

## **POLICY ISSUE INFORMATION**

April 6, 2009

SECY-09-0054

FOR: The Commissioners

FROM: R. W. Borchardt  
Executive Director for Operations

SUBJECT: REACTOR OVERSIGHT PROCESS SELF-ASSESSMENT FOR  
CALENDAR YEAR 2008

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) 2008.

SUMMARY:

The results of the CY 2008 self-assessment indicate 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 to be objective, risk informed, understandable, and predictable, and the ROP met the agency's strategic goals of ensuring safety and security. 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 2008 to address issues raised by the Commission, recommended by independent reviews, and obtained from internal and external stakeholder feedback.

The staff continues to improve the performance indicator (PI) program to ensure that the PIs are meaningful inputs to the ROP. The inspection program independently verified that plants were operated safely and securely, appropriately identified performance issues, and ensured the adequacy of licensee corrective actions to address the noted performance issues.

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The Significance Determination Process (SDP) remained an effective tool for determining the safety and security significance of identified performance issues and the staff met the SDP timeliness goal in CY 2008. The assessment program was revised to incorporate lessons learned from implementation of the safety culture enhancements and continued to ensure that the staff and licensees acted as necessary to address identified performance issues. The staff will continue to actively solicit input from the NRC's internal and external stakeholders and further improve the ROP based on stakeholder feedback and lessons learned.

#### BACKGROUND:

The staff performed the CY 2008 self-assessment in accordance with Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program." In accordance with IMC 0307, 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. The ROP self-assessment program evaluates the overall effectiveness of the ROP in meeting its pre-established goals and intended outcomes.

In response to the staff's annual briefing, the Commission directed the staff to take the actions specified in the June 30, 2008, Staff Requirements Memorandum (SRM) M080604, "Briefing on Results of the Agency Action Review Meeting, June 4, 2008." In summary, these actions included looking for ways to clarify to industry and the public the meaning and use of "green" performance indicators within the ROP, evaluating possible improvements to the ROP self-assessment metrics for the PIs and the SDP, and making appropriate recommendations to the Commission if the staff evaluations of resident inspector demographics and the reasons for leaving the resident program reflect a need for additional measures. 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 program goals and intended outcomes. The goals of the ROP include the four specific program goals of being objective, risk-informed, understandable, and predictable as well as the applicable organizational excellence objectives (e.g., openness and effectiveness) from the NRC's Strategic Plan for Fiscal Years 2008–2013. Each of these ROP goals supports the NRC's mission and characterizes the manner in which the agency intends to achieve its strategic goals of safety and security. The intended outcomes of the ROP, which help form its basis and are incorporated into the various ROP processes include the following:

- appropriately monitoring and assessing licensee performance,
- identifying performance issues through NRC inspection and licensee PIs,
- determining the 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, and
- making program improvements based on stakeholder feedback and lessons learned.

During the ninth year of ROP implementation (CY 2008), 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, insights from internal stakeholders based on the biennial survey and 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 ROP effectiveness and potential areas for improvement.

The staff evaluated the key ROP program areas, ROP communication activities, independent evaluations, ROP resources, and resident inspector (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 self-assessment and conclusions.

### **ROP Program Area Evaluations**

The staff performed evaluations in each of the four key program areas of the ROP: the PI program, inspection program, SDP, and assessment program. The results are summarized below and are discussed in more detail in Enclosure 1. 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. ML090690616).

PI Program — The staff continued to improve the PI program in CY 2008 to ensure the PIs provide useful insights and contribute to the identification of performance outliers. The staff also continued to look for leading indicators of declining performance as well as look for ways to modify or improve the existing PIs to ensure their effectiveness. All of the PI program metrics met their established criteria for CY 2008. The staff is currently working with industry to improve the Mitigating Systems Performance Index (MSPI) based on lessons learned and is assessing additional training needs for inspectors for the Safety System Functional Failures (SSFF) PI. Based on Commission direction, the staff worked to clarify for stakeholders the actual meaning of a "green" PI and evaluated and revised some of the PI metrics. Although the staff has endeavored to clarify the meaning and role of PIs in the assessment process, stakeholder feedback indicates an ongoing concern that PIs should better distinguish between levels of licensee performance. Specifically, there were a substantial number of critical comments from the internal survey indicating that the PI program does not provide meaningful insights and does not predict declining performance. The staff will continue to reinforce the message that a green PI represents performance that does not require additional NRC oversight, that PIs provide useful trending information, and that PIs are only a contributor to the identification of performance outliers. In addition, the staff will continue to refine existing PIs and explore options for introducing new PIs to ensure that the PI program provides useful insights and contributes to the identification of declining performance.

Inspection Program — NRC inspectors independently verified that plants were operated safely and securely, appropriately identified performance issues, and evaluated the adequacy of licensee corrective actions to address those performance issues. All inspection program metrics were met including the regions' completion of the required baseline inspection program for CY 2008. The staff performed its annual evaluation of the inspection procedures to

determine whether any additional improvements to the baseline inspections were warranted based on inspection findings identified during fiscal year (FY) 2008. The results of this evaluation will be considered during the more in-depth ROP realignment effort scheduled during CY 2009. The staff continued to use operating experience information in the baseline inspection program including the use of the Operating Experience Smart Sample process. The staff also recognizes the need to (1) better communicate how operating experience is currently considered in the ROP and (2) augment program documents to more systematically integrate operating experience into the inspection program. An NRC senior-level management working group also developed strategies and initiated actions to address challenges to RI retention issues. Internal survey responses were favorable on the quality of inspection reports and the adequacy of the inspection program's coverage of areas important to safety and security.

SDP — The SDP remains an effective tool for determining the safety and security significance of identified performance issues. The SDP met the timeliness goal of 90 days for a third consecutive year as well as meeting all other metrics. The staff issued several revised SDP guidance documents in 2008 including the two SDP appendices for the Public Radiation Safety and Occupational Radiation Safety cornerstones. The staff developed a special SDP to evaluate findings identified during the performance of Temporary Instruction (TI) 2515/171, "Verification of Site Specific Implementation of B.5.b Phase 2 & 3 Mitigating Strategies." Additionally, in response to Commission direction, the staff added the materials control and accountability (MC&A) attribute to the security baseline inspection program and developed the MC&A SDP. The staff continues to develop analytical tools for SDP and other staff risk applications to ensure that the standardized plant analysis risk (SPAR) models reflect the as-built, as-operated plant configuration and provide more consistent results when risk assessments are performed. This effort includes developing new generic low power/shutdown SPAR models. The responses to the internal survey indicate that the staff members are confident about the performance of the SDP although many indicated that additional training would be beneficial. The staff is working to meet this need and will address this issue in CY 2009.

Assessment Program — Staff implementation of the assessment program ensured that staff and licensees took necessary actions to address and focus on performance issues. All of the assessment metrics met their established criteria for CY 2008. The staff compiled lessons learned from the initial 18-month implementation of the safety culture enhancements to the ROP and further enhanced the ROP safety culture guidance documents. Additional changes may be necessary in CY 2009 or CY 2010 to better align with the Commission's safety culture policy statement once it has been finalized. The staff plans to explore ways to utilize cross-regional experience to further improve the implementation of the substantive cross-cutting issue guidance. The staff also revised the definition of a "repetitive degraded cornerstone" to address concerns that the potential existed for two lingering PI inputs to drive a licensee into the "Multiple/Repetitive Degraded Cornerstone" column (Column 4) of the Action Matrix. The staff established ways to better integrate traditional enforcement outcomes into the assessment process and is in the process of incorporating the implementation details into ROP guidance documents. The staff noted a decrease in the number of sites in the "Degraded Cornerstone" column (Column 3) and Column 4 of the ROP Action Matrix in CY 2008 and will continue to monitor the potential issue first identified in CY 2007 when the number of sites in Columns 3 and 4 had increased.

## **ROP Communication Activities**

In CY 2008, the staff continued to emphasize stakeholder involvement and open communication regarding the ROP. The staff used a variety of communication methods to ensure that all stakeholders could access ROP information and had an opportunity 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.

External Stakeholder Interface — The staff conducted monthly public working-level meetings with the Nuclear Energy Institute (NEI), the industry, and interested stakeholders to discuss the status of ongoing refinements to the ROP. Based on stakeholder feedback, the staff added 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 offered the opportunity for public comment at the end of each topical area to enhance the public's ability to engage relevant staff members on topics discussed during these meetings. The staff also conducted public meetings in the vicinity of each operating reactor to discuss the results of the NRC's assessment of the licensee's performance. These annual meetings provide an opportunity to engage interested stakeholders on the NRC's role in ensuring safe and secure plant operations. The staff published the Annual Report to Congress on the Security Inspection Program in July 2008 to continue to communicate information and results related to the Security cornerstone. The staff also sponsored a breakout session at the Regulatory Information Conference in March 2008, which focused on getting ahead of performance issues, and discussed additional ROP topics during the regional breakout sessions. The staff plans to issue its next external survey to evaluate ROP effectiveness and gather stakeholder insights in October 2009. These outreach efforts have resulted in valuable feedback and ROP improvements.

The NRC has placed a high priority on communicating with licensees and other Federal agencies including the U.S. Department of Homeland Security, the Homeland Security Council, the Federal Bureau of Investigation, and the intelligence community. This communication includes, in part, assessment of and response to the changing elevated threat environment, review and inspection of revised security plans for all 104 nuclear power reactors, and clarification of requirements for orders issued since September 11, 2001. This coordinated effort, lessons learned from program implementation, and ongoing rulemaking activities should help improve consistency and provide for a more stable regulatory environment. The staff is continuing outreach efforts with various stakeholders to help ensure timely communication and involvement in regulatory activities.

The staff maintained and enhanced the NRC's Web pages to communicate current ROP-related information and results. The staff continues to maintain the ROP Web pages to ensure that they communicate accurate information. In addition, the staff is working to improve internal processes to ensure that ROP information is reported more promptly. The improved process will facilitate public access to program documents and streamline the staff process for updating changes to procedures.

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. The staff also met periodically with regional managers to discuss more complex ROP

topics and issues. In addition, the staff participated in each region's inspector counterpart meeting so that regional staff and management could provide feedback on ROP implementation.

The staff administered its biennial internal survey in October 2008 to evaluate program effectiveness and gather direct feedback from the staff responsible for implementing the ROP. The responses to the internal survey were generally positive and showed a similar level of satisfaction when compared with the previous internal survey in CY 2006. Most of the internal survey questions and responses contributed directly to the annual ROP performance metrics and self-assessment. Enclosure 2 provides more detail on the results of the internal survey. The staff analysis of the survey responses appears in Enclosure 1 in the applicable portions of the program area evaluations as well as in the annual ROP performance metric report (ADAMS Accession No. ML090690616). In addition, the staff plans to prepare a consolidated response to the internal survey to more specifically address some of the comments, and the main themes derived from the comments, and will make this response available to internal stakeholders through the ROP Digital City Web site. A consolidated table including all internal and external survey results since inception of the ROP along with the staff's evaluation and response is available on the ROP Web page entitled, "ROP Program Evaluations and Stakeholder Feedback."

The NRC staff frequently updated the ROP Digital City Web site to include recent and useful information for internal stakeholders. The NRC staff continued to issue the inspector newsletter on a quarterly basis to share value-added findings, best practices, inspection guidance, and regulatory issues that are timely and have wide application and interest to inspectors and staff implementing the ROP. Each of the four regions has a newsletter editorial board member who identifies potential topics and authors for newsletter articles and provides technical review of the content. The RIs, NRR and NSIR headquarters staff, and staff in the regional offices write the articles. Printed and/or electronic copies are distributed, and the newsletter is also available on the NRR ROP Digital City internal Web site. The Inspector Newsletter is also represented as a community of practice on the NRC's Knowledge Management website, which provides a place for inspectors to seek and discuss information that appeared in newsletter articles. The staff effectively utilized and continued to improve the initial and continuing inspector training programs to produce and maintain well-qualified competent inspectors. Based on the internal survey results and less formal feedback, inspectors appear to be generally satisfied with the training necessary to implement the ROP, but they have identified areas where they would benefit from additional training. These topic areas include the SDP, safety culture, the SSFF PI, and the computer system used to track inspection reports and findings (Reactor Program System). The staff plans to provide additional training in these areas in CY 2009.

The ROP feedback process allows the NRC staff to identify concerns or issues and recommend improvements related to ROP policies, procedures, or guidance. Based on the results of the recent internal survey, the staff believes that improvements made in CY 2006 for tracking feedback forms increased the timeliness of and stakeholder satisfaction with the internal feedback process. However, the staff recognizes the potential for additional process improvements to further increase overall efficiency and reliability and plans to address them in CY 2009.

## **ROP Performance Metrics and Independent Evaluations**

ROP Performance Metrics — Based on the NRC staff's review, all of the 45 performance metrics for the ROP met the established criteria. All eight metrics in the PI program area, all seven metrics in the inspection program area, all six metrics in the SDP area, all eight metrics in the assessment program area, and all sixteen overall ROP program metrics met the established criteria. The staff further discusses these performance metrics in the program area evaluations in Enclosure 1 as well as in the annual performance metric report (ADAMS Accession No. ML090690616).

Independent Evaluations — In addition to the ROP self-assessment program, several independent evaluations have been performed in the past few years. These evaluations generally provided favorable results, but they also suggested potential areas of improvement. Most recently, the staff hired FocalPoint Consulting Group to perform an independent evaluation of the reactor oversight and incident response programs in 2008 with the objective of developing recommendations to strengthen program performance. Overall, FocalPoint found the programs to be effective in accomplishing their mission of providing reactor oversight and incident response but provided a number of findings and recommendations for the staff's consideration. The final report, "Independent Evaluation of the Reactor Oversight and Incident Response Program," dated December 31, 2008 (ADAMS Accession No. ML090680415), presents details of these findings and recommendations.

