

POLICY ISSUE INFORMATION

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SECY-08-0046

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations

SUBJECT: REACTOR OVERSIGHT PROCESS SELF-ASSESSMENT FOR
CALENDAR YEAR 2007

PURPOSE:

The purpose of this paper is to present the results of the staff's annual self-assessment of the Reactor Oversight Process (ROP) for Calendar Year (CY) 2007.

SUMMARY:

The results of the CY 2007 self-assessment indicated that the ROP met its program goals and achieved its intended outcomes. The staff of the U.S. Nuclear Regulatory Commission (NRC) found the ROP objective, risk informed, understandable, and predictable, and the ROP met the agency goals of ensuring safety, openness, and effectiveness as listed in the NRC's Strategic Plan for Fiscal Years (FY) 2004 - 2009. NRC staff maintained its focus on stakeholder involvement and continued to improve various aspects of the ROP. The staff implemented several ROP improvements in CY 2007 to address issues raised by the Commission, recommended by independent reviews, and obtained from internal and external stakeholder feedback.

The NRC inspection and assessment program independently verified that nuclear power plants were operated safely and securely. During the year the staff made several improvements to the ROP including the timeliness of significance determination process (SDP) results, implementing

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enhancements to more fully address safety culture and oversight of licensees with performance problems, realigning inspection resources to improve effectiveness, and making changes to some performance indicators (PIs) to better identify declining safety performance. However, the staff recognizes the need for further enhancements to the ROP and will continue to actively solicit input from the NRC's internal and external stakeholders. For example, the staff plans to explore ways in which substantive cross-cutting issues, traditional enforcement actions, and other insights could be used more effectively in the ROP.

BACKGROUND:

On February 24, 2000, the staff issued SECY-00-0049, "Results of the Revised Reactor Oversight Process Pilot Program." The resulting Staff Requirements Memorandum (SRM), dated March 28, 2000, approved initial implementation of the ROP as recommended by the staff. The initial implementation of the ROP began on April 2, 2000. SECY-01-0114, "Results of the Initial Implementation of the New Reactor Oversight Process," dated June 25, 2001, noted the staff's intention to perform an annual self-assessment of the ROP. Accordingly, the staff has issued an ROP self-assessment Commission paper each year before the Agency Action Review Meeting (AARM) and has briefed the Commission on the self-assessment results following the AARM. This paper provides the results of the ROP self-assessment for CY 2007.

The staff performed the CY 2007 self-assessment in accordance with Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program." The ROP self-assessment program evaluates the overall effectiveness of the ROP through its success in meeting its pre-established goals and intended outcomes. In accordance with IMC 0307, this self-assessment does not include security and safeguards except where specifically noted. The annual Report to Congress on the Security Inspection Program, however, provides an assessment of the security program. The staff plans to reincorporate the security cornerstone in the ROP self-assessment process in CY 2008.

In response to the staff's briefing on the results of the AARM on May 31, 2007, the Commission directed the staff to take the actions specified in SRM M070531, dated June 14, 2007. In summary, these actions included providing a paper that describes the Baseline Risk Index for Initiating Events (BRIIE) and plans for its use as a new industrywide indicator; expanding the resident inspector (RI) demographics in the next self-assessment report on the ROP; continuing to look for leading PIs and ways to modify or improve the existing indicators; and considering ways to promote senior resident inspectors (SRIs) while still retaining them within the RI program. This paper and its enclosures address each of these items, along with previous commitments and other direction from the Commission.

DISCUSSION:

The staff uses program evaluations and performance metrics to determine the effectiveness of the ROP in meeting its seven program goals and intended outcomes. The seven goals include the four program-specific goals of being objective, risk informed, understandable, and predictable, as well as the three applicable performance goals listed in the NRC's Strategic Plan for FY 2004 - 2009 (ensuring safety, openness, and effectiveness). The staff plans to revise IMC 0307 to reflect the recently issued Strategic Plan for FY 2008 - 2013 (including security), and will perform subsequent annual self-assessments in accordance with the revised guidance.

The following intended outcomes of the ROP help form its basis and are incorporated into the various ROP processes:

- appropriately monitoring and assessing licensee performance
- identifying performance issues through NRC inspection and licensee PIs
- determining the safety significance of identified performance issues
- adjusting resources to focus on significant performance issues
- evaluating the adequacy of corrective actions for performance issues
- taking necessary regulatory actions for significant performance issues
- communicating inspection and assessment results to stakeholders
- improving the program based on stakeholder feedback and lessons learned

During the eighth year of ROP implementation (CY 2007), the staff conducted numerous activities and obtained data from many diverse sources to ensure that it performed a comprehensive and robust self-assessment. Data sources included the ROP performance metrics described in IMC 0307, recommendations from independent evaluations, comments from external stakeholders in response to a *Federal Register* notice, insights from internal stakeholders through the ROP internal feedback process, and feedback received from stakeholders at various meetings, workshops, and conferences. The staff also applied the direction and insight provided by the Commission through several SRMs. The staff analyzed this information to gain insights regarding the effectiveness of the ROP in fulfilling its program goals and intended outcomes.

The staff evaluated the key program areas of PIs, inspection, SDP, and assessment, as discussed in the following paragraphs. In addition, the staff assessment included ROP communication activities, ROP self-assessment and independent evaluations, ROP resources, and RI demographics and staffing. As noted in the pertinent sections of this paper, the staff has also included several enclosures with additional detail to support the staff's assessment and conclusions.

ROP Program Area Evaluations

The staff performed evaluations in each of the four key program areas of the ROP—PI, inspection, SDP, and assessment. Enclosure 1 discusses the results, summarized below, in detail. In addition, the annual ROP performance metric report, available through the Agencywide Documents Access and Management System (ADAMS), provides the data and staff analysis for each program area metric (ADAMS Accession No. ML080350368).

PI Program—The staff continued to improve the PI program in CY 2007 to provide more meaningful indication of declining plant performance and to identify outliers. The Mitigating Systems Performance Index (MSPI) provided a significant input to the ROP Action Matrix; of the 16 new greater-than-green PIs in CY 2007, 10 were from MSPI. The staff and industry are reviewing the lessons learned from the first 2 years of MSPI implementation and will evaluate possible changes. The staff and industry jointly developed the Unplanned Scrams with Complications PI to replace the Unplanned Scrams with Loss of Normal Heat Removal PI. Further, the Personnel Screening Program and Fitness-for-Duty/Personnel Reliability PIs were discontinued because they provided minimal input and reasonable confidence exists through the security baseline inspection program. The staff plans to interact with the industry to explore

other PIs that might provide more meaningful input. The staff is also reviewing the effectiveness of the Safety System Functional Failure PI, which had been an excellent indicator of poor and declining performance before the ROP, but has not been since ROP implementation. The staff will continue its efforts to improve the Emergency Preparedness PIs, the Reactor Coolant Leakage PI, and the other PIs, depending on available resources. Two of the eight PI metrics did not meet the established criteria. Specifically, the metric for whether the PIs provide for a timely indication of declining safety performance was missed based on three distinct sites crossing multiple thresholds in a given quarter. Additionally, the metric for the perception as to whether the PI program provides insights to help ensure plant safety was missed as identified by the external survey. As noted above, several significant efforts are currently underway or have recently been completed to improve the PI program.

Inspection Program—NRC inspectors independently verified that plants were operated safely, appropriately identified performance issues, and evaluated the adequacy of licensee corrective actions to address the noted performance issues. The staff completed its second ROP realignment review to ensure the most effective overall application of inspection resources. Based on this review, changes were made to about 60% of the baseline inspection procedures, including the restructuring of the engineering inspection process. Through implementation of a new approach for modifications inspections and change in the frequency of the Component Design Basis Inspections (CDBIs), the revised program will consist of one major engineering inspection each year over a 3-year cycle (e.g., modifications, CDBI, fire protection). The staff successfully integrated the operating experience information into the baseline inspection program using the Operating Experience Smart Sample process. The staff conducted an accelerated program to inspect and assess material control and accounting programs at all nuclear power plants and wet storage sites, and completed all the remaining first cycle force-on-force inspections at reactor sites. The regions completed the required baseline inspection program for CY 2007, and all but one of the inspection program metrics were met. The timeliness of temporary instructions (TIs) metric was missed based on the untimely completion of one TI at one site.

SDP—During this assessment period, the SDP remained an effective tool for determining the safety significance of identified performance issues. Most notably, the program met the SDP timeliness goal for the second consecutive year. The staff developed several significant enhancements to the SDP guidance, including revamping the initial screening and characterization of findings process, improving the SDP appeal process, and revising the Public Radiation Safety SDP to improve its objectivity. Additionally, the staff revised and made publicly available the Risk Assessment Standardization Project handbook to provide enhanced risk analysis methods and guidance regarding the assessment of licensee probabilistic risk assessment quality. The staff also continued the Security Findings Review Panel (SFRP) for all security findings to ensure regulatory consistency, and developed a comprehensive SFRP database for knowledge management and inspector use. One SDP performance metric—the perception that the SDP provides an objective and understandable regulatory response to performance issues—failed to meet program expectations. To address this concern, the staff has revised the Public Radiation Safety SDP to make it more objective and plans to perform a similar review for the Emergency Preparedness and Security SDPs.

Assessment Program—The staff has made several enhancements to the ROP program guidance to more fully address safety culture and the oversight of licensees with performance problems. The staff is compiling lessons learned from the initial 18-month implementation of the

enhanced ROP and plans to further enhance the ROP safety culture guidance documents. A key contributor to this effort will be the lessons-learned report resulting from the initial implementation of the revised IP 95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs, or One Red Input," at the Palo Verde site in 2007. The staff also revised the assessment program to add guidance and clarity regarding when licensee senior management should be requested to meet with the Commission to discuss actions being taken to improve performance and to enhance the NRC's communication with the public. The staff evaluated the three ROP Action Matrix deviations from CY 2007 for potential program changes and deemed that further evaluation and experience would be needed to conclude whether program changes would be necessary for the one new deviation and had already implemented changes for the two that were renewed. During CY 2007, the staff noted an increase in the number of sites in columns 3 and 4 of the ROP Action Matrix. Although a similar decline in licensee performance was not evident in the current industry trends program (ITP) results, the staff plans to monitor and assess this potential issue in CY 2008. Two of the eight assessment metrics did not meet their established criteria. Specifically, the metric for whether degradations in plant performance were gradual and allow adequate agency engagement of the licensee was missed because there were five occurrences where plants moved more than one column to the right in the Action Matrix. Additionally, the metric for whether the response to performance issues was timely was missed because the elapsed time between issuance of an assessment letter and the respective supplemental inspection exit meeting date had increased over previous years. The staff will further assess the data and engage with internal and external stakeholders to better understand the root causes of these issues.

ROP Communication Activities

The staff continued to seek and implement improvements to the ROP based on feedback and insights from all stakeholders. The staff used a variety of communication vehicles to ensure that all stakeholders have access to ROP information and results and have an opportunity to participate in the process and provide feedback. The staff continued to conduct monthly public meetings with external stakeholders and conducted a survey of external stakeholders to actively solicit and analyze stakeholder feedback regarding the effectiveness of the ROP. In addition, the staff began issuing public security inspection report cover letters and initiated actions to further assess the level of openness and transparency associated with the security cornerstone. The staff also continued the ongoing internal feedback process, held biweekly telephone conferences as well as frequent meetings with internal stakeholders, and visited each region to give inspection staff and management the opportunity to discuss ROP implementation and provide feedback. In addition, the staff continued to maintain the ROP Web pages to ensure that they remain useful tools for communicating accurate and timely information to all stakeholders.

The responses from the survey of external stakeholders were similar in content to those in previous years, but the number of responses declined significantly. The agency received only 7 responses for the CY 2007 survey, down significantly from 16 in CY 2006 and 21 in CY 2005. Specifically, utility representatives provided four of the seven responses, while public representatives submitted two and a State agency provided one. Overall, the utility responses were generally positive, whereas the two public respondents were less positive and raised specific concerns about the effectiveness of the ROP. Enclosure 3 provides more detail on the results of the external survey. Enclosure 1 provides the staff analysis of the survey responses

in the applicable portions of the program area evaluations, as well as the annual ROP performance metric report (ADAMS Accession No. ML080350368). In addition, as done for previous external surveys, the staff will prepare a consolidated response to the CY 2007 external survey. The staff will post this paper, the annual ROP performance metric report, and the consolidated response to the CY 2007 external survey to the ROP Web page, and each survey respondent will receive these documents. A consolidated table including all internal and external survey results since inception of the ROP, along with the staff's evaluation and response, appears on the ROP Web page entitled "ROP Program Evaluations and Stakeholder Feedback."

ROP Self-Assessment Metrics and Independent Evaluations

The objectives and details of the ROP self-assessment program appear in IMC 0307. This paper, supplemented by the annual report of performance metrics, provides the results of the staff's self-assessment for CY 2007. The staff performed its annual self-assessment of performance metrics for CY 2007 in accordance with the recent revision to IMC 0307. Based on the NRC staff's review, most of the 48 performance metrics for the ROP met the established criteria. All 16 metrics in the "Overall ROP" area met the established criteria; however, two PI program metrics, one inspection program metric, one SDP metric, and two assessment program metrics did not. The staff discusses its corrective actions to address these issues in the metric report as well as in the program area evaluations in Enclosure 1.

In addition to the ROP self-assessment program, several independent evaluations have been performed in the past few years, most notably by the U.S. Government Accountability Office (GAO), Office of Management and Budget, the Office of the Inspector General, and the Davis-Besse Lessons Learned Task Force (DBLLTF). These evaluations generally provided favorable results, but they also suggested potential areas of improvement. The staff addresses several recommendations from these independent evaluations in the enclosures to this paper.

GAO completed an independent evaluation of the ROP and issued its report on September 27, 2006 (ADAMS Accession No. ML062720030). The report, entitled "Nuclear Regulatory Commission: Oversight of Nuclear Power Plant Safety Has Improved, but Refinements Are Needed (GAO-06-1029)," included three recommendations. The NRC formally responded to the GAO report on November 27, 2006 (ADAMS Accession No. ML062910527), and provided an update in its annual status report to GAO on March 12, 2007 (ADAMS Accession No. ML070400008). The staff is addressing the GAO recommendations as discussed in further detail in Enclosure 2. Greater detail on the GAO evaluation and all other independent evaluations of the ROP, along with the staff's response and resultant program improvements, appear on the ROP Web page entitled "ROP Program Evaluations and Stakeholder Feedback."

The staff also received and evaluated feedback from licensees as part of the regulatory impact process. The regulatory impact process was established in 1991, based on Commission direction to develop a process for obtaining feedback from licensees and reporting the feedback to the Commission. Over the past year, the staff received feedback from 68 reactor licensees on 139 issues. Of the comments received, 86 percent were favorable, and 14 percent were unfavorable. The comments fell into two main categories—formal communication with licensees and inspector performance. Enclosure 4 provides a summary of the feedback received, the staff's evaluation, and the proposed improvement actions.

The NRC also collects and monitors industry-wide data to assess whether the nuclear industry is maintaining the safety performance of operating plants. The NRC also uses these industry-level indicators to provide feedback to improve the ROP. In CY 2006, the staff completed the development of the BRIIE, a PI that monitors risk-significant initiating events and assigns an importance value to each initiating event according to its relative contribution to industry core damage frequency. In SECY-07-184, "Industry Trends Program for Operating Power Reactors—Baseline Risk Index for Initiating Events," dated October 22, 2007, the staff requested Commission approval to implement the BRIIE as part of the ITP. The Commission approved the staff's request in its SRM of December 21, 2007; however, the Commission directed the staff to develop a public communication strategy to explain the meaning of the BRIIE, its underlying concept, and its intended use before making the information publicly available. The staff is in the process of incorporating the BRIIE into the ITP and will provide initial results in the Commission ITP paper that will be issued in early 2009. The staff has reported the FY 2007 results of the ITP to the Commission in an annual paper that complements this paper. The results of the ITP will also be reviewed at the AARM.

