may: work with other PRA experts in NRR to develop risk information; act as facilitators on technical issues during bi-weekly conference calls; provide information about the program on the SRA Internet home page; and, when requested, offer insights to enforcement actions proposed by regional office staff. The cost of the SRA program in fiscal year 1998 was approximately \$900,000.

The Office of the Inspector General (OIG) recognizes the importance of NRC's risk-informed initiatives and has made several suggestions to enhance their implementation. For example, in October 1996, OIG issued a Special Evaluation Report⁽³⁾ that concluded the agency needed to define what a performance-based system is, and how it will affect the citing of violations and use of enforcement actions. To do this, OIG suggested that NRC develop a comprehensive, integrated strategy for how its risk-informed, performance-based efforts will be accomplished. The report also suggested that this strategy should include a means for measuring progress towards meeting the objectives of that strategy.

In addition, the U.S. General Accounting Office (GAO) has reviewed NRC's risk-informed initiatives and recently testified before a Senate Subcommittee⁽⁴⁾ on the need for NRC to develop a risk-informed safety approach. In the past, GAO identified several improvements needed for NRC to move toward a risk-informed regulatory approach, such as a comprehensive strategic plan with objectives, time

³ "Better Definition and Planning Needed to Guide NRC's Transition to a Risk-Informed, Performance-Based Regulatory System," OIG/96E-18, dated October 4, 1996.

⁴ February 4, 1999, GAO testimony before the Senate Subcommittee on Clean Air, Wetlands, Private Property, and Nuclear Safety, GAO/T-RCED-99-71.

lines, and performance measures. GAO also expressed concern that NRC's assessment and enforcement processes are not consistently applied across the industry. GAO found this was due to the lack of specific enforcement criteria, the subjective nature of NRC's enforcement process, and confusion among some NRC managers about their role in the plant assessment process. NRC and industry representatives are currently working to revise regulatory programs to address these concerns.

The Commission recently released a "White Paper"⁽⁵⁾ which defined the terms and expectations for risk-informed, performance-based regulation. This paper and the SRA program are important elements that NRC is using to implement risk-informed, performance-based initiatives.

FINDINGS

OIG found that SRAs have provided beneficial risk insights to the agency. For example, SRAs provide valuable insight in planning inspections, analyzing the safety significance of plant events, and assessing the safety significance of violations during enforcement panels. In addition, during major plant operations, such as refueling outages, SRAs are available to help NRC staff focus attention on the areas of most risk significance.

However, SRAs could provide more benefit to the agency. To do so, NRC needs to revisit the SRA program objectives to ensure they are properly integrated into the agency's regulatory approaches, and provide a greater headquarters focus to identify best practices and ensure regional office SRAs use them consistently.

NRC NEEDS TO REVISIT SRA PROGRAM OBJECTIVES

NRC staff told us that when the SRA program was established, its objectives were to create a career path for growth beyond the Senior Reactor Inspector position, and provide risk insights to NRC staff through better risk-informed training. Agency staff told us they anticipated this training would help instill better risk insights throughout the agency. The staff also stated that although the program objectives are not described in one document, they can be derived by reviewing various documents, such as the SRA position description, regional office guidance that addresses SRAs and risk insight use, and the NRC Inspection Manual.

⁵ Staff Requirements Memorandum dated February 24, 1999, SECY-98-144, "White Paper on Risk-Informed and Performance-Based Regulation."

According to NRC officials, the SRA program is still evolving and its role is reflective of the agency's move toward developing new risk-informed perspectives. As a result, SRAs help identify new ways to provide risk insights, as well as new areas for SRA involvement. SRAs currently provide support to other NRC programs, such as conducting reviews of NRC inspection reports or licensee event reports for the inspection program, or providing risk assessments of regulatory violations to assist in establishing severity levels for the enforcement program. SRAs are also available to support other functions to meet the risk information needs of agency staff.

In response to the requirements of the Government Performance and Results Act of 1993 and other changes in the external environment, NRC launched several initiatives to improve the agency's effectiveness and efficiency. As part of this effort, NRC contracted with the Arthur Andersen company in July 1998 to (1) provide a high-level assessment of NRC's current processes for planning, budgeting, conducting program assessments, and monitoring and measuring performance, and (2) assist with implementing a top-down assessment of NRC's programs and activities, with the objective of increasing organizational effectiveness and efficiency. In March 1999, Arthur Andersen reported that NRC programs "are not effectively integrated across offices or programs." We believe this conclusion is applicable to the SRA program.