The staff addressed the Government Accountability Office (GAO) recommendations to improve the oversight of safety culture as noted in GAO-06-1029, "Nuclear Regulatory Commission: Oversight of Nuclear Power Plant Safety Has Improved, but Refinements Are Needed," dated September 27, 2006 (ADAMS Accession No. ML062720030). The report included three recommendations for safety culture. The NRC formally responded to the GAO report on November 27, 2006, and provided an update in its annual status report to the GAO on March 12, 2007, and on March 28, 2008. The staff considers action on these recommendations complete and is recommending closure to GAO.

The staff addresses several recommendations from these and other independent evaluations in the enclosures to this paper. Greater detail on the 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."

Regulatory Impact — 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 70 reactor licensees on 146 issues. Of the comments received, 92 percent were favorable, and 8 percent were unfavorable. The comments fell into two main categories — inspector performance and formal communication with licensees. Enclosure 3 provides a summary of the feedback received, the staff's evaluation, and the proposed improvement actions.

Industry Performance Trends — The NRC also collects and monitors industry-wide data to assess whether the nuclear industry as a whole is maintaining the safety performance of operating plants. The NRC also uses these industry level indicators as feedback for improving the ROP. In FY 2007, the staff completed the development of the Baseline Risk Index for

Initiating Events (BRIIE), an indicator that weights each initiating event according to its relative contribution to industry core damage frequency. The staff will report the FY 2008 results of the Industry Trends Program including the results of the new BRIIE to the Commission in an annual paper that complements this paper. The results of the Industry Trends Program will also be reviewed at the AARM.

### **ROP Resources**

Overall staff effort in FY 2008, as reflected in expended hours, decreased by 4.3 percent compared with expended hours in FY 2007. Baseline inspection hours decreased in 2008 resulting primarily from the reduced frequency in performing Inspection Procedure (IP) 71111.21, "Component Design Bases Inspection," and fewer hours being charged to IP 71152, "Identification and Resolution of Problems." The regions conducted fewer of these major inspections in 2008, and together these inspections account for almost 70 percent of the reduction in direct baseline inspection hours. The hours charged to other baseline procedures remained relatively unchanged. As in previous years, all four regions completed the required baseline inspections in CY 2008.

Plant-specific inspection effort increased notably in FY 2008 compared with that in FY 2007. The increase reflects increased supplemental inspections based on the higher than normal number of plants in Columns 3 and 4 of the Action Matrix in 2007, an increase in reactive inspections, and several inspections in the security cornerstone. Generic safety issues (GSI) inspections are typically one-time inspections of specific safety and security issues with significant variability in effort possible from year to year. The increased effort related to GSI inspections in FY 2008 reflects the implementation of several temporary instructions. Enclosure 4 discusses ROP resources in more detail.

### **Resident Inspector 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 annually. The staff also developed a 90 percent site staffing metric in 2008 which is included with the annual analysis. The staff concluded that the RIs and senior resident inspectors (SRI) remain knowledgeable and experienced although the turnover in the RI ranks over the last several years has resulted in a decline of on-site inspection experience, which may result in challenges in implementing the inspection program. While the most recent turnover rates in both RI and SRI ranks have improved, it still appears that enhancements are warranted to maintain an experienced and stable RI and SRI program. These enhancements will be the subject of a separate paper to the Commission. The staff plans to continue to closely monitor resident demographics and site staffing in 2009. Enclosure 5 provides detailed analyses of the 2008 RI demographics and site staffing.

Similar to the RI program, recruiting and retaining other regional specialists such as operator license examiners may pose challenges in the future. The staff will continue to monitor the staffing levels of regional specialists and will take action as necessary.

COMMITMENTS:

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

- (1) The staff performed its lessons-learned review of the MSPI and is currently working with its stakeholders to improve the PI. The staff has continued to evaluate other PI improvements to make the program a better input to the ROP assessment process as described in Enclosure 1.
- (2) The staff explored 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 as described in Enclosure 5.
- (3) The staff monitored SDP timeliness and developed additional improvements to streamline the SDP program with the inspection program as described in Enclosure 1.
- (4) The staff enhanced ROP inspection and assessment guidance based on the lessons-learned evaluation of the safety culture enhancements as described in Enclosure 1. Additionally, the staff assessed the temporary increase in the number of sites in Columns 3 and 4 of the ROP Action Matrix as described in Enclosure 1.

New Commitments — As described in this paper, the staff plans the following eight significant actions or activities to improve the efficiency and effectiveness of the ROP in CY 2009:

- (1) The staff will continue to implement improvement initiatives based on its MSPI lessons learned review and will provide training on the SSFF PI to the inspection staff.
- (2) The staff will revise program guidance to better integrate operating experience into the ROP inspection and assessment processes.
- (3) The staff will provide recommendations in a separate paper to the Commission detailing potential improvements to the attraction and retention practices for RI and SRI staff.
- (4) The staff will develop and implement additional SDP training to ensure the inspectors remain efficient and effective in determining the safety and security significance of identified performance issues.
- (5) The staff will begin developing models for low-power and shutdown situations for use in the SDP.
- (6) The staff will revise program guidance to better integrate traditional enforcement outcomes into the assessment process.
- (7) The staff will revise program guidance, as necessary, to better align with the Commission's safety culture policy statement once it has been finalized.

- (8) The staff will explore ways to utilize cross-regional experience to further improve the implementation of the substantive cross-cutting issue guidance.

The staff will include the status of these commitments and other program improvements noted in this paper in the CY 2009 ROP self-assessment.

#### CONCLUSIONS:

The self-assessment results for CY 2008 indicate that the ROP provided effective oversight as demonstrated by meeting the 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 successful in ensuring openness and effectiveness in support of the agency's mission and its strategic goals of safety and security. The NRC appropriately monitored operating nuclear power plant activities and focused agency resources on performance issues in CY 2008, and plants continue to receive a level of oversight commensurate with their performance. The staff continues to emphasize stakeholder involvement and improve various aspects of the ROP as a result of feedback and lessons learned.

#### RESOURCES:

NRC headquarters and regional resources are needed to conduct the periodic assessment and realignment of ROP inspection procedures, ROP annual program assessment, mid-cycle and end-of-cycle licensee performance assessment; to revise and maintain the NRC Inspection Manual; and to perform all ROP management and oversight activities. The staff estimates that 56.0 full-time equivalent (FTE) staff members and \$652,000 will be needed for FY 2009 and that 56.5 FTE and \$875,000 will be needed for FY 2010 to conduct these NRR-funded activities. These resources break down as follows:

For FY 2009:

PA 122148	14.7 FTE regions	6.0 FTE HQ	= 20.7 FTE and \$ 425,000
PA 122150	13.0 FTE regions	22.3 FTE HQ	= 35.3 FTE and \$ 227,000

For FY 2010:

PA 122148	14.7 FTE regions	6.0 FTE HQ	= 20.7 FTE and \$ 705,000
PA 122150	11.0 FTE regions	24.8 FTE HQ	= 35.8 FTE and \$ 170,000

NSIR estimates that approximately 6.7 FTE will be needed for FY 2009 and 9.5 FTE will be needed for FY 2010 for its ROP management, development, and oversight activities and for licensee performance assessment. The Office of Nuclear Regulatory Research (RES) estimates that approximately 1.7 FTE and \$923,000 will be needed for FY 2009 and that 1.9 FTE and \$771,000 will be needed for FY 2010 for its ROP assistance programs. The NSIR and RES effort is budgeted and performed by the respective offices (separate from the NRR effort). The staff does not anticipate any resources beyond those already included in the current budget requests for FY 2009 and FY 2010 to be needed for these activities. Resources required in future years beyond FY 2010 would be addressed during the Planning, Budgeting, and Performance Management (PBPM) process of the respective year.

COORDINATION:

The Office of the General Counsel has reviewed this Commission paper and has no legal objection. The Office of the Chief Financial Officer has reviewed this Commission paper and determined that there is no financial impact.

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R. W. Borchardt  
Executive Director  
for Operations

Enclosures:

1. Reactor Oversight Process Program Area Evaluations
2. Stakeholder Survey Results
3. Regulatory Impact Summary
4. Reactor Oversight Process Resources
5. Resident Inspector Demographics

## **Reactor Oversight Process 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 (PI), inspection, Significance Determination Process (SDP), and assessment. The staff used self-assessment metrics, internal and external stakeholder feedback, and other information to gain insights into 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 provides the data and staff analysis for each of the program area metrics (ADAMS Accession No. ML090690616).

### **Performance Indicator Program**

The staff continued to improve the PI program in calendar year (CY) 2008 to ensure the PIs provide useful insights and contribute to the identification of performance outliers. The staff also continued to look for leading indicators of declining performance as well as look for ways to modify or improve the existing PIs to ensure their effectiveness. As noted in several previous self-assessments, the number of greater than green PIs has declined significantly since initial ROP implementation in April 2000. The number of greater than green PIs had temporarily increased upon implementation of the Mitigating Systems Performance Index (MSPI) in April 2006 but has steadily declined since April 2007. The MSPI was effective at identifying outliers and brought attention to licensees with long-standing equipment problems. Since then, the number of MSPI performance issues has diminished, and the MSPI is now following this downward trend as well. The staff believes that the improved industry performance shown in the MSPI is, in part, the result of changes made to plant probabilistic risk assessments (PRA) and equipment modifications that reduced the risk significance of failures.

The staff committed in the CY 2007 ROP self-assessment to complete its lessons-learned review of the MSPI and, based on its recommendations and discussion with industry, to make any necessary changes to improve the PI. Due to the complexity of the review, the staff's lessons-learned review has taken nearly 2 years to date and is anticipated to extend into CY 2009 before it is complete. Although not fully complete, the review has yielded important insights into the performance of MSPI and areas for improvement have been identified. Several white papers presented and discussed with industry at the monthly ROP public meetings have described these opportunities for improvement. The white papers discuss proper characterization of component failures and planned and unplanned unavailability, appropriate mathematical protocols for adding and multiplying values within the MSPI algorithm, and general guidance expectations for determining when and under what conditions licensees can revise their planned unavailability baselines. The staff anticipates that it will have fully resolved these issues by the end of calendar year 2009. The staff also plans to further assess the effectiveness of the MSPI through periodic review of industry experience and resulting frequently asked questions (FAQ) on the MSPI.

The staff also made guidance improvements to the Unplanned Power Changes per 7000 Critical Hours PI and the Emergency Response Organization Drill Participation PIs. The staff is also reviewing the effectiveness of the Safety System Functional Failure (SSFF) PI, which had been an excellent indicator of poor and declining performance before the ROP was implemented, but

its effectiveness has since declined because this indicator provides less trending information and rarely crosses the green-white threshold. As noted in last year's self-assessment, the staff has discovered that differences among licensee interpretation of the guidance documents contribute to inconsistencies in licensee reporting of SSFFs. The staff is assessing additional training needs for inspectors to help ensure a clear understanding and consistent implementation of the reporting guidance for this indicator. The staff will also continue its efforts to improve the Emergency Preparedness PIs (specifically the Alert and Notification System PI) and the other PIs depending on available resources. On June 5, 2008, the staff issued Temporary Instruction (TI) 2515/175, "Emergency Response Organization, Drill/Exercise Performance Indicator, Program Review." The objective of this TI is to gather information during CY 2008 and CY 2009 to support the program office assessment of the drill/exercise performance PI data.

On February 28, 2008, the NRC issued Regulatory Issues Summary (RIS) 2008-04, "Discontinuation of Two Performance Indicators Associated with the Security Reactor Oversight Process," to inform licensees that the Personnel Screening Program and the Fitness-for-Duty/Personnel Reliability PIs will be discontinued. The agency discontinued these indicators because they provided minimal input and because reasonable confidence exists through the security baseline inspection program. The staff plans to interact with the industry to explore other PIs in the Security cornerstone that might provide more meaningful insights into licensee performance. In addition, the staff will continue to refine existing PIs and explore options for introducing new PIs to ensure that the PI program remains an effective input into the ROP assessment process.

Staff Requirements Memorandum (SRM) M080604, "Briefing on Results of the Agency Action Review Meeting," dated June 30, 2008, directed the staff to look for ways to clarify to industry and the public the meaning and use of "green" PIs within the ROP. In response to this concern, the staff revised the sample boilerplate public assessment meeting slides that are available for the regions to use when holding public meetings. The staff revised these slides to emphasize that green PI performance represents performance in which cornerstone objectives are fully met and additional NRC oversight is not required. In addition, NUREG-1649, "Reactor Oversight Process," is being updated to reflect this same message and to note that the baseline inspection program can be focused, if desired, on a PI trending toward the green/white threshold. The staff also changed the NRC ROP Web site to better explain how inputs into the ROP assessment process are considered and to better define how the ROP uses green inspection findings and PIs. The staff worked to clarify for all stakeholders the actual meaning of a green PI, and the staff continues to reinforce the role of PIs in assessment and to communicate that PIs provide useful trending information and are only one component of licensee performance assessment.

Based on the Commission's direction in SRM M080604, the staff also evaluated the self-assessment metrics for the PI program for potential improvements. As a result, the staff revised two of the PI metrics. The specific metrics related to stakeholder perception as to whether the PI program provides useful insights (PI-4) and whether the PI program identifies performance outliers (PI-8). The staff revised the wording of these metrics and the survey questions associated with them to emphasize that the PI program is "used in conjunction with the inspection program" to provide useful insights and that the PI program is only "a contributor to" the identification of performance outliers. The results of the 2008 survey, which was limited to internal stakeholders, did not appear to demonstrate a significant change in the level of satisfaction in these areas when compared to the previous internal survey in 2006 although the

percentage of positive responses did increase slightly. The staff will reevaluate the effectiveness of these changes to the metrics based on the results of the upcoming external survey in 2009.

The staff met all eight of the PI metrics for CY 2008. The internal survey of stakeholders generally found the PI program to be meeting the ROP goals of providing useful information on risk-significant areas. Most survey respondents found the PIs to be clearly defined and understandable and to provide an appropriate overlap with the inspection program. They also stated that the PIs provide an objective indication of declining safety performance and can be effectively used to identify outliers. Of the stakeholders who provided written comments, most wrote that the PI program has not worked in accordance with the ROP goals of being understandable (e.g., MSPI) and well defined or useful. Many internal stakeholder comments indicated concern about the industry's ability to manage the PIs – possibly a contributing cause of the decrease in the number of greater-than-green PIs.