ROP Resources

Overall staff effort in FY 2007, as reflected in expended hours, increased 2.3 percent compared with FY 2006. Baseline inspection hours increased in 2007 primarily because of increased direct inspection effort, with a corresponding increase in baseline inspection preparation and documentation. Staff inspection hours charged to inspection procedure (IP) 71111.21, "Component Design Bases Inspection;" IP 71152, "Identification and Resolution of Problems;" and IP 71153, "Follow-up of Events and Notices of Enforcement Discretion," account for the bulk of the increase. The staff plans to evaluate the baseline inspection expenditures in CY 2008 to further understand this increase. As in the 2006 inspection cycle, all four regions completed the required baseline inspections in CY 2007. Resources spent for plant-specific inspections in FY 2007 noticeably decreased overall compared with FY 2006. However, inspection resources in this area are expected to significantly increase in FY 2008 because of the increased number of sites in columns 3 and 4 of the ROP Action Matrix and an increase in special inspections. An increase in effort related to generic safety inspections reflects the growing activity in this area. The generic safety inspections are typically one-time inspections of specific safety issues, and the effort involved can vary significantly from year to year. Enclosure 5 provides a detailed discussion of ROP resources.

RI Demographics and Site Staffing

As directed in an SRM dated April 8, 1998, the staff developed measures to monitor and trend RI demographics and report the results to the Commission on an annual basis. The staff also developed a site staffing metric in response to a DBLLTF recommendation, which is included with the annual analysis. The data from 2003 to 2007 indicate that the experience levels of both RIs and SRIs have remained high. The staff turnover rate for the RIs and SRIs increased nationwide from 2006 creating a complex human resource allocation problem for the regions. Although all four regions met the 90-percent site staffing metric in 2007, two of the four regions had several sites that individually were below 90-percent site staffing. The staff plans to closely monitor resident demographics and site staffing in 2008 because of anticipated continuing influences on the program as a result of the expansion of the nuclear industry and internal growth to support the Office of New Reactors. In addition, a task force is currently assessing RI program retention issues and barriers for entering the program. The task force plans to provide

recommendations and potential solutions to senior NRC management. Enclosure 6 provides detailed analyses of the 2007 RI demographics and site staffing.

COMMITMENTS:

Prior Commitments—The staff made four commitments in the CY 2006 ROP self-assessment to improve the efficiency and effectiveness of the ROP. The following summarizes the four actions taken by the staff to address these commitments:

- (1) The staff continued to monitor MSPI implementation and incorporated additional improvements to the PI program to better identify those plants with declining performance, as described in Enclosure 1.
- (2) The staff implemented the ROP realignment process and adjusted inspection resources accordingly, as described in Enclosure 1. The staff will conduct the next biennial ROP realignment in CY 2009.
- (3) The staff continued to monitor implementation of the safety culture enhancements and addressed related GAO recommendations in this area, as described in Enclosure 1 and detailed in Enclosure 2.
- (4) The staff implemented adjustments/changes to the process related to the point at which licensee senior management will be requested to meet with the Commission to discuss actions being taken to improve performance, as described in Enclosure 1.

New Commitments—As described in this paper, the staff plans the following four significant actions or activities to improve the efficiency and effectiveness of the ROP in CY 2008:

- (1) The staff will complete its lessons-learned review of the MSPI and, based on its recommendations and discussion with industry, will make any necessary changes to improve the PI program. The staff will further address additional improvements to the PI program to better identify those plants with declining performance.
- (2) The staff will explore ways to ensure site coverage and continuity within the resident program and ensure that vacancies in the RI program are filled in a timely manner with experienced individuals.
- (3) The staff will continue to monitor SDP timeliness and develop additional improvements to streamline the SDP program with the inspection program.
- (4) The staff will further enhance ROP inspection and assessment guidance based on the lessons-learned evaluation of the safety culture enhancements. Additionally, the staff will further assess the causes of the increase in the number of sites in columns 3 and 4 of the ROP Action Matrix.

The staff will include the status of these commitments and other program improvements noted in this paper in the CY 2008 ROP self-assessment.

CONCLUSIONS:

The self-assessment results for CY 2007 indicate that the ROP provided effective safety oversight, as demonstrated by meeting the seven program goals and achieving its intended outcomes. The staff continues to experience challenges in certain areas and recognizes the need for further improvement. The ROP was successful in being objective, risk informed, understandable, predictable, and in ensuring safety, openness, and effectiveness. The NRC has appropriately focused agency resources on performance issues in CY 2007, and plants continue to receive a level of oversight commensurate with their performance. The staff continues to improve various aspects of the ROP as a result of stakeholder participation, feedback, and lessons learned. Based on its CY 2007 self-assessment, the staff intends to focus on the commitments discussed above.

RESOURCES:

NRC headquarters and regional resources are needed to conduct the periodic assessment and realignment of ROP inspection procedures, revision and maintenance of the NRC Inspection Manual, ROP annual program assessment, mid-cycle and end-of-cycle licensee performance assessment, and all ROP management and oversight activities. The staff estimates that approximately 57 full-time equivalent (FTE) staff members and \$815,000 will be needed for FY 2008, and 57 FTE and \$675,000 will be needed for FY 2009 to conduct these NRR-funded activities. No resources beyond those already included in the current budget requests for FY 2008 and FY 2009 are needed for these activities.

COORDINATION:

The Office of the General Counsel has reviewed this Commission paper and has no legal objections to its content. The Office of the Chief Financial Officer has reviewed this Commission paper for resource implications and has no objections.

/RA Martin J. Virgilio for/

Luis A. Reyes
Executive Director
for Operations

Enclosures:

1. ROP Program Area Evaluations
2. Safety Culture Enhancements
3. Internal and External Communications
4. Regulatory Impact Summary
5. ROP Resources
6. Resident Inspector Demographics

ROP Program Area Evaluations

The staff of the U.S. Nuclear Regulatory Commission (NRC) performed program evaluations in each of the four key program areas of the Reactor Oversight Process (ROP), including performance indicators (PIs), inspection, significance determination process (SDP), and assessment. As defined in Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program," the goals of the ROP include being predictable, understandable, objective, and risk informed, and supporting the three applicable performance goals listed in the NRC's Strategic Plan for Fiscal Years (FYs) 2004–2009 (ensuring safety, openness, and effectiveness). The staff plans to revise IMC 0307 to reflect the recently issued Strategic Plan for Fiscal Years 2008–2013 and will perform subsequent program evaluations in accordance with the revised guidance. The staff used self-assessment metrics, internal and external stakeholder feedback, and other information to provide insights regarding the effectiveness of the ROP in meeting its goals and intended outcomes.

Based on the metric results, stakeholder insights, and other lessons learned through ongoing program monitoring, the staff identified certain issues and actions in each of the four key program areas as described below. The annual ROP performance metric report, available through the Agencywide Documents Access and Management System (ADAMS), provides the data and staff analysis for each of the program area metrics (ADAMS Accession No. ML080350368). Enclosure 3 and applicable portions of the ROP performance metric report provide more detail on the results and analysis of the external stakeholder surveys.

Performance Indicator Program

The staff continued to improve the PI program in CY 2007 to provide more meaningful indication of declining plant performance and to identify outliers. The NRC replaced the Unplanned Scrams with Loss of Normal Heat Removal (USwLONHR) PI with the Unplanned Scrams with Complications (USwC) PI in the third quarter of 2007 as a result of a joint industry and NRC staff effort. The Mitigating Systems Performance Index (MSPI) provided a significant input to the ROP Action Matrix; of the 16 new greater-than-green PIs in CY 2007, 10 were from MSPI. In staff requirements memorandum (SRM) M070531, dated June 14, 2007, the Commission directed the staff to continue to look for leading performance indicators, as practical, as well as for ways to modify or improve the existing indicators. Several of these potential improvements are discussed below.

Significant efforts are currently underway to assess the effectiveness of the MSPI since it was implemented nearly 2 years ago in 2006. The most significant effort is the MSPI lessons learned review being conducted by the Office of Nuclear Regulatory Research (RES). This review, which will use data collected over the past 24 months, will focus on detecting identifiable trends and outliers in performance, aspects of the MSPI guidance that could be improved, and areas of the MSPI that are not providing benefit in assessing performance in either unavailability or unreliability. The staff will periodically update the industry on its progress during this review and will share its findings during the monthly ROP public meetings. The industry is also conducting a review of the MSPI, and the staff will evaluate both results for potential program improvements.

Another significant project underway is to clarify the guidance on when MSPI performance issues count in the ROP Action Matrix. This effort is part of a broader agency effort to assess

how PIs (along with inspection findings) should be counted in the ROP Action Matrix when they have the same underlying reason that caused the performance threshold to be crossed. Since the second quarter of 2006, the industry has reported eight quarters of MSPI data. Tabulation of industry MSPI data continues to reveal an increase in the number of white PIs reported with the MSPI when compared to its predecessor, the Safety System Unavailability PI. It is still too early to draw conclusions on the impact and performance of the MSPI, although it is clear that the emergency alternating current (AC) system has resulted in the most greater-than-green performance issues. The staff plans to monitor the MSPI over the course of CY 2008, continue to engage industry through the monthly ROP public meetings, and make any necessary changes to the MSPI based on lessons learned.

Based on a review of data prior to implementation of the ROP, the Safety System Functional Failure (SSFF) PI had been an excellent indicator of poor and/or declining licensee performance. However, since implementation of the ROP, three units crossed the green/white threshold in the first 2 quarters of 2000, and the next white SSFF PI did not occur until the second quarter of 2007. The staff has noticed that the number of reported events has decreased by 70 percent. Further, the number of event retractions has increased by 50 percent since the beginning of the ROP.

The NRC has published two documents that provide guidance to licensees on the topic of event reportability—NUREG-1022, “Event Reporting Guidelines, 10 CFR 50.72 and 50.73,” and NRC Inspection Manual Part 9900, “Technical Guidance, Operability Determinations & Functionality Assessments.” The staff has discovered that differences among licensee interpretation of the guidance documents contribute to inconsistencies in licensee reporting of SSFFs. The staff is organizing a working group of regional and headquarters personnel to evaluate the guidance and determine if any changes are needed.

The staff and industry continue to address issues related to the Nuclear Energy Institute (NEI) guidance document, NEI 99-02, “Regulatory Assessment Performance Indicator Guideline.” As events at the plants occur, differences in PI guidance interpretations arise, which require the staff and industry to address needed changes. The staff is evaluating NEI 99-02 to eliminate wording that can result in differing opinions by licensee and staff and will work with industry to clarify the guidance.

The staff and industry reviewed and evaluated proposals for modifying or maintaining existing PIs in the security cornerstone. The working group considered developing new PIs, combining existing PIs, modifying the predetermined thresholds of the existing PIs, and maintaining the current PIs. Based on its review, the group recommended and the Commission approved (SECY-07-0136) that the Personnel Screening Program and Fitness-for-Duty/Personnel Reliability PIs be deleted because these PIs were evaluated by the baseline inspection program, and that this redundancy challenged efficiency and caused undue regulatory burden. The staff will continue to work with industry to consider replacement PIs and other enhancements to the security ROP.

The staff and industry jointly developed the USwC PI to replace the (USwLONHR) PI in the Initiating Events cornerstone. The USwC counts any one of six events or conditions that complicate the operators’ recovery actions. The green-white threshold is set at one per four quarters. A second event in a four-quarter period will cause the PI to cross the green-white threshold. The first data were reported in the third quarter of CY 2007 using data from the fourth

quarter of CY 2006 through the third quarter of CY 2007. While no plants crossed the green-white threshold, 15 units each reported one count in this PI.

The staff continues to work on an improved Reactor Coolant System Leakage PI. The Westinghouse Owners Group (WOG) completed its work, and the staff expects to use the same methodology as the WOG did for pressurized-water reactors. It is more difficult, however, to develop a similar PI for boiling-water reactors. The staff will continue to pursue a boiling-water reactor methodology for monitoring the performance of reactor coolant system leakage; however, other issues had higher priority in CY 2007 and may in CY 2008 as well.

The Emergency Preparedness (EP) cornerstone comprises three PIs: Drill/Exercise Performance (DEP), Drill Participation (DP), and Alert and Notification System (ANS). During CY 2007, one licensee's Emergency Response Organization (ERO) drill participation PI crossed the Yellow threshold in the first quarter of 2007. The licensee had incorrectly applied the requirements of NEI 99-02 to give credit for drill/exercise participation during the potential members' ERO training. This condition was the subject of a frequently asked question in CY 2006. During CY 2008, NRC staff and the ROP Working Group will be revisiting the issue of crediting training evolutions towards the PI. The ANS PI for another licensee crossed the Yellow threshold during the second quarter of 2007 as a result of a failure to activate the siren system during the full volume test. NRC and Federal Emergency Management Agency (FEMA) staff are working together to evaluate current siren guidance and requirements documents to determine areas for improvement as a result of this issue. The DEP PI is measured by a combined success rate of emergency classification, notification, and protective action recommendations. Since licensees are not required to perform a specific number (or minimum) of drills for each of the three components, this could result in an inadequate indication of declining or deficient performance. To address this concern, the staff plans to issue a temporary instruction to collect data for each of its individual components. This effort will occur over CYs 2008 and 2009. Following collection of the data, the EP program office will perform an evaluation of the DEP PI to ensure that it is providing valuable information.

Two of the eight PI metrics did not meet the established criteria. Metric PI-3, "Timely Indication of Declining Safety Performance," was missed based on three distinct sites crossing multiple thresholds. The staff plans to monitor this trend to determine if it is indicative of declining industry performance or a problem with the effectiveness of the PI program. Metric PI-4, "PI Program Provides Insights to Help Ensure Plant Safety," did not meet its criteria because public and State respondents gave feedback that the PIs do not provide an adequate indication of declining safety performance. The staff believes the PI program provides insights to help ensure plant safety, but it recognizes the need to further improve the PI program to provide more timely and meaningful indications of plant performance. The remaining PI metrics met expectations. Additional concerns noted in the external survey responses included the declining number of greater-than-green PIs, that the PI program should be periodically "reset" to reflect the differences in observed occurrences and the current expectations, and that the NRC should continue to better risk inform the PIs and improve the level of insight they provide. The staff is in the process of improving those PIs discussed above and continues to work with the industry to revise and/or introduce other PIs to improve the program's effectiveness in contributing to the identification of declining performance.

Inspection Program

The inspection program verified that plants were operated safely in CY 2007 and ensured that performance issues were identified and corrected in a timely manner by the licensee. All four regions completed their baseline inspections in CY 2007 in accordance with IMC 2515, "Light-Water Reactor Inspection Program—Operations Phase," and IMC 2201, "Security and Safeguards Inspection Program for Commercial Nuclear Power Reactors." Each region documented its CY 2007 completion of the baseline inspection program in a memorandum. These memoranda can be found in ADAMS under ML080430029 (Region I), ML080770153 (Region II), ML080450429 (Region III), and ML080730456 (Region IV). Additionally, all security baseline inspections in CY 2007 were completed as required, as documented in a memorandum from the Office of Nuclear Security and Incident Response (NSIR) (ML080390446), but this memorandum is not publicly available.

The staff performed an effectiveness review, known as ROP realignment, for all baseline inspection procedures in the ROP cornerstone areas of Initiating Events, Mitigating Systems, Barrier Integrity, Occupational Radiation Safety, and Public Radiation Safety. Inspection procedures in the EP and Security cornerstones were not reviewed as part of the ROP realignment effort in CY 2007. The review considered inspection results over a 3-year period (CY 2004 through CY 2006). The purpose of this review was to ensure the most effective overall application of inspection resources in accordance with Appendix B to IMC 0307. The staff made changes affecting inspection scope and frequency to 12 baseline inspection procedures and implemented the revised baseline inspection program beginning in CY 2008. As part of this process, the staff evaluated the scope and frequency associated with the engineering inspection procedures and created a fully integrated engineering inspection process. Through implementation of a new approach for modifications inspections and change in the frequency of component design bases inspections (CDBIs), the revised program will consist of one major engineering inspection each year over a 3-year cycle (e.g., modifications, CDBI, fire protection). Additional details on the results of the 2007 ROP realignment process appear under ADAMS Accession No. ML073020593. The staff plans to perform the next ROP realignment in CY 2009, and the baseline inspection program will reflect any changes resulting from that effort starting in CY 2010.

