

POLICY ISSUE INFORMATION

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FOR: The Commissioners

FROM: Luis A. Reyes
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SUBJECT: REACTOR OVERSIGHT PROCESS SELF-ASSESSMENT
FOR CALENDAR YEAR 2004

PURPOSE:

To present the results of the staff's annual self-assessment of the Reactor Oversight Process (ROP) for calendar year (CY) 2004. This self-assessment also constitutes the fiscal year (FY) 2005 program evaluation of the ROP as described in Appendix B to the FY 2004 - 2009 Strategic Plan.

SUMMARY:

The CY 2004 self-assessment results indicate that the ROP has been successful in meeting its program goals of being objective, risk-informed, understandable, and predictable. The ROP was also effective in supporting the Nuclear Regulatory Commission's (NRC's) 2004 performance goals of maintaining safety, enhancing public confidence, making activities more effective, efficient, and realistic, and reducing unnecessary regulatory burden. The NRC staff maintained its focus on stakeholder involvement and continued to improve various aspects of the ROP as a result of feedback and lessons learned. In particular, the staff implemented several additional ROP improvements recommended by the Davis-Besse Lessons Learned Task Force (DBLLTF), the Office of the Inspector General (OIG), other independent evaluations, and internal and external stakeholders.

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The responses to the NRC's 2004 surveys of internal and external stakeholders were generally favorable; however, some stakeholders raised concerns about the effectiveness of the performance indicator (PI) program, the timeliness and subjectivity of the significance determination process (SDP), and other areas where improvements have been suggested. Most ROP performance metrics were met, with the exception of one PI metric, four SDP metrics, one assessment metric, and two overall metrics.

As part of the self-assessment effort, the staff identified issues and actions in the key ROP program areas of PIs, inspection, SDP, and assessment. The staff and many stakeholders have become increasingly concerned about the ability of the current set of PIs to provide adequate indications of declining performance in a timely manner. The frequently asked question (FAQ) process for resolving interpretations in PI guidance continues to be inefficient and resource intensive. The revised resident inspector staffing policy, additional regional resources allocated in FY 2004 and beyond, and aggressive recruiting, hiring, and qualification of new inspectors appear to have addressed the site staffing and resource concerns. The staff continues to focus on improving SDP timeliness and has made significant progress in implementing the SDP Improvement Plan, though timeliness remains a concern. The staff also made several improvements in the assessment program during CY 2004, particularly in the area of cross-cutting issues, though continued improvement is warranted.

Although significant progress has been made in CY 2004, the staff expects to make continued improvements to the ROP based on lessons learned and stakeholder feedback. The staff will continue to actively solicit input from the NRC's internal and external stakeholders and will evaluate potential program improvements via the ongoing self-assessment process. The staff will also continue to report the results of its annual self-assessment as part of the Commission briefing following the Agency Action Review Meeting (AARM).

BACKGROUND:

On February 24, 2000, the staff issued SECY-00-0049, "Results of the Revised Reactor Oversight Process Pilot Program." The resulting staff requirements memorandum (SRM), issued on March 28, 2000, approved initial implementation of the ROP as recommended by the staff. The initial implementation of the ROP began on April 2, 2000. In a followup SRM issued on May 17, 2000, the Commission directed the staff to report on the implementation of the ROP results after the first year of implementation. The staff did so and documented the results in SECY-01-0114, "Results of the Initial Implementation of the New Reactor Oversight Process," issued on June 25, 2001. SECY-01-0114 also noted the staff's intention to continue to perform an annual self-assessment of the ROP. Accordingly, the staff has issued an ROP self-assessment Commission paper each year prior to the AARM. This paper provides the results of the fifth annual self-assessment of the ROP.

This self-assessment was performed in accordance with Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program." As noted in IMC 0307, the ROP is a regulatory framework that includes licensee performance indicator data, NRC inspection activity and determination of inspection finding significance, and assessment with the goals of being objective, risk-informed, understandable, and predictable. The ROP self-assessment program evaluates the overall success of the ROP in meeting these objectives and the

agency's performance goals. The NRC's performance goals have changed as a result of the latest Strategic Plan as stipulated in NUREG-1614, Volume 3, dated August 2004.

As a result, the staff has revised the performance measures in the Office of Nuclear Reactor Regulation (NRR) operating plan and plans to revise the ROP self-assessment program to support these new safety performance measures. Next year's ROP self-assessment will be in accordance with the revised IMC 0307 and associated performance goals.

DISCUSSION:

During the fifth year of ROP implementation (CY 2004), the staff conducted numerous activities and obtained data from many diverse sources to ensure that a comprehensive and robust self-assessment was performed. Data sources included the ROP self-assessment metrics described in IMC 0307, recommendations from independent evaluations, comments from external stakeholders in response to a *Federal Register* notice (FRN), insights from internal stakeholders based on survey results, the ROP internal feedback process, and feedback received from stakeholders at various meetings, workshops, and conferences. The staff also utilized the direction and insight provided by the Commission through several SRMs. The staff analyzed this information to gain insights regarding the effectiveness of the ROP in fulfilling the regulatory principles of being predictable, understandable, objective, and risk-informed. The self-assessment also provided insights regarding the success of the ROP in supporting the NRC's performance goals.

The self-assessment metrics, stakeholder feedback, and other pertinent information supported the staff's conclusion that the ROP is generally effective, though the staff continues to experience significant challenges in certain ROP areas and recognizes the need for further improvement. The staff believes that the ROP appropriately monitored operating nuclear power plant activities and focused the NRC's resources on significant performance issues in CY 2004, and that plants continue to receive a level of oversight commensurate with their performance.

The staff identified issues and needed actions in the key program areas of PIs, inspection, SDP, and assessment, as discussed in the following paragraphs. In addition, the staff has included discussions and assessments of ROP communication and training activities, ROP self-assessment and independent evaluations, ROP resources, and resident inspector demographics. The final section of this discussion contains the staff's overall conclusions concerning the ROP self-assessment. As noted in the pertinent sections of this paper, the staff has also included several attachments with additional detail to support the staff's assessment and conclusions.

ROP Program Area Evaluations

The staff performed evaluations in each of the four key program areas of the ROP: PIs, inspection, SDP, and assessment. The results are summarized below. Attachments 1 through 4 to this paper discuss the four ROP program areas in more detail, respectively. Attachment 5 provides a consolidated listing of implementation issues in each program area with a status of each issue. In addition, the annual ROP performance metric report provides the data and staff analysis for each of the program area metrics (reference ADAMS Accession No. ML050670162).

PI Program - Although the staff concluded that the PI program continues to provide objective indications of licensee performance, there are several areas within this program that require additional attention.

- The PI program has not been fully effective in aiding the NRC assessment program in the identification of weaker performing sites.
- The frequently asked questions (FAQ) process for resolving PI issues has not been consistently timely nor efficient.
- The lack of clear concise guidance for some PIs has contributed to the timeliness and efficiency issues.

The staff continued to work closely with stakeholders to implement the Mitigating Systems Performance Index (MSPI) as a replacement for the safety system unavailability (SSU) PI. The MSPI is presently scheduled for implementation in 2006 following a series of three industry-sponsored training workshops in 2005. One area requiring further discussion with industry, which could impact MSPI implementation, is probabilistic risk assessment (PRA) quality. Most PI metrics were met in CY 2004, with the exception that there is an increasing backlog of unanswered FAQs regarding PI guidance. The staff plans to continue assessing the PI program during CY 2005 to address outstanding concerns related to PIs identified through staff, the Advisory Committee on Reactor Safeguards (ACRS), industry, and stakeholder feedback.

Inspection Program - All inspection program self-assessment metrics met their criteria for CY 2004, and feedback from internal and external stakeholders was generally favorable. The baseline inspection program was completed at all plants using regional resources. The increases in the regional inspection budget in 2004 and actions by the regional offices to fill open inspector positions prevented the staffing shortage issues experienced in 2002 and 2003 from extending into the 2004 inspection cycle. The inspection program continued to make improvements during the fifth year of ROP implementation. In particular, the staff implemented several changes to the inspection program to address recommendations from the DBLLTF and other stakeholders. In response to the Commission's direction, the staff initiated a pilot program to improve the effectiveness of the design engineering inspections and is pursuing program enhancements in the area of safety culture. The staff has also begun to address recommendations from the recent OIG audit of the baseline inspection program.

The staff's self-assessment of inspection findings, internal and external feedback forms, and other independent reviews of the ROP indicated that adjustments are warranted in the level of resources applied to some of the baseline inspection procedures. There were instances in which a relatively small number of findings were identified for the amount of inspection resources expended. Internal feedback from inspectors further indicated that the inspection scope and level of effort should be reviewed and adjusted for some inspection procedures. As a result, the staff is developing a systematic process to review and recommend improvements to the inspection program. The process will better align the available inspection resources with risk-significant areas. The staff plans to perform this more detailed analysis of the scope and level of effort of each of the inspection procedures in CY 2005 and plans to adjust existing resources for CY 2006.

Significance Determination Process - The ongoing initiatives to improve SDP efficiency and effectiveness continued during CY 2004. The staff further implemented the SDP Improvement Plan to address key stakeholder recommendations, including those from an audit by the OIG in 2002, the SDP Task Group in 2002, and input from the internal and external feedback processes. The significant objectives completed in CY 2004 were the issuance of new SDPs covering steam generator tube integrity and shutdown risk, and the issuance of completely revised fire protection and containment SDPs. The standardization of the site-specific risk-informed inspection notebooks and the development of the pre-solved Phase 2 tables are well underway with completion scheduled by the end of FY 2005.