The SRA program is maturing and an important element in helping the agency move forward in implementing more risk-informed, performance-based regulatory approaches. Therefore, we believe that now is an appropriate time for NRC to revisit the objectives of the SRA program to ensure they are properly integrated into NRC's new regulatory approaches. By taking this action, the SRA program should provide even more benefit to the agency.

GUIDANCE NEEDED TO FOCUS SRA ACTIVITIES

While SRAs are providing regional staff with risk insights in various important areas such as enforcement and inspection, guidance is needed in directing SRA activities and ensuring they use best practices consistently. Currently, the regional SRAs are functioning in a decentralized mode and, as a result, there is a potential for the best practices between regions to go unnoticed.

The delegation of SRA program management to Regional Administrators has resulted in a variety of approaches that SRAs use to provide risk insights. For example, OIG found that SRAs in one regional office are installing the simplified plant analysis of risk (SPAR) model on resident inspectors' computers to help the inspectors develop and analyze risk information pertaining to their plants. However, staff in other regional offices told us they do not favor using computer models for this

purpose. This is because resident inspectors generally are not aware of the model limitations and do not have the technical skills and knowledge to use them effectively. Instead of using the SPAR model, SRAs in some regions prefer to use computer models developed by licensees for each plant.

We also found that regional offices rely on SRAs for a variety of uses. For example, staff in one regional office told us that SRAs spend about one-third of their time conducting inspections, whereas SRAs in other regions seldom conduct inspections. Staff voiced varied opinions regarding the use of SRAs to conduct inspections. Some SRAs stated that they believe it is beneficial to be closely involved in the inspection process because it helps sharpen their inspection skills and assists in establishing a close relationship between resident inspectors and licensees. In contrast, other NRC staff believe SRAs should review the inspection report executive summaries and findings, and provide risk insight assessments.

CONCLUSIONS

SRAs have provided beneficial insights as NRC moves ahead with risk-informed, performance-based regulatory approaches. However, OIG found the program may not be achieving its full potential for several important reasons. Since NRC and SRA staff are moving forward in developing and applying risk-informed, performance-based perspectives, OIG believes now is the appropriate time for the agency to revisit the objectives of the SRA program to ensure it is properly integrated into NRR's implementation of these regulatory approaches. In addition, headquarters managers need to provide better focus and guidance to ensure SRAs employ best practices consistently. With refined program objectives and focused guidance, OIG believes SRAs can provide even greater benefits and insight into NRC's new regulatory initiatives.

RECOMMENDATIONS

To guide in greater implementation of risk-informed approaches and take full advantage of SRAs, we recommend that the Executive Director for Operations:

- (1) Revisit the goals and objectives for the SRA program to ensure they are properly updated and integrated into NRR's implementation of risk-informed, performance-based regulatory approaches.
- (2) Provide better program focus and guidance to ensure that the best SRA practices are identified and used consistently.

OIG COMMENTS ON AGENCY RESPONSE

On May 17, 1999, the Deputy Executive Director for Regulatory Programs stated that he agrees with the findings and recommendations of this report. He also noted that although the term "program" has sometimes been used when describing the activities of SRAs, more precisely the SRAs are simply one of many specialists whose function is to help implement effective reactor inspection, assessment, and enforcement programs. He recommended that the use of the term "SRA program" reflect either SRA positions or SRA activities, as appropriate. His comments are contained in Appendix II. We have incorporated editorial changes in our final report where appropriate.

Given the important role that Senior Reactor Analysts play in providing risk insights and participating in risk-informed, performance-based regulatory activities, we plan to closely monitor the agency's progress in implementing our recommendations.

OBJECTIVE, SCOPE, AND METHODOLOGY

The objective of this audit was to determine if Senior Reactor Analysts (SRAs) could be more effective in providing the Nuclear Regulatory Commission (NRC) staff with better insights on safety and risk issues.

To accomplish our objective we interviewed NRC staff, managers and SRAs at headquarters and in the regional offices. To gain further perspectives, we interviewed NRC staff at two nuclear power plants in Region I. We also reviewed NRC's management controls and various program planning documents, including background information, current regional office guidance, and examples of SRA risk analyses.

This audit was conducted in accordance with generally accepted Government auditing standards between November 1998 and March 1999.