In addition to the detailed ROP realignment process, the staff performed its annual evaluation of the inspection procedures in fiscal year (FY) 2007 to determine whether any additional improvements to the baseline inspections were warranted based on inspection findings over the most recent FY. The staff also performed a best practices review of the problem identification and resolution inspection procedure (IP 71152, "Identification and Resolution of Problems"). The purpose of this review was to help ensure consistent implementation of the procedure and to identify potential effectiveness and efficiency improvements. The staff made recommendations and identified some potential changes as a result of these reviews that will be evaluated in CY 2008.

NSIR staff conducted a self-assessment of the adequacy of the EP cornerstone baseline inspection of biennial evaluated exercises. NSIR initiated this self-assessment as there had been an increase in inspection findings related to licensees failing to adequately critique exercise performance weaknesses. In some cases, NRC inspectors discovered recurrences of previously identified exercise weaknesses, suggesting inadequate corrective actions. Further, some of these findings have resulted in escalated enforcement action and findings of greater-

than-green significance. Results of the self-assessment, with recommendations, were presented to NSIR management. Implementation of these recommendations is currently being considered.

In CY 2006, the staff made substantive changes to a number of inspection program documents to incorporate safety culture enhancements. The staff performed an assessment of the inspection findings resulting from the safety culture enhancements during the 18-month pilot program and plans to evaluate the lessons learned and develop any recommendations for improvement during CY 2008. Enclosure 2 provides additional detail on the evaluation of safety culture enhancements to the ROP.

The staff successfully integrated operating experience information into the baseline inspection program using the Operating Experience Smart Sample (OpESS) process. This program provides inspectors with concise information related to selected industry operating events that have generic applicability and potential risk significance and can be readily inspected using the baseline inspection program. The staff issued four OpESS documents during CY 2007, dealing with issues such as pressurized-water reactor containment sump recirculation, pipe foreign material blockage, and crane and heavy lift inspections. Inspectors are encouraged to review and use OpESS information for planning future inspection activities. The staff also issued the inspector newsletter in each quarter of CY 2007 to share inspection tips and lessons learned. Feedback from the inspectors and management indicates that the newsletter continued to serve as an effective tool for internal communication and knowledge transfer.

The staff continued to improve the initial and continuing inspector training programs in order to develop and maintain well-qualified, competent inspectors. Recommendations identified by the staff were reviewed in accordance with the ROP feedback process and the improvements incorporated into inspection standards, as appropriate. The staff developed and implemented computer-based training for the new Unplanned Scrams with Complications PI. The staff also updated computer-based training for inspectors and took several steps to augment inspector classroom training curricula to incorporate safety culture training in parallel with the implementation of the safety culture initiative. In addition, the staff conducted training on ROP safety culture and cross-cutting issue topics at the regional counterpart and security inspector counterpart meetings. Based upon insights from the industry, which has also used the staff's training tools, the staff believes that the ongoing safety culture training activities have promoted a more consistent implementation of the inspection program. Additionally, NSIR staff began development of a comprehensive security inspection training curriculum in CY 2007 which is scheduled to be fully developed and deployed by CY 2009.

All but one of the nine inspection program metrics met their established criteria in CY 2007. Regions successfully completed temporary instructions in a timely manner 98 percent of the time; however, the temporary instruction was completed 3 weeks after the required completion date at one plant, resulting in the metric not being met. The delay was necessary after the licensee identified issues affecting their readiness for the inspection, which in turn delayed NRC inspection efforts. The staff is considering changing the criteria from 100 percent complete to 95 percent in the next revision of IMC 0307 to allow for conditions beyond the staff's control.

The external survey resulted in favorable feedback regarding whether information contained in inspection reports was relevant, useful, and written in plain English. Additionally, most external stakeholders believed that the inspection program adequately covers areas that are important to

safety. Although comments were generally favorable, specific recommendations included making better use of potentially generic information and improving the problem identification and resolution inspections. The staff will review and evaluate these comments and address them in its consolidated response to the external survey.

Significance Determination Process

The SDP continues to mature and remains an effective tool for determining the safety significance of identified performance issues. Oversight of the process has continued to focus on the timeliness of SDP reviews and on improvements to the process based on feedback from internal and external stakeholders. Most notably, the SDP met the timeliness goal of 90 days for a second consecutive year.

The staff developed several enhancements in 2007 that were incorporated into the SDP guidance in early 2008—revamping the Phase 1, “Initial Screening and Characterization of Findings,” portion of the SDP, updating IMC 0609 guidance to reflect NSIR programmatic responsibilities, and amending the SDP appeal process. Enhancements to the Phase 1 tool, in conjunction with comparable planned changes to IMC 0612, will (1) improve the inspectors’ ability and increase consistency in screening and characterizing the performance deficiencies for findings of low safety significance across all seven cornerstones, (2) eliminate confusion by removing the tool from the reactor Phase 2, “At Power,” SDP (Appendix A to IMC 0609), and (3) provide clarification in defining the performance deficiency. Findings that do not initially screen as green will continue to be evaluated using the appropriate SDP appendix identified in the revised Phase 1 tool.

The Phase 1 worksheets will include the capability to screen findings related to spent fuel pools and independent spent fuel storage installations (ISFSIs). Before the development of Appendix M, “Significance Determination Process Using Qualitative Attributes,” these findings did not have an SDP well suited for their specific application. Now, findings involving spent fuel pool and ISFSI issues can be assessed using qualitative engineering judgment and regulatory oversight experience, which are acceptable in a risk-informed process. For security-related findings, NSIR will initially screen and characterize findings using the Phase 1 worksheets. The staff has updated the guidance in IMC 0609 to discuss NSIR programmatic responsibilities and reflect security-related documents for inspection/SDP oversight that parallel the Office of Nuclear Reactor Regulation (NRR) documents.

The staff revised the Public Radiation Safety SDP as directed by the Commission in the SRM for SECY-07-0112, “Staff Evaluation and Proposed Revision to the Public Radiation Safety Significance Determination Process to Address Radioactive Liquid Spills and Leaks,” dated July 6, 2007. The staff worked with internal and external stakeholders and received feedback on various aspects of the SDP to improve its effectiveness and efficiency. The scope of the review consisted of an evaluation of (1) the current criteria for a white finding to ensure consistency with risk-informed goals of the ROP, (2) the entry conditions into the radioactive effluent release program branch of the SDP flowchart for spills and leaks, and (3) the SDP to ensure that it reflects the NRC Strategic Plan goal of openness. The staff also made two other changes to the Public Radiation Safety SDP—removing a yellow characterization from the transportation branch of the SDP and a white characterization for the aggregation of findings in the radioactive material control branch of the SDP. These changes were necessary because the level of the

characterization of findings is not in keeping with the risk-informed nature of the ROP. The NRC issued the revised Public Radiation Safety SDP in early 2008.

The staff continued its efforts to enhance the SDP for the material control and accounting (MC&A) key attributes. As described in SECY-08-0005, "Results of Material Control and Accounting Baseline Inspections Conducted at Nuclear Power Reactors and Wet Storage Sites," dated January 8, 2008, the staff evaluated the results obtained from its MC&A inspections conducted at commercial nuclear power plants and wet storage sites. The Commission paper also describes efforts to fully integrate MC&A into the ROP and notes that this activity would be conducted with public participation to the degree possible given the subject matter. The staff also continued the Security Findings Review Panel (SFRP) for all security findings to ensure regulatory consistency, and developed a comprehensive SFRP database for knowledge management and inspector use.

During 2007, two licensees appealed the final determination of two separate findings characterized as white. The regional administrator upheld the original decisions to maintain the characterization of the performance deficiencies as white; however, both licensees petitioned for a second appeal through the Office of the Executive Director for Operations (OEDO). The staff again reviewed both appeals, and the agency upheld the final decisions. As a result of this activity, NRR senior management directed the staff overseeing the SDP appeal process to review, identify, and fix the inconsistencies in the appeal guidance. Process inconsistencies included not allowing the licensee to submit new information for a proposed greater-than-green finding following the regulatory conference, not having a Significance and Enforcement Review Panel (SERP) review the appeal panel recommendations, and having OEDO as the next higher step to appeal after the Regional Administrator.

The staff revised the SDP appeal process with several significant enhancements. The revision will clarify the circumstances under which the staff will (1) accept additional information after issuing a final significance for a licensee performance deficiency, (2) require that NRR or NSIR (for security or EP issues) concur in a region's decision to accept an appeal, (3) modify the decision making process for appeals by having the results of the appeal panel reviewed by a SERP, and (4) redefine the final appeal decision to be a joint determination by the regional administrator and the Director, NRR or NSIR. OEDO will no longer be involved in appeals. The NRC issued the revised SDP appeal guidance in early 2008.

During 2007, the staff met with representatives from NEI, industry, and other stakeholders in a series of public meetings to discuss the industry proposal to use industry probabilistic risk assessment analyses in lieu of NRC risk assessment tools for assessing the significance of findings. The NRC reviewed the industry proposal and concluded that the ROP required the NRC to maintain independence by evaluating the significance of findings and not just reviewing the results of the licensee's assessment. At present, the industry has not uniformly implemented a standardized approach to performing risk analysis that would ensure uniform application across the spectrum of industry probabilistic risk assessment models. In this regard, the NRC's use of standardized plant analysis risk (SPAR) models, together with the ongoing development of guidance on conducting Phase 3 risk assessments, commonly referred to as the risk assessment standardization project (RASP), ensures greater uniformity in the agency's regulatory assessments. ADAMS contains summaries of the public meetings (Accession Nos. ML071490069 and ML070640567) and the final NRC response to NEI (Accession No. ML072490566).

To support the implementation of the ROP, the NRC initiated the RASP to establish procedures and improve the methods of risk assessment in various risk-informed regulatory applications. One specific purpose of this project was to develop guidelines and methods that the NRC staff could use to achieve more consistent results when performing risk assessments of operational events and licensee performance issues. RES prepared the "Risk Assessment of Operating Events" Handbook (hereafter referred to as the RASP Handbook) to assist NRC staff in improving the timeliness, quality, and consistency of risk assessments. The methods described in the RASP Handbook may be applied to Phase 3 SDP, the accident sequence precursor (ASP) program, and event assessments performed in accordance with Management Directive 8.3, "NRC Incident Investigation Program."

The staff revised the RASP Handbook to include three volumes designed to address internal events (Volume 1), external events (Volume 2), and SPAR model reviews (Volume 3). Volumes 1 and 2 updated staff guidance that was provided for trial use in 2005 and 2006, respectively. Volume 3 provides analysts and SPAR model developers with additional guidance to ensure that the SPAR models used in the risk analysis of operational events represent the as-built, as-operated plant to the extent needed to support the analyses. The information in the RASP Handbook has been beneficial to the risk analysis staff and is referenced in the SDP program guidance. The staff also recently made the RASP Handbook publicly available on the ROP Web page and in ADAMS.

In the 2007 annual assessment of the ASP program, RES staff identified through the ROP that 14 events were potentially significant (ADAMS Accession No. ML080230518). Of these 14 potentially significant events, the staff identified 6 precursors that exceeded ASP program thresholds. All six precursors were greater-than-green findings analyzed in the SDP or documented in the analyses of significant operational events in accordance with Management Directive 8.3.

The responses to the external survey were generally unfavorable for the SDP, but they appeared to be less critical than in previous years. Several respondents stated that they believed the SDP to be a useful tool to quickly determine a plant's status in specific oversight areas and that it is generally risk informed; however, the SDP remains complex, requiring one to be an expert on the SDP process. Industry respondents noted concerns with the staff's use of SPAR models in determining the risk of findings and expressed their feeling that the Radiation Protection, Security, and EP SDPs are overly subjective and deterministic. As noted above, the staff discussed the use of SPAR models with the industry in a series of public meetings; it has revised the Public Radiation Safety SDP to make it more objective and plans to perform similar reviews for the Emergency Preparedness and the Security SDPs. Although these comments continue to indicate a negative perception, resulting in a failure to meet one of the SDP metrics, the staff continues to actively engage external stakeholders to address their concerns. The remaining SDP performance metrics were met and indicated that SDP implementation has improved over the previous years. Most notably, the SDP timeliness metric was met for a second consecutive year. The average age of all the SDP findings that were presented to the SERP during FY 2007 was 62 days, well within the 90-day goal.

Assessment Program

The most significant change in the assessment program in CY 2007 resulted from the Commission SRM dated April 19, 2007, which directed the staff to change the ROP assessment

program to include the provision that the Chief Executive Officer of a licensee for a plant newly in column 4 of the NRC Action Matrix shall, within 6 months of entering into column 4, brief the Commission on the activities the licensee will be taking to improve the operation of the unit(s). This change also included a provision to invite any licensee who remains within column 3 of the ROP Action Matrix for 3 years to meet with the Commission. The Commission would then evaluate whether additional subsequent briefings by the licensee would be requested after the Agency Action Review Meeting (AARM) with senior agency management. The staff revised the ROP Action Matrix and associated portions of IMC 0305, "Operating Reactor Assessment Program," to incorporate these program changes.

The 18-month initial implementation period for the safety culture enhancements finished at the end of CY 2007. The staff monitored and evaluated the program enhancements to identify the changes needed in ROP guidance documents to improve their effectiveness and efficiency. The staff interacted, as appropriate, with internal and external stakeholders, including the industry, public, and nongovernment organizations, to obtain and consider their input and comments on potential changes. Enclosure 2 provides information on the results of this initial implementation assessment in accordance with the staff's commitment to do so in SECY-06-0122. The need to implement additional modifications to increase the effectiveness of the safety culture enhancements of the ROP will be determined based on the lessons learned in this initial implementation.

Moreover, the treatment of security performance issues as they may relate to the cross-cutting areas (i.e., human performance, problem identification and resolution, and safety conscious work environment) is considered within the NRC's safety culture framework. As such, security performance issues that are identified to have cross-cutting aspects will be assessed in an integrated fashion across the seven cornerstones of safety.

On February 25, 2008, the Commission issued SRM COMGBJ-08-0001 that, in part, approved the need to expand the Commission's policy of safety culture to address the unique aspects of security. This SRM requires the staff to address how stakeholder involvement can most effectively be used to address safety, including any unique aspects of security. Further, the staff is to address whether publishing NRC's expectations for safety and security is best accomplished in one safety/security culture statement or in two separate statements.

In addition, the Commission directed the staff (in the SRM dated March 22, 2007) to improve its communication with the public and other stakeholders on reactor oversight. Specifically, the Commission noted that the NRC should issue a press release summarizing the status of the fleet of reactors when it issues annual ROP assessment letters to the licensees. As a result, the staff provided additional details in the press release that communicated overall operating reactor performance following the mid-cycle performance assessments (reference press release 07-115 dated September 6, 2007). The staff plans to continue to provide these additional details on the performance of operating reactors in the future semiannual press releases following the performance assessments.

During CY 2007, the staff identified a possible declining trend within industry performance, as evidenced by an increase in the number of sites in columns 3 and 4 of the ROP Action Matrix. Approximately 5–7 sites (7–10 units) were in columns 3 and 4 between CYs 2003 and 2006; however, during CY 2007, the number increased to 11 sites (17 units). Although a similar decline was not evident in the current industry trends program (ITP) results, the staff is

evaluating this data, as well as other indicators, to determine whether this is an early indication of declining industry performance. The staff plans to discuss this potential concern during the 2008 AARM, and any conclusions or insights gained during the AARM discussions will be shared with the Commission during the Commission briefing on the AARM results.