Four SDP self-assessment metrics did not meet the established goals: SDP timeliness, the accuracy of reported information, the perceived inconsistency in significance of findings across cornerstones, and the staff's proficiency in using the SDP. Although SDP timeliness in reaching final significance remains a challenge, the new and revised SDPs, the associated training, the standardized risk-informed inspection notebooks, the Phase 2 pre-solved tables, and the enhanced SPAR models are all intended to streamline the process. The staff's plans to address SDP timeliness were presented to the Commission during the briefing on reactor safety and licensing activities on December 9, 2004. The staff will continue to monitor planned SDP improvements and developments via the SDP Improvement Plan.

Assessment Program - During CY 2004, the staff made several improvements in the assessment program, as reflected in revisions to IMC 0305, "Operating Reactor Assessment Program." In particular, the staff revised the guidance in IMC 0305 to: (1) better define the threshold for a substantive cross-cutting issue and subsequent agency actions; (2) evaluate the causes for ROP Action Matrix deviations and identify appropriate changes to the ROP; and (3) improve the standardization and transparency of agency actions associated with plants exiting increased oversight columns of the Action Matrix.

All but one of the performance metrics in the assessment area met their established criteria or goals in CY 2004. The exception was the increase in the number of Action Matrix deviations, which has been addressed by the program revisions noted above. Additionally, the staff generally received positive feedback about the assessment program from the internal and external surveys. However, a common theme in both surveys and at the 2005 Regulatory Information Conference was that the agency needs better guidance for substantive cross-cutting issues. The staff will continue its efforts to improve this guidance in CY 2005.

ROP Communication and Training Activities

The staff effectively implemented the ROP Communication Plan in CY 2004. The staff utilized a variety of communication activities to ensure that all stakeholders have access to ROP information and results, and have an opportunity to participate in the process and provide feedback. The staff also continued to conduct monthly public meetings with external stakeholders, and continued the ongoing internal feedback process, as well as biweekly telephone conferences and frequent meetings with internal stakeholders. In addition, the staff conducted surveys of both internal and external stakeholders to actively solicit and analyze stakeholder feedback regarding the ROP's effectiveness.

Public Meetings - The NRC staff conducts monthly public working-level meetings with the Nuclear Energy Institute (NEI), the industry, and other stakeholders to discuss the status of ongoing refinements to the ROP. In particular, the staff continued efforts to implement the Mitigating Systems Performance Index (MSPI) and to address issues with the PI program. The staff also conducted public meetings in the vicinity of each operating reactor to discuss the results of the NRC's annual assessment of the licensee's performance. These meetings were used as an opportunity to engage interested stakeholders on the performance of the plant and the role of the agency in ensuring safe plant operations. The staff also sponsored three breakout sessions at the 2005 Regulatory Information Conference (RIC). The topics covered were cross-cutting issues, performance indicators, and the ROP in general. The RIC sessions and public meetings resulted in valuable feedback for the staff.

Internal Feedback Process - The ROP feedback process provides a useful means for the NRC staff to identify concerns or issues and to recommend improvements related to ROP policies, procedures, or guidance. Timeliness in resolving feedback issues has improved over the last year, but remains a focus for improvement. Based on the recent ROP survey and discussions with regional feedback coordinators, the regional staff appears to be generally satisfied with the feedback process response time. The staff expects to implement enhancements to the feedback process in CY 2005, to include providing users with the ability to easily view open and closed feedback forms, a search capability, and electronic submission of feedback forms.

Stakeholder Surveys - The staff issued its annual external survey through the *Federal Register* in October 2004. The responses from the survey of external stakeholders were generally in line with responses from previous years, as were the number and distribution of the responses. Approximately half of the 21 responses came from NEI or utilities endorsing the NEI response, while six responses came from State or local agencies and four responses came from public interest groups or members of the public. The responses were generally positive, with concerns being raised specifically about SDP timeliness and subjectivity, the effectiveness of the PI program, the NRC's responsiveness to stakeholder comments, and other perceived needed improvements to the ROP. The staff made some modifications to the external survey this year to enable a more objective comparison of current stakeholder satisfaction on specific issues to satisfaction after initial ROP implementation, but no significant differences were noted. To address the continued concerns that the NRC has been unresponsive to stakeholder feedback, the staff plans to consolidate the comments by question and provide a comprehensive response to each question. This consolidated response, along with this Commission paper and the annual ROP performance metric report, will be posted to the ROP Web page and sent to each respondent to the survey.

The staff also administered an internal survey in November 2004 and received 209 anonymous responses, of which 71 contained written comments. NRC stakeholder participation included resident/senior resident inspectors, regional-based inspectors and staff, senior reactor analysts, regional and headquarters line management, and headquarters technical and program staff employees. Using the computer-based survey, the respondents selected from five possible answers (strongly agree, agree, disagree, strongly disagree, and unable to answer) to several specific questions and were provided space to expound on the responses or make additional comments. The responses were generally positive and showed an increase in stakeholder satisfaction when compared to the previous internal survey, though some concerns were noted, particularly with the effectiveness of the SDP and inspection program.

More detail on the results of the internal and external surveys is provided in Attachment 6. Staff analysis of the survey responses is included in the applicable portions of the program area evaluations in Attachments 1 through 4, as well as in the annual ROP performance metric report (reference ADAMS Accession No. ML050670162).

Inspector Training - The staff continued its efforts to improve the initial and continuing inspector training programs as described in IMC 1245, "Qualification Program for the Office of Nuclear Reactor Regulation (NRR) Programs." The primary goal of IMC 1245 is to produce and maintain well-qualified, competent inspectors. While the program office has the primary responsibility for IMC 1245, the program office and the regions have established a partnership by forming the IMC 1245 Management Steering Group (MSG) and the IMC 1245 Working Group (WG). The IMC 1245 WG, which consists of program office staff, regional branch chiefs, training coordinators, and resident inspectors, reviews feedback forms and implements recommendations to IMC 1245. The IMC 1245 MSG, which consists of the program office branch chief and regional division directors, monitors the initial inspector training and qualification program and approves changes to requirements of the inspector training program.

During CY 2004, the staff developed and distributed Web-based training courses and in-person training sessions to address specific DBLLTF recommendations concerning boric acid corrosion, questioning attitude, and ROP refresher training (DBLLTF items 3.3.1.1, 3.3.4.6, 3.3.5.1, and 3.3.5.2). The Web-based training courses remain available on the training Web page to be used by new inspectors as part of the initial inspector qualification process and by qualified inspectors as an inspection resource. The IMC 1245 MSG and WG annually review the effectiveness of inspector training through feedback forms submitted, results of the inspector oral boards, and regional experience. Improvements and revisions are recommended and implemented as appropriate. The staff continued to use Web-based training courses to provide continuing inspector training. During 2004, the staff developed and distributed three Web-based training courses to address the initial issuance of and the revision to three appendices of IMC 0609, "Significance Determination Process." The internal survey performed during CY 2004 indicated that although the majority of internal stakeholders felt that ROP training was effective, approximately a third of the individuals did not feel that there was adequate training on the ROP. The survey results will be considered by the IMC 1245 MSG and WG in the 2005 revision to IMC 1245.

In response to DBLLTF recommendation 3.3.4.6, the staff developed a training methodology and provided ROP refresher training for NRC management and staff. The first ROP refresher training, provided to the Regions during the Regional Inspector Counterpart Meeting in May 2004, focused on maintaining a questioning attitude. According to the ROP refresher training process, the staff will request topics for refresher training in the Spring, discuss potential topics with the IMC 1245 Management Steering Group, and provide the training in the Fall. The inspector training programs remained effective in CY 2004, particularly through implementation of the IMC 1245 WG and MSG and the Web-based training initiatives.

ROP Web Pages - The staff effectively utilized the ROP Web pages to communicate accurate and timely ROP information to all stakeholders. The staff successfully used the external ROP Web page to post plant assessment results and to disseminate useful information to the public as needs warranted. The internal ROP Web page, known as "ROP Digital City," continued to serve as a hub for inspectors to the various types of available information,

including read-and-sign training, the inspector newsletter, reactor operating experience, and draft guidance. The performance metrics and positive feedback from both external and internal stakeholders indicate that the ROP Web pages are useful, accurate, and timely.

Treatment of Physical Protection Information - During 2004, the Commission determined that inspection and assessment information within the physical protection (PP) cornerstone of the ROP would no longer be publicly available. This decision was necessary to ensure that potentially useful information is not provided to an adversary. The NRC will continue to inspect and assess physical security of nuclear facilities; however the results will no longer be made publicly available. Accordingly, the staff deleted information regarding plant performance in the PP cornerstone from the public ROP Web pages. The staff also identified and removed from the public domain all of the NRC's current inspection program documents on security, physical protection, and material control and accountability.

The Office of Nuclear Security and Incident Response (NSIR) is actively developing a separate, nonpublic process to address how PP information will be considered in assessing plant performance and determining agency responses. The new processes will keep the cornerstone within the ROP framework but separate from other ROP communications about licensee performance. For this reason, the staff did not include security and safeguards activities in this self-assessment. Those new processes are being communicated to the Commission via separate Commission papers. NSIR intends to develop and implement a similar self-assessment process to cover the security and physical protection oversight programs.