Another area of concern is that some PI guidance is confusing, complex, and difficult to interpret. The PI guidance document, Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," is revised periodically by NEI to better define and clarify the guidance primarily using approved FAQs. FAQs are discussed during the monthly ROP public meetings and need consensus from meeting participants prior to approval. Approved FAQs are considered active but are not directly incorporated into the NEI guidance document until the next revision, thus adding to the confusion. Some internal stakeholders believe this could be better performed and maintained if the NRC assumed control of the document.

In spite of efforts to clarify for stakeholders the actual meaning of a green PI, the staff continued to receive some comments that were critical of the usefulness of the PI in distinguishing between levels of performance. Many commented that with so few PIs crossing the green to white threshold, the PI program does not provide meaningful insights. Others felt that the PI program is not predictive of declining plant performance. The staff will continue to reinforce the message that a green PI represents performance that does not require additional NRC oversight, that PIs provide useful trending information, and that PIs are only one contributor to the identification of performance outliers. In addition, the staff will continue to refine existing PIs and explore options for introducing new PIs to ensure that the PI program provides useful insights and contributes to the identification of declining performance.

### **Inspection Program**

The inspection program verified that plants were operated safely in CY 2008 and ensured that performance issues were identified and corrected in a timely manner by the licensees. All four regions completed their baseline inspections in CY 2008 in accordance with Inspection Manual Chapter (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 2008 completion of the baseline inspection program in a memorandum available in ADAMS (Accession No. ML090410750 for Region I, ML090440127 for Region II, ML090440495 for Region III, and ML090400078 for Region IV). Additionally, all security baseline inspections in CY 2008 were completed as required, as documented in a memorandum from the Office of Nuclear Security and Incident Response (NSIR) (ADAMS Accession No. ML090570469), but this memorandum is not publicly available.

During CY 2008, the staff improved key inspection program documents and issued revised inspection procedures (IP) to implement the changes resulting from the CY 2007 ROP realignment. The staff also performed its annual evaluation of the IPs in fiscal year (FY) 2008 to determine whether any additional improvements to the baseline inspections were warranted based on inspection findings identified during FY 2008. The purpose of this review was to help ensure consistent implementation of the procedure and to identify potential improvements in effectiveness and efficiency. The staff made some recommendations to address the possible additional inspection resource needs and to improve the effectiveness of the health physics inspections. The staff will review these and other recommendations during the biennial ROP realignment effort in CY 2009 as discussed below. Any changes to the inspection program will become effective during CY 2010.

The staff will perform a more in-depth effectiveness review, known as ROP realignment, for all baseline IPs in all ROP cornerstone areas (Initiating Events, Mitigating Systems, Barrier Integrity, Occupational Radiation Safety, Public Radiation Safety, Emergency Preparedness, and Security) in CY 2009. Appendix B to IMC 0307, "Reactor Oversight Process Self-Assessment Program," describes the ROP realignment process. The review will consider inspection results over a 3-year time period from FY 2006 through FY 2008. The purpose of this review will be to ensure that the baseline inspection program applies the appropriate level of inspections in selected areas based on risk, licensee deficiencies identified in the past, and feedback from the regions. During the last ROP realignment review performed in CY 2007, the staff made changes affecting the inspection scope and frequency of 12 baseline IPs.

On January 15, 2009, the staff issued a revision to IP 95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs, or One Red Input," which incorporated lessons-learned items from the initial implementation of the ROP safety culture enhancements including an evaluation of the conduct of the IP 95003 at Palo Verde. The staff also considered feedback from external stakeholders on the potential safety culture changes. The changes to IP 95003 provide guidance on how the NRC will perform a graded safety culture assessment. Depending on the circumstances, the scope of the graded safety culture assessment may range from focusing on functional groups or specific safety culture components, which the licensee's third-party assessment identified as having problems or being insufficiently evaluated, to conducting an NRC independent safety culture assessment. Additional changes in response to recommendations resulting from the Palo Verde 95003 inspection included clarifying the flexibility of inspection timing, adding consideration of an outage inspection component, and adding consideration of the additional inspection guidance contained in the emergency preparedness attachment for each IP 95003 inspection. The staff made several additional changes to the assessment program guidance (IMC 0305, "Operating Reactor Assessment Program") as described under the assessment program evaluation below.

The staff continued to implement the Operating Experience Smart Sample (OpESS) Program to provide inspectors with concise information related to selected industry operating events that have generic applicability and potential risk significance and can be readily inspected through the baseline inspection program. The staff issued three OpESS documents during CY 2008 regarding (1) the negative trend in recurring events involving feedwater systems; (2) inspection of electrical connections for motor control center, circuit breakers and interfaces; and (3) a revision to a prior OpESS dealing with crane and heavy lift inspection. Inspectors are

encouraged to review and use OpESS information for planning future inspection activities. However, the staff also recognizes the need to (1) better communicate the way the ROP currently considers operating experience and (2) augment program documents to more systematically integrate operating experience into the inspection program. The staff plans to revise program guidance to better integrate operating experience into the ROP inspection and assessment processes in CY 2009. The staff also plans to develop a more formal program to manage security-related operating experience.

Although the resident and senior resident inspector turnover rates decreased during CY 2008 when compared to the turnover rates in CY 2007, attraction and retention of resident and senior resident inspectors remained a challenge for the inspection program. Enclosure 5 of this SECY paper offers additional discussion and analysis of resident inspector demographics and issues.

The staff continued to improve the initial and continuing inspector training programs to produce and maintain well-qualified competent inspectors. Recommendations by the staff were reviewed in accordance with the ROP feedback process, and the improvements were incorporated into inspection qualification standards as appropriate. The internal survey results show that inspectors were generally satisfied with training to implement the ROP but slightly less satisfied than during the previous survey. In the survey, inspectors requested more training on the SDP, safety culture, and the computer system used to track inspection reports and findings (Reactor Program System). Another message from the survey was that inspectors asked for more opportunities for continuing training after completion of qualification requirements.

The staff continued development or completed a number of training initiatives over the last year, which will respond to and improve each of the issues raised in the survey. Specifically, the staff received approval to develop a prequalification 1-week training course to improve inspectors' understanding of the SDP and ROP. The staff updated the guidance for writing inspection reports and performed training at the regional counterpart meetings including instruction in how inspectors should assign and document cross-cutting aspects for their inspection findings, and the staff is continuing efforts to develop additional safety culture training. In response to regional feedback, the staff conducted classroom training and developed Web-based training on the Reactor Program System to improve inspection scheduling and the reporting of inspection issues. To give inspectors more continuing training options, the staff completed development of post-qualification training for inservice inspection and fire protection inspectors and continued development of similar training in the electrical and mechanical areas. Additionally, the NSIR staff completed development of a comprehensive agency security training curriculum which will enhance security inspector competencies.

All inspection program metrics met their established criteria during CY 2008. The internal survey resulted in favorable feedback regarding whether information contained in inspection reports was relevant, useful, and written in plain English. However, the inspectors also provided feedback that the documentation of inspection scope in inspection reports could be improved to make these reports easier to read. Additionally, the internal survey produced favorable feedback regarding whether the inspection program adequately covers areas important to safety and security. However, feedback also suggested that increased flexibility in the ROP requirements, reduction in the number of inspection samples for selected IPs, and an increase in maintenance observation activities may be warranted to improve the effectiveness of the

baseline inspection program. The staff will consider these issues during the ROP realignment effort in CY 2009.

### **Significance Determination Process**

The SDP continues to mature and remains an effective tool for determining the safety and security 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 third consecutive year as well as meeting all other IMC 0307 SDP metrics. The NRC received no appeals for findings evaluated with a significance greater than green.

In early 2008, the staff issued revisions to several SDP guidance documents, contained in attachments and appendices to IMC 0609, "Significance Determination Process." These revisions included the revamped Phase 1, "Initial Screening and Characterization of Findings," portion of the SDP (Attachment 4 to IMC 0609); clarification of IMC 0609 guidance for SDP timeliness; and updates to the guidance for conducting Significance and Enforcement Review Panels (Attachment 1 to IMC 0609). The staff also revised the SDP appendices "Public Radiation Safety" and "Occupational Radiation Safety" (Appendices C and D to IMC 0609) to make them more objective and improve their effectiveness and efficiency. The staff worked with the Office of Enforcement (OE) to realign the SDP guidance with the Enforcement Policy and the revised Enforcement Manual. This included developing common templates for preliminary and final determination letters and streamlining the SDP program with IMC 0612, "Power Reactor Inspection Reports."

The staff developed a special SDP to evaluate findings identified during the performance of TI 2515/171, "Verification of Site Specific Implementation of B.5.b Phase 2 & 3 Mitigating Strategies." This qualitative SDP, developed using expert judgment and inspection experience, was successful in assisting inspectors to characterize the significance of inspection findings. The SDP provided valuable insights while evaluating a variety of findings, especially assessing the recoverability of a mitigating strategy. All findings were evaluated to be of low safety significance (green). Although the SDP was adequate to characterize the risk significance of inspection findings and the TI required no revisions during implementation, the inspectors identified areas for improvement within the SDP and inspection process that will be incorporated into the ROP baseline inspection program.

In response to Commission direction, NSIR added the materials control and accountability (MC&A) attribute to the security baseline inspection program, which is governed by IMC 0320, "Operating Reactor Security Oversight Process," and IMC 2201, "Security and Safeguards Inspection Program for Commercial Power Reactors." At the same time, NSIR developed the MC&A SDP and added it to the Physical Protection SDP, which was revised and renamed the Baseline Security SDP. The staff used enforcement history, inspection experience, and expert judgment (which included the input of industry representatives) to develop the MC&A portion of the Baseline Security SDP. Additionally, the staff is currently evaluating the security SDP with stakeholder involvement and plans to develop enhancements as needed.

In early 2008, the staff made the three-volume "Risk Assessment of Operating Events" Handbook (hereafter referred to as the RASP Handbook) publicly available on the NRC public Web site and in ADAMS. The purpose of this initiative was to openly communicate with the

public because the information in the RASP Handbook has been beneficial to the risk analyst staff and is referenced in the SDP program guidance. To enhance the development of analytical tools for SDP and other staff risk applications, the Office of Nuclear Reactor Regulation (NRR) opened a new user need request with the Office of Nuclear Regulatory Research (RES). This new request, which superseded the user need request of 2004, identified a need for continued development and enhancements in standardized plant analysis risk (SPAR) models; it includes developing two new generic low-power/shutdown (LPSD) SPAR models per year to support development of future full-scope LPSD SPAR models and enhancing "internal" and "external" events. This request also identified the need for modeling alternative mitigating strategies performed by licensees. The "internal events" SPAR models need to reflect recent plant modifications, development and integration of "external events" (e.g., internal fire), and low-power and shutdown operational events. The goal of this user need request is to use the expertise in RES to continue the development and enhancement of SPAR models to reflect the as-built, as-operated, plant configuration and provide more consistent risk assessment results.

Based on the Commission's direction in SRM M080604, the staff evaluated the self-assessment metrics for the SDP for potential improvements. As a result, the staff eliminated the alternative metric for SDP timeliness (SDP-6b) and the metric for accurately communicating SDP results to the public (SDP-7) because of the high performance in this area since 2004. The staff also revised the wording for the metric regarding stakeholder perception (SDP-4) and corresponding survey questions to emphasize that the SDP should result in an "appropriate" regulatory response as opposed to an objective and understandable regulatory approach across all cornerstones. The results of the 2008 survey, which was limited to internal stakeholders, did not appear to demonstrate a significant change in the level of satisfaction in these areas when compared to the previous internal survey in 2006. The staff plans to improve and administer additional SDP training in 2009 as described below and will reevaluate the effectiveness of the changes to this metric based on the results of the upcoming external survey in 2009.

The staff currently maintains six performance metrics to monitor the effectiveness of the SDP. Overall, the metrics indicated that the implementation of the SDP has remained consistent with that of the previous assessment period. The responses to the internal survey were generally favorable for the SDP. The staff appears confident that the SDP (1) provides consistent results that are an appropriate regulatory response to performance issues; (2) meets important program objectives such as being scrutable, accurate, repeatable, timely and based on clear standards; and (3) is effective in communicating results to the licensee and public. A majority of the respondents believe that the SDPs are easy to use and that program guidance documents are clear. However, several respondents noted that SDP training could be improved and additional refresher training would be helpful. Although specific training for the fire protection SDP (P-108) was established several years ago, some respondents stated that the SDP remains complex. The staff has initiated efforts to improve basic SDP training for new employees and inspectors as well as refresher training for experienced inspectors and plans to conduct the training in CY 2009.

The staff will continue to monitor SDP timeliness, develop additional enhancements to streamline the SDP program, and implement effective training for SDP users in 2009. Further improvements in the SDP will contribute to staff efficiency and effectiveness in determining the safety and security significance of identified performance issues. The SDP continues to serve as an essential component of the ROP.

## **Assessment Program**

Staff implementation of the assessment program ensured that staff and licensees took necessary actions to address and focus on performance issues. SECY-09-002, "Revision to the Reactor Oversight Process Implementation Guidance," dated January 2, 2009, discusses the most significant change in the assessment program in CY 2008. In this paper, the staff described the changes to IMC 0305, which was revised and reissued on January 8, 2009. The revision included routine guidance improvements and incorporated lessons learned from the ROP safety culture evaluation. Of particular note are the revised entry conditions for the "repetitive degraded cornerstone." This change clarifies licensee performance criteria that would result in a licensee entering the Multiple/Repetitive Degraded Cornerstone column (Column 4) of the Action Matrix.

Both internal and external stakeholders had expressed concerns that two PIs that linger in the Action Matrix for more than four quarters could drive a licensee to Column 4 of the Action Matrix. Most notably, since MSPi inputs are based on 12 quarters of data, MSPi indicators may stay greater than green for a prolonged period of time. The staff addressed the stakeholder concerns by changing the entry requirements for Column 4 to make them more transparent and user friendly. This revised Column 4 definition continues to require five consecutive quarters of degraded cornerstone performance; however, at least one of the five quarters must have at least three white inputs (or one yellow and one white input) to the Action Matrix. This new definition clarifies the criteria for entering Column 4 of the Action Matrix and incorporates the treatment of PIs and the handling of inspection findings more consistently.