As requested by the Commission and incorporated into the self-assessment program, the staff reviewed the causes of the Action Matrix deviations during CY 2007 and evaluated them for potential improvements to the program. The following summarizes these evaluations:

- On October 28, 2005, and renewed on December 11, 2006, and December 19, 2007, the Executive Director for Operations (EDO) approved deviation memorandums to provide heightened NRC oversight at the Indian Point Energy Center. The staff intends to continue to closely monitor the licensee's actions in CY 2008 to address issues associated with onsite ground-water contamination characterization and mitigation and with the ANS, including implementation and testing of the replacement ANS that Entergy is installing in response to the Energy Policy Act of 2005. The actions for the Indian Point Energy Center represent a customized approach that considers factors beyond each unit's Action Matrix categorization. This approach is consistent with underlying concepts of IMC 0305.
- On May 16, 2005, and renewed in July 2006 and August 2007, the EDO approved deviation memorandums to provide heightened NRC oversight at Davis-Besse. The staff intends to continue monitoring the licensee's efforts to sustain improved plant performance following resolution of the long-standing underlying problems that culminated in a red finding associated with the severe wastage that was discovered on the reactor vessel head. As noted in last year's self-assessment, the staff revised IMC 0305 to allow the regional offices to use additional follow-up actions for plants that are exiting the IMC 0350 process. The programmatic changes made as a result of this deviation could prevent the need for similar deviations in the future.
- The NRC issued a deviation memorandum in November 2007 to address security-related concerns at the Peach Bottom site. The security-related finding also had a documented cross-cutting aspect in the area of safety conscious work environment (SCWE). The NRC has taken several actions in evaluating the licensee's scope of effort and progress in addressing the SCWE and inattentiveness issues. The NRC actions included augmented inspection teams and a confirmatory action letter. These NRC actions provide the regulatory framework to monitor the company's progress in addressing security-related and SCWE issues at Peach Bottom until the next performance assessment. A confirmatory action letter (CAL) was issued to document the company's agreement to take certain actions in response to inattentiveness on the part of some security officers. The company's actions include detailed briefings to security force personnel on acceptable behavior; round-the-clock supervisory oversight of security activities, and keeping the NRC informed of the status of the Peach Bottom transition from a contractor security force to one that is run by Exelon. The commitments in the CAL will remain in effect until the NRC has reviewed Exelon's root cause analysis of the security program issues, the company's corrective actions and implementation schedule, and the company's method for assessing the effectiveness of the corrective actions. As a result of these issues, a temporary instruction has been developed to inspect the transition of contract security force to proprietary security force. The staff continues to

evaluate this deviation for impact on the ROP and will consider program improvements based on the lessons learned from the ongoing evaluation.

As a result of the Commission's desire to explore ways in which the ROP can be enhanced to more fully address licensee performance, the staff is considering how substantive cross-cutting issues (SCCIs), traditional enforcement actions, and other insights could be used more effectively in the ROP. The staff plans to study these issues over the course of this year and explore ways to enhance the ROP to be more predictive of declining performance and a better indicator of current performance. Possible ways to more fully incorporate these regulatory tools would be to (1) take more assertive NRC actions for repetitive SCCIs, such as requiring additional NRC inspection or affecting a licensee's position in the ROP Action Matrix; and (2) use certain traditional enforcement items as a more integrated input into the assessment process. The staff will also engage industry and other stakeholders for their perspectives during the course of the public monthly meetings on the ROP.

In response to SRM M070724C, "Briefing on Palo Verde Nuclear Generating Station," dated August 13, 2007, the staff assessed if there was any correlation between facility licensee performance and the number of licensed operators at the facility during the last four years (2004-2007). The staff used existing data sources to calculate the average licensed operator staffing levels and the net change in operator staffing at each facility over the four-year period. However, it found no statistically significant correlation between those parameters and the overall plant performance (based on the ROP Action Matrix) or the number of events/issues involving operations staff (based on Human Factors Information System database entries) at each facility over the same time period. The staff did note that the vast majority of facilities (all but 6 of the 39 single units and all but 7 of the 32 multi-units) had experienced a decline in the number of license holders over the four-year period, with an average decline of almost ten percent. The absence of a statistically significant correlation suggests that changes in operator staffing would not be good predictor of future plant performance, however it does not preclude the possibility of a cause-and-effect relationship between operator staffing and plant performance at selected facilities.

The staff met all but two of the assessment metrics for CY 2007. Metric AS-7, "Degradations in Plant Performance Are Gradual and Allow Adequate Agency Engagement of the Licensees," failed to meet expectations based on a declining trend. Five units (four sites) moved two or more columns to the right in the Action Matrix for a variety of reasons involving PIs and inspection findings. This is a negative trend over the past few years, as only one site had moved two or more columns in the Action Matrix since the fourth quarter of 2004. The staff will assess the data and engage with the industry to better understand the root causes to determine if this is actual degradation in licensee performance or something else. Additionally, metric AS-4, "The NRC's Response to Performance Issues Is Timely," was not met based on an increase in the average number of days between issuance of the assessment letters and the completion of the supplemental inspection. However, the delays in performing the follow-up inspections were often due to the licensee not being ready for the inspection. The staff will evaluate this issue for potential improvements to the program in CY 2008.

Based on the external survey results, appropriate actions were taken to respond to performance issues and the assessment reports were generally written in useful and plain language. The CY 2007 external survey asked participants (1) if the NRC takes appropriate actions to address performance issues for those plants with identified performance deficiencies, (2) if the

information contained in assessment reports is relevant, useful, and written in plain language, and (3) whether the ROP safety culture enhancements help identify licensee safety culture weaknesses and focus licensee and NRC attention appropriately. While responses were generally favorable, some stakeholders expressed concerns with double counting of PIs and inspection findings, and particularly with the MSPI. The staff has begun to review and to engage industry on these double-counting concerns. Additionally, participants expressed concerns with the basis for deviations from the Action Matrix and perhaps a too-strict adherence to risk-informed approaches, when some subjectivity would be better suited to the situation. Some others felt that for complex issues, the Action Matrix is less clear and consistent. External stakeholders generally agreed that the information contained in assessment reports is relevant, useful, and written in plain English. Some stakeholders found the recent revisions to IMC 0305 regarding the numbering scheme for cross-cutting aspects to be an improvement. Others felt assessment reports were too concise and used too much boilerplate information, making it difficult to obtain useful information.

Overall Conclusions

Each of the four program areas of the ROP has contributed to the success of the ROP in meeting the seven program goals of being objective, risk informed, understandable, and predictable, and ensuring safety, openness, and effectiveness. The ROP achieved its intended outcomes as demonstrated by the successful implementation of the various ROP processes. Stakeholder feedback and several independent evaluations have resulted in significant program enhancements, with additional reviews underway. The staff will continue to work with industry and the external stakeholders to further enhance and improve ROP effectiveness.

Safety Culture Enhancements

Background

The U.S. Nuclear Regulatory Commission (NRC) has taken significant actions to incorporate safety culture into the Reactor Oversight Process (ROP). These efforts have included (1) revising ROP guidance documents and inspection procedures to define key safety culture aspects and prescribe when a self- or independent assessment of a licensee's safety culture is warranted based on licensee performance, (2) interacting with external stakeholders during the development phase, including providing the opportunity to comment on the draft ROP documents that incorporated the safety culture changes, (3) conducting training for inspectors on the safety culture ROP changes, and (4) implementing a multioffice ROP staff team to monitor the implementation of the safety culture enhancements, resolve implementation issues, interface with internal and external stakeholders, and evaluate and act on lessons learned. The safety culture enhancements to the ROP went into effect on July 1, 2006.

The end of calendar year (CY) 2007 marked the completion an 18-month initial implementation period, during which the staff monitored and evaluated the effectiveness of the enhancements. This enclosure provides information on the results of this initial implementation assessment in accordance with the staff's commitment to do so in SECY-06-0122, "Safety Culture Initiative Activities to Enhance the Reactor Oversight Process and Outcomes of the Initiatives," dated May 24, 2006. The need to implement additional modifications to increase the effectiveness of the ROP safety culture enhancements was determined based on the lessons learned from this initial implementation.

Lessons-Learned Evaluation Considerations and Inputs

The objectives of the lessons-learned evaluation relative to the safety culture enhancements were to identify the changes needed in ROP guidance documents to improve their effectiveness and efficiency and to interact, as appropriate, with internal and external stakeholders, including the industry, public, and nongovernment organizations, to obtain and consider their input and comments on potential changes.

The safety culture lessons-learned evaluation considered (1) staff monitoring of safety culture activities over the 18-month initial implementation period, (2) a staff audit of inspection reports on cross-cutting aspects, (3) a staff review of the implementation of guidance on cross-cutting issues and aspects, (4) Nuclear Energy Institute (NEI) and Regional Utility Group (RUG) survey results, (5) the Palo Verde Inspection Procedure 95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs, or One Red Input," lessons-learned report, (6) ROP self-assessment internal and external survey results, (7) ROP feedback forms, and (8) further staff evaluation of the cross-cutting components and aspects.

The responses to the most recent ROP external survey indicate that more experience with the safety culture enhancements is needed before judging their effectiveness in focusing NRC and licensee attention on safety culture performance issues. Nonetheless, the staff believes that it is appropriate to evaluate all of the lessons learned insights available at this time to identify aspects where the ROP guidance can be further enhanced with respect to safety culture.

To date, some lessons-learned recommendations have resulted in changes to ROP guidance documents. The staff has considered other lessons-learned recommendations and is in the process of implementing them. Finally, the staff is considering or will consider other lessons learned and will identify and implement changes to address them in the near future. The following sections describe the various sources of lessons-learned input and their status.

Lessons-Learned Evaluations Considered and Changes Implemented

Early in the implementation of the ROP safety culture enhancements, NRC staff received feedback from the ROP monthly public meetings, where the staff meets with industry representatives and obtains feedback on the implementation of the ROP from the licensees' perspectives, including the implementation of the ROP safety culture enhancements. In particular, the staff became aware of some instances of miscommunication between the inspector and the licensee relative to which cross-cutting aspect of the finding was being assigned. (Cross-cutting aspects are subelements of safety culture components that inspectors review to determine if they are a significant contributor to the performance deficiency.) In addition, internal stakeholders identified that the ROP inspection database did not readily capture cross-cutting aspects for inspection findings. To address these issues, the agency made an inspection guidance change to Inspection Manual Chapter (IMC) 0305, "Operating Reactor Assessment Program," to assign a unique alpha-numeric designator for each cross-cutting aspect so that the cross-cutting aspect could be clearly identified in verbal and written communications. The staff also made changes to the ROP inspection database to both retrofit the cross-cutting aspect designators to prior findings (from July 1, 2006) and to capture the cross-cutting aspect designator for future inspection findings.

The staff actions have resulted in improved communications between the inspectors and the licensees, as confirmed by subsequent NEI and Region IV Utility Group (RUG IV) survey feedback discussed later in this enclosure. The changes also allowed improved reactor program system (RPS) data tracking of cross-cutting aspect information for findings to allow sorting and data analysis of inspection findings in support of the ROP mid-cycle and end-of-cycle assessments.

Guidance Changes in Process from Lessons-Learned Evaluations Considered and Identified

The NRC performed other activities that provide valuable insights to the safety culture lessons-learned evaluation. The staff performed an audit of a sample of 54 inspection reports from all regions representing a variety of report types. The inspection reports were examined to evaluate how cross-cutting aspects (i.e., aspects of the safety culture components) for inspection findings were assigned and documented. The audit group concluded that overall inspectors appropriately applied guidance for assigning cross-cutting aspects; however, weaknesses were identified in the documentation of the findings. Additionally, inconsistencies in program guidance (e.g., IMC 0305 and IMC 0612, "Power Reactor Inspection Reports") for assigning and documenting cross-cutting aspects were identified.

The staff is developing several enhancements of IMC 0612 in response to the audit recommendations. Revisions to the guidance and definitions in IMC 0305 and IMC 0612 will be proposed to provide greater clarification about the relationship between performance deficiencies and cross-cutting aspects. The staff will propose further guidance in IMC 0612 to

promote greater consistency in the way that inspection reports document and support cross-cutting aspects. The staff is drafting the IMC 0612 guidance so that inspectors provide positive documentation that they considered assignment of a cross-cutting aspect in those cases when they did not assign one to a finding. Further guidance is being drafted on assigning cross-cutting aspects for performance deficiencies with multiple parts or examples. Finally, the staff will propose additional guidance to enable inspectors to make more uniform decisions on whether cross-cutting aspects reflect current licensee performance. The proposed changes to the inspection guidance are subject to management reviews that may result in subsequent changes to the inspection guidance. In addition, the agency plans to discuss the proposed changes with public stakeholders.

Another staff review group which included representatives from each of the regions, the Office of Enforcement, and the Office of Nuclear Reactor Regulation evaluated implementation practices across the four NRC regions with regard to the assignment of cross-cutting aspects to inspection findings, how cross-cutting aspects are assessed in the review process, and the identification of substantive cross-cutting issues (SCCIs). The review group performed peer observations of regional inspection debriefs and mid-cycle assessments.

The review determined that the regions are implementing the program in accordance with IMC 0612 and 0305. The review group identified that during the early stages of implementation there were some issues associated with clearly documenting cross-cutting aspects, however, there are indications showing improvement in this area. In addition, recent data is revealing that the difference between the regions on the number of findings with cross-cutting aspects is narrowing which is indicative of improved consistency among the regions. While there were some differences noted in how the regions prepared for and conducted the assessments, the differences were not significant and had no impact on the overall process.

The peer observations of mid-cycle assessments identified the need to enhance IMC 0305 to clarify that a cross-cutting theme needs to involve four or more inspection findings with the same cross-cutting aspect. The cross-cutting issue implementation staff review also identified redundancy in the first two criteria for an SCCI in the problem identification and resolution and human performance cross-cutting areas in IMC 0305, Section 06.07, "Substantive Cross-Cutting Issues." The staff will revise IMC 0305 to clarify that a cross-cutting theme is a set number of inspection findings with the same cross-cutting aspect and will clarify the SCCI criteria to eliminate confusion and redundancy.

Industry Safety Culture Surveys

NEI and the industry ROP Task Force administered a 19-question survey in August 2007 to determine whether the implementation of the ROP guidance document revisions to better address safety culture continue to meet key ROP principles.

The survey received 30 licensee respondents. NEI provided its final survey results on October 24, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML072980787).

The staff review of the NEI survey results concluded that more than 85 percent of the licensee respondents indicated that cross-cutting aspects are being properly identified at exit meetings

and in the inspection reports and inspectors are identifying the basis for their selection of cross-cutting aspects and are following the guidance in IMC 0612.

The NEI survey identified the following items:

- The majority of respondents acknowledged that safety culture and the identification of cross-cutting aspects were difficult at first. Inspectors did not always identify cross-cutting aspects during exit meetings, although they appeared in the inspection reports. However, the respondents also noted that this has changed, and the majority agrees that this is no longer a problem.
- The majority of respondents viewed that the assignment of cross-cutting aspects and the IMC 0612 guidance can be somewhat subjective. They noted that when licensees have a dialogue with the inspectors, it helps to gain a common understanding of the assigned cross-cutting aspect.
- The majority of respondents stated that they are more likely to challenge the characterization of green findings because of the associated cross-cutting aspect assignment.
- Some respondents noted considerable variability between plants in the number of inspection findings that are assigned cross-cutting aspects.

NEI communicated the following recommendations on behalf of the industry:

- Work with the NRC to clarify the guidance in IMC 0612 for the assignment of cross-cutting aspects and examples.
- Continue to monitor for consistent application of the safety culture enhancements.

In addition to the NEI survey, RUG IV performed a survey and provided the results to the NRC (in a letter dated October 30, 2007). The RUG IV survey included feedback from 13 reactor sites in Regions 1, 3, and 4. The survey included several nonsite-specific examples where cross-cutting aspects were felt not to be indicative of current performance and several examples where a finding was issued as more than minor where the belief was the issue met the criteria for minor. RUG IV stated that it had no examples where it believed that the NRC inappropriately identified an SCCI for a site. During a meeting with the NRC, RUG IV expressed an overall view similar to the NEI feedback that the NRC is now applying cross-cutting aspects more consistently and in accordance with inspection program guidelines.

In conclusion, the results of the industry surveys indicate that the majority of the industry respondents feel that the NRC is properly implementing the ROP safety culture changes regarding the assignment of cross-cutting aspects and SCCIs.

Lessons-Learned Evaluations Considered or to Be Considered and Changes to Be Evaluated

One of the major ROP safety culture enhancements was an extensive modification to Inspection Procedure 95003. The staff added guidance to the inspection procedure to describe how the NRC will evaluate a licensee's third-party safety culture assessment and how the NRC will perform its own independent assessment of the licensee's safety culture. The NRC issued the revised inspection procedure in October 2006, and it was used for the first time at the Palo Verde site in 2007. As part of the inspection procedure implementation, Region IV, which led the inspection, issued a lessons-learned report. The lessons-learned report will serve as a major input to the overall assessment to further enhance the ROP safety culture guidance documents, including Inspection Procedure 95003, to enhance their efficiency while maintaining their effectiveness in accomplishing their intended objectives. The staff will consider changes to the inspection procedure to redefine the primary focus of the NRC safety culture assessment to be determining the adequacy of the licensee's third-party safety culture assessment. If the staff's review of the third-party assessment methodology determines that it is adequate, NRC safety culture assessment resources can be better targeted to focus on areas of identified weaknesses rather than performing an independent assessment.