Information Technology Initiatives for Inspectors - The revised inspector newsletter has been in existence for two years and the staff continues to receive positive feedback from a variety of sources including the inspector population, regional management, and NRR. The purpose of the inspector newsletter remains the same—to provide useful information to inspectors. One of the primary reasons for the success of the newsletter is the editorial board, which consists of regional managers. The board knows the inspector population and what is useful for inspectors to conduct their jobs. A key component of the newsletter is the continued input from the new operating experience program. The newsletter continues to be issued bimonthly and is available on an internal Web site.

The Inspector Community Forum, an electronic Web-based knowledge management tool, was developed to be a recognized source of information for inspection preparation and a messaging board to facilitate communications between inspectors. The Inspector Community Forum is expected to enhance the depth and efficiency of inspection preparation and broaden inspector communication networks. The forum was tested by a focus group of regional inspectors in CY 2004, who concluded that the forum added value in supporting the inspection process. As a result, implementation of the Inspector Community Forum occurred in early 2005.

During CY 2004, the staff completed an information technology (IT) trial on pen tablets and a review of a digital pen. The staff will continue to explore IT initiatives for the inspector population that will help them perform their jobs in a more efficient manner. As discussed previously, the staff intends to transition the feedback process to an electronic format in 2005.

ROP Self-Assessment Metrics and Independent Evaluations

The objectives and details of the ROP self-assessment program are contained in IMC 0307. This paper, supplemented by the annual report of performance metrics, provides the results of the staff's self-assessment for CY 2004. In addition to the ROP self-assessment program, several independent evaluations have been performed since the inception of the ROP to analyze its effectiveness and recommend improvements. In the past few years, the Office of Management and Budget (OMB), the OIG, the ACRS, the DBLLTF, and the SDP Task Group have all performed evaluations of the ROP. These evaluations have generally provided favorable results, but have also suggested potential areas of improvement. Several recommendations from these independent evaluations are addressed in this paper.

Annual ROP Performance Metrics - The staff performed its annual self-assessment of performance metrics for CY 2004 in accordance with IMC 0307. The annual report was issued on April 1, 2005, and is publically available through ADAMS (reference ADAMS Accession No. ML050670162). The majority of metrics met their established criteria. All metrics in the inspection area met their criteria, but some metrics in the PI, SDP, and assessment program areas did not. The staff's corrective actions to address these issues are discussed in the program area evaluations in Attachments 1 through 4.

In addition to the specific program area metrics, there are 18 overall ROP metrics of a more general nature. Two of these overall ROP metrics failed to meet the established criteria. Specifically, these metrics gauge whether the public perceives the NRC to be responsive to its inputs and comments, and whether the public perceives that the ROP results in unintended consequences. Similar to the external survey conducted in 2003, numerous stakeholders felt that the staff was not responsive to comments or did not provide adequate feedback on the public's comments. The staff continues to develop and enhance communication and feedback with the public, and will explore new avenues for collecting and responding to public comments. The staff will continue to investigate and attempt to resolve the aspects of the ROP that may result in unintended consequences. These issues are discussed further in Attachment 6, "Stakeholder Survey Results."

Program Evaluation per Strategic Plan - As noted in last year's annual self-assessment, OMB completed its review of the ROP using the Program Assessment Rating Tool (PART) in FY 2003. OMB scored the ROP at 89 percent, corresponding to an "Effective" rating. As a result of this PART evaluation, the staff committed in the Strategic Plan to perform a program evaluation of the ROP in FY 2005. The scope of the evaluation includes: (1) the efficiency of the agency's baseline inspection program, (2) the effectiveness of the SDP, and (3) the usefulness of current performance indicators in enhancing agency planning and response. The 2004 self-assessment of the ROP, described in this paper, constitutes the FY 2005 program evaluation of the ROP as committed to in the strategic plan. The staff considers this action completed. The details of the results of the FY 2005 program evaluation can be found in Attachments 1 through 3 under the respective program area evaluations.

The NRC's safety goals and measures have also changed as a result of the latest Strategic Plan, as stipulated in NUREG-1614, Volume 3, dated August 2004. Based on these changes, and in response to OMB recommendations, the staff revised the performance measures in the NRR operating plan. These revised measures are in effect for FY 2005. This effort completes

the staff evaluation of the performance measures committed to in the staff's FY 2006 performance budget in NUREG-1100, Volume 21, dated February 2005 (e.g., the Green Book).

DBLLTF Recommendation Status - During 2004, the staff continued to make enhancements to the ROP based on the implementation of Davis-Besse Lessons Learned Task Force action items. These changes will enhance the NRC's ability to detect declining plant performance, including the specific issues that were identified at the Davis Besse plant. The changes completed in 2004 included revisions to (1) Inspection Procedure (IP) 71111.08, "Inservice Inspection Activities," to add periodic inspection requirements and guidance for boric acid corrosion control, (2) IMC 0305, "Operating Reactor Assessment Program," to include consideration of independent assessment of licensee performance during mid-cycle and end-of-cycle assessment preparations, (3) IP 71111.20, "Refueling and Other Outage Activities," to include containment walkdowns and consideration of walkdowns in other restricted areas, and (4) several procedures to verify licensees have programs and processes in place to detect, monitor, and take corrective actions for adverse trends of reactor coolant system leakage. The staff also developed and issued a site staffing metric to monitor gaps in permanent resident and senior resident staffing at reactor sites.

Further details on specific DBLLTF recommendations are included in the relevant program area discussions of this paper. The status of the DBLLTF recommendations is also maintained in the Director's Quarterly Status Report to ensure continued management attention (reference ADAMS Accession No. ML043480034) and is available on the NRC's public Web page.

OIG Audit Activity - The staff continued to address recommendations from the OIG audit of the SDP completed in 2002. The audit yielded 11 specific recommendations, which the staff incorporated into the SDP Improvement Plan for tracking purposes. The staff provided two updates to the OIG, most recently in January 2005. Upon review of the January 2005 update, the OIG agreed to close all recommendations. The OIG also completed an audit of the baseline inspection program in 2004. The staff agreed with nine of the ten recommendations and planned to improve the effectiveness and efficiency of the baseline inspection program by making changes to the program during CY 2005. The staff disagreed with one recommendation from the OIG report which recommended that the staff develop and implement guidance for documenting, tracking, and trending informal inspection issues.

Regulatory Impact Summary - As part of the regulatory impact process, the staff received feedback from 77 reactor licensees on 256 issues during the current reporting period. Of the comments received, 77 percent were favorable and 23 percent were unfavorable. The comments fell into four main categories: formal communication with licensees, inspector performance, security and safeguards activities, and the ROP.

Regarding formal communication with licensees, almost half of the licensees' comments concerned the effectiveness of communication between the NRC staff and licensees. About 85 percent of the licensees' comments on communication with the NRC staff were favorable. A third of the licensees' comments concerned inspector performance and almost all of the comments praised the NRC's inspection staff. Eight percent of the licensees' comments related to the NRC's security and safeguards activities and all these comments were unfavorable. Commenters expressed concerns with the lack of stability and the number of regulatory changes in this area. Five percent of the licensees' comments concerned the ROP,

and about half of those comments were favorable. Licensees praised the ROP as an improvement over the previous process. However, half the comments were critical of specific program elements, especially the SDP.

In previous years, the staff reported the annual regulatory impact results in a separate Commission paper. Beginning with this self-assessment, the staff has included the regulatory impact summary as an attachment to the annual ROP self-assessment Commission paper. Accordingly, Attachment 7 provides a more detailed analysis of the regulatory impact summary. Industry Performance Trends - In addition to the PIs used to assess individual plant performance under the ROP, the NRC collects and monitors industrywide data to assess whether the nuclear industry is maintaining the safety performance of operating plants. The NRC also uses these industry-level indicators to provide feedback on the ROP. The staff continued to implement and further develop the Industry Trends Program (ITP) in CY 2004. One important output of the ITP is to report the number of statistically significant adverse industry trends in safety performance to Congress each year as part of the NRC's Performance and Accountability Report. The results of the ITP, along with any actions taken or planned, have been reported to the Commission in an annual paper that complements this paper. The results of the ITP will also be reviewed at the AARM.

ROP Resource Analysis

The inspection effort in 2004 increased noticeably over 2003. Because of the balanced distribution among all elements of the ROP, the increased inspection effort in 2004 cannot be attributed to one specific factor. The increased effort is most likely the result of increased regional inspection staffing levels and increases in the number of qualified inspectors as recent new hires and regional Nuclear Safety Professional Development Program graduates enter the inspector workforce. The revised resident inspector staffing policy allowing assignment of replacement resident inspectors prior to the departure of the incumbent inspector and additional regional resources improved the site staffing levels in CY 2004 and helped alleviate the resource burden in completing the baseline inspection program, along with the aggressive recruiting, hiring, and qualification of new inspectors. All four regions completed their baseline inspections in 2004 using existing regional resources without the coping measures that were necessary the previous two inspection cycles.