The recent IMC 0305 revision also includes other changes resulting from staff evaluations. Some of the more significant program improvements included (1) adding flexibility for scheduling and conducting the annual public meeting, (2) clarifying guidance concerning double-counting inputs to the Action Matrix and closing out greater-than-green findings, and (3) requiring greater-than-green PIs to remain as an input into the Action Matrix until the supplemental inspection is successfully completed (even though the PIs might have returned to green). The staff also made several changes as a result of lessons learned from the ROP safety culture program enhancements as discussed below.

As requested by the Commission and incorporated into the self-assessment program, the staff reviewed the causes of one Action Matrix deviation issued during CY 2008 and evaluated it for potential improvements to the program. In summary, on October 28, 2005, and renewed on December 11, 2006, December 19, 2007, and December 18, 2008, the Executive Director for Operations approved deviation memoranda to provide heightened NRC oversight at the Indian Point Energy Center. The staff will continue to closely monitor the licensee's actions in CY 2009 to characterize and mitigate onsite ground-water contamination. 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, and no additional changes to IMC 0305 are planned as a result.

Safety Culture – The staff implemented several ROP safety culture enhancements in July 2006 in response to Commission direction and ongoing ROP improvement initiatives. The staff monitored and evaluated these enhancements during their initial 18-month implementation period to identify additional changes needed in ROP guidance documents to improve their

effectiveness and efficiency. The staff also interacted with internal and external stakeholders to obtain and consider their feedback on the ROP safety culture enhancements. As a result of the feedback and lessons learned, the staff concluded that the enhanced guidance improved the NRC's ability and provided an effective means to monitor safety culture although additional improvements were still warranted.

Lessons learned from the ROP safety culture evaluation resulted in the program changes that were incorporated in the January 2009 revision to IMC 0305. The staff also revised IP 95003 as discussed in the inspection program section of this paper and is currently revising IP 71152, "Identification and Resolution of Problems," to incorporate additional lessons learned. Some of the more significant changes related to safety culture in the January 2009 revision to IMC 0305 include (1) lengthening the time period for considering safety conscious work environment (SCWE) items in the substantive cross-cutting issue (SCCI) process; (2) using a graded approach to NRC independent safety culture assessments to align with the corresponding changes made to IP 95003 that was issued on January 15, 2009; (3) clarifying that for plants in Column 4 and in the "Unacceptable Performance" column (Column 5) the licensee is expected to perform a third-party safety culture assessment; and (4) clarifying that the generic SCCI closure criteria applies when the closure criteria are not specified in the assessment letter.

In addition, to assess the consistency of regional implementation of the SCCI process, a task group consisting of staff from the regional offices recently completed an evaluation of the process. Overall, the task group found that the regions are properly implementing the guidance of IMC 0305 for opening SCCIs and evaluating open SCCIs for closure. However, the review identified some differences among the regions in making SCCI decisions, establishing exit criteria, and documenting SCCI decisions. As a result, the task group recommended enhancing documentation of the decision-making bases for opening and closing SCCIs in the assessment letters to licensees and modifying ROP guidance to clarify expectations regarding SCCI closure criteria. This will be followed up by a systematic approach to utilizing cross-regional experience to further improve the implementation of the SCCI guidance. In parallel with the staff's safety culture activities, the industry has initiated an effort to develop standardized guidance for licensees on how to conduct their periodic self-initiated as well as NRC-requested safety culture assessments. The staff will engage with industry during CY 2009 and will consider endorsing the industry guidance after careful review and stakeholder interactions.

The industry continues to express concerns with the staff's approach to the oversight of safety culture. The industry has initiated a working group effort to develop an alternative approach to safety culture assessment in which licensee site leadership teams would evaluate site information to ascertain whether a safety culture problem exists. The staff plans to meet with industry to better understand their approach.

The staff is also preparing a separate Commission paper to provide a draft safety culture policy statement that will apply to all NRC licensees and certificate holders and that will incorporate security culture elements into the overall safety culture policy. The staff will revise IMC 0305 guidance in CY 2009 or CY 2010, as necessary, to incorporate additional lessons learned, refine the cross-cutting aspect descriptions to be more objective, and to better align with the Commission's approved policy statement on safety culture as it applies to operating reactors.

Traditional Enforcement – In the CY 2007 self-assessment, the staff noted its intent to explore how certain traditional enforcement items related to all seven cornerstones could be used as a

more integrated input into the assessment program. An NRC working group, comprised of representatives from each Region, NRR, and OE, met with the industry in June 2008 and again in January 2009 to gather perspectives for achieving a more integrated enforcement process with the ROP. The two specific changes to the assessment process described below characterize the approach to using traditional enforcement in the assessment process proposed by the working group. The staff is incorporating the implementation details into ROP guidance documents and will monitor the implementation of the revised guidance to determine its effectiveness.

- (1) For cases involving potential willfulness, process the performance deficiency separately from the investigation.

Separating the two aspects of a performance deficiency allows the technical aspect to become a timely input into the Action Matrix since the finding and its potential affect on the assessment process will not be delayed pending completion of the investigation into willfulness by the NRC's Office of Investigation (OI). Separation ensures that the risk significant findings used in the assessment process and the agency activities dictated by the Action Matrix are reflective of, and responsive to, current performance. Any associated violations are held and issued only when the investigation into potential willfulness is complete. The investigation and subsequent violations address whether or not there are aspects of licensee performance, such as willfulness, that are the basis for traditional enforcement actions.

Implementing this change would institutionalize the lessons learned from dealing with the inattentive security officers at Peach Bottom and with the Davis-Besse degraded reactor head issues, both of which involved lengthy investigations. IMC 0612 and IMC 0305 do not specifically discuss the ability to separate the performance deficiency from the subsequent enforcement, but they do not preclude it. Incorporating this change will clarify that separation of the two is allowed and will ensure appropriate coordination with the OI to avoid the compromise of an ongoing investigation by inspection program activities.

- (2) Perform followup inspection on all traditional enforcement outcomes.

The ROP does not currently require routine followup of enforcement actions. The assessment program currently only considers escalated enforcement, but it is not a direct input to the ROP Action Matrix. Performing followup inspection on each traditional enforcement outcome will place a focus on the regulatory significance associated with licensee actions that are willful, impede the regulatory process, or have actual consequences. The staff will examine traditional enforcement outcomes over the preceding 12 months during the mid-cycle and end-of-cycle performance reviews. Using an escalating approach similar to that in the Action Matrix, the number, severity level, and similarities among the violations will trigger one of three levels of inspection response. However, the inspection response to the traditional enforcement outcomes would not be a direct input into the Action Matrix since the SDP would have already captured any associated risk significance by processing the performance deficiency separately.

In last year's ROP self-assessment, the staff noted a possible declining trend in industry performance as evidenced by an increase in the number of sites in Columns 3 and 4 of the ROP Action Matrix. The staff assessed ROP data further and engaged with internal and external stakeholders to better understand the apparent inconsistency with the Industry Trends Program (ITP) results of FY 2007. As noted in the PI discussion above, the staff observed that the number of greater-than-green PIs had temporarily increased upon implementation of MSPI in April 2006 but has steadily declined since April 2007. This trend was a significant contributor to the temporary increase in the number of sites in Columns 3 and 4 of the ROP Action Matrix in CY 2007. ROP results for CY 2008 indicate that the number of plants in Columns 3 and 4 has returned to previous levels and that the industry's safety performance evidenced by the ROP is consistent with the ITP results. The staff will continue to monitor the number of plants in Columns 3 and 4 but plans no additional action at this time.

In response to lessons learned from the handling of allegations in March 2007 and September 2007 of inattentive security officers at Peach Bottom, the staff issued an allegation guidance memorandum to provide interim guidance to the NRC staff responsible for handling allegations. The lessons-learned reviews included an assessment by the Agency Allegation Advisor, a Region I review team analysis, and a Senior Executive Review Panel evaluation of the events related to the Peach Bottom allegations. The Commission approved recommendations for enhancing the allegation program resulting from these reviews and provided additional direction. The staff plans to revise the agency allegations policy based on the lessons learned and feedback from internal and external stakeholders and plans to provide the policy to the Commission for approval.

The staff met all of the assessment metrics for CY 2008. In the 2008 internal survey, the perception of the assessment program was generally positive although some stakeholders noted that safety culture guidance (i.e., cross-cutting aspects and issues) was too complex, subjective, and not always worth the effort expended. Internal stakeholders expressed diverse opinions as to the value of the program changes made as a result of the safety culture initiative. Notwithstanding the written comments, more than half of the internal respondents continue to indicate that the changes to the ROP will help to identify weaknesses in licensee safety culture and to focus both licensee and NRC resources accordingly. Responses to related questions about the adequacy of the supporting ROP infrastructure (process, procedures, and training) again indicate that more than half of the respondents continue to believe that the current infrastructure is adequate. The inspection and assessment guidance related to safety culture was modified in January 2009 to provide additional guidance, and the staff plans to continue to evaluate the effectiveness of the safety culture initiative including inspector training in CY 2009.

## Stakeholder Survey Results

Consistent with the guidelines prescribed by Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program," the staff of the U.S. Nuclear Regulatory Commission (NRC) conducted an internal survey during this self-assessment cycle to solicit and analyze stakeholder feedback regarding the effectiveness of the Reactor Oversight Process (ROP). Consistent with the biennial frequency prescribed by IMC 0307, the staff did not conduct an external survey in calendar year (CY) 2008. In accordance with the current schedule of alternating years, the next external survey will occur in CY 2009, and the next internal survey will occur in CY 2010.

The NRC conducted previous surveys in November 2006, November 2004, December 2002, March 2001 (in the initial year of ROP implementation), and November 1999 (during the pilot phase). Most of the internal survey questions and responses contributed directly to the annual ROP performance metrics. A general analysis of the stakeholder responses to the internal survey is summarized below, while a more detailed analysis is available in the annual ROP performance metric report (ADAMS Accession No. ML090690616) and the applicable performance area discussions in Enclosure 1 to this paper.

The staff announced the survey through multiple channels to encourage internal stakeholders to participate. Nevertheless, fewer respondents participated in CY 2008 (159 respondents) than in CY 2006 (266 respondents). The respondents were internal NRC stakeholders including resident and senior resident inspectors, region-based inspectors and staff, senior reactor analysts, regional and headquarters line management, and headquarters technical and program staff employees. The staff also received fewer internal survey comments in CY 2008 (285 comments) than in CY 2006 (589 comments). Overall, the comments reflected frank and honest feedback. The overall percentage of questions deemed "unable to answer" or "did not answer" remained about the same in CY 2008 (17 percent) and CY 2006 (15 percent). Some internal stakeholders voiced concerns over certain aspects of the ROP as discussed in the pertinent sections below.

The staff made several changes to the CY 2008 ROP internal survey to reflect lessons learned from previous surveys. Survey topic areas were reordered to conform to ROP guidance. A new survey topic area, "Security," was added to obtain more focused feedback on security-related issues. A few questions on information contained in assessment letters were added to the "Assessment Process" section. Inspection program area questions previously separated into program and procedure sections were combined into one topic area, "Inspection Programs." Several performance indicator (PI) questions were rewritten to reinforce the fundamental ROP concept that PIs combine with the inspection program as inputs to the ROP assessment process. The Significance Determination Process (SDP) questions previously separated into SDP process and SDP results were combined into one topic area. Questions regarding the effectiveness of the Reactor Program System were also added. The CY 2008 survey included 114 questions, whereas the CY 2006 survey included 86 questions.

The respondents selected answers from a computer-based program in the following topic areas: (1) Demographics, (2) Assessment Program, (3) Inspection Program, (4) PIs, (5) SDP, (6) ROP Web Page and Reactor Program System, (7) Feedback Forms, (8) Training Issues, (9) Security, and (10) Overall ROP. Each section of the survey allowed for additional comments. All survey responses and comments were provided anonymously, and each question had five possible answers (strongly agree, agree, disagree, strongly disagree, and unable to answer).

The results of the survey sections are provided below. Note that the numbers in parentheses (where applicable) represent the combined percentages of respondents who endorsed the stated view versus the opposing view. Responses of “unable to answer” were not factored into these percentages.

Demographics - Survey respondents made selections for each of four demographic issues: position, work location, grade, and years of service with the NRC. Most of the respondents are inspectors directly implementing the ROP. More than 130 of the 159 respondents are regional staff including resident inspectors, region-based inspectors, senior reactor analysts, and managers. Regional participation breakdowns are as follows: Region I had 31 respondents, Region II had 32, Region III had 44, and Region IV had 30. Headquarters had 22 respondents accounting for 14 percent of the respondents.

Assessment Process – This area of the survey included 18 questions versus 10 in the 2006 survey. The increase in questions was in response to several factors. A few questions on information contained in assessment letters were added. Several questions in the “Other Issues” section of the 2006 survey were consolidated into the “Assessment Process” section of this survey and clarification was added to several questions from the 2006 survey to improve the 2008 survey. The relatively high percentage of agreement in all questions generally demonstrated a stable or improving trend.

Respondents agree that the assessment process provides an appropriate range of regulatory actions in response to safety issues (92 percent). Most respondents (80 percent) agree that the assessment process provides for timely resolution of issues commensurate with safety significance. Eighty-four percent of the respondents feel that the assessment process properly incorporates enforcement actions. The staff completed efforts in late 2008 to define ways to better integrate traditional enforcement outcomes into the assessment process and is now incorporating the implementation details into ROP guidance documents. Over three-quarters (82 percent) of respondents agree that the assessment process focuses resources on the areas of greatest safety significance. The majority (59 percent) of the respondents agree that the assessment process minimizes duplication/rework in preparation for assessment meetings.