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

May 17, 1999

MEMORANDUM TO: Thomas J. Barchi
Assistant Inspector General for Audits

FROM: Frank J. Miraglia Jr. *Frank J. Miraglia Jr.*
Deputy Executive Director for Regulatory Programs

SUBJECT: DRAFT AUDIT REPORT - THE SRA PROGRAM COULD PROVIDE
MORE BENEFITS

This responds to the April 21, 1999, memorandum transmitting the subject draft audit report. I am pleased to note your conclusion that Senior Reactor Analysts (SRAs) have provided beneficial insights for risk-informed, performance-based regulatory approaches. With respect to your specific recommendations, I offer the following comments:

Recommendation 1

Revisit the goals and objectives for the SRA program to ensure they are properly updated and integrated into NRR's implementation of risk-informed, performance-based regulatory approaches.

Comment

Agree. The SRA position was created to achieve a greater and more effective utilization of risk information in support of NRC reactor inspection program objectives. We believe that the essence of your recommendation is to more formally articulate the specific task objectives to be accomplished by SRAs in support of higher-level program objectives. In view of the many changes now being undertaken within the reactor oversight process, we agree that this is an appropriate time to evaluate the experience gained to-date with the SRA position and to formally incorporate more specificity of SRA functions into the process descriptions being developed. Our current schedule for finalizing these descriptions, following the pilot program beginning this summer, is April 2000.

We wish to further note that, although the term "program" has sometimes been used when describing the activities of SRAs, more precisely the SRAs are simply one of many specialists whose function is to help implement effective reactor inspection, assessment, and enforcement programs. We recommend that the use of the term "SRA program" reflect either SRA positions or SRA activities, as appropriate.

Recommendation 2

Provide better program focus and guidance to ensure that the best SRA practices are identified and used consistently.

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Comment

Agree. The guidance provided to SRAs can be improved. We periodically hold SRA counterpart workshop/meetings, one purpose of which has been to help identify and share best practices among the SRAs. We will use the next meeting to help formulate guidance that provides better consistency of risk analysis methods while maintaining the flexibility to apply the most appropriate method to a particular task. This guidance will be promulgated in the newly revised oversight process. Our current schedule for finalizing these descriptions, following the pilot program beginning this summer, is April 2000.

cc: Chairman Jackson
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield
H. Miller, RI
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NRC ORGANIZATION CHART



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GLOSSARY: OFFICE OF THE INSPECTOR GENERAL PRODUCTS

INVESTIGATIVE

1. *INVESTIGATIVE REPORT - WHITE COVER*

An Investigative Report documents pertinent facts of a case and describes available evidence relevant to allegations against individuals, including aspects of an allegation not substantiated. Investigative reports do not recommend disciplinary action against individual employees. Investigative reports are sensitive documents and contain information subject to the Privacy Act restrictions. Reports are given to officials and managers who have a need to know in order to properly determine whether administrative action is warranted. The agency is expected to advise the OIG within 90 days of receiving the investigative report as to what disciplinary or other action has been taken in response to investigative report findings.

2. *EVENT INQUIRY - GREEN COVER*

The Event Inquiry is an investigative product that documents the examination of events or agency actions that do not focus specifically on individual misconduct. These reports identify institutional weaknesses that led to or allowed a problem to occur. The agency is requested to advise the OIG of managerial initiatives taken in response to issues identified in these reports but tracking its recommendations is not required.

3. *MANAGEMENT IMPLICATIONS REPORT (MIR) - MEMORANDUM*

MIRs provide a "ROOT CAUSE" analysis sufficient for managers to facilitate correction of problems and to avoid similar issues in the future. Agency tracking of recommendations is not required.

AUDIT

4. *AUDIT REPORT - BLUE COVER*

An Audit Report is the documentation of the review, recommendations, and findings resulting from an objective assessment of a program, function, or activity. Audits follow a defined procedure that allows for agency review and comment on draft audit reports. The audit results are also reported in the OIG's "Semiannual Report" to the Congress. Tracking of audit report recommendations and agency response is required.

5. *SPECIAL EVALUATION REPORT - BURGUNDY COVER*

A Special Evaluation Report documents the results of short-term, limited assessments. It provides an initial, quick response to a question or issue, and data to determine whether an in-depth independent audit should be planned. Agency tracking of recommendations is not required.

REGULATORY

6. *REGULATORY COMMENTARY - BROWN COVER*

Regulatory Commentary is the review of existing and proposed legislation, regulations, and policies so as to assist the agency in preventing and detecting fraud, waste, and abuse in programs and operations. Commentaries cite the IG Act as authority for the review, state the specific law, regulation or policy examined, pertinent background information considered and identifies OIG concerns, observations, and objections. Significant observations regarding action or inaction by the agency are reported in the OIG Semiannual Report to Congress. Each report indicates whether a response is required.