Overall, inspection resource expenditures have decreased significantly over the past ten years. However, the staff believes that resource savings are reaching a limit as available efficiencies are exhausted. Future resource savings may only be possible through significant revisions of the ROP. As discussed in other sections of this paper, a number of initiatives currently underway may provide resource savings and improved program effectiveness. These initiatives include an in-depth review of the baseline inspection procedures, revised design engineering inspections, credit for licensee self-assessments, continued SDP improvements, and implementation of the MSPI program. A more detailed analysis of ROP resources is provided in Attachment 8.

Resident Inspector Demographics

As the Commission requested in its SRM dated April 8, 1998, the staff developed measures to monitor and trend resident inspector (RI) demographics and reports the data and analyses to the Commission on an annual basis. The staff believes that the RI program continues to attract and retain quality staff, and the staff has no further recommendations for changing the RI program. The number of new RIs entering the program in CY 2004 was reduced by almost one-half compared to CY 2003, and few senior resident inspectors left the program during CY 2004. In addition, inspectors are not leaving the agency, but are being promoted or reassigned to positions within the regions or at headquarters keeping their expertise within the NRC. However, it is important to recognize that the movement of inspectors between sites, between regions and to headquarters has a “domino” effect and impacts the effectiveness and efficiency of work completed. The policy to allow double encumbering of new resident and senior resident inspectors was utilized in the regions during CY 2004 and appears to have helped minimize predictable site coverage gaps, but is only effective when residents stay for the entire 7-year rotation. Frequently, resident vacancies occur with little notice; therefore, regions cannot make use of the early reassignment of residents to address resident gaps in these situations. Attachment 9 presents a more detailed analysis of the 2004 RI demographics and staffing issues.

COMMITMENTS:

Listed below are the significant actions or activities planned by the staff in this paper to improve the efficiency and effectiveness of the ROP:

- The staff will interact with industry and other stakeholders in CY 2005 to address concerns about the ability of the current set of PIs to provide adequate indications of declining performance in a timely manner.
- The staff will perform a more detailed analysis of the scope and level of effort of the inspection procedures in CY 2005 and adjust existing resources within the baseline inspection program for CY 2006.
- The staff will provide the Commission with an evaluation of the effectiveness of recent changes made to improve the timeliness of the fire protection SDP in the CY 2005 ROP self-assessment Commission paper.
- The staff will further improve existing guidance related to cross-cutting issues in order to support the mid-cycle review meetings scheduled for August 2005.
- The staff will assess the results of the pilot engineering design inspections and develop recommendations for Commission consideration in FY 2005.
- The staff will continue to report the results of its annual self-assessment as part of the Commission briefing following the AARM in May 2005.

The status of these commitments and other program improvements noted in this paper will be included in the CY 2005 ROP self-assessment Commission paper.

CONCLUSIONS:

The self-assessment results in CY 2004 indicate that the ROP has been successful in meeting its program goals of being objective, risk-informed, understandable, and predictable. The ROP was also effective in supporting the agency's CY 2004 performance goals of maintaining safety, enhancing public confidence, making activities more effective, efficient, and realistic, and reducing unnecessary regulatory burden. The staff continued to focus on stakeholder involvement and to improve various aspects of the ROP as a result of feedback and lessons learned.

Based on our CY 2004 self-assessment, the staff intends to focus on the following areas during CY 2005:

- Working with industry to address issues with the PI program
- Adjusting focus and resources within the baseline inspection program
- Improving SDP efficiency and effectiveness
- Further improving guidance related to cross-cutting issues

The staff will also continue evolutionary improvements to various aspects of the ROP.

RESOURCES:

This paper describes a number of program improvement activities. The resource requirements to develop and implement these improvements are a part of the overall ROP development and management effort and have been included in the budget requests through FY 2006. The current estimates are approximately 49 full-time equivalents (FTE) and approximately \$2 million for FY 2005 and approximately 57 FTE and \$3 million for FY 2006. These numbers include all NRR, regional, and Office of Research (RES) efforts for ROP development, management, and performance assessment activities within the scope of the current budget requests. No additional resources are needed for FY 2005 and FY 2006. Planned actions to improve the ROP will be prioritized and scheduled to remain within allocated resources.

COORDINATION:

The Office of the General Counsel has reviewed this Commission paper and has no legal objections to its content.

The Office of the Chief Financial Officer has reviewed this Commission paper for resource implications and has no objections.

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- Attachments:
1. PI Program Evaluation
 2. Inspection Program Evaluation
 3. Significance Determination Process Evaluation
 4. Assessment Program Evaluation
 5. Status of Implementation Issues
 6. Stakeholder Survey Results
 7. Regulatory Impact Summary
 8. ROP Resource Analysis
 9. Resident Inspector Demographics and Staffing

Performance Indicator Program Evaluation

Scope and Objectives - The staff of the U.S. Nuclear Regulatory Commission (NRC) performed an evaluation of the performance indicator (PI) program in accordance with Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program." The staff used self-assessment metrics and other pertinent information to provide insights regarding the effectiveness of the Reactor Oversight Process (ROP) in fulfilling the regulatory principles of being predictable, understandable, objective, and risk-informed, and in supporting the NRC's 2004 performance goals of maintaining safety, enhancing public confidence, making regulatory activities more effective, efficient, and realistic, and reducing unnecessary regulatory burden. The staff also obtained input from internal stakeholders through an internal survey, counterpart meetings, focus groups, and the internal feedback process. In addition, the staff obtained external feedback through a *Federal Register* notice (FRN) solicitation for comments and through periodic meetings with the industry and other stakeholders.

The staff's previous ROP Self-Assessment Commission paper, dated April 6, 2004, identified potential problems in the PI area with regard to the efficiency and effectiveness of the Frequently Asked Question (FAQ) process, and the effectiveness of the PI program in identifying licensee performance problems. As a result, the staff stated the intention to reassess the PI program during CY 2004. This attachment reports the results of the reassessment. The staff also committed in the fiscal year (FY) 2004–2009 Strategic Plan to perform a program evaluation of the ROP in FY 2005, including an evaluation of the usefulness of current performance indicators for enhancing agency planning and response. The assessment provided in this attachment completes that action.

Additionally, over the life of the ROP, and based on the metric results, stakeholder feedback, and other lessons learned through ongoing program monitoring, the staff has identified a number of other issues and actions regarding the PI program. A summary of the status of those ongoing issues and actions is included in Attachment 5 and is also discussed in further detail below. In addition, the annual ROP performance metric report provides the data and staff analysis for each of the program area metrics (reference ADAMS Accession No. ML050670162).

Summary of Previous Self-Assessment - In SECY-04-0053, "Reactor Oversight Process Self-Assessment for Calendar Year 2003," the staff discussed the status of efforts in calendar year (CY) 2003 to define and implement a new PI called the Mitigating Systems Performance Index (MSPI), which is intended to replace the Safety System Unavailability (SSU) PIs. The staff also described the backlog of FAQs for resolving interpretations in PI guidance, primarily concerning the Scrams With Loss of Normal Heat Removal (SWLONHR) PI. The staff documented issues in several other PIs that need simplification or clarification and discussed the overall declining trend in greater-than-green PIs. In addition, survey results had indicated that many stakeholders believe that the PIs are ineffective at identifying significant performance problems.

Historical Perspective - When the ROP was being developed (1998–2000), it was decided that there would be two primary inputs into the process to assess the performance of operating reactors. One input would be PIs. The task group working on the formation of the ROP sought

to identify PIs as a means of measuring performance of key attributes where possible. Where such a PI could not be identified, or the PI proposed was not sufficiently comprehensive, inspection activities were proposed, resulting in inspection findings being the second input into the assessment of licensee performance. Together, PI results and inspection findings, in combination with other defining principles of the ROP, would provide adequate margin in the assessment of license performance, so that appropriate licensee and NRC actions could be taken before unacceptable performance occurs.

Participation by reactor licensees in the PI program was not made mandatory by rulemaking, but rather was agreed to by the industry. A joint NRC/industry working group was established to oversee the PI program and resolve program questions (so-called “frequently asked questions,” or FAQs). NEI was asked to write the PI guidance document, NEI 99-02.

The 18 PIs in the PI program are spread over the seven cornerstones of the ROP. If licensee performance is acceptable for a given PI, the PI is defined as “green.” If performance in a particular PI declines to beyond a predetermined threshold, that PI then becomes “white.” Further decline in performance for some of the PIs can result in the PI being “yellow” or “red.” The thresholds for the transition from one color to another were defined during program development, and some are performance-based and risk-informed, while others were based upon expert panel elicitation. Industry representatives and other public stakeholders were provided an opportunity to comment on the PI thresholds that were established by the staff.

A major goal of the ROP is to promptly assess licensee performance and when called for redirect NRC inspection resources to poorer performing plants. It is therefore important that the PI results be finalized and reported in a timely fashion. Licensees report PI data three weeks after the end of each calendar quarter. The staff processes the data and posts it on the NRC’s public Website, so that the data is available within five weeks of the end of the quarter. As part of the NRC baseline inspection program, the inspection staff confirms the accurate reporting of PI data by each licensee, on a sampling basis. This is an annual inspection requirement and may not occur until well after a given quarter of PI data has been submitted by a licensee.

When the PI program was developed, the green-white thresholds were set, using industry performance data from 1995 to 1997, such that about 5 percent of the plants would exceed the green-white threshold — that is either white, yellow, or red — for each PI, given continuing industry performance similar to those years. The years 1995 to 1997 were chosen as a period in which industry performance was considered acceptable to the NRC for the purposes of establishing ROP thresholds.