The majority of the respondents agree that the assessment process provides objective assessments of licensee performance (81 percent) and that the agency uses appropriate actions to address performance issues for those licensees outside of the “Licensee Response” column of the Action Matrix (87 percent). Two-thirds of the respondents (68 percent) believe that the assessment process allows effective consideration of safety culture aspects. Sixty-six percent agree that the assessment process integrates and provides insights into substantive cross-cutting issues. Only 59 percent agree that the ROP safety culture enhancements (in both assessment and inspection areas) help in identifying licensee safety culture weaknesses and focusing licensee and NRC attention appropriately. The safety culture initiative was first implemented in mid-2006. Questions were added to the 2006 and 2008 internal surveys to solicit feedback on safety culture.

The 2008 internal survey revealed a generally positive perception of the assessment program although some stakeholders noted that cross-cutting aspects and issues and safety culture guidance were too complex, subjective, and not always worth the effort expended. Internal stakeholders expressed diverse opinions as to the value of the program changes made as a

result of the safety culture initiative. Notwithstanding the written comments, more than half of the internal respondents continue to indicate that the changes to the ROP will help to identify weaknesses in licensee safety culture and to focus both licensee and NRC resources accordingly. ROP guidance was modified recently to provide additional guidance in the cross-cutting area, and the staff plans to continue to evaluate the effectiveness of the safety culture initiative in CY 2009.

Inspection Program – This area of the survey included 20 questions versus 13 in CY 2006. Inspection program area questions previously separated into program and procedure sections in the CY 2006 survey were combined into one topic area, “Inspection Programs.” The staff added new questions focusing on the baseline inspection program and information contained in inspection reports. Several questions in the “Other Issues” section in the 2006 survey were consolidated into the “Inspection Program” section of this survey. Several questions from the 2006 survey were clarified to improve the 2008 survey. The relatively high percentage of agreement in the responses to all questions generally demonstrated a stable or improving trend.

Most respondents agree that the information contained in inspection reports is communicated in a timely fashion (95 percent) and is communicated accurately (93 percent). More than three-quarters of the internal stakeholders believe that the baseline inspection program appropriately inspects for and identifies risk-significant issues (88 percent) and that it provides appropriate coverage of plant activities and operations important to safety (81 percent). More than three-quarters of the respondents believe that the baseline inspection program leads to objective findings for which significance can be clearly documented (84 percent). The majority of respondents agree that the baseline inspection procedures provide adequate guidance on cross-cutting aspects (59 percent) and provide estimates that reflect the effort required to complete the procedure (58 percent). Inspection guidance was modified recently to provide additional guidance in the cross-cutting area, and the staff plans to continue to evaluate the effectiveness of the safety culture initiative in CY 2009.

A high percentage of the respondents believe that the baseline inspection program procedures are adequate to address intended cornerstone attributes (91 percent), are conducted at an appropriate frequency (86 percent), and adequately sample risk-significant aspects of each inspectable area (90 percent). A high percentage of the respondents believe that the supplemental inspection procedures provide sufficient information to confirm the adequacy of a licensee’s root cause and corrective action effort (87 percent). Many survey respondents also agree that issuing noncited violations and relying on licensees’ corrective action programs constitute an adequate approach to resolving issues of very low safety significance (i.e., “green” findings) (84 percent). Many of the respondents indicate that baseline inspection procedures are clearly written (77 percent). Of those surveyed, seventy-eight percent believe that the baseline inspection procedures place sufficient emphasis on field observation and inspections.

The internal survey resulted in favorable feedback regarding whether information contained in inspection reports was relevant, useful, and written in plain English. However, the inspectors also provided feedback that the documentation of inspection scope in inspection reports could be improved to make these reports easier to read. Additionally, the internal survey provides favorable feedback regarding whether the inspection program adequately covers areas that are important to safety. However, feedback also suggests that increasing the flexibility of the ROP requirements, reducing the number of inspection samples for selected inspection procedures, and increasing maintenance observation activities may be warranted to improve the

effectiveness of the baseline inspection program. The staff will consider these issues during the ROP realignment effort in CY 2009.

Performance Indicators – This area of the survey included seven questions. Several PI questions were rewritten to reinforce the fundamental ROP concept that PIs are considered in conjunction with inspection findings for reactor oversight and performance assessment. The relatively high percentage of agreement in all questions generally demonstrated a stable trend.

The majority of the respondents believe that the PIs are understandable (72 percent). Additionally, many believe that they are clearly defined (79 percent) and provide an appropriate level of overlap with the inspection program (79 percent). More than two-thirds of the respondents believe that the PIs provide useful information on risk-significant areas (74 percent). Seventy-one percent of the respondents agree that PIs provide useful insights and, when combined with the inspection program, help ensure plant safety.

Only 61 percent of the respondents believe that the PIs provide an objective indication of declining safety performance. Sixty-five percent of the respondents agree that PIs effectively contribute to the identification of performance outliers based on risk informed, objective, and predictable indicators.

The internal survey indicates that the PI program meets the ROP goals of providing useful information on risk-significant areas. Most survey respondents believe that the PIs are clearly defined, understandable, and provide an appropriate overlap with the inspection program. They also state that the PIs provide an objective indication of declining safety performance and can be effectively used to identify outliers. However, of the stakeholders who provided written comments, many indicate that the PI program has not worked in accordance with the ROP goals of being understandable, well defined, or useful. Several indicate that with so few PIs crossing the green to white threshold, the PI program does not provide meaningful insights. Others feel that the PI program is not predictive of identifying plants with declining plant performance. The staff will continue to reinforce the message that a green PI represents performance that does not require additional NRC oversight and that PIs are only one contributor to the identification of performance outliers. In addition, the staff will continue to refine existing PIs and explore options for introducing new PIs to ensure that the PI program provides useful insights and contributes to the identification of declining performance.

Significance Determination Process (SDP) – This area of the survey includes 17 questions versus 15 in CY 2006. Most questions were the same as in the 2006 survey and the responses revealed a stable or improving trend.

Many of the respondents agree that the SDPs provide a basis for effective communication of inspection findings to the licensee (83 percent) and focus NRC attention on safety-significant issues (85 percent). Three quarters of the respondents agree that the SDP provides consistent and repeatable results (74 percent) and a basis for effective communication of inspection findings to the public (68 percent).

Sixty-six percent of the respondents agree that program guidance documents are clear, and over two-thirds agree that resource expenditures are appropriate (68 percent). The majority (57 percent) of respondents believe that non-reactor safety SDPs are easy to use, while a greater percentage of the respondents believe that the reactor safety SDPs are easy to use

(63 percent). A little over half of the respondents believe SDP training is effective (55 percent). The staff implemented several SDP improvements in CY 2008 including revised guidance for the initial screening and characterization of findings in the Phase 1 process, maintaining SDP timeliness, and for conducting Significance and Enforcement Review Panels. The internal survey results show a positive reception of these improvements, and this trend should be reflected in future surveys.

Eighty-five percent of the respondents believe that the SDP results are verifiable. A majority of the respondents believe that the SDP results correctly characterize the risk-significance of inspection findings (74 percent), are accurate (71 percent), are timely (75 percent), are based on clear standards (62 percent), and are realistic (76 percent).

The responses to the internal survey are generally favorable for the SDP. The respondents appear confident that the SDP (1) provides consistent results that are an appropriate regulatory response to performance issues; (2) meets important program objectives such as being scrutable, accurate, repeatable, timely, and based on clear standards; and (3) is effective in communicating results to the licensees and the public. A majority of the respondents believe that the SDPs are easy to use and that program guidance documents are clear. However, several respondents noted that SDP training and guidance could be improved and additional refresher training would be helpful. The staff is working to improve initial and refresher SDP training in CY 2009 to address the indicated need for more effective training, and the staff continues to make improvements to the guidance to improve the understandability and effectiveness of the various SDPs.

ROP Web Page and Reactor Program System – This area of the survey included eight questions. The staff added new questions regarding the effectiveness of the Reactor Program System in 2008. The other questions were the same as in the 2006 survey, and the responses revealed a stable or improving trend.

The vast of the respondents agree that information on plant performance is accurate (95 percent), timely (91 percent), and understandable (written in plain English) (88 percent). Additionally, the respondents believe that the information is adequate to keep NRC internal stakeholders informed (89 percent) and is organized for easy retrieval (81 percent).

About two-thirds of the respondents agree that the Reactor Program System is effective in managing issues and findings (69 percent), is effective in scheduling and managing inspections (66 percent), and is an effective tool for determining completion of the baseline inspection program (71 percent).

Feedback Forms – This area of the survey included four questions. The percentage of respondents who agree with the stated view increased for all questions when compared to the 2006 survey.

Many respondents believe that the responses to feedback forms are accurate (84 percent) and are understandable and written in plain English (86 percent). More than half agree that the responses to feedback forms are timely (58 percent) and almost three quarters of the respondents believe that the responses from feedback forms are responsive and address the issues raised (73 percent).

Close to 40 percent of those surveyed were unable to answer these questions because they did not have experience using the feedback process. Some respondents state that the feedback process could be improved to make it more effective and responsive. The staff believes that the improvements made in CY 2006 for tracking feedback forms increased timeliness and stakeholder satisfaction with the internal feedback process. However, the staff recognizes the potential for additional process improvements to increase overall efficiency and reliability and plans to further improve the feedback process in CY 2009.

Training Issues - This area of the survey included six questions. The percentage of agreement in the responses to all questions generally demonstrated a stable or improving trend.

Regarding training issues and professional development, 70 percent of the respondents agree that adequate training is provided to effectively implement the ROP. Most of the respondents agree that inspectors are encouraged to maintain a questioning attitude (91 percent). Only 54 percent agree that adequate training is available for the safety culture enhancements to the ROP inspection procedures and manual chapters. The staff plans to continue to evaluate the effectiveness of the safety culture initiative including inspector training during CY 2009.

The internal survey shows that inspectors are generally satisfied with training to implement the ROP but slightly less satisfied than during the previous survey. In the survey, inspectors requested more training on the SDP, safety culture, and the computer system used to track inspection reports and findings (the Reactor Program System). Another message from the survey is that inspectors seek more opportunities for continuing training after completion of qualification requirements. The staff plans to address these training needs in CY 2009.

Security - This new area of the survey included 14 questions. In general, most participating respondents agree that the security aspects of the ROP have been executed effectively within the Security cornerstone. This new survey topic area was added to obtain feedback on cornerstone inspection procedures, the security assessment process, and security inspection reports. The survey also asked questions concerning the Reactor Program System as it relates to the Security cornerstone.

About 73 percent of the internal survey population did not address the "Security" section of the internal survey. An assessment of those respondents who did address this section follows. The majority of participating respondents agree that baseline inspection procedures cover all areas important to plant security (89 percent) and are conducted at the appropriate frequency (90 percent). Over three-quarters of the participating respondents agree that the baseline inspection program provides appropriate coverage of plant activities and operations important to security (89 percent).

Additionally, participating respondents agree that the Reactor Program System is effective in managing security issues and findings (78 percent), scheduling and managing security inspections (80 percent), and determining completion of the security baseline inspection program (78 percent). Only 47 percent of the participating respondents agreed that security inspection reports and their cover letters provide sufficient information to the public. The staff continues to evaluate the appropriate level of security-related inspection and licensee performance information that could be made available to the general public without jeopardizing security or revealing actual or potential vulnerabilities.

Overall ROP – This area of the survey included 16 questions. Most questions remain the same as in the 2006 survey, and the responses revealed a stable or improving trend. Several questions in the “Other Issues” section in the 2006 survey were consolidated into the “Overall ROP” section of this survey resulting in additional questions. Most respondents agree that overall the ROP is predictable (91 percent), consistent (85 percent), and timely (90 percent). Seventy-eight percent agree that the ROP provides appropriate efficiency and effectiveness.

The majority of respondents indicate that the ROP generally provides appropriate assurance that plants are being operated safely (89 percent), appropriate regulatory attention to licensees with performance problems (88 percent), and a realistic approach to the oversight process (86 percent). Respondents further agree that the ROP provides appropriate objectivity (87 percent). Almost three quarters (73 percent) of the internal stakeholders agree that the ROP appropriately identifies declining safety and security performance before there is a significant reduction in safety and security margins. The staff is in the process of improving several PIs and continues to work with the industry to revise and/or introduce other PIs to improve the program’s effectiveness as an input to the ROP assessment process.

Respondents believe that the ROP generally provides an effective, risk-informed approach to oversight (83 percent) and provides appropriate regulatory attention to licensees with performance problems (88 percent). Additionally, the internal stakeholders agree that the ROP provides appropriate inspector and licensee communication (93 percent) and provides appropriate communication effectiveness through the use of plain language in official correspondence (86 percent).

About three quarters of respondents agree that the resources needed to oversee licensees using the ROP are appropriate. Eighty-two percent agree that the ROP encourages self-improvement of licensees. Many survey respondents also agree that the ROP provides sufficient information to keep the public informed of the agency oversight activities related to the plants (85 percent).

### **Stakeholder Survey Conclusions**

The responses from the survey of internal stakeholders are generally in line with responses from previous years as are the distribution of the responses. The responses are generally positive with some concerns being raised in each of the ROP program areas. The staff has or will consider the feedback from these surveys in modifying the associated areas of the ROP. The applicable portions of the program evaluations in Enclosure 1 to this paper as well as in the ROP performance metric report (reference ADAMS Accession No. ML090690616) offer further discussion and analysis of the survey results. The staff further plans to prepare a consolidated response to the internal survey to more specifically address some of the comments and the main themes derived from the comments and will make this response available to internal stakeholders through the ROP Digital City Web site. In addition, a consolidated table including all internal and external survey results since inception of the ROP, along with the staff’s evaluation and response, can be accessed 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," issued August 18, 1992.

The feedback process requires regional management to solicit informal feedback from its 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 70 reactor licensees regarding 146 issues. The comments fell into two main categories—inspector performance and formal communication with licensees. Of the comments received, 92 percent were favorable and 8 percent were unfavorable. The following sections summarize the feedback received, the staff's evaluation, and the proposed improvement actions.