Several staff groups are working on evaluating the safety culture lessons-learned information to identify further enhancements for the inspection and assessment guidance. In particular, the staff is evaluating the threshold for the number of inspection findings with the same cross-cutting aspect necessary to consider whether an SCCI exists. The staff is examining the need to revise Inspection Procedure 71152, "Problem Identification and Resolution," to add more guidance regarding safety conscious work environment inspections. The staff will assess the descriptions of the cross-cutting components and cross-cutting aspects in IMC 0305 and consider modifying them as appropriate. The staff continues to evaluate input from the ROP self-assessment internal and external surveys, ROP feedback forms, and other experience gained during the 18-month implementation period.

Conclusion

Results of reviews to date indicate that the staff is appropriately implementing guidance associated with the safety culture enhancement. Some recommendations have resulted in changes to ROP guidance documents and other changes are in progress. The staff is continuing to review the safety culture lessons learned information and plans to develop additional proposed changes to the inspection program guidance. The staff plans to interact with internal and external stakeholders and issue the bulk of the revised ROP guidance documents by August 2008. The staff recognizes that some limited situations could arise during the lessons-learned evaluation where the work on the inspection program guidance could extend beyond August 2008.

Internal and External Communications

In calendar year (CY) 2007, the staff of the U.S. Nuclear Regulatory Commission (NRC) continued to focus on stakeholder involvement and open communication regarding the Reactor Oversight Process (ROP). The staff used a variety of communication methods to ensure that all stakeholders were able to access ROP information and were able to participate in the process and provide feedback. As discussed below, the staff sought and implemented improvements to the ROP based on feedback and insights from all stakeholders.

Internal Stakeholder Interface

The staff of the Office of Nuclear Reactor Regulation (NRR) and the Office of Nuclear Security and Incident Response (NSIR) continued to conduct biweekly conference calls with regional management and staff to discuss current issues associated with the ROP. In addition, the staff met periodically with regional managers to discuss more complex ROP topics and issues. The staff participated in each region's inspector counterpart meeting so that regional staff and management could provide feedback on ROP implementation. The agency frequently updated the ROP Digital City Web page to include recent and useful information specifically for internal stakeholders. The staff issued several editions of the inspector newsletter to share inspection tips and lessons learned. In addition, the staff used the Operating Experience Smart Sample program and provided information from the conduct of the Security Findings Review Panel (SFRP) to inspectors to further integrate operating experience with the ROP.

The staff continues to refine the ROP feedback process to improve its timeliness, efficiency, and effectiveness. The improved process, which staff implemented at the beginning of fiscal year (FY) 2007, assigned feedback review to the staff via a work planning and characterization form (green sheet). The NRR Work Planning and Control Center issued the green sheet to account for resource usage and track the response for timeliness. Based on feedback and lessons learned during CY 2007, staff will now limit the use of separate green sheets for feedback resolution to questions requiring interdivisional consultation. This will reduce the administrative burden. In CY 2007, the staff received a total of 123 feedback forms and resolved 101 of them. In addition, the staff resolved 90 of the 100 feedback forms from earlier years, greatly reducing the backlog. Only 32 feedback forms were open at the end of CY 2007. In CY 2008, the staff will emphasize the completion of document changes based on feedback received.

External Stakeholder Interface

The staff conducted monthly public working-level meetings with the Nuclear Energy Institute, the industry, and interested stakeholders to discuss the status of ongoing refinements to the ROP. Based on feedback from external stakeholders, the staff began adding detail to the agenda in the meeting notices so that potentially interested stakeholders could determine beforehand whether the NRC planned to discuss topics of interest. The staff also conducted public meetings in the vicinity of each operating reactor to discuss the results of the NRC's annual assessment of the licensee's performance. These meetings provided an opportunity to engage interested stakeholders on the performance of the plant and the role of the agency in ensuring safe plant operations. The staff plans to allow additional flexibility for these meetings to meet the interests of public stakeholders. Further, NSIR staff conducted an annual public meeting on November 8, 2007 to present security-related assessment information on the overall security

performance of the commercial reactor industry, and to respond to questions and solicit comments on issues concerning nuclear security. The staff also published in September 2007 the Annual Report to Congress on the Security Inspection Program. The staff also sponsored a breakout session at the Regulatory Information Conference in March 2007 focusing on the recent ROP inspection and assessment program changes related to the safety culture initiative and discussed additional ROP topics during the regional breakout sessions. The staff also issued its external survey through the *Federal Register* in October 2007 to evaluate ROP effectiveness and gather stakeholder insights. The staff maintained and enhanced the NRC's Web pages to communicate current ROP-related information and results. These outreach efforts have resulted in valuable feedback and ROP improvements.

Stakeholder Survey Results

Consistent with the guidelines prescribed by Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program," the staff conducted an external survey during this self-assessment cycle to solicit and analyze stakeholder feedback regarding the effectiveness of the ROP. The staff did not conduct an internal survey in CY 2007, consistent with the biennial frequency prescribed by IMC 0307. All of the external survey questions and resultant responses contributed directly to the annual ROP performance metrics. The staff published the survey in a *Federal Register* notice (FRN) on October 11, 2007, to seek external stakeholder input regarding the implementation of the ROP. The survey requested responses to 21 specific questions (question 20 consisted of six subquestions) corresponding to specific ROP performance metrics as defined in IMC 0307. The first half of the questions were specific to the program areas (performance indicators (PIs), inspection, significance determination process (SDP), and assessment), while the second half of the questions were more general in nature across all program areas. The agency has issued this solicitation of public comments each year since initial ROP implementation in CY 2000. The guidelines of IMC 0307 and the FRN do not preclude stakeholders from commenting on the security cornerstone.

The agency used a somewhat different survey this year in that it included no polling using multiple-choice ratings and only requested comments to each of the questions. Because of the relatively low number of responses received in each of the 3 years before 2007, the multiple-choice ratings did not provide any statistical insights. As a result, this year's survey asked for only written responses. The staff made only minor changes to a few questions but added a new question, consisting of six subquestions, to correspond with the ROP safety culture metric. Question 21 requested additional information and comments related to the ROP that were not directly captured by the 20 specific questions.

In an effort to solicit feedback, the staff (1) mailed approximately 700 surveys directly to stakeholders, (2) placed a direct link to the survey information on both the ROP Web page and the "Documents for Comment" page of the NRC's external Web site, and (3) issued a press release. The results of the external survey and the staff's plans to address the insights gained are discussed below.

The NRC received seven responses to the FRN issued in October 2007 from individuals and/or organizations listed below. These responses are available in the NRC's Agencywide Documents Access and Management System (ADAMS) under the accession numbers in parentheses following the respondent's name:

- Nuclear Energy Institute (ML073600803)
- Strategic Teaming and Resource Sharing (ML073600835)
- Entergy (ML073600853)
- Union of Concerned Scientists (ML073600850)
- Foster, private citizen (ML072960472)
- Ohio Department of Health (ML073600856)
- Region IV Utility Group (ML073600840)

Overall respondent satisfaction is similar to that measured in previous surveys. There were no dramatic improvements or declines. Based on a review of the responses, external stakeholders comprised three distinct categories—(1) utility licensees and groups that represent their interest accounted for four of the seven responses, (2) State government agencies accounted for one of the responses, and (3) public interest groups or members of the public accounted for two of the responses. The level of participation continued to decline from 16 in CY 2006 to 7 in CY 2007. However, the number of total responses received this year was only slightly less than the number of participants who provided written comments in last years survey responses.

Similar to previous survey results, the licensees and some of the public respondents were divided regarding whether the PI program is effective and ensures safety. However, this area received more positive comments than in previous surveys. Most of those that answered the survey questions believe that the PI program promotes plant safety, while a public citizen group strongly disagreed. The trend turns somewhat positive regarding the Mitigating Systems Performance Index (MSPI) and the risk-informed aspect. The negative comments contended that the reduction in the number of greater-than-green PIs has rendered the program incapable of detecting declining performance. In contrast, the industry groups and licensees stated that the PI program in conjunction with the inspection program ensures plant safety and provides sufficient overlap. The NRC staff recognizes the need to further improve the PI program to provide more timely and meaningful indications of plant performance.

Nearly all respondents, including public citizen groups, provided positive feedback on the inspection program and stated that the program adequately covers areas important to safety and is effective in identifying and ensuring the prompt correction of any performance deficiencies. This represents a slight improvement from the previous surveys. Two public comments raised an issue from different perspectives, holding that there are deficiencies in licensee corrective action programs and that the NRC's inspection program is not able to ensure the effectiveness of licensee corrective action programs. A similar public comment from the last survey also called for a stronger enforcement program to ensure corrective actions in problem areas. One licensee respondent requested that the NRC make better use of generic information on emerging inspection issues. In addition, all respondents except one agreed that inspection reports are relevant, useful, and written in plain English. Only one comment from the public stated that it is hard to obtain useful information from the inspection reports.

Similar to previous survey results, the SDP received several unfavorable comments from the respondents. The issues identified are similar to those from previous surveys, that the process is subjective, inconsistent, and unpredictable. The licensee groups seem to have the most concerns regarding the SDP process. For example, one of the concerns raised stated that the process to determine whether an issue is greater than minor is neither clear nor consistent.

The industry respondents generally agreed that actions taken by the NRC to address performance issues follow the established process and are appropriate, consistent, and predictable. One licensee group raised an issue regarding the double counting of findings in the Action Matrix. The NRC and the industry have discussed this issue and are working on a resolution. The majority of respondents, including licensees and government agencies, agree that the information in the assessment reports is relevant, useful, and written in plain English. One comment from the industry stated that the substantive cross-cutting issues identified are not consistent from region to region.

The CY 2007 survey contained a new question with six subquestions that correspond to the ROP safety culture metric. All seven respondents provided feedback on the questions and stated that more experience with the safety culture enhancements is needed before judging their effectiveness on focusing NRC and licensee resources on safety culture performance issues. The respondents suggested that the NRC (1) evaluate the lessons learned from the recent supplemental inspection at Palo Verde, (2) consider increasing the number of inspection findings for a substantive cross-cutting issue, and (3) reexamine the characterization of the cross-cutting aspects in IMC 0305, "Operating Reactor Assessment Program." As described in Enclosure 2, the staff is currently performing the lessons-learned evaluation for the ROP safety culture enhancements and will consider the input from the external survey during this process.

Based on the feedback on the questions regarding the overall program, the majority of the respondents agreed that the ROP (1) is predictable and objective, (2) is generally risk informed, (3) is understandable and written in plain English, (4) is effective, efficient, and realistic, (5) ensures openness in the regulatory process, (6) provides sufficient opportunities for the public to participate in the process, (7) has been implemented as defined, (8) minimizes unintended consequences, and (9) provides adequate regulatory assurance when combined with other NRC regulatory processes that plants are being operated and maintained safely. Respondents noted concerns that the ROP is more reactive than proactive.

With regard to openness, a public citizen group asked that the NRC include more details in the ROP monthly meeting agenda so the public is aware of the topics to be discussed. The agency has already addressed this concern, as noted above. A majority of respondents, including government agencies and members of the public, agree that the NRC has been responsive to public inputs. Only one public respondent disagreed and stated that the NRC's response has been slow or inadequate. An additional comment indicated that it can be intimidating for a member of the public to provide input during public meetings.

In addition to the general analysis above, the staff's analysis of the specific responses appears in the applicable portions of the program area evaluations in Enclosures 1 and 2 as well as in the annual ROP performance metrics report (ADAMS Accession No. ML080350368).

As noted above, the staff reviewed all of the survey responses and evaluated the stakeholder comments as part of this annual self-assessment. The staff also plans to prepare a consolidated response to the CY 2007 external survey, as it did for CYs 2004, 2005, and 2006. In addition, to ensure continued openness and responsiveness to public input and comments on the ROP, the staff plans to complete this task in response to future external surveys in accordance with the revised IMC 0307.

As noted in SECY-07-0069, "Reactor Oversight Process Self-Assessment for Calendar Year 2006," dated April 6, 2007, IMC 0307 changed the frequency of the external survey to every other year, alternating with the internal survey. This change was suggested in order to gain further efficiencies and because the comments and staff analysis had tended to repeat the same themes from year to year. The level of participation also experienced a notable decline from previous years' surveys. The staff solicited feedback regarding the proposed change in survey frequency by adding a specific question to the 2006 external survey. Half of the respondents indicated that they agreed with the change in frequency, while the other half indicated that they disagreed, including a few who expressed concerns with changing the frequency. As a result, the staff stated that it planned to conduct the external survey in CY 2007 and revise IMC 0307 to change the frequency to every other year. Based on this change, the ROP performance metrics and self-assessment for the even years would include survey inputs and analysis from internal stakeholders (starting in CY 2008), and the following odd years would include external survey inputs and analysis (the next one occurring in CY 2009). Regardless, the staff will consider internal and external feedback each year based on continuous feedback during meetings, the feedback process, and other venues. In addition, the staff will continue to solicit and consider stakeholder feedback for significant ROP changes (e.g., safety culture, MSPI, openness of the security cornerstone, material control and accounting significance determination process, etc.).

As in previous years, the staff will acknowledge receipt of each FRN response by correspondence indicating that the staff has considered and generally addressed the comments in this paper. In addition, the NRC will post this paper, the annual ROP performance metric report, and the consolidated response to the ROP Web page and send them, along with the acknowledgment letters, to each survey respondent. Interested parties can also access a consolidated table, including all internal and external survey results since the inception of the ROP, along with the staff's evaluation and response, through the ROP Web page entitled "ROP Program Evaluations and Stakeholder Feedback."

Regulatory Impact Summary

Scope and Objectives

On December 20, 1991, the Commission issued a staff requirements memorandum directing the staff of the U.S. Nuclear Regulatory Commission (NRC) to develop a process for obtaining continual feedback from licensees and to report the feedback on the process to the Commission each year. The staff described the continual feedback process in SECY-92-286, "Staff's Progress on Implementing Activities Described in SECY-91-172, 'Regulatory Impact Survey Report—Final,'" dated August 18, 1992.

The feedback process requires regional management to solicit informal feedback from their licensees during routine visits to reactor sites. The managers record this feedback and forward the feedback forms to the Office of Nuclear Reactor Regulation (NRR) and the Office of Nuclear Security and Incident Response (NSIR). The regions, NRR, and NSIR then evaluate the concerns identified and take any necessary corrective actions. This process, which was implemented in October 1992, has given licensees frequent opportunities to comment on regulatory impact.

This enclosure reports on feedback received from licensees during the previous fiscal year. During this period, the staff received feedback from 68 reactor licensees regarding 139 issues, down from 191 over the previous period. The comments fell into two main categories—formal communication with licensees and inspector performance. Of the comments received, 86 percent were favorable and 14 percent were unfavorable.

One category discussed last year was licensee complaints regarding the number of regulatory changes in the security and safeguards area. NRC actions to improve consistency and stability in this area and the completion of a November 2007 public meeting appear to have been effective, as licensees raised no complaints this year.

The following sections summarize the feedback received and the staff's evaluation.

Formal Communication with Licensees

Feedback

Half of the licensees' comments concerned the effectiveness of communication between the NRC staff and licensees, and over 90 percent of these comments were favorable. Almost all comments were favorable with regard to communications with inspectors and regional management.

Many licensees said that communication was good or excellent, and others noted that the staff's communication skills have improved. A few licensees reported a communication problem related to the clarity of an inspection issue.

Evaluation

The staff concludes that the communication between the NRC and its licensees is effective and that the reported communication problems were isolated instances. The staff based this conclusion on the large number of routine interactions between the NRC and its licensees, combined with the large number of favorable comments and the relatively small number of unfavorable comments received during the past year.

The staff is aware of the importance of prompt and accurate communication and emphasizes this goal in the policy, guidance, and training for the inspection program. Effective communications will remain a challenge and will receive continuing attention from regional and headquarters management.

Inspector Performance

Feedback

One-quarter of the licensees' comments concerned inspector performance. This category covers a wide range of inspector practices, but it excludes issues involving communication with licensees discussed in the previous section. Almost 85 percent of the comments praised the NRC's inspection staff, noting the high quality of inspections, the technical competence, and the effective working relationship between the NRC and its licensees.