Historical Results and Analysis -The results of the PI program for the 18 existing PIs since initial implementation are summarized as follows:

- The percentage of PIs that were reported as greater than green since program inception is 0.60 percent
- The percentage of PIs that were reported as greater than green in CY 2004 is 0.47 percent
- The highest percentage of PIs that were reported as greater than green occurred in CY 2000, at 1.18%

- Six PIs have been all green at all plants since program inception:
 - BI01, Reactor Coolant System Activity
 - EP02, Emergency Response Organization Participation
 - PR01, RETS/ODCM Radiological Effluent Indicator
 - MS04, Safety System Unavailability, Residual Heat Removal System
 - Two physical protection PIs

- Eight PIs have been all green at all plants following the first year of full program implementation (2000):
 - BI01, Reactor Coolant System Activity
 - EP02, Emergency Response Organization Participation
 - PR01, RETS/ODCM Radiological Effluent Indicator
 - MS04, Safety System Unavailability, Residual Heat Removal System
 - MS05, Safety System Functional Failures
 - All three physical protection PIs

Based on the above data, and on reviews of more detailed data on individual PI's, the staff concludes that the PI program has succeeded in focusing industry attention in selected areas. For example, the "Emergency Response Organization Drill/Exercise Performance" PI data demonstrates improved industry performance since the program was implemented. Several other PIs also show an improving trend. However, the number of PIs that are consistently green at all plants bring into question the present value of those PIs to the program.

The staff also assessed the contribution made by the PI program in redirecting NRC inspection resources and management focus to poorer performing licensees.

- Since program implementation, a number of facilities have been placed in the multiple/degraded cornerstone column of the Action Matrix (column 4) or under the oversight of an IMC 0350 panel, thereby identifying those plants as poor performers. The number of PIs that were greater than green before each plant was placed in their respective performance category, are as follows:
 - Davis-Besse PIs were all green prior to Davis-Besse being placed under IMC 0350 oversight.
 - Cooper PIs were all green prior to Cooper entering column 4.
 - Point Beach 1 & 2 - each unit had two white PIs in the two years prior to both units entering column 4. The white PIs did not contribute to Point Beach entering column 4.
 - Perry had two white PIs in the three years prior to entering column 4. The white PIs did not contribute to Perry entering column 4.
 - Oconee Unit 1 had one white PI in the year prior to entering column 4. The white PI contributed to Oconee Unit 1 entering column 4.

- Indian Point 2 had a yellow PI and two white PIs in 2000, which placed the unit in column 3 (degraded cornerstone). The PIs did not contribute to Indian Point 2 entering column 4.

Based on the historical results, the staff has concluded that the PI program has not contributed to the early identification of poor performing sites to the degree envisioned by the staff. However, the staff considers the Unplanned Power Changes and Safety System Functional Failures PIs to be leading indicators. The staff also believes that the Scrams With Loss of Normal Heat Removal PI has the potential to be a leading indicator of declining performance.

Process Issues - The process for resolving PI issues has also not been consistently timely nor efficient. The lack of clear concise guidance for selected PIs has contributed to the timeliness and efficiency issues. The staff has had trouble dealing with a number of potentially white PIs with which interpretation issues have arisen. This is partly because the PI guidance document is subject to interpretation and the joint NRC/industry working group has had difficulty agreeing on which events or conditions are to be included in the PI calculation.

When a question arises about whether an event or condition should be reported in the quarterly PI report, it is referred to the joint NRC/industry working group to decide. As noted above, these questions are called FAQs. As of April 2005, there were 24 FAQs open. A licensee may interpret the PI guidance in NEI 99-02 in such a way that a condition or event is not reported in the quarterly PI report. The licensee need not involve nor notify the NRC staff in making this determination. As part of the baseline inspection program, the NRC inspection staff will perform the PI verification inspection on a sampling basis sometime during the next 12 months and may, if the issue is identified in the sample, disagree with the licensee's interpretation. However, this disagreement might not occur for up to a year or more after the event in question, so that by the time the question reaches the working group as an FAQ, it is already untimely.

The working group meets once a month and can take several meetings to gather data and discuss an issue before attempting to reach consensus. If consensus can be reached, then the issue is resolved and the answer to the question may become a precedent for future questions. If a consensus cannot be reached, the issue is then raised to the NRR Director, Division of Inspection Program Management (DIPM), to decide. Note that prior to 2004, there was no process to resolve questions for which a consensus could not be reached. Although the process was put in place in 2004, the industry does not view the process as retroactive, so there remain a number of old open questions that are yet to be resolved.

One significant reason for differences between the staff and industry is that industry often believes operator recovery actions should be credited. The staff concern is with the subjective nature of assessing the likely success of operator actions, and with the recognition that PIs can effectively measure equipment performance, but that PIs poorly track human performance that is not concisely defined. For these reasons the staff believes that operator actions should generally not be credited for PIs.

Another option available to the staff when the staff concludes that a PI is not being properly reported is to implement Inspection Procedure (IP) 71150, "Discrepant or Unreported Performance Indicator Data." Under this process the staff declares a licensee's PI data report invalid and colors the associated PI gray until the staff determines the correct color through

inspection. During 2004, the staff implemented the discrepant PI process for the first time. The associated inspection found that the licensee had taken steps inappropriate for the program, which influenced the PI result. The PI was subsequently colored white. Two other cases of potentially discrepant PIs are currently under review by the staff that could be treated similarly.

Future Staff Actions on Process Issues - During CY 2005, the staff intends to interact with NEI and other stakeholders at a senior management level to define steps to improve the effectiveness and efficiency of the program, and to identify enhancements to the program intended to increase its contribution to the identification of plants with poorer performance. To accomplish this goal, there should be consideration as to whether the present PIs are accomplishing what was originally intended; the guidance on PIs must be made precise, clear, and well organized so as to minimize the likelihood of alternate interpretations; FAQ responses must also be written in a manner that minimizes mis-interpretation and should be promptly incorporated into the PI guidance; and the entire process must be more timely.

Mitigating Systems Performance Index - The Mitigating Systems Performance Index (MSPI) is being developed by the staff and the industry to replace the existing Safety System Unavailability (SSU) PIs. In a staff requirements memorandum (SRM) dated May 27, 2004, the Commission provided direction to the staff regarding MSPI. During 2004, the staff continued to work with stakeholders to resolve issues identified during the MSPI pilot program. A major concern from the pilot program was the industry position that the Significance Determination Process (SDP) should not be used for events or conditions monitored by the MSPI. After industry representatives agreed to retain the SDP for MSPI issues, many of the other concerns of the staff were either minimized or resolved. While there are a few remaining issues to be worked out, the MSPI is now scheduled for implementation in 2006 following a series of three industry sponsored workshops in 2005. NEI has the lead responsibility for working with all operating reactors to prepare them to implement MSPI. The first workshop was held in early February. NRC staff observations from the workshop are summarized below.

1. Some licensees appeared to be just beginning to learn about MSPI. This may result in an increased level of effort to prepare all licensees for MSPI implementation in 2006.
2. The NRC staff and industry have agreed on criteria for licensee PRAs to be considered adequate for use with MSPI. Industry comments at the workshop indicate that there are important, open PRA issues relevant to MSPI at an estimated 50 percent of the plants, with some facilities having as many as 30 or 40 issues to resolve.

The issue of PRA quality was discussed at the March 2005 ROP working group meeting and industry indicated that it could not meet the PRA quality criteria previously agreed upon, by the MSPI implementation date. The staff is evaluating the industry position and will discuss alternatives at future ROP working group meetings. This could potentially impact the MSPI implementation date.

Scram With Loss of Normal Heat Removal PI - There is a backlog of 11 FAQs regarding the Scram With Loss of Normal Heat Removal (SWLONHR) PI. Several of them are more than three years old, which means they no longer contribute to the PI calculation, and hence the color of the PI (the PI counts SwLONHR over the previous 12 quarters).

The staff's intent for this PI is to separately count scrams that are more complicated than routine scrams. The more risk-significant scrams are assessed under other processes. There are currently two PIs that the staff considers to be leading indicators: Unplanned Power Changes and Safety System Functional Failures. The staff believes that this PI has the potential to also be a leading indicator of declining performance. A plant that has a history of complicated scrams may be more likely to have a risk-significant scram.

To address a number of issues with this PI, a task force was formed with members from both the NRC and the industry. The task force is evaluating whether to count events or conditions that require operators to depart from their normal scram recovery procedure, as a possible modification to the PI definition. Such deviations would include failure of two or more control rods to fully insert, failure of the turbine to trip, loss of any ESF bus, a safety injection actuation signal, unrecoverable loss of all main feedwater, and unrecoverable loss of all steam dumps to the condenser.

Safety System Functional Failures - The Safety System Functional Failure (SSFF) PI counts all events or conditions that could have prevented the fulfillment of the safety function of structures or systems needed to shut down the reactor, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident, as required to be reported in accordance with 10 CFR 50.73(a)(2)(v). Every quarter licensees report (as ROP PI data) the number of events that they determine could have prevented the fulfillment of any of those functions; however they do not report the Licensee Event Report (LER) numbers or any other information about those events. The Idaho National Laboratory (INL) receives all LERs and also determines which events meet the definition of SSFFs. The number of SSFFs reported by licensees is about 20 percent lower than the number identified by INL. The industry representatives on the NRC/industry working group volunteered to look into this discrepancy. They formed a task force that reviewed all LERs determined to be SSFFs by either licensees or INL or both. The staff is currently reviewing the task force report; preliminary results indicate that there may be differences between the staff and many licensees regarding interpretation of the reporting requirements of 10 CFR 50.73(a)(2)(v), as described in NUREG-1022, Rev. 2.