### (1) Inspector Performance

#### Feedback

Almost half of the licensees' comments concerned inspector performance. This category covers a wide range of inspector practices but excludes issues involving communication with licensees, which is discussed in the next section. About 90 percent of the comments praised the NRC's inspection staff while noting the high quality of inspections and the effective working relationship between the NRC and its licensees.

Licensees viewed most inspections including team inspections as professional and of high quality. Most licensees stated that NRC inspections were effective and correctly characterized the licensee's performance. However, two licensees raised concerns about the force-on-force inspection process, and one licensee expressed concern about the B.5.b Phase 2 and 3 inspection effort.

#### Evaluation and Action

The staff concludes that inspectors were professional and maintained effective working relationships with the exception of isolated incidents. About 90 percent of the comments received this year were favorable. In general, the staff reviewed the negative feedback for trends and found that it related only to isolated incidents. However, the staff made enhancements to the force-on-force inspection procedure and processes as a result of the regulatory impact process and other feedback to improve its efficiency and effectiveness.

The NRC management continues to emphasize to the staff the importance of professional conduct. Senior NRC managers reinforce these expectations in inspector counterpart meetings, workshops, and 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.

## **(2) Formal Communication with Licensees**

### Feedback

About 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 communication problems related to the clarity of inspection issues, including differences in the assessment of an issue as discussed during the inspection, as presented at the exit meeting, or as documented in the inspection report.

### Evaluation and Action

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 bases this conclusion on the large number of routine interactions between the NRC and its licensees combined with the many favorable comments and the relatively few 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 provided for the inspection program. Effective communications will remain a challenge and will receive continued monitoring and attention from regional and headquarters management.

## Reactor Oversight Process Resources

### Summary of 2008 Reactor Oversight Process Resources

Table 1<sup>1</sup> summarizes the 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 2008 decreased by 4.3 percent compared with FY 2007 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 decreased in 2008. Since plant status hours remained relatively constant and baseline inspection preparation and documentation track proportionally with direct inspection hours, the staff looked at the hours charged to baseline direct inspection effort to understand the causes for the decrease.

The decrease was primarily the result of the reduced frequency in performing inspection procedure (IP) 71111.21, "Component Design Bases Inspection," which changed from biennial to triennial starting in 2008, and fewer hours charged to IP 71152, "Identification and Resolution of Problems." The regions conducted fewer of both of these major inspections in 2008, and the two account for almost 70 percent of the reduction in direct baseline inspection hours. IP 71152 is conducted on a biennial frequency, and 2007 is the first year of the biennial cycle. More IP 71152 inspections were performed during 2007 (the first year of the biennial cycle) than during 2008 (the second year of the cycle). As a result, the hours charged to IP 71152 were higher in 2007, and the lower number of hours in 2008 is consistent with the biennial frequency of the inspection. Overall, the average number of hours charged to IP 71152 for the 2005-2006 biennial inspection cycle was comparable to the 2007-2008 inspection cycle. The hours charged to other baseline procedures remained relatively unchanged. IP 71152, IP 71111.21, and the remainder of the baseline inspection procedures will be reviewed for appropriate resource allocation during the ROP realignment effort in CY 2009.

As in previous years, all four regions completed the required baseline inspections in 2008.

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 and special inspections performed in response to events, and the infrequently performed inspections listed in Appendix C of NRC Inspection Manual Chapters (IMC) 2515, "Light-Water Reactor Inspection Program -- Operations Phase," and IMC 2201, "Security and Safeguards Inspection program for Commercial Power Reactors," which are not part of the baseline or supplemental inspection program.

Plant-specific inspection effort increased in FY 2008 compared with FY 2007 primarily because of the IP 95003, "Supplemental Inspection for Repetitive Degraded Cornerstones, Multiple Degraded Cornerstones, Multiple Yellow Inputs, or One Red Input," inspection at the Palo Verde site and because of an increase in IP 95002 inspections at several sites. Additional contributors to the plant-specific effort include reactive inspections at several sites and other significant inspections conducted in FY 2008 including those for the Security cornerstone.

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

Generic safety issue (GSI) inspections are typically one-time inspections of specific safety and security issues with significant variability in effort possible from year to year. The increased effort related to GSI inspections in FY 2008 reflects the conduct of several temporary instructions (TI) including TI 2515/166, "Pressurized Water Reactor Containment Sump Blockage;" TI 2515/171, "Verification of Site Specific Implementation of B.5.b Phase 2 & 3 Mitigating Strategies;" TI 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds;" and TI 2515/176, "Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing."

The effort reported for "other activities" including inspection-related travel, Significance Determination Process (SDP), and routine communication (which now encompasses regional support, enforcement support, and review of technical documents) also decreased slightly in 2008. The effort for these activities typically tends to respond in concert with baseline inspection effort.

The regional effort for licensee performance assessment continued to decline in 2008. This continuing trend is most likely indicative of the increasing staff familiarity with the performance assessment process. The decreasing rate of decline during the past 3 years also suggests that the performance assessment effort may be reaching its steady-state value.

### **Reactor Oversight Process Resource Model and Regional Inspection Budget**

The review of issues related to inspection resources is part of the ongoing ROP self-assessment and baseline procedure realignment process, and budgeted inspection resources are adjusted as required by program needs.

In 2006, Region I piloted a resource model that included 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, Nine Mile Point, and Millstone 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 was valid and allowed for an equivalent level of confidence in the NRC's oversight of licensee performance at unique dual-unit sites when compared to the previous inspection and assessment of these sites. Previously, the NRC treated Millstone as two single units and treated Nine Mile Point as a normal dual-unit model with additional regional resources applied.

The staff approved implementation of the USBM model at Millstone and Nine Mile Point with the allocation of the corresponding resources. The staff also concluded that the USBM is not applicable to Beaver Valley since the difference between the Beaver Valley units are less significant and primarily relate to organizational and procedural differences. Implementing the USBM for Millstone and Nine Mile Point results in an overall resource savings since the reduction in inspection resources in going from two single-unit sites at Millstone offsets the increase in resources associated with going from a dual-unit site to the USBM in the case of Nine Mile Point. The USBM was fully implemented at Nine Mile Point and Millstone during the 2008 inspection cycle. The USBM is effective and provides appropriate resources for these unique sites.

For budget considerations in general, USBM nominal values equal the dual-unit maximum values for sample size and inspection hours with a  $\pm 15$  percent range, which is consistent with

the variance used for ROP inspection procedures. Resources at this level have been included in the FY 2009 and 2010 Office of Nuclear Reactor Regulation (NRR)/regional baseline inspection budget to implement the USBM and inspect Millstone and Nine Mile Point as unique dual-unit sites.

### **Reactor Oversight Process Improvement Initiatives**

Since the formation of the Office of Nuclear Security and Incident Response (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, the staff revised the inspection-related time-reporting codes in FY 2007 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. These changes have improved the accuracy of ROP time reporting.

A number of initiatives are currently underway to improve program efficiency and effectiveness and these 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 SDP improvements, and implementation of the performance indicator improvements. Enclosure 1 of this paper discusses these initiatives.

**Table 1  
Resources Expended<sup>1</sup>  
(Inspection-Related Staff Effort Expended at Operating Power Reactors)**

	52 weeks FY 2006 <u>09/25/05-09/23/06</u>	52 weeks FY 2007 <u>09/24/06-09/22/07</u>	52 weeks FY 2008 <u>09/23/07-09/20/08</u>
Baseline Inspections			
Direct Inspection Effort	144,117	156,547	147,396
Inspection Prep/Doc	107,042	111,770	99,522
Plant Status	<u>51,488</u>	<u>48,804</u>	<u>49,481</u>
Subtotal	302,647	317,130	296,399
Plant-Specific Inspections			
Direct Inspection Effort	16,709	12,278	14,063
Inspection Prep/Doc	<u>11,130</u>	<u>8,174</u>	<u>9,909</u>
Subtotal	27,839	20,452	23,972
Generic Safety Issues Inspections	8,295	11,212	13,492
Performance Assessment (Regional Effort Only)	16,885	14,349	13,517
Other Activities <sup>2</sup>	66,156	68,493	65,754
Total Staff Effort	421,822 hr	431,636 hr	413,134 hr
Total Staff Effort/Operating Site <sup>3</sup>	6,296 hr/site	6,540 hr/site	6,260 hr/site

<sup>1</sup> Resources expended includes regional, NRR, and NSIR hours.

<sup>2</sup> Other activities include inspection-related travel, SDP, and routine communication (which encompasses regional support, enforcement support, and review of technical documents).

<sup>3</sup> In prior years, Millstone was treated as two single-unit sites. Starting in 2007, the NRC inspected Millstone 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/operating site 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 the staff requirements memorandum (SRM) for COMGJD-98-001/COMEXM-98-002, "Discussion of Resident Inspector Demographics and the Balance Between Expertise and Objectivity," 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 RI experience base and to identify any necessary improvements. 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 1–7 and Figures 1–10). Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program," provides details regarding the RI program demographic data analysis. The staff used median values from the month of November 2004 to November 2008 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 the 2008 Resident Inspector Group**

The RI demographic data for 2008 (see Tables 1 and 2) indicates that the RI turnover rate has remained high (31 percent) in 2008. This is especially significant given the 46 percent turnover rate in 2007. The attrition that has occurred over the last several years has resulted in a median RI work experience level of about 1 year. The decrease in RI work experience of the RI group is somewhat balanced by this group's increased regulatory experience of approximately 4½ years and relevant non-NRC experience of 9 years. Table 6 shows a breakdown of experience data for RIs by region.

It should be noted that 82 percent of the RIs who left the RI program remained with the NRC. Of the 22 RIs who left during 2008, 10 were promoted to SRI positions, 8 were either promoted

or laterally reassigned to a regional office or headquarters, 1 retired, and 3 resigned from the NRC.

**Table 1  
Resident Inspector Turnover**

	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Promoted to SRI</b>	3	10	11	13	10
<b>Promoted/ Reassigned</b>	3	9	2	13	8
<b>Retired</b>	0	2	1	3	1
<b>Resigned</b>	0	2	0	4	3
<b>Total</b>	<b>6</b>	<b>23</b>	<b>14</b>	<b>33</b>	<b>22</b>
<b>Turnover Rate</b>	8%	32%	20%	46%	31%

**Table 2  
Resident Inspectors  
(Median Values in Years)**

	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>NRC Time</b>	3.42	3.36	4.04	4.25	4.48
<b>Total Resident Time</b>	2.00	2.31	2.39	1.87	1.28
<b>Current Site Time</b>	1.85	2.25	2.23	1.85	1.28
<b>Relevant Non-NRC Experience</b>	10.00	10.63	10.75	10.38	9.00

**Analysis of the 2008 Senior Resident Inspector Group**

SRI demographic data for 2008 (see Tables 3 and 4) indicates that the SRI turnover rate (18%) and the relevant non-NRC experience level have remained steady. In 2008, 12 of 66 SRIs left the RI program. Of those 12, 5 were promoted, 4 were laterally reassigned to headquarters or a regional office, 1 retired, and 2 resigned from the NRC. These data do not include SRIs who were laterally reassigned to another site. Table 7 presents a numerical breakdown of the SRI positions by region.

**Table 3  
Senior Resident Inspector Turnover**

	2004	2005	2006	2007	2008
<b>Promoted</b>	0	5	7	7	5
<b>Reassigned</b>	3	4	7	7	4
<b>Retired</b>	2	1	1	1	1
<b>Resigned</b>	0	0	1	2	2
<b>Total</b>	<b>5</b>	<b>10</b>	<b>16</b>	<b>17</b>	<b>12</b>
<b>Turnover Rate</b>	8%	15%	24%	26%	18%

**Table 4  
Senior Resident Inspectors  
(Median Values in Years)**

	2004	2005	2006	2007	2008
<b>NRC Time</b>	8.80	8.84	9.28	10.11	10.86
<b>Total Resident Time</b>	7.32	7.54	7.77	7.93	7.30
<b>Current Site Time</b>	2.31	2.63	3.21	2.52	2.28
<b>Relevant Non- NRC Experience</b>	6.55	7.96	9.08	10.04	9.38

**Resident Inspector Attraction and Retention**

Staff turnover within the NRC, whether caused by promotion, reassignment, retirement, or resignation, is an ongoing process of which the RI program is not insulated. To ensure that the RI program can continue to fulfill its mission, the Commission directed the staff in SRM-M070531, "Briefing on the Results of the Agency Action Review Meeting (AARM)," dated June 14, 2007, to evaluate recruitment, training, and development to confirm that there are adequate human resources to meet changing needs. Therefore, because of the importance of maintaining an experienced and stable onsite inspection presence, the NRC has initiated several actions to help alleviate the burden associated with the transient nature of the RI program. The staff will present these actions to the Commission in a separate paper.

**Site Staffing**

The staff developed a site staffing metric of 90 percent program wide 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 through timely assignment of permanent RI staff. 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. IMC 0307 provides details regarding the site staffing metric and criterion.

Despite the turnover rates in the RI and SRI positions, the regions succeeded in meeting their site staffing metric of 90 percent. The average site staffing for all regions was 98 percent in calendar year 2008. However, five sites fell below the 90 percent site staffing requirement. All five sites were staffed above the 86 percent level and were supplemented by region based inspectors to assist in completing the baseline inspection program. Given the continued high turnover rates experienced in 2008, meeting this metric was challenging and had a significant impact on inspectors and management. Table 5 tracks the number of sites since 2005 that were under the 90 percent site staffing goal.