Licensees viewed inspections performed by resident and region-based inspectors as professional and of high quality. However, a few licensees made unfavorable comments regarding concerns or disagreements they had with the inspector's characterization of an inspection issue.

Evaluation

The staff concludes that inspectors, with the exception of isolated incidents, were professional and maintained effective working relationships. About 85 percent of the comments received this year were favorable. The staff reviewed the negative feedback for trends, but found only isolated incidents; therefore, no actions are needed at this time.

NRC management continues to emphasize to the staff the importance of professional conduct. Senior NRC managers reinforce these expectations in inspector counterpart meetings, workshops, training courses, and during site visits conducted in accordance with Inspection Manual Chapter 0102, "Oversight and Objectivity of Inspectors and Examiners at Reactor Facilities." The staff will continue to closely monitor inspector performance.

ROP Resources

Summary of 2007 Reactor Oversight Process Resources

Table 1¹ summarizes U.S. Nuclear Regulatory Commission (NRC) staff resources expended for the Reactor Oversight Process (ROP) during the past 3 fiscal years (FYs). Overall staff effort in FY 2007 increased by 2.3 percent compared with FY 2006 for the activities listed in Table 1.

Baseline inspection hours include direct inspection effort, baseline inspection preparation and documentation, and plant status activity. Baseline inspection hours increased in 2007 primarily because of increased direct inspection effort with a corresponding increase in baseline inspection preparation and documentation. The inspection procedures (IPs) that account for the bulk of the increase are IP 71111.21, "Component Design Bases Inspection," IP 71152, "Identification and Resolution of Problems," and IP 71153, "Followup of Events and Notices of Enforcement Discretion." The increase related to IP 71152 also reflects accounting changes implemented in the middle of CY 2006, in which effort related to daily reviews of licensee corrective action is charged to IP 71152 instead of to "plant status." As such, "plant status" effort continued the corresponding reduction seen initially in FY 2006. The direct inspection effort for the baseline inspections funded by the Office of Nuclear Security and Incident Response (NSIR) in FY 2007 remained essentially unchanged from FY 2006 levels. The staff plans to evaluate the baseline inspection expenditures in CY 2008 to further understand this increase. As in the 2006 inspection cycle, all four regions completed the required baseline inspections in 2007.

Plant-specific inspections include supplemental inspections conducted in response to greater-than-green inspection findings and performance indicators, reactive inspections such as augmented inspection teams (AITs) and special inspections (SIs) performed in response to events, and the infrequently performed inspections listed in Appendix C of NRC Inspection Manual Chapters (IMC) 2515 and IMC 2201, "Security and Safeguards Inspection program for Commercial Power Reactors," that are not part of the baseline or supplemental inspection program.

Plant-specific inspections noticeably decreased in FY 2007 compared with FY 2006. The decrease was evident in all the components of plant-specific inspections. The effort for supplemental inspections (IP 95001, IP 95002, and IP 95003) decreased in FY 2007 compared with FY 2006. A decrease was also reported in reactive inspection effort (AITs and SIs) and for the infrequently performed inspections. Since the staff conducts these inspections in response to operational events and inspection findings, significant variability in effort is possible from year to year. This paper reports resource data for the period September 24, 2006, through September 22, 2007, and several significant inspections took place after this time period. The FY 2008 results will capture those expenditures, and the staff expects a significant increase in resources spent on plant-specific inspections, including those for the security cornerstone (e.g., safeguards information control and Exelon contracted security force transition, etc.).

¹ The staff implements the ROP on a calendar year (CY) basis; however, it obtains and reports resource data on an FY basis.

An increase in effort related to generic safety issues (GSI) inspections reflects the growing activity in this area. GSI inspections are typically one-time inspections of specific safety issues, with significant variability in effort possible from year to year.

The effort reported for “other activities,” including inspection related travel, significance determination process, and routine communication (which now encompasses regional support, enforcement support, and review of technical documents) also increased slightly in 2007. The effort for these activities tends to respond in concert with baseline inspection effort

The regional effort for licensee performance assessment continued to decline in 2007. This continuing trend is most likely indicative of the maturing staff familiarity with the performance assessment process.

ROP Resource Model and Regional Inspection Budget

The regional inspection budget for FY 2007 and beyond was increased slightly to reflect ROP resource requirements. Issues related to inspection resources are reviewed as part of the ongoing ROP self-assessment and budget resources are adjusted as required by program needs.

In 2006, Region I piloted a resource model that includes a “unique site” designation in addition to single-, dual- and triple-unit sites. This “unique site budget model” (USBM) concept was piloted at Beaver Valley (BV), Nine Mile Point (NMP), and Millstone (MS) during the 2006 inspection cycle.

Based on an assessment of the results the staff concluded that, overall, the pilot implementation in Region I demonstrated that the concept of the USBM is valid and allows for an equivalent level of confidence in the NRC’s oversight of licensee performance at unique, dual-unit sites as compared to how these sites were previously inspected and assessed. Previously, MS was treated as two single units, and NMP was treated as a normal dual-unit model with additional regional resources applied.

The staff approved, going forward, implementation of the USBM model at MS and NMP with allocation of the corresponding resources. The staff also concluded that the USBM is not applicable to BV since the difference between the BV units are less significant and primarily relate to organizational and procedural differences. The USBM is appropriate for MS and NMP since these sites have significant design, organizational structure, and physical differences. Implementing the USBM at MS and NMP provides a net efficiency given that MS was previously budgeted as two, single-unit sites under the ROP. Implementing the USBM for MS and NMP results in an overall resource savings as the reduction in FTE in going from two, single-unit sites at MS offsets the increase in FTE associated with going from a dual-unit site to the USBM in the case of NMP.

For budget considerations, in general, USBM nominal values equal the dual-unit maximum values for sample size and inspection hours, with a ± 15 percent range which is consistent with the variance used for ROP inspection procedures. Resources at this level have been included in the FY 2008 and 2009 NRR/Regional baseline inspection budget to implement the USBM and inspect MS and NMP as unique dual-unit sites.

As a result of its assessment, the staff also concluded that the USBM is suitable for consideration for other dual-unit sites with design, organizational, physical, regulatory, and procedural differences, and proposed a protocol for other regions to consider and adopt the USBM, as appropriate. Basically, a regional office would evaluate the differences between site units against previously identified criteria. If it determined that the site was unique, the regional office would provide justification for approval to adopt the USBM for that site.

Reactor Oversight Process Improvement Initiatives

Since the formation of NSIR, the legacy activity codes used to report inspection-related effort charged to the ROP made it difficult to identify and separate the specific ROP effort attributable to NSIR and NRR individually. As a way to eliminate this difficulty, in FY 2007, the staff revised the inspection-related time-reporting codes to allow precise identification of the hours charged to ROP inspection-related activities. Time-reporting activity codes were established for those inspection-related activities that are funded by NSIR. These new NSIR codes parallel the existing NRR activity codes. In addition, several of the NRR inspection activity codes were also revised and renamed to more accurately identify the work to which the activity code refers. The changes that have been implemented should improve the accuracy of ROP time reporting.

A number of initiatives are currently underway that may improve program efficiency and effectiveness and may reduce inspection resource requirements. These initiatives include a realignment of resources allocated to the individual baseline inspection procedures (including design engineering inspections), regional best practice initiatives, continued significance determination process improvements, and implementation of the performance indicator improvements. These initiatives are discussed in other sections of this paper.

**Table 1
Resources Expended¹
(Inspection-Related Staff Effort Expended at Operating Power Reactors)**

	52 weeks FY 2005 9/26/04-9/24/05	52 weeks FY 2006 9/25/05-9/23/06	52 weeks FY 2007 9/24/06-9/22/07
Baseline Inspections			
Direct Inspection Effort	145,042	144,117	156,547
Inspection Prep/Doc	110,837	107,042	111,770
Plant Status	<u>55,394</u>	<u>51,488</u>	<u>48,804</u>
Subtotal	311,273	302,647	317,130
Plant Specific Inspections			
Direct Inspection Effort	14,818	16,709	12,278
Inspection Prep/Doc	<u>9,149</u>	<u>11,130</u>	<u>8,174</u>
Subtotal	23,967	27,839	20,452
GSI/SI	10,011	8,295	11,212
Performance Assessment (Regional effort only)	19,284	16,885	14,349
Other Activities ²	59,290	66,156	68,493
Total Staff Effort	423,825 hrs	421,822 hrs	431,636 hrs
Total Staff Effort/Operating Site³	6,326 hrs/site	6,296 hrs/site	6,540 hrs/site

¹ Includes regional, NRR, and NSIR hours.

² Other activities include inspection related travel, significance determination process, and routine communication (which encompasses regional support, enforcement support, and review of technical documents).

³ In prior years, MS was treated as two single-unit sites. Starting in 2007, the NRC inspected MS as one dual-unit site. Therefore, the number of sites decreased from 67 to 66 in FY 2007. The FY 2007 increase in total staff effort resulted, in part, from the use of a smaller denominator for this calculation.

Resident Inspector Demographics

Scope and Objectives

This enclosure provides the annual update on demographic data for inspectors assigned to the resident inspector (RI) program, as the Commission directed in a staff requirements memorandum issued April 8, 1998. This analysis seeks to determine whether the agency's actions associated with the RI program have resulted in a stable or increasing resident experience base and to identify any necessary actions. This enclosure also provides an update on site staffing.

Resident Inspector Demographic Data

The U.S. Nuclear Regulatory Commission (NRC) staff review of the demographics included analysis of the overall program data for the RI and senior resident inspector (SRI) groups (see Tables 1–6 and Figures 1–10). The staff used median values from the month of November 2003 to November 2007 for statistical comparison.

The demographic analysis consists of the following four distinct data sets:

- (1) "NRC time" is the total number of years the individual has accumulated as an NRC employee.
- (2) "Total resident time" is the total number of years the individual has accumulated as an RI or SRI.
- (3) "Current site time" is the total number of years spent as an RI or SRI at the current site.
- (4) "Relevant non-NRC experience" is nuclear power experience acquired outside of the NRC. Examples of relevant non-NRC experience include operation, engineering, maintenance, or construction experience with commercial nuclear power plants, naval shipyards, U.S. Department of Energy facilities, or the U.S. Navy's nuclear power program.

Analysis of 2007 Resident Inspector Group

RI demographic data for 2007 (see Tables 1, 3, and 5 and Figures 1, 3, 5, 7, and 9) indicate that the RI turnover rate increased resulting in a decrease of both total resident time and current site time. Although the turnover rate has increased and current site time and total resident time numbers are down, the RIs continue to maintain a high level of experience.

During 2007, 33 of 72 RIs left the RI program (46 percent). Of the 33 RIs who left, 13 were promoted to SRI positions, 13 were either promoted or laterally reassigned to a regional office or headquarters, 3 retired, and 4 resigned from the NRC. This data does not include RIs who were laterally reassigned to another site. Table 1 tracks the RIs who left the RI program from 2003 to 2007.

**Table 1
Resident Inspector Turnover**

	2003	2004	2005	2006	2007
Promoted to SRI	14	3	10	11	13
Promoted/ Reassigned	12	3	9	2	13
Retired	1	0	2	1	3
Resigned	0	0	2	0	4
Total	27	6	23	14	33
Turnover Rate	38%	8%	32%	20%	46%

The RI turnover rate for 2007 increased by 26 percent from 2006. Even though a significant portion of the RIs were promoted to an SRI position (40 percent), an equal share of the RIs were either promoted or reassigned outside the RI program.

This turnover has resulted in decreases in the total resident time and current site time across the agency. The national median value (NMV) for total resident time decreased 20 percent from 2006 to 2007. This decrease offset the gradual 20 percent increase in the NMV for total resident time from 2003 to 2006.

The national data from 2003 to 2007 shows that the RIs have maintained an average of 10 years relevant non-NRC experience and 4 years of NRC time. This demonstrates that the RIs continue to maintain a high level of experience despite the high turnover rates in recent years.

Further, there were 18 new RIs in 2007 and they had an average of 10 years of relevant non-NRC experience and 3 years of NRC time (or a combined total of 13 years relevant nuclear experience). This shows that the new RIs that are filling open positions have a substantial amount of nuclear experience. The staff is considering combining the NRC time and relevant non-NRC experience data to reflect overall nuclear experience in the next revision to IMC 0307.

NOTE: The RI demographics data in 2008 will reflect the addition of five new RIs from November to December 2007.

The staff was directed in the staff requirements memorandum dated June 14, 2007 to evaluate the recruitment, training, and development of the RI program to confirm that the human resources are adequate to meet changing needs. The staff collected the following information:

- RI Recruitment - The regions recruit inspectors to potentially fill RI positions externally from universities, service academy career conferences, job fairs, the Nuclear Safety

Professional Development Program, U.S. Navy and shipyards, the nuclear power industry, and corporate engineering firms. The regions recruit internally by posting RI vacancies within the region or nationwide. Due to the high turnover rate in 2007, the regions have had difficulty filling RI vacancies and have implemented various recruitment strategies to fill the open positions. The staff will continue to evaluate the RI recruitment strategies in 2008.

- **RI Training** - In 2007, the regions qualified 23 individuals in accordance with Inspection Manual Chapter (IMC) 1245, "Inspector Qualification Program." Currently, 41 individuals are in the IMC 1245 qualification program, and 38 are projected to receive their inspector qualification in 2008. Overall, the inspector training program in the regions is well established and continues to produce highly qualified inspectors.
- **RI Development** - RIs continue to develop professionally by filling rotational assignments and participating in team inspections, training opportunities, inspector seminars, and knowledge transfer sessions.

Analysis of 2007 Senior Resident Inspector Group

SRI demographic data for 2007 (see Tables 2, 4, and 6 and Figures 2, 4, 6, 8, and 10) indicate that the SRI turnover rate was high resulting in a national decrease in current site time from 2006 to 2007. Although there was a national drop in current site time, the NMV for total nuclear experience (combined NRC time and relevant non-NRC time) and total resident time has increased annually since 2004.

In 2007, 17 of 66 SRIs left the program (26 percent). Of those 17, 7 were promoted, 7 were laterally reassigned to headquarters or a regional office, 1 retired, and 2 resigned from the NRC. This data does not include SRIs who were laterally reassigned to another site. Table 2 tracks the SRIs who left the program from 2003 to 2007.

Table 2
Senior Resident Inspector Turnover

	2003	2004	2005	2006	2007
Promoted	7	0	5	7	7
Reassigned	6	3	4	7	7
Retired	1	2	1	1	1
Resigned	0	0	0	1	2
Total	14	5	10	16	17
Turnover Rate	21%	8%	15%	24%	26%

The SRI turnover rate in 2007 (26 percent) is about the same as in 2006; however, it has been increasing since 2004. The high national SRI turnover rate directly affected the NMV for current site time. In 2007, all four regions' SRI current site time was less than three years and decreased from 2006. This decrease offset the gradual national current site time increase from 2003 to 2006. Although the national current site time numbers have decreased, SRI experience level remains high in that the NMV for total resident time and relevant nuclear experience has been increasing since 2004.

The staff was directed in the staff requirements memorandum dated June 14, 2007, to consider ways to enable SRIs to be promoted and still remain within the RI program. A task force of staff from the Office of the Executive Director for Operations and the Deputy Regional Administrators is currently assessing RI program retention issues and will provide the Deputy Executive Director for Regulatory Programs with recommendations and potential solutions.

Site Staffing Requirement

The staff developed a site staffing metric in response to a recommendation by the Davis-Besse Lessons Learned Task Force (DBLLTF). The purpose of the metric is to evaluate the agency's ability to provide continuity of regulatory oversight. Specifically, DBLLTF item 3.3.5.3 recommended that the staff establish a measurement for RI staffing, including program expectations to satisfy minimum staffing levels.

The following note is an excerpt from IMC 0307, "ROP Self-Assessment," and defines the staffing metric criterion:

NOTE: Inspectors assigned to the site permanently or through a rotation with a minimum duration of 6 weeks shall be counted. Inspectors on 6 week or longer rotational assignments will be identified as such. Inspectors assigned to the site for less than six weeks will not be counted, but should be indicated as such. Additionally, the regions shall indicate sites where permanently assigned resident or senior resident inspectors are away from the site for an extended period of time (one continuous time period which is greater than 6 weeks). Only inspectors who have attained at least a basic inspector certification status, as defined by Appendix A to Inspection Manual Chapter 1245, shall be counted.