Status of Davis-Besse Lessons Learned Task Force (DBLLTF) Item: Reactor Coolant System (RCS) Leakage PI - The DBLLTF recommended that the staff continue ongoing efforts to review and improve the usefulness of the barrier integrity PIs (reference DBLLTF item 3.3.3.3) and evaluate the feasibility of establishing a PI that tracks the number, duration, and rate of primary system leaks that have been identified but not corrected. One of the primary tasks of the NRC/Industry working group is to continuously review and improve all the PIs. With regard to the RCS Leakage PI, the NRC/industry working group has formed a task group to develop a proposal for a new PI. The group has agreed that this PI should monitor unidentified leakage rather than identified leakage and that the measured values of unidentified leakage should be averaged over an appropriate time interval to identify baseline values and trends. However, the appropriate averaging methodology has not yet been determined. The second part of the recommendation requires a feasibility evaluation of establishing an additional PI for tracking number, duration and rate of primary system leaks. If determined to be feasible, a proposed PI will be developed and submitted to the PI working group, but preliminary discussions seem to indicate that such a measure would not be feasible.

Other PIs That Require Simplification or Clarification - The staff plans to evaluate the Unplanned Power Changes per 7,000 Critical Hours PI to determine whether power changes

that were avoided because the NRC issued a Notice of Enforcement Discretion or a temporary technical specification change should be included. In addition, the staff plans to clarify the guidance regarding the 72 hour rule for planning a power reduction and the 20 percent power change minimum requirement for counting the change as a PI. This effort is currently on hold due to higher priority work.

The RCS Activity PI was intended to monitor the integrity of the fuel cladding as a barrier to the release of fission products from the fuel. There are technical problems with the way the PI is constructed, and the staff has been looking into the use of the World Association of Nuclear Operators fuel reliability PI. This effort is on hold due to higher priority work.

The staff is also considering reinstating the containment leakage PI, which monitored the results of local leak rate tests type B and C. It was removed from the PI program following the ROP pilot program for the following reasons: (1) there is lack of uniformity across the industry in the test methods used and the data collected because licensees may choose between two methods for performing leak rate tests; (2) the tests are normally conducted during refueling outages, so the data are end-of-cycle numbers which may or may not be indicative of the worst-case leakage in the previous operating cycle; and (3) licensees are required to restore containment leak rates to within acceptable limits prior to restart. Nevertheless, there may be some value in this PI if it encourages licensees to become more uniform in their test methodology, and even a backward look at containment integrity could be of value by identifying recurrent issues. For these reasons, the staff plans to reevaluate the containment leakage PI. This effort is also on hold due to higher priority work.

In addition, the staff will reassess the possibility of using deterministic rather than risk-based thresholds for the Initiating Events PIs, particularly for the white/yellow and yellow/red thresholds, as recommended by the Advisory Committee on Reactor Safeguards (ACRS). As part of its continuing reassessment of the PI program, the staff will also look into the feasibility of new indicators, including those for cross-cutting issues, as recommended by the ACRS and other stakeholders.

INPO's Consolidated Data Entry Program - The staff completed its review of the Institute of Nuclear Power Operations' (INPO's) Consolidated Data Entry (CDE) Program and found that it is consistent with the staff's needs for licensee data used in various NRC programs. Use of CDE for the MSPI indicators is currently under development by INPO with licensee and staff involvement.

PI Program Performance Metrics - All but one of the PI metrics were met. The following seven metrics met their established criteria: (1) consistent results given same guidance, (2) timely indication of declining safety performance (based on PIs crossing multiple thresholds), (3) minimize potential for licensee actions taken in response to the PI program that adversely impact plant safety, (4) timely PI data reporting, (5) stakeholders perceive appropriate overlap of PIs and inspection programs, (6) reporting conflict reduction, and (7) clarity of PI guidance. The 'Number of Questions Regarding Interpretation of PI Guidance' metric declined steadily in 2002 and 2003. However, in 2004 the number of unresolved FAQs increased slightly. Many of these questions were related to the SWLONHR and the SSU PIs. The staff continues to work with stakeholders to resolve the open issues.

Internal Survey Results - Every two years the staff conducts a survey of NRC employees actively involved in the ROP. The 2004 internal survey produced three important themes with regard to PIs: (1) there are too few non-green PIs and the thresholds are too high to identify performance issues; (2) PI definitions allow for misinterpretation by licensees; and (3) the RCS leakage, SSU, and Alert and Notification System Reliability PIs are inadequate. The staff is aware of these issues and they are, in part, the reason for the ongoing program review to identify improvements to the PI program. The staff is also aware that the PI guidance must be made more clear, precise, and concise in order to minimize FAQs. The staff is currently working to develop an improved RCS leakage PI; to replace the SSU with the MSPI; and to improve the ANS Reliability PI.

External Survey Results - Participants in the external ROP survey included 11 industry representatives, 6 State or local government agencies, and 4 private citizens or public interest groups. The external survey used the same questions as the external survey of the past several years, which correspond directly to four of the PI metrics previous discussed:

1. Does the Performance Indicator Program promote plant safety?
2. Does appropriate overlap exist between the Performance Indicator Program and the Inspection Program?
3. Is the reporting of PI data efficient?
4. Does NEI 99-02, "Regulatory Assessment Performance Indicator Guideline" provide clear guidance regarding performance indicators?

Participants were provided the following six possible responses: very much, somewhat, neutral, somewhat less than needed, far less than needed, and not applicable.

Most of the responses to question #1 were "somewhat" to "very much" with a slightly declining trend from 2002 to 2004. The responses to question #2 were evenly divided among "very much," "somewhat," and "neutral" with a slightly declining trend. For question #3, the responses were mostly "neutral" with an improving trend. The responses to question #4 were mostly "somewhat" with an improving trend.

Similar to prior years, the responses to the external survey indicated that the public, largely represented by public advocacy groups, and the nuclear industry have different views on the efficiency and effectiveness of the PI program. The industry generally believes that the PI program is working well, while public advocacy groups have become increasingly concerned that the PIs are being managed by the licensees and have become ineffective as indicators of plant performance. The results of the survey also indicate that external stakeholders believe the efficiency of PI data reporting and the adequacy of the guidance document are both improving, but this is mostly a reflection of comments made by industry, and is therefore largely an industry self-assessment of their own performance.

More detail on the results of the internal and external surveys is provided in Attachment 6. Further staff analysis of the survey responses is included in the annual ROP performance metric report (reference ADAMS Accession No. ML050670162).

Program Evaluation per Strategic Plan - The staff committed in Appendix B to the FY 2004–2009 Strategic Plan to perform a program evaluation of the ROP in FY 2005, to include an evaluation of the usefulness of current performance indicators for enhancing agency

planning and response. This evaluation is described in this Commission paper and constitutes one of the three FY 2005 program evaluations of the ROP as delineated in the Strategic Plan. The staff considers this action complete. However, the staff will continue to evaluate the efficiency of the PI program and make program improvements in accordance with the annual ROP self-assessment program as described in IMC 0307.

Self-Assessment Conclusions - In conclusion, although the PI program continues to provide the NRC with objective indicators regarding plant performance, and in some areas has focused licensee attention, contributing to improved performance, the staff and some public stakeholders have become increasingly concerned with the untimeliness and inefficiency of the FAQ process, and with the capability of the current PIs to contribute to the identification of declining performance. Accordingly, the staff plans to engage senior industry management to define actions to address these issues.

Inspection Program Evaluation

Scope and Objectives - The staff of the U.S. Nuclear Regulatory Commission (NRC) performed an evaluation of the inspection program in accordance with Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program." The staff used self-assessment metrics and other pertinent information to provide insights regarding the effectiveness of the Reactor Oversight Process (ROP) in fulfilling the regulatory principles of being predictable, understandable, objective, and risk-informed, and in supporting the NRC's 2004 performance goals of maintaining safety, enhancing public confidence, making regulatory activities more effective, efficient, and realistic, and reducing unnecessary regulatory burden. The staff also obtained input from internal stakeholders through an internal survey, counterpart meetings, focus groups, and the internal feedback process. In addition, the staff obtained external feedback through a *Federal Register* notice (FRN) solicitation for comments and through periodic meetings with the industry and other stakeholders.

Based on the metric results, stakeholder feedback, and other lessons learned through ongoing program monitoring, the staff identified certain issues and actions to further improve the inspection program. These issues are discussed in further detail below and the status of implementation issues is summarized in Attachment 5. In addition, the annual ROP performance metric report provides the data and staff analysis for each of the program area metrics (reference ADAMS Accession No. ML050670162).

Program Evaluation per Strategic Plan - The staff committed in Appendix B to the fiscal year (FY) 2004–2009 Strategic Plan to perform a program evaluation of the ROP in FY 2005. One aspect of the program specifically noted in the scope of the evaluation was the efficiency of the baseline inspection program. The efficiency of the baseline inspection program was evaluated as part of the calendar year (CY) 2004 annual self-assessment of the ROP and the results of this evaluation are discussed below. Therefore, the CY 2004 self-assessment of the inspection program constitutes one of the three FY 2005 program evaluations of the ROP as delineated in the Strategic Plan, and the staff considers this action completed.

