

## **ROP Program Area Evaluations**

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

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

### **Performance Indicator Program**

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

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

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

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

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

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

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

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

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

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

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

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

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

## Inspection Program

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

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

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

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

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

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

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

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

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

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

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

### **Significance Determination Process**

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

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

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

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

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

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

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

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

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

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

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

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

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

### **Assessment Program**

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



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

### **Overall Conclusions**

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