Data will indicate the number of days a qualified resident and senior resident inspector are permanently assigned to the site during the year divided by the number of days in the year. Number of days spent on training; meetings away from the site; participation in team inspections; leave; or other temporary duties (e.g. acting for branch chiefs in his/her absence) will not be counted against the metric unless the absence exceeds 6 continuous weeks.

Site Staffing Analysis

The criterion for the metric is 90 percent program wide. In 2007 the average site staffing for all the regions was 96 percent, with each region exceeding 90 percent. However, nine sites were below the 90 percent mark. Of these nine sites, eight were between 84 and 89 percent, and one site was 74 percent. The site that had 74 percent site staffing had an RI who retired from the NRC in June of 2007. For each of these nine sites, the vacancies were temporarily filled by

qualified inspectors, but their tours were less than the minimum duration of 6 weeks and therefore counted against the metric. In 2005 three sites did not meet the criterion of 90 percent and in 2006 only one site was below 90 percent.

As a result of the high turnover rate in 2007, the regions were presented a significant challenge in providing continuity of regulatory oversight at the affected sites. Two regions were able to meet the 90 percent site staffing goal at all of the individual sites; however, this was a significant burden on the regional staff and management. The RI and SRI vacancies were filled by inspectors on extended rotations, resulting in complex regional human resource allocation issues. Additionally, inspection resources were provided by other regions and headquarters enabling the region to fill the openings for 6 weeks or longer and meet the metric. The other two regions experienced difficulty in staffing the vacant RI and SRI positions for extended periods resulting in 9 sites falling below the 90 percent site staffing goal. In 2007, the sites that fell below the 90 percent mark were dealing with an RI or SRI who left the site permanently (either by retirement, resignation, or transfer to a regional or headquarters position). To support the site inspection efforts, the regions provided qualified inspectors to the sites but for periods shorter than 6 weeks. Because these periods were less than 6 weeks, the site was recorded as not continuously staffed during this timeframe. However, at no time did these sites remain without qualified inspectors to support the required inspection efforts.

Conclusions

The staff concluded the following:

- The combined RI and SRI turnover rate increased significantly in 2007 creating a complex regional human resource allocation issue.
- The NMVs for RI total resident time and for both RI and SRI current site time decreased from 2006 to 2007 as a result of the high turnover rates.
- In 2007, nine sites experienced staffing levels below 90 percent according to the site staffing metric criteria. This is a significant increase from 2005 and 2006. The site staffing data correlate with the high RI and SRI turnover rates.
- The overall experience levels (NRC time and relevant non-NRC time) of RIs and SRIs have remained high as indicated by the national data since 2003 (see Figures 9 and 10).

The two significant impacts in 2007 were the high RI and SRI turnover rates and the increase in the number of sites with a staffing level below 90 percent. The RI and SRI turnover rates were elevated because of the increase in promotional opportunities at the Office of New Reactors and the construction inspection efforts in Region II. Since the RI and SRI turnover rates were 46 percent and 26 percent respectively, it was difficult to provide permanent inspectors to sites in a timely manner. As a result, nine individual sites had staffing levels below 90 percent according to the site staffing metric criteria. The staff will review current program requirements to address the increased RI and SRI turnover rates to ensure site staffing continuity. Specifically, a task force of NRC staff is currently assessing RI program retention issues and various recruitment barriers.

- (1) **NRC Time:** NRC time for RIs increased in Region III, remained relatively constant in Regions I and IV, and decreased in Region II. NRC time for the SRIs increased in Region I and remained relatively constant in Regions II, III, and IV.

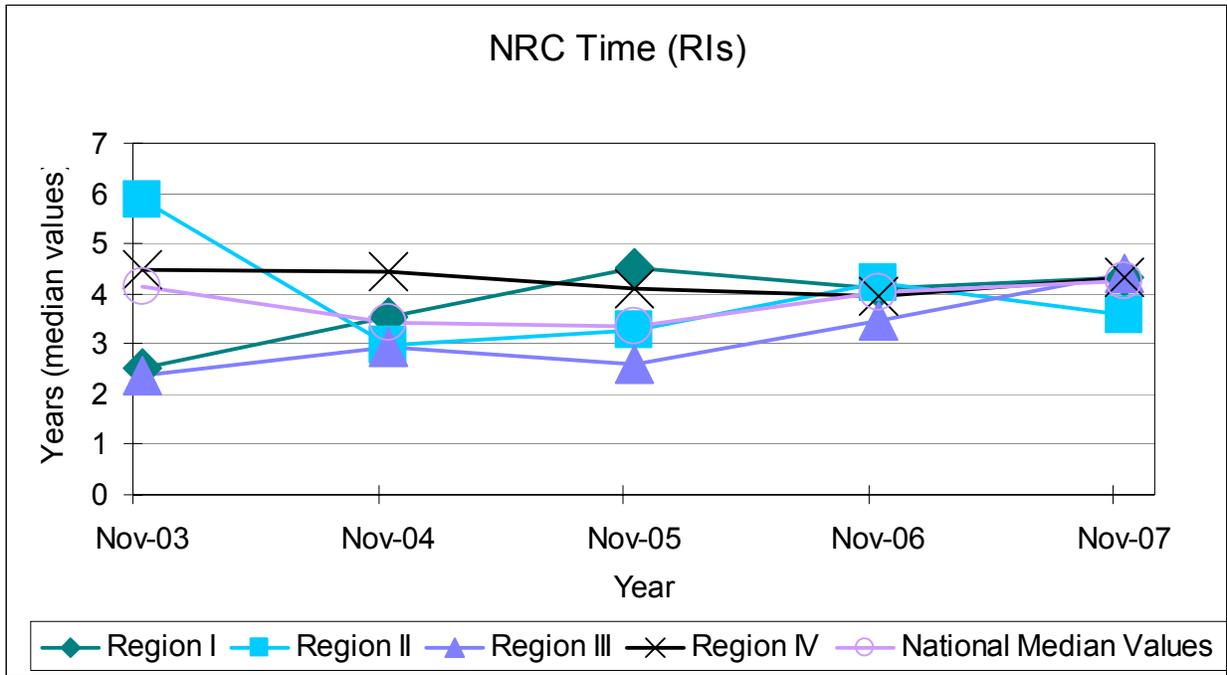


Figure 1

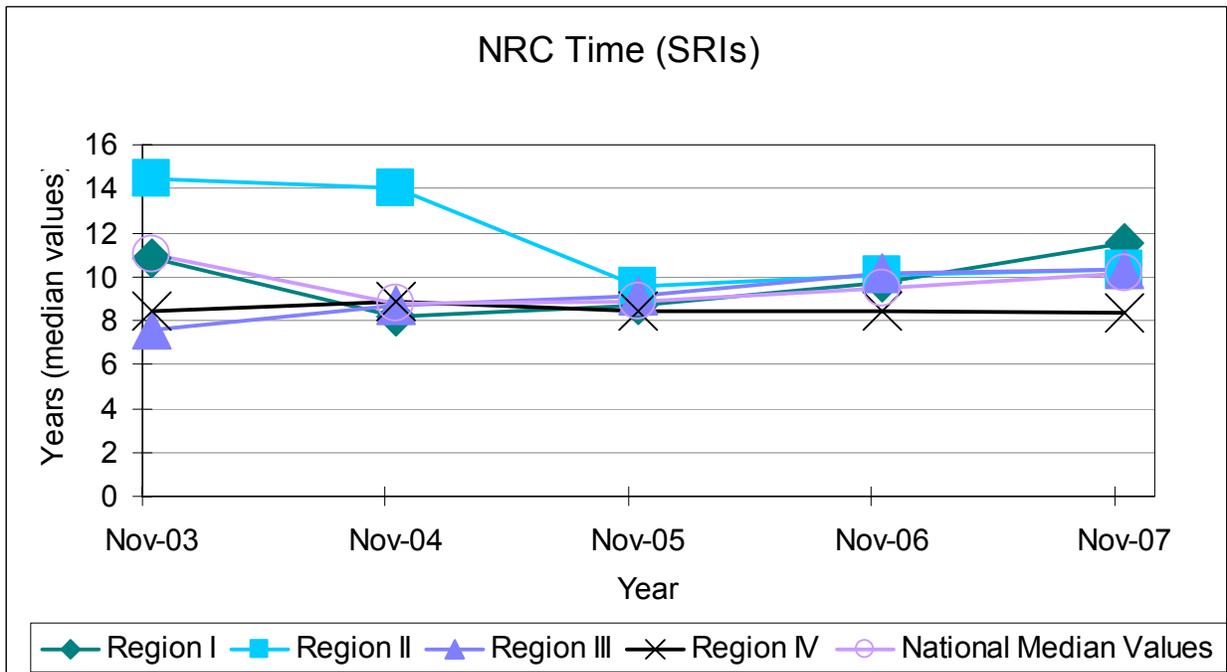


Figure 2

- (2) **Total Resident Time:** Total resident time for the RIs increased in Region I, remained relatively constant in Region III, and decreased in Regions II and IV. Total resident time for the SRIs increased in Regions II, III, and IV and remained relatively constant in Region I.

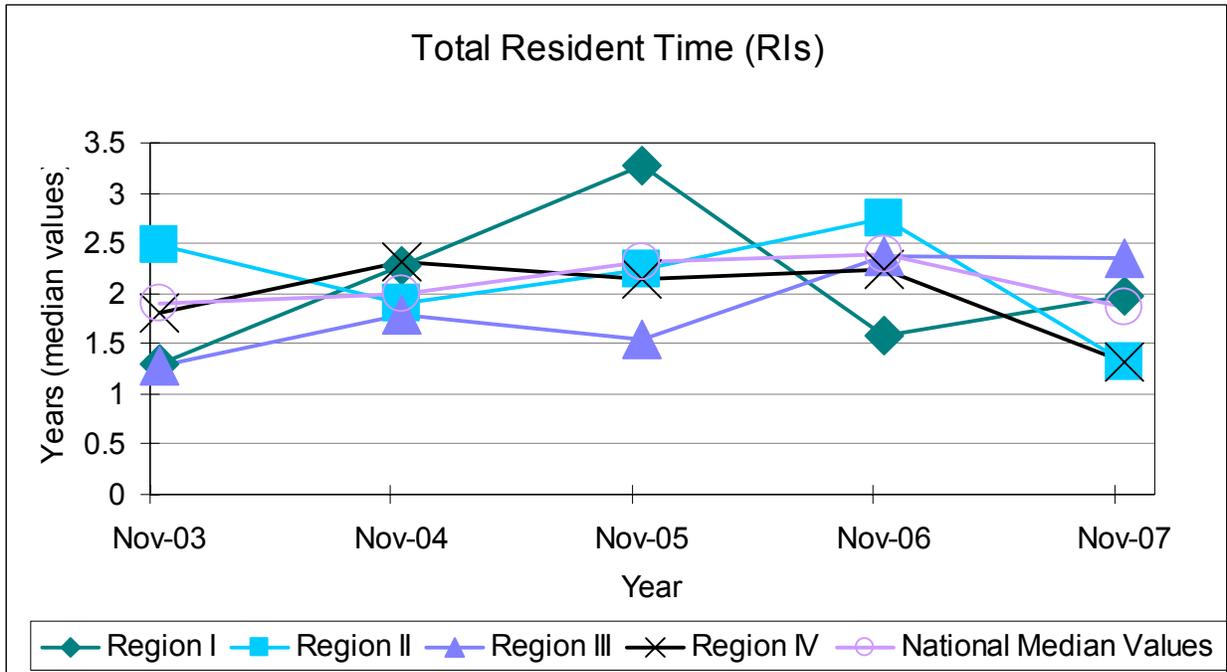


Figure 3

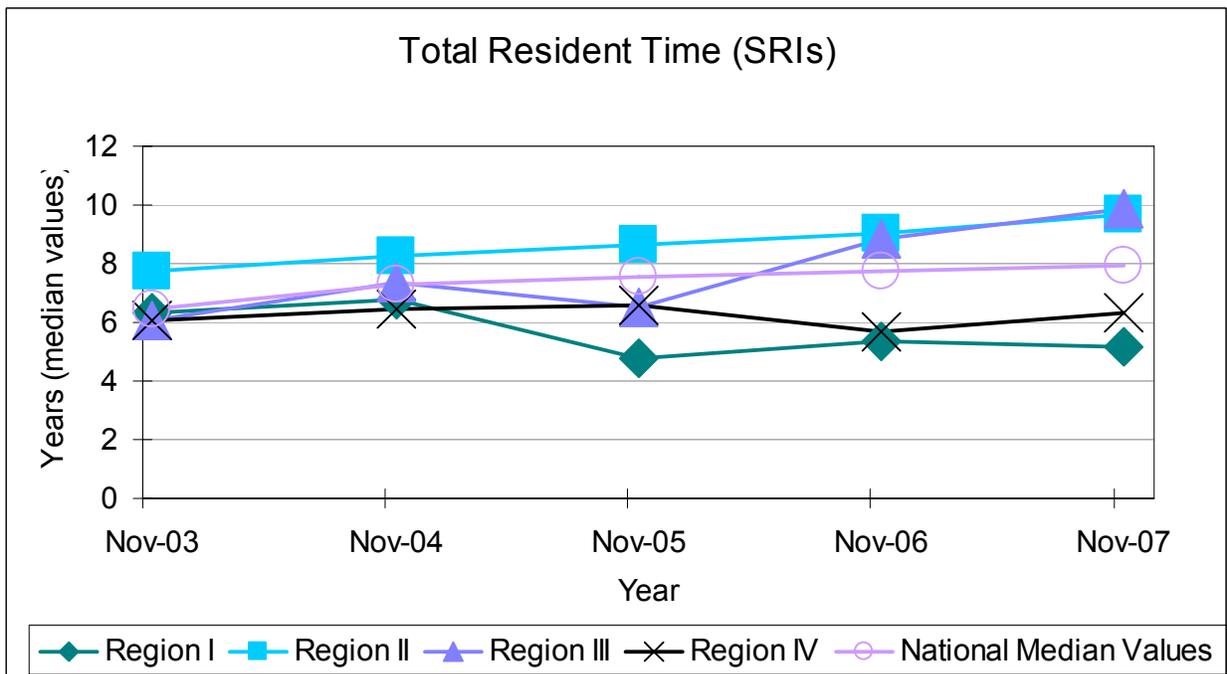


Figure 4

- (3) **Current Site Time:** Current site time for the RIs increased in Region I, remained relatively constant in Region III, and decreased in Regions II and IV. Current site time for the SRIs remained relatively constant in Region II and decreased in Regions I, III, and IV.