**Table 5  
Number of Sites Under 90 Percent Site Staffing**

	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>Number of Sites</b>	3	1	9	5

**Table 6  
Resident Inspectors 2008 by Region  
(Median Values)**

<b>2008</b>	NRC Time (years)	Total Resident Time (years)	Current Site Time (years)	Relevant Non-NRC Experience (years)
Region I	4.50	1.02	0.98	8.83
Region II	4.43	1.40	1.40	12.40
Region III	4.41	1.19	1.19	7.88
Region IV	4.27	1.25	1.25	6.00
<b>All Regions</b>	<b>4.48</b>	<b>1.28</b>	<b>1.28</b>	<b>9.00</b>

**Table 7**  
**Senior Resident Inspectors 2008 by Region**  
**(Median Values)**

<b>2007</b>	<b>NRC Time (years)</b>	<b>Total Resident Time (years)</b>	<b>Current Site Time (years)</b>	<b>Relevant Non- NRC Experience (years)</b>
Region I	12.13	8.00	1.51	7.21
Region II	10.94	9.07	3.51	13.00
Region III	11.08	10.16	2.74	8.42
Region IV	8.33	5.08	1.21	9.42
<b>All Regions</b>	<b>10.86</b>	<b>7.30</b>	<b>2.28</b>	<b>9.38</b>

### **Conclusions**

The RI program continues to attract experienced engineers as indicated by the high level of relevant non-NRC experience found in this group. However, the high turnover rates in recent years have resulted in a decline of onsite inspection experience, challenges in filling vacant RI positions, and a significant amount of effort by management and inspection staff to provide continuity of regulatory oversight. These current issues may present challenges in implementing the inspection program.

Because of the number of challenges that regions face associated with staffing vacant RI positions in a timely manner, meeting operating plan metrics, and maintaining an experienced and stable RI program; program enhancements to improve the flexibility and timely hiring of RIs are recommended. These enhancements will be the subject of a separate paper to the Commission.