Summary of Previous Self-Assessment - In SECY-04-0053, "Reactor Oversight Process Self-Assessment for Calendar Year 2003," the staff noted that the inspection program continued to improve in CY 2003. The staff had implemented several changes to the inspection program to address recommendations from the Davis-Besse Lessons Learned Task Force (DBLLTF) and other stakeholders. In particular, these changes included significant revisions to Inspection Procedure (IP) 71152, "Problem Identification and Resolution (PI&R)," and IP 71111.05, "Fire Protection." In addition, the staff made minor adjustments to several other IPs regarding procedure scope, frequency, and level of effort as a result of the annual review of the inspection procedures, the survey results, and the feedback process. The regions had completed the required baseline inspection program for CY 2003, though resource challenges continued, prompting the staff to revise the resident inspector staffing policy and increase the budgeted regional resources. The staff also planned additional improvements for the inspection program to reflect lessons learned from the Davis-Besse reactor vessel head degradation, as well as continuing feedback from the regions through their implementation of the ROP.

Completion of the Baseline Inspection Program and Site Coverage Issues - All four regions completed their baseline inspections in CY 2004 in accordance with IMC 2515, "Light-Water Reactor Inspection Program — Operations Phase." Each region documented their completion of the baseline inspection program in CY 2004 via memoranda. These memoranda can be found in ADAMS under ML050630303 (Region I), ML050620589 (Region II), ML050610305 (Region III), and ML050620177 (Region IV). In CY 2004, the baseline inspection program was completed using existing regional resources without the coping measures that were necessary the previous two inspection cycles. The resource challenges in CY 2002 and CY 2003 were addressed by increasing the regional budget, revising the resident inspector policy to allow early assignment of resident and senior resident inspectors to a site, and aggressively recruiting, hiring, and qualifying new inspectors. These initiatives improved the site staffing levels in CY 2004 and alleviated the previous resource issues in completing the baseline inspection program.

The staff committed in NRR's Management Control Plan to monitor the impact and effectiveness of actions taken in FY 2004 to increase the availability of fully qualified inspectors as discussed above. The effectiveness evaluation was completed as part of this annual self-assessment, and is discussed in further detail in the resource discussions in Attachment 8.

Changes to Inspection Guidance - In CY 2003, the staff made significant revisions to two baseline inspection procedures to change the respective scope and/or level of effort. Specifically, the staff revised the PI&R procedure (IP 71152) in response to recommendations and feedback from the DBLLTF, the PI&R focus group, and inspectors. The changes included enhanced requirements regarding the routine PI&R reviews conducted by resident inspectors, biennial reviews of longstanding issues, and biennial reviews of operating experience issues.

In addition, the staff revised the fire protection procedure (IP 71111.05) to provide additional inspection requirements and guidance for evaluating licensees' manual actions in lieu of full implementation of Section III.G.2, "Associated Circuits," of Appendix R to Part 50 of Title 10 of the *Code of Federal Regulations*. The suspension of associated circuits inspections continued throughout CY 2004. In support of the fire protection improvement plan initiated by the NRC's Office of Nuclear Reactor Regulation (NRR), the staff lifted the inspection moratorium on associated circuits and revised the inspection guidance in December 2004. Specifically, the staff added guidance for identifying circuits that could prevent a plant from achieving and maintaining hot shutdown conditions after a fire. Inspection of these circuits was suspended in 2000, pending fire tests and the assessment of the test results in order to gain risk insights into the phenomena of fire-induced electrical cable failures.

In CY 2004, the staff revised the plant status procedure (IMC 2515, Appendix D) to provide guidance to ensure that the licensee properly monitors for reactor coolant pressure boundary leakage or potential unidentified leakage that exceeds technical specification (TS) limits. Additional guidance was provided to monitor licensee's actions when the licensee is operating with multiple, repetitive, or unplanned TS action statement entries and to review licensee's corrective action summary reports.

The staff committed in NRR's Management Control Plan to evaluate the effectiveness of the revisions to the PI&R and fire protection IPs and adjustments to several other IPs regarding procedure scope, frequency, and level of effort, and to continue to improve major program

guidance as a result of stakeholder feedback and lessons learned. This effectiveness evaluation and improvement effort will be completed in FY 2005.

Analysis of Inspection Procedures - The staff performed its annual review of each baseline inspection procedure in CY 2004. The period assessed was from October 2003 through September 2004. The focus of the review was to identify potential areas for improvement in the baseline inspection program and to identify any notable changes in inspection results. The staff evaluated each inspection procedure against the requirements in IMC 0307, and performed additional analyses of inspection findings. Based on this review, the staff did not identify any significant changes to the inspection program, although the staff is making minor adjustments to some inspection procedures and plans to do a more detailed analysis and resource adjustment in CY 2005.

It is difficult to make assessments of the effectiveness of inspection procedures for a number of reasons. Among the variables that influence inspection findings are:

- The level of performance of the licensee in the area being inspected.
- The quality of the inspection tools and training provided to the inspector in the area under inspection.
- The fact that the inspection process is a small sampling of the total activities in the area under inspection, and the uncertainty of whether our inspections are focused on the correct activities in an area.
- The experience and inspection abilities of the inspector doing the inspection.

Recognizing these uncertainties, the staff's self-assessment of the inspection findings, internal and external feedback forms, and other independent reviews of the ROP indicate that the inspection program had been generally successful in identifying the risk significance of performance deficiencies in many of the areas inspected. In some areas, there were few inspection findings compared to the amount of resources expended. Additionally, there was a large variation with respect to the number of findings identified per 1000 hours of inspections performed across all the baseline inspection procedures.

Internal feedback from inspectors and regional management also indicated the need for some adjustment to be made to the inspection program. Specifically, the inspectors believed that inspection scope and level of effort may need to be adjusted as appropriate for some inspection procedures. The staff intends to perform similar analyses of inspection data for FY 2003 and FY 2002 and based on these analyses, the staff will modify the baseline inspection program. The purpose of these improvements will be to better align inspection resources to inspected areas where there is an indication of risk-significant performance deficiencies. The staff plans to perform a more detailed analysis of the scope and level of effort of the inspection procedures in CY 2005. As a result of this systematic analysis, the staff plans to adjust existing resources within the baseline inspection program for CY 2006.

Analysis of Inspection Findings - The staff noted an increase in the total number of findings identified during FY 2004. This could be an early indication of a declining performance trend in the industry, however the Industry Trends Program does not yet support this possible

conclusion. There were 881 green findings, 12 white findings, and no yellow or red findings. Comparisons to previous years are provided in Table 1.

Table 1

	10/01/2001-09/30/2002	10/01/2002-09/30/2003	10/01/2003-09/30/2004
Green	696	716	881
White	26	14	12
Yellow	2	2	0
Red	3	1	0
Total:	727	733	893

Reviews by the regions indicated that this increased trend appeared to be caused, in part, by several other factors. First, the regions increased their focus on facilities operating in the degraded or multiple degraded cornerstone columns, which contributed to some of the increase in the number of green findings. Second, more performance deficiencies were identified as a result of the increased number of events. Additionally, more effective and efficient implementation of the ROP, in part resulting from lessons learned from the Davis-Besse vessel head degradation and from more effective training, appeared to result in increased identification of performance deficiencies. The staff will evaluate the number of findings identified during FY 2005 to determine whether the trend continues to increase and to identify potential contributors.

Engineering Design Inspections - In response to direction from the Commission, the staff developed a pilot inspection program designed to improve the effectiveness of inspections in the design/engineering area. The details regarding the pilot program are contained in SECY-04-0071, "Proposed Program to Improve the Effectiveness of the Nuclear Regulatory Commission Inspections of Design Issues," dated April 29, 2004. During Phase 1 of the pilot program, the staff reviewed the results of previous design inspections and reviewed existing and previous inspection guidance. During Phase 2 of the pilot program, the staff developed a prototype inspection procedure, Temporary Instruction 2515/158, "Functional Review of Low Margin/Risk Significant Components and Human Actions," to focus inspection resources on areas of higher risk importance. The temporary instruction was implemented at one pilot site in each region. During Phase 3 of the pilot program, beginning in March 2005, the staff will assess the results of the pilot inspections and will develop recommendations for Commission consideration. As part of its assessment, the staff will solicit feedback from internal and external stakeholders. Based on an initial review of the pilot inspection results, the staff's preliminary view is that the revised approach appears to be an improvement over previous inspection efforts.

Licensee Self-Assessments - As part of the staff's ongoing efforts to improve the effectiveness and efficiency of the ROP, the staff began evaluating a process that would allow licensees to

receive credit for certain self-assessments. The staff is considering allowing licensees to substitute a self-assessment for specific, predetermined baseline inspections, as long as the self-assessment is conducted in accordance with an NRC-approved industry self-assessment process. The staff would still monitor these self-assessments, but the staff anticipates that resource savings to the NRC and its licensees could be significant for these inspectable areas. The staff plans to conduct a pilot program to ascertain the feasibility of a licensee self-assessment process. However, these efforts were deferred until completion of the design/engineering pilot program. After completing the pilot inspections and assessing the results, the staff will evaluate the proposed policy of granting licensee credit for their self-assessment activities.