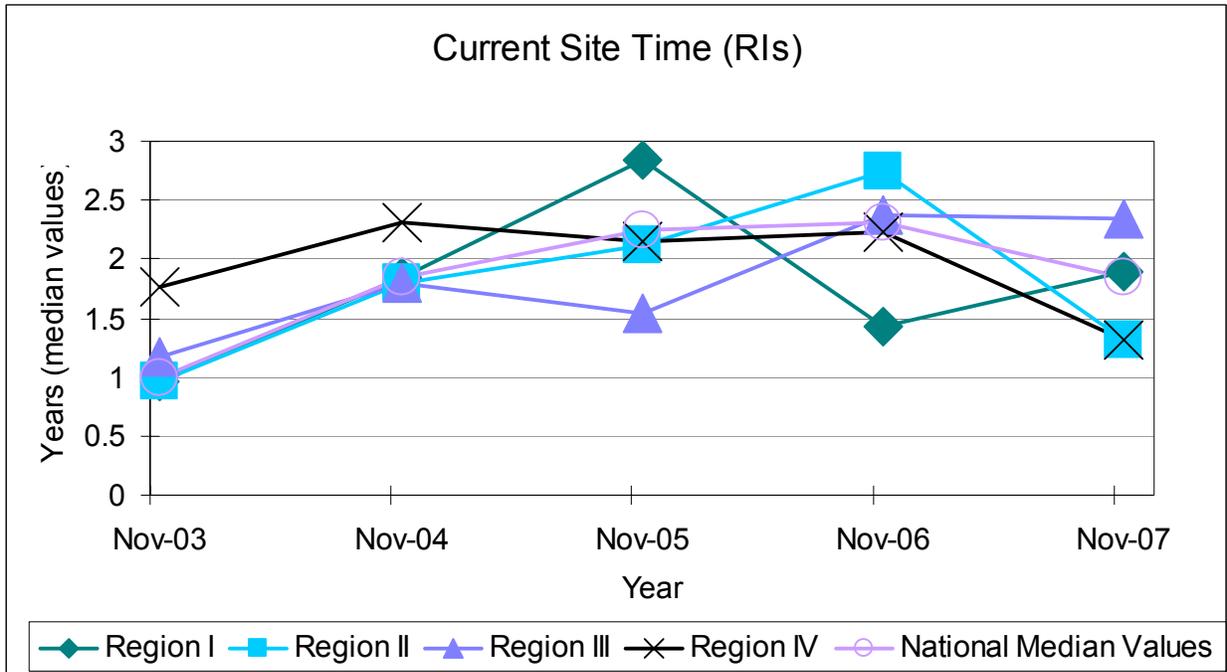


Figure 5

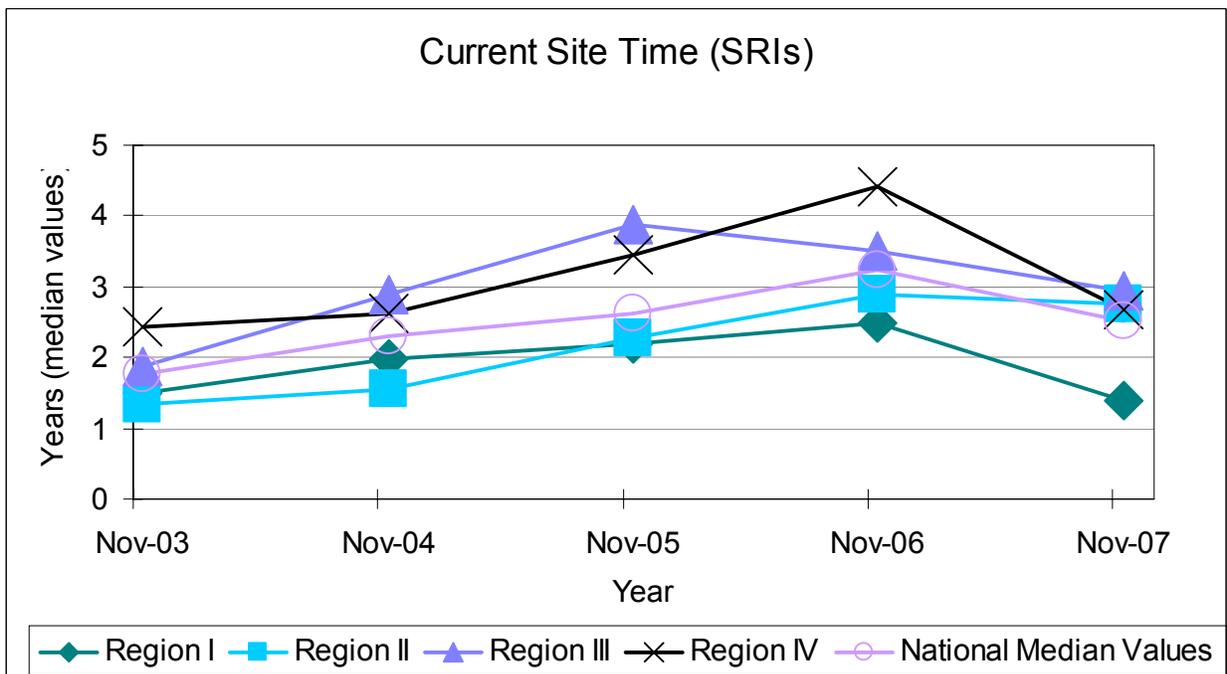


Figure 6

- (4) **Relevant Non-NRC Experience:** Relevant non-NRC experience for the RIs increased in Region II, remained relatively constant in Region IV, and decreased in Regions I and III. Relevant non-NRC experience for the SRIs increased in Regions I, II, and IV and remained relatively constant in Region III.

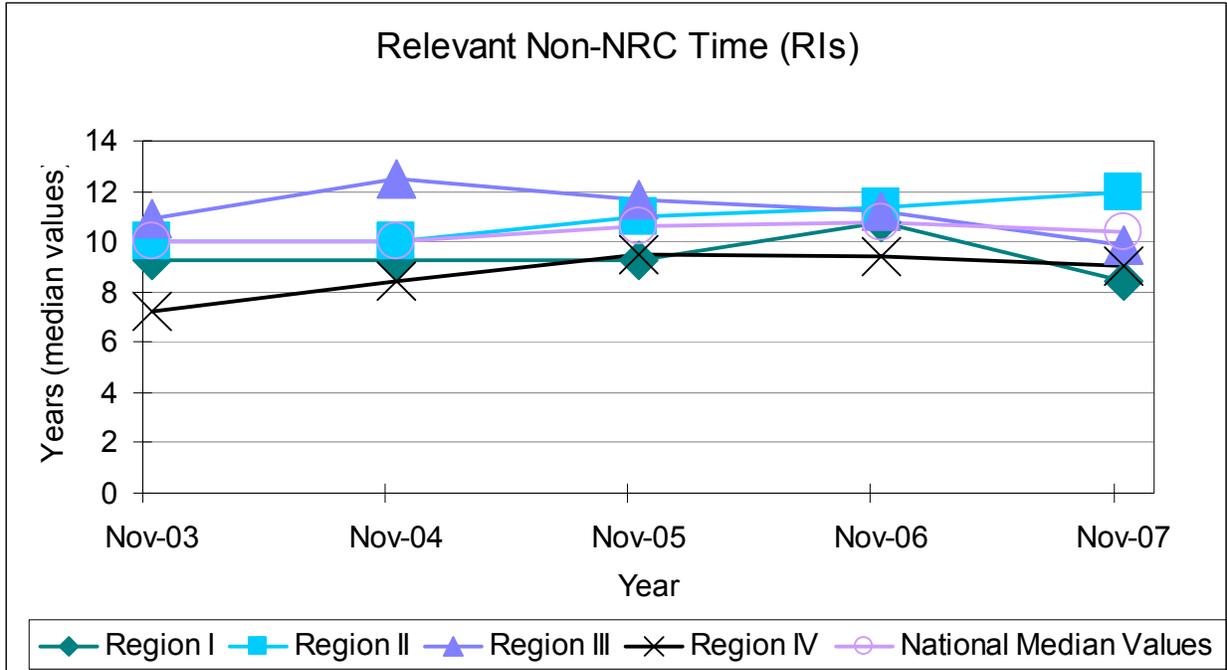


Figure 7

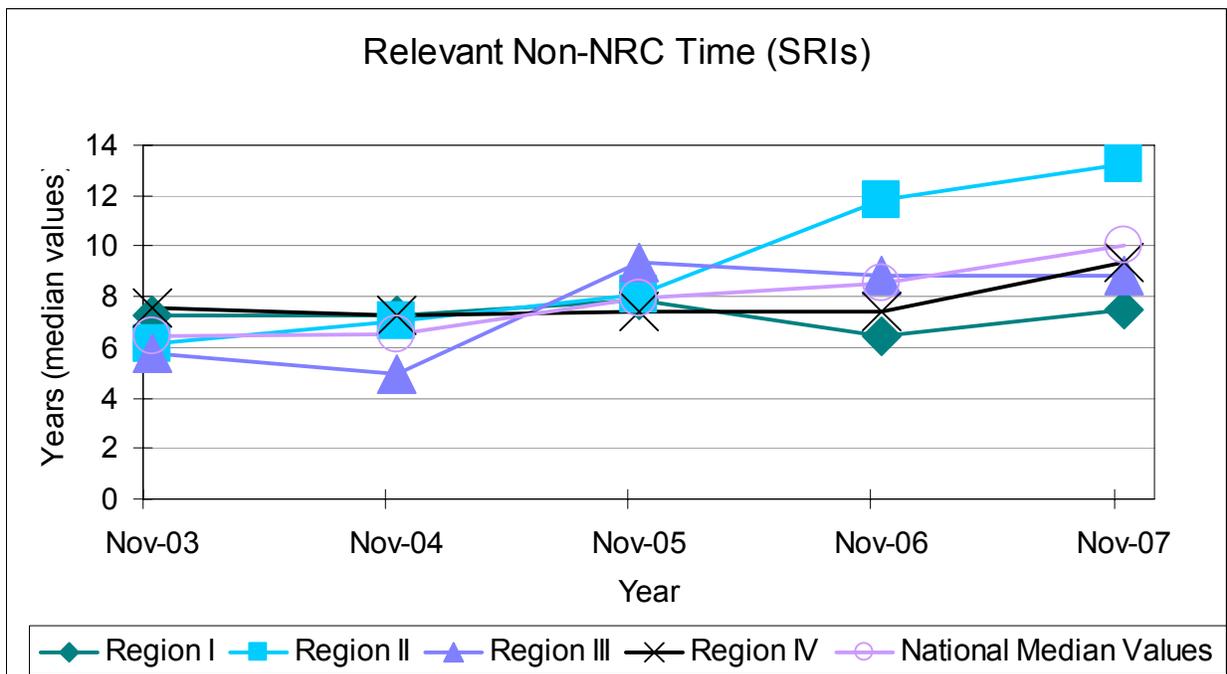


Figure 8

Summary: Overall, the demographic data regarding the RIs were relatively constant. As for the SRIs, there was a slight increase in NRC time and relevant non-NRC experience, total resident time remained constant, and there was a slight decrease in current site time.

**Table 3
Resident Inspectors**

	2003	2004	2005	2006	2007
NRC Time	4.13	3.42	3.36	4.04	4.25
Total Resident Time	1.99	2.00	2.31	2.39	1.87
Current Site Time	1.00	1.85	2.25	2.23	1.85
Relevant Non- NRC Experience	10.00	10.00	10.63	10.75	10.38

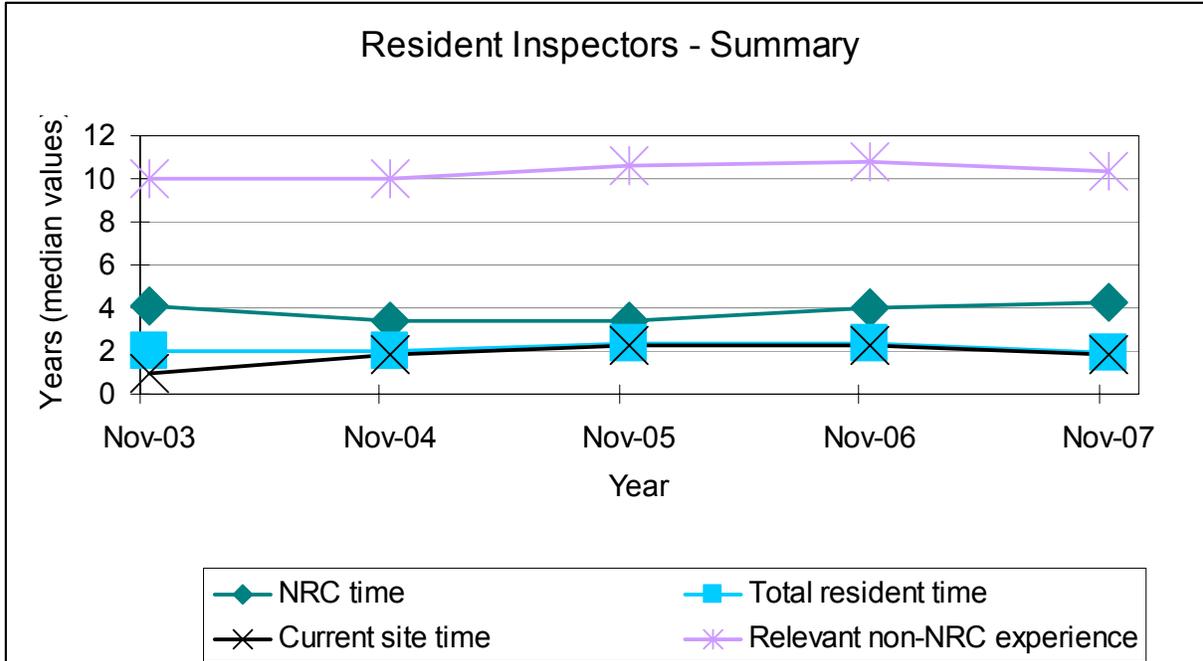


Figure 9

Table 4
Senior Resident Inspectors

	2003	2004	2005	2006	2007
NRC Time	11.00	8.80	8.84	9.28	10.11
Total Resident Time	6.48	7.32	7.54	7.77	7.93
Current Site Time	1.76	2.31	2.63	3.21	2.52
Relevant Non- NRC Experience	6.42	6.55	7.96	9.08	10.04

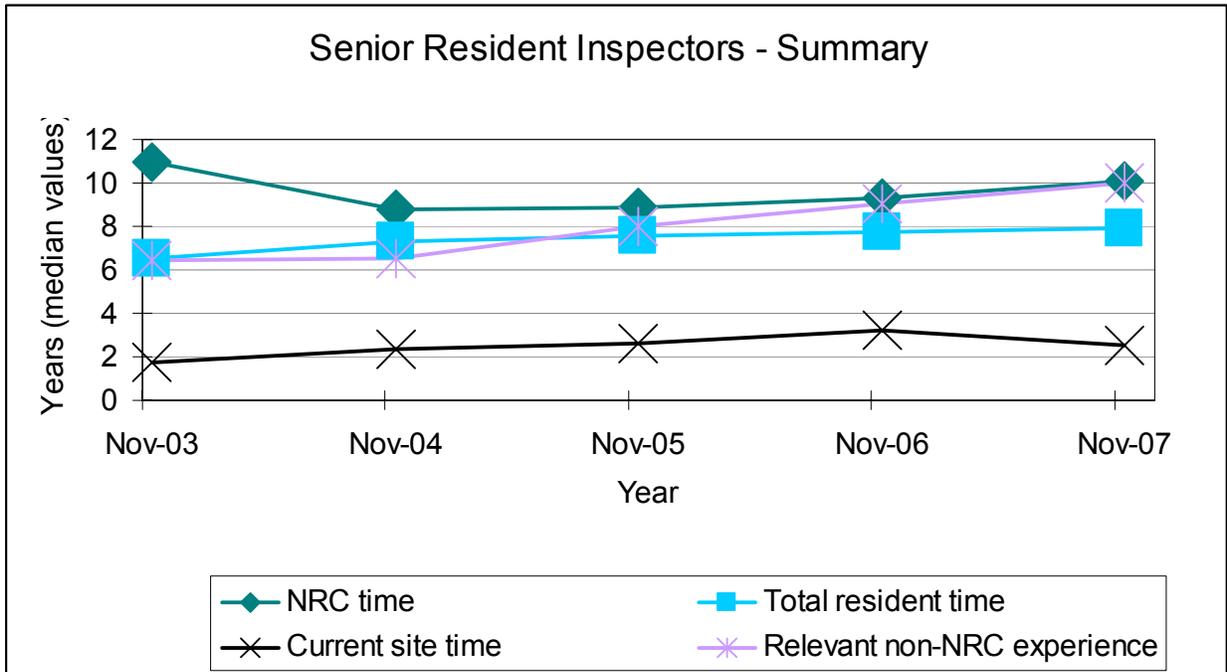


Figure 10

**Table 5
Resident Inspectors 2007 by Region**

2007	NRC Time	Total Resident Time	Current Site Time	<i>Relevant Non-NRC Experience</i>
Region I	4.31	1.97	1.89	8.42
Region II	3.58	1.32	1.32	12.00
Region III	4.42	2.35	2.35	9.83
Region IV	4.34	1.32	1.32	9.00
Total	4.25	1.87	1.85	10.38

**Table 6
Senior Resident Inspectors 2007 by Region**

2007	NRC Time	Total Resident Time	Current Site Time	<i>Relevant Non-NRC Experience</i>
Region I	11.51	5.19	1.39	7.50
Region II	10.32	9.67	2.75	13.25
Region III	10.30	9.86	2.93	8.83
Region IV	8.33	6.30	2.68	9.38
Total	10.11	7.93	2.52	10.04