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

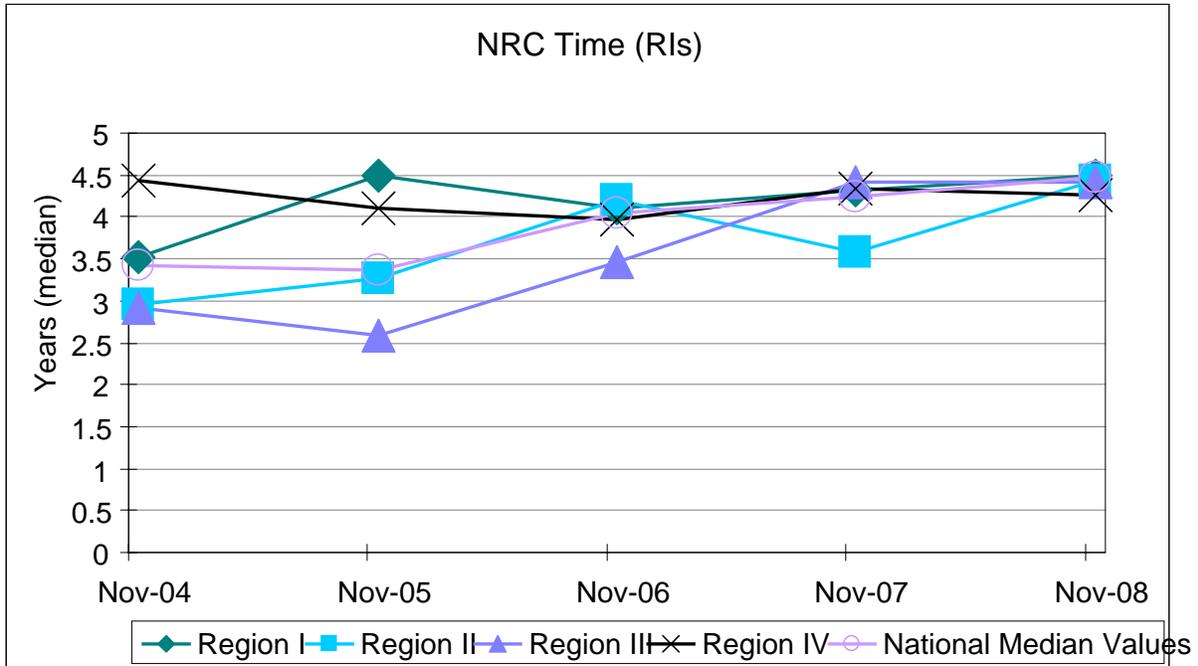


Figure 1

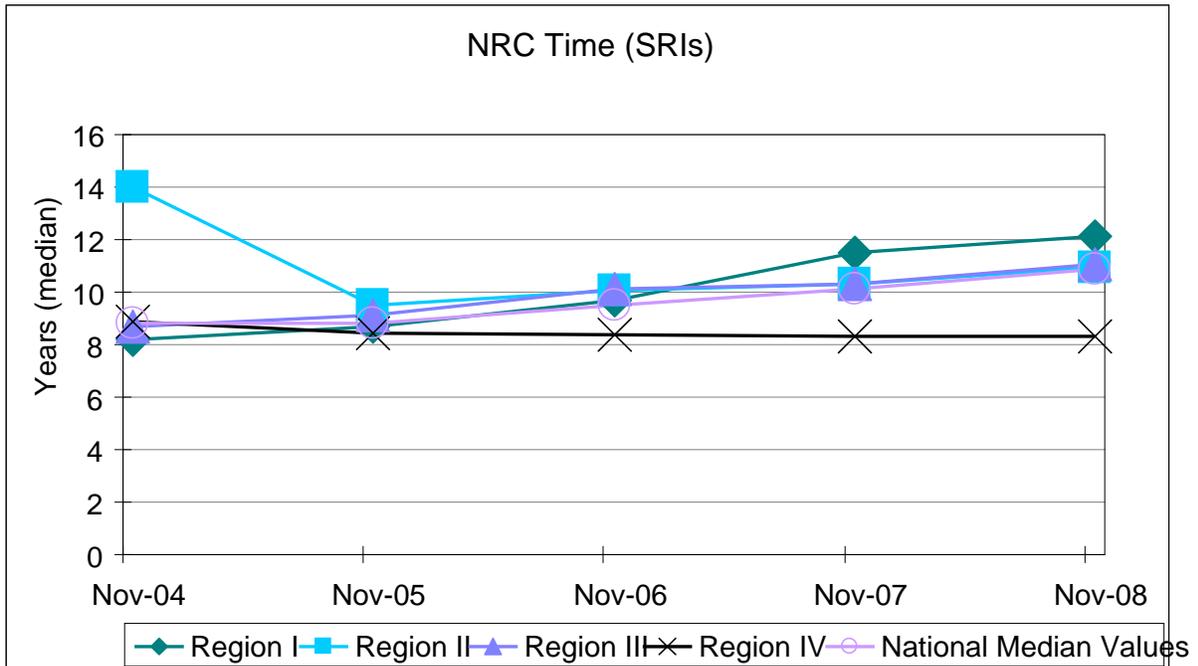


Figure 2

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

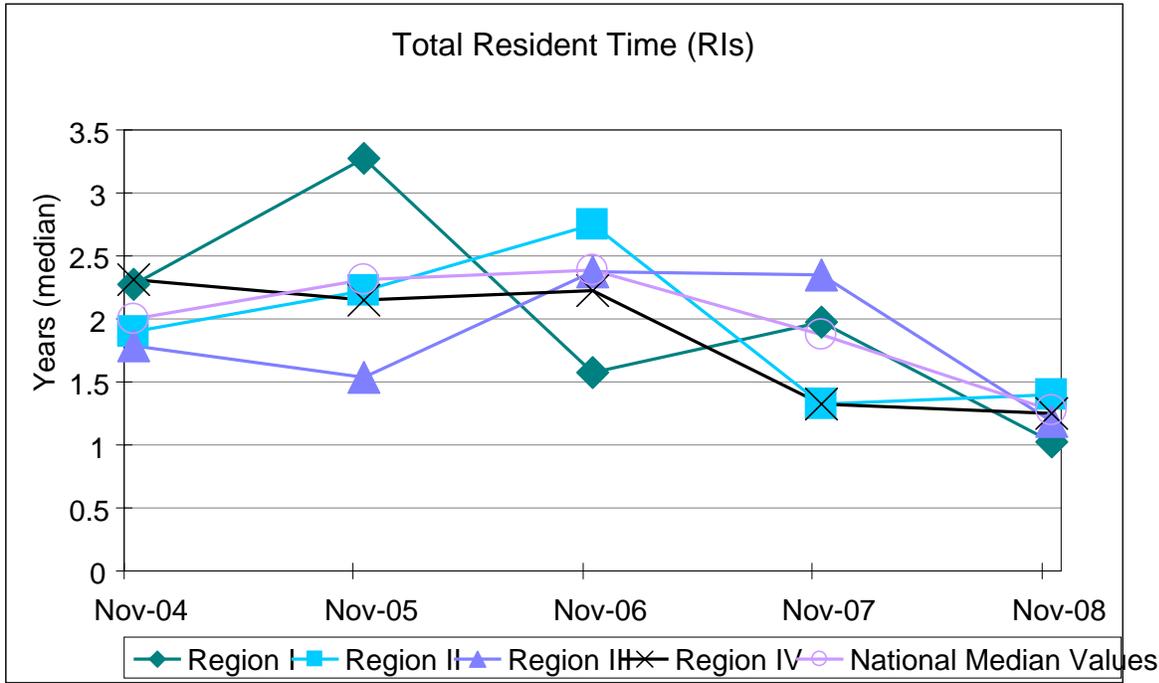


Figure 3

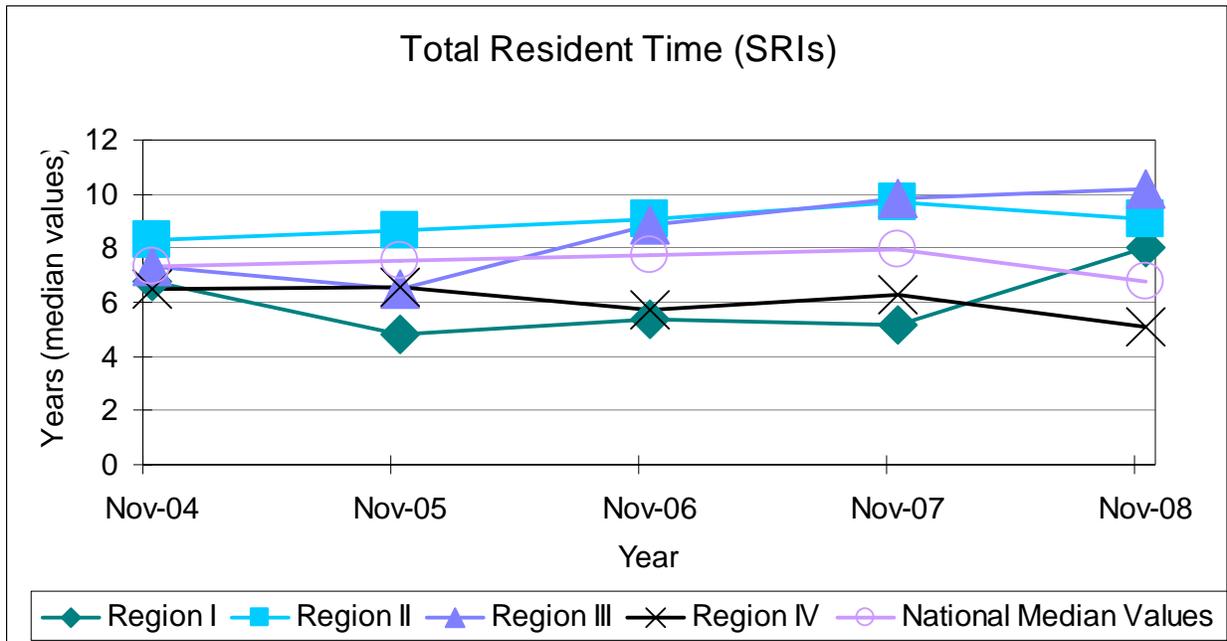


Figure 4

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

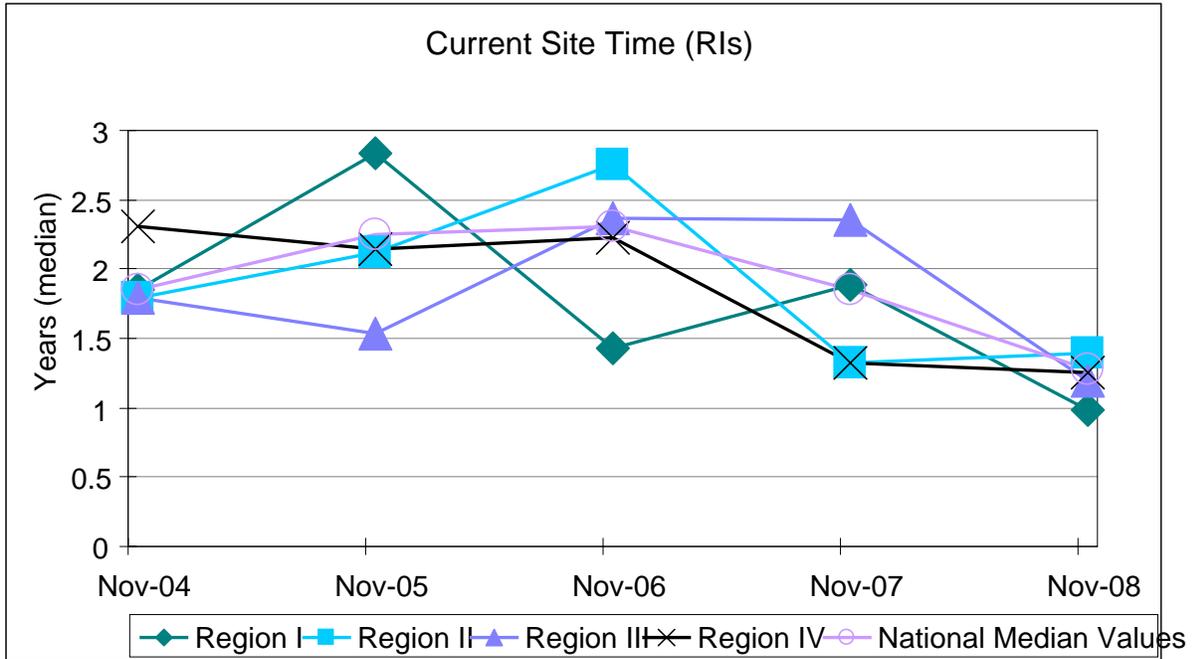


Figure 5

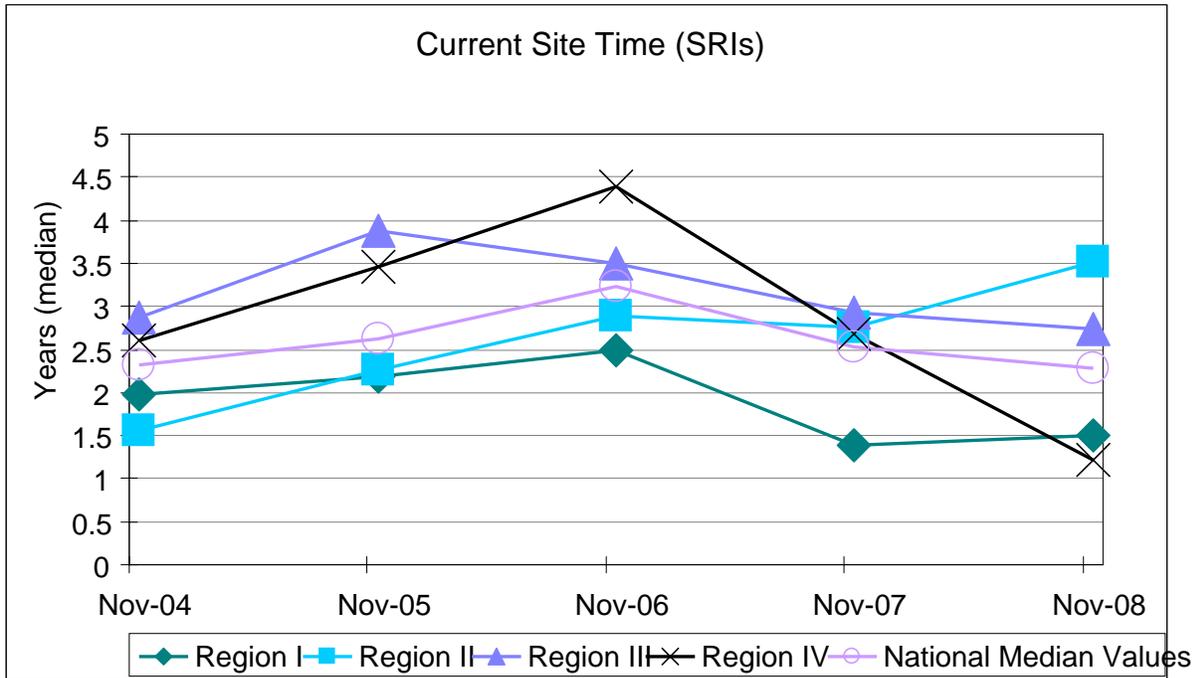


Figure 6

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

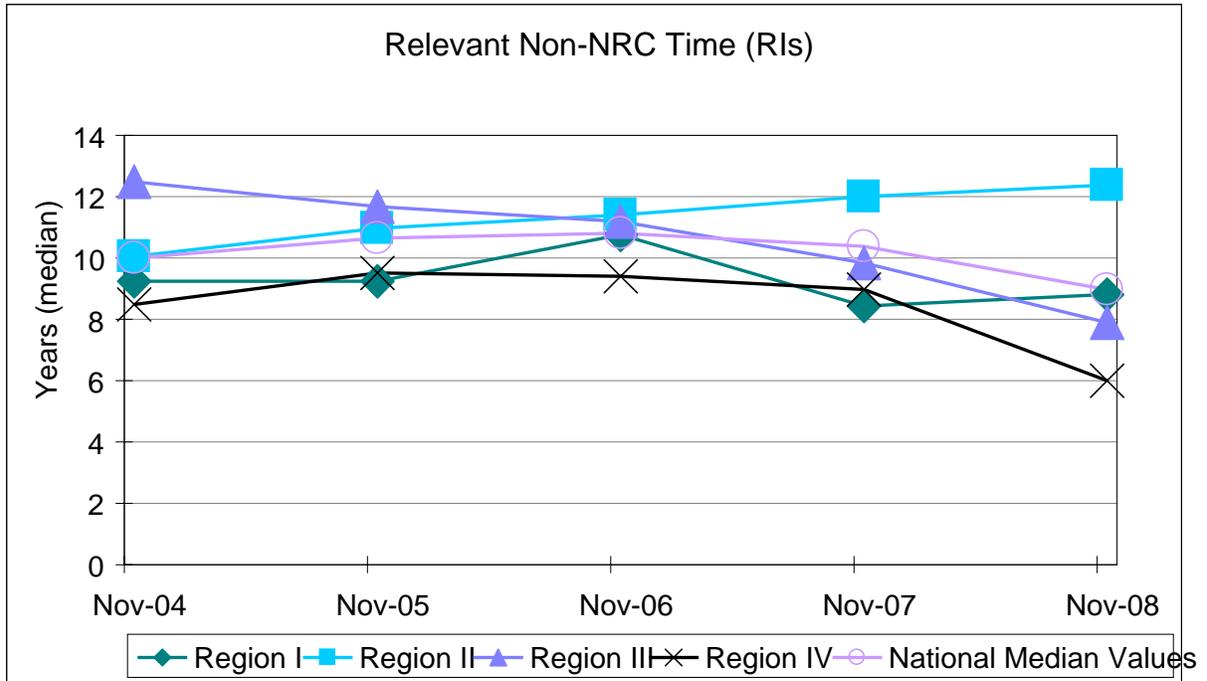


Figure 7

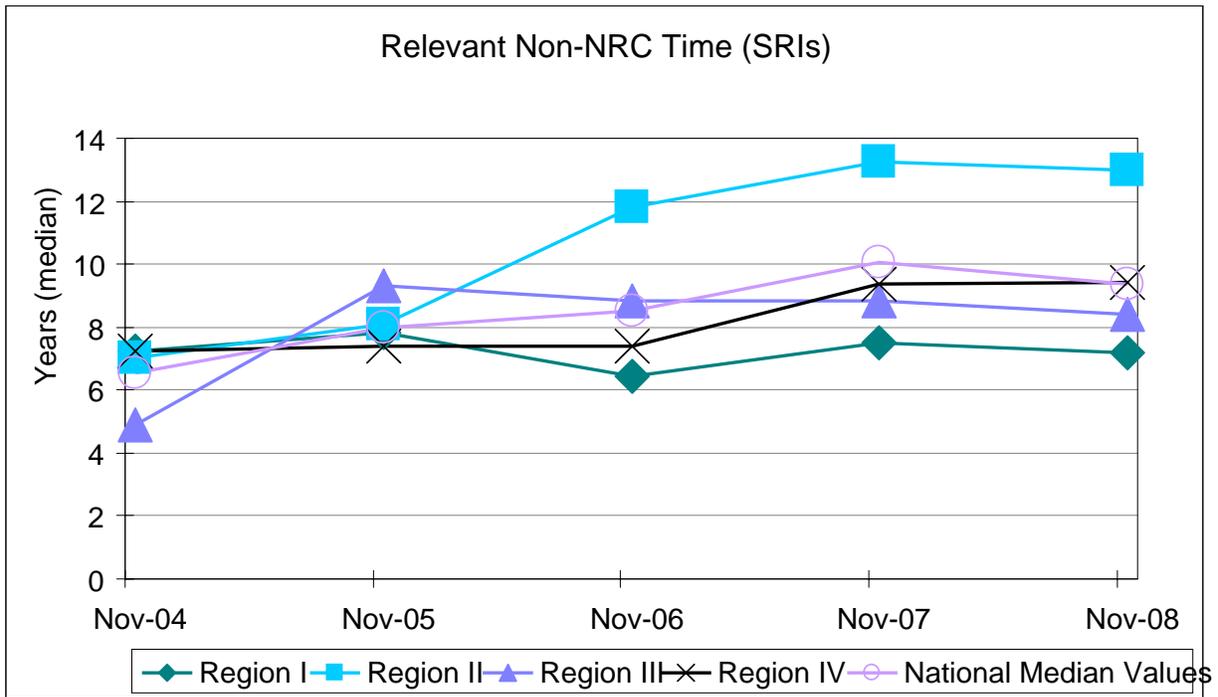


Figure 8

- (5) **Summary:** The average national demographic data for the RIs and SRIs show a decrease in total resident time, current site time, and relevant non-NRC experience and an increase in NRC time.

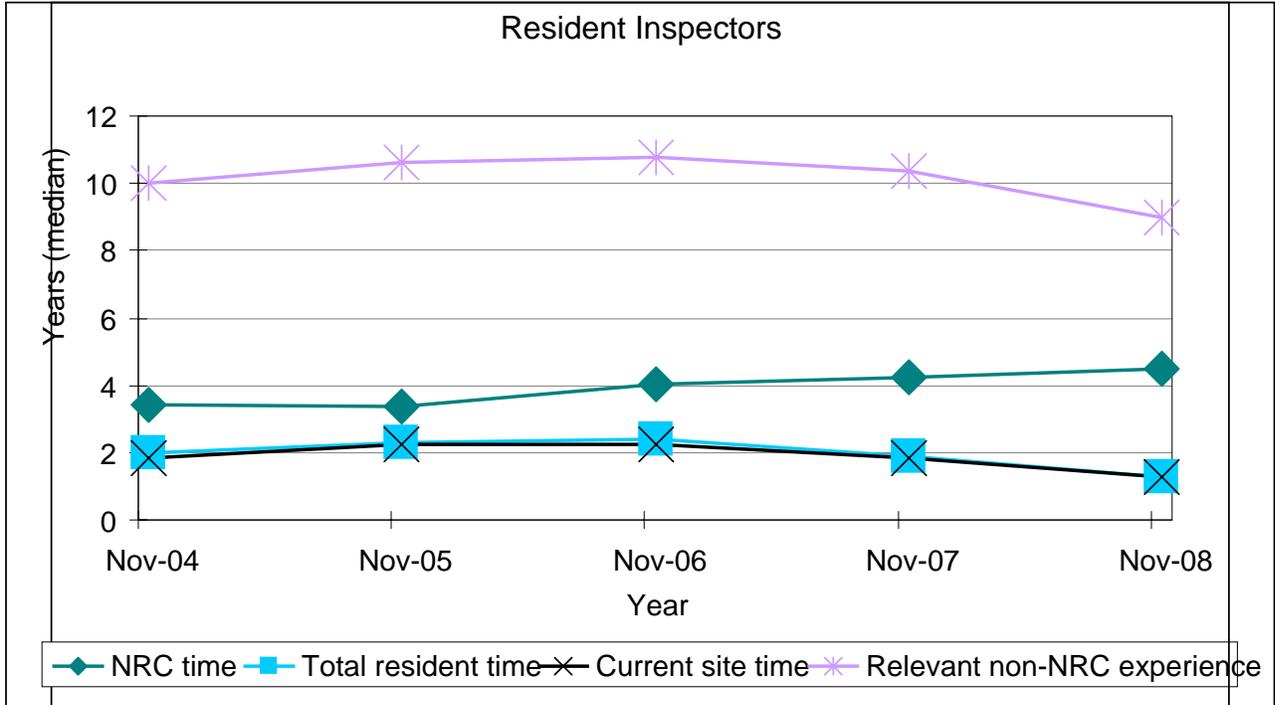


Figure 9

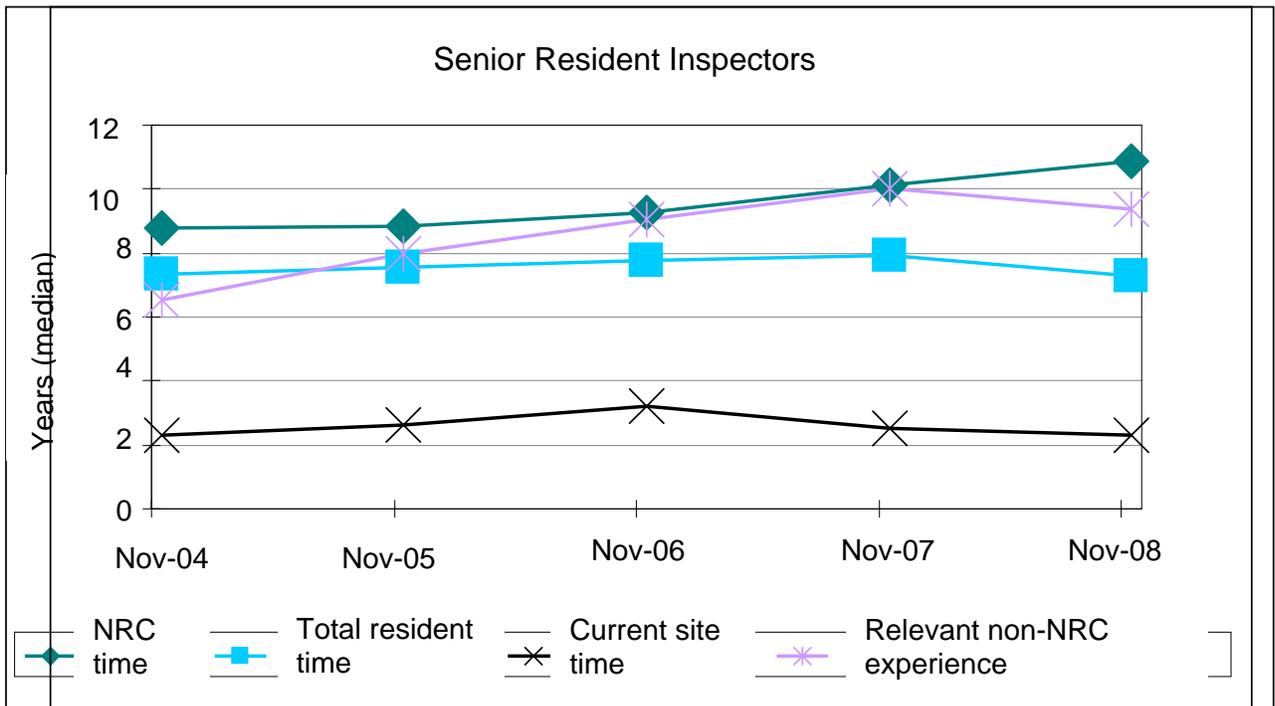


Figure 10