Commission SRM on Safety Culture - In response to a DBLLTF recommendation to provide more structured and focused inspections to assess licensee's employee concerns programs and safety-conscious work environment (SCWE), the staff provided recommendations and options to the Commission in SECY-04-0111, "Recommended Staff Actions Regarding Agency Guidance in the Areas of Safety Conscious Work Environment and Safety Culture," dated July 1, 2004. On August 30, 2004, the Commission issued a staff requirements memorandum (SRM) that directed the staff to enhance the ROP treatment of cross-cutting issues to more fully address safety culture. The SRM stated that the staff should rely on inspector observations and other indicators already available, should develop tools that allow inspectors to rely on more objective findings, should consider including enhanced problem identification and resolution initiatives, and should ensure that the inspectors are properly trained in the area of safety culture. The Office of Enforcement is the lead office on this issue, with support from NRR, the Office of Research, and the regions.

Status of DBLLTF Items for the Inspection Program - Numerous improvements were made to the inspection program in CY 2004 as a result of DBLLTF recommendations. Eight specific recommendations were incorporated and closed in 2004. Only two related to the inspection program remain open. The following items were closed in 2004:

- Develop inspection guidance pertaining to reactor coolant system unidentified leakage (DBLLTF item 3.2.1.2)
- Ensure that licensee procedures provide adequate guidance for the identification of reactor coolant pressure boundary leakage (DBLLTF item 3.2.1.3)
- Develop inspection guidance for the verification of the implementation of owners groups' commitments (DBLLTF item 3.2.3.2)
- Develop inspection guidance to ensure the adequacy of PWR plant boric acid corrosion control programs (DBLLTF item 3.2.2.1)
- Develop inspection guidance to assess repetitive or multiple technical specification action statement entries (DBLLTF item 3.3.1.2)
- Evaluate inspection guidance pertaining to refueling outage activities (DBLLTF item 3.3.4.1)
- Strengthen inspection guidance for reviewing operating experience

(DBLLTF item 3.3.4.2)

- Provide more structured and focused inspections to assess licensee employee concerns programs and safety-conscious work environment (DBLLTF item 3.3.4.5)
- Establish program expectations and metrics to satisfy minimum resident inspector staffing levels (DBLLTF item 3.3.5.3)

Two additional DBLLTF items remained opened at the end of calendar year 2004:

- *Inspect the adequacy of PWR plant boric acid corrosion control programs* (DBLLTF item 3.2.2.1)

The evaluation of responses to Bulletin 2002-01, which included audits of boric acid corrosion control (BACC) programs at five plants, determined that plants appeared to be complying with requirements at the programmatic level. The results of the evaluation were summarized in Regulatory Issue Summary (RIS) 2003-13. Temporary Instruction (TI) 2515/150 provided guidance for inspecting licensees' reactor pressure vessel (RPV) head inspections pursuant to Order EA-03-009, and included instructions for followup on findings of boric acid accumulation. Inspection Procedure (IP) 71111.08, "Inservice Inspection Activities," was revised in May 2004 to add periodic inspection requirements and guidance for boric acid corrosion control.

In addition, training modules on BACC and stress corrosion cracking were included in a Web-based training course. A training module on the "Effects of Corrosion" was completed by all current inspectors. IMC 1245, "Qualification Program for the Office of Nuclear Reactor Regulation Programs," was revised to include an individual study activity requiring all qualifying inspectors to review the technical subject Web-based training as well as future Web-based training items. The target date to close this item was extended to May 2005 to allow time to conduct more inspections in this area.

- *Reassess the basis for the cancellation of the inspection procedures that were deleted by Change Notice 01-017* (DBLLTF item 3.3.4.7)

In March 2005, a review of all IPs cancelled by IMC Change Notice 01-017 was completed and recommended reactivations were restored to the IMC 2515 Supplemental Inspection Program (Appendix B). This made the IPs available to inspectors for use during any supplemental inspections required as a result of poor licensee performance.

Effectiveness reviews are currently in process for several of the aforementioned DBLLTF items and others that were closed during the previous year. The staff has specifically solicited feedback from inspectors who have actually implemented these IPs following the specified changes, from both the regional IP leads and from resident inspectors at two to three sites in each region. The status and details on the DBLLTF recommendations are available in the Director's Quarterly Status Report (reference ADAMS Accession No. ML043480034) and on the NRC's public Web page.

Office of Inspector General's (OIG's) Audit of the Baseline Inspection Program - The staff received the final report of the OIG's audit of the baseline inspection program in December of 2004 (OIG-05-A-06). The staff agreed with nine of the ten recommendations and plans to improve the effectiveness and efficiency of the baseline inspection program by making changes to the program during CY 2005. The staff disagreed with Recommendation 3 in the OIG report that the staff develop and implement guidance for documenting, tracking, and trending informal inspection issues. A fundamental principle of the ROP is the use of risk information to focus both NRC and licensee attention on issues of greatest significance, and to minimize the level of effort focused on minor issues. Although minor findings are not documented in inspection reports, the ROP explicitly allows minor findings to be conveyed to a licensee verbally for appropriate resolution. The feedback received from NRC regional managers and licensees indicates that this communication process is working well.

Inspection Program Performance Metrics - All inspection program metrics met their established criteria in CY 2004. These metrics are: (1) percentage of inspection findings documented in accordance with requirements, (2) number of baseline inspection procedures significantly changed, (3) number of feedback forms per document, (4) completion of the baseline inspection program, (5) inspection reports are timely, (6) temporary instructions are completed timely, (7) public communication is timely, (8) public communication is accurate, and (9) analysis of inspection hours. Two other metrics, which are discussed below, evaluate feedback received from internal and external stakeholders.

During CY 2004, the staff reduced the number of inspection reports reviewed because of improvement observed during CY 2003. The staff reviewed an integrated inspection report from each regional branch and team inspection reports from each region. About 97 percent of the findings were documented in accordance with IMC 0612 requirements. The staff received 114 feedback forms during CY 2004, comparable to previous years, and has improved responsiveness.

Internal Survey Results - Most responses indicated that the baseline inspection program appropriately inspects for and identifies risk-significant issues, and provides appropriate coverage of plant activities and operations important to safety. About half of the respondents (43 percent) disagreed that the level of effort for conducting each inspection is consistent with that estimated in the inspection procedure.

Most responses (73 to 83 percent) agreed that the baseline inspection procedures were adequate to address intended cornerstone attributes, were clearly written, adequately sampled risk important aspects of each inspectable area, and were conducted at an appropriate frequency.

Some of the more prevalent comments on the inspection program were:

- Inspection procedure scope and level of effort need to be reviewed and adjusted as appropriate.
- Issues which screen out as minor should be monitored.
- More time is needed for plant status, walking around the plant, and other nonspecific activities to let inspectors follow their instincts.

External Survey Results - Participants in the external ROP survey included 11 industry representatives, 6 State or local government agencies, and 4 private citizens or public interest groups. The majority of those who provided feedback to the question on whether the information in the inspection reports is useful to them responded that the inspection reports were clearly written and provided a better understanding of plant operations. Other comments included:

- The information contained in the inspection report is very useful and overall, the quality of these reports has improved.
- The most useful information is the analysis of findings because it has consequences for the licensee.
- By the time we receive an NRC inspection report, the information is old.
- The organization of the inspection reports with the ties to cornerstones helps provide better definition and focus in problem areas. The listing in the reports of inspection scope is duplicative of the inspection procedures and should be eliminated.
- Information in the inspection reports is useful and acceptably formatted. The reports should continue to focus on risk and safety significance issues, leaving any suggestions for improvements to be discussed at the inspection exit meeting.

More detail on the results of the internal and external surveys is provided in Attachment 6. Further staff analysis of the survey responses is included in the annual ROP performance metric report (reference ADAMS Accession No. ML050670162).

Self-Assessment Conclusions - In conclusion, the inspection program met its established goals during CY 2004. The staff made several improvements to the program to address DBLLTF recommendations. The regions completed the required baseline inspection program for CY 2004, and the increases in the regional inspection budget in 2004 and action by regional offices in filling open inspector positions prevented the staffing shortages experienced in 2002 and 2003 from extending into the 2004 inspection cycle. The annual IP evaluation did not result in any significant changes to the inspection procedures, but the staff plans to further evaluate the effectiveness of the baseline inspection procedures in CY 2005 and make the necessary changes to the inspection program.

Significance Determination Process Evaluation

Scope and Objectives - The staff of the U.S. Nuclear Regulatory Commission (NRC) performed an evaluation of the significance determination process (SDP) in accordance with Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program." The staff used self-assessment metrics and other pertinent information to provide insights regarding the effectiveness of the Reactor Oversight Process (ROP) in fulfilling the regulatory principles of being predictable, understandable, objective, and risk-informed, and in supporting the NRC's 2004 performance goals of maintaining safety, enhancing public confidence, making regulatory activities more effective, efficient, and realistic, and reducing unnecessary regulatory burden. The staff also obtained input from internal stakeholders through an internal survey, counterpart meetings, focus groups, and the internal feedback process. In addition, the staff obtained external feedback through a *Federal Register* notice (FRN) solicitation for comments and through periodic meetings with the industry and other stakeholders.

Based on the metric results, stakeholder feedback, and other lessons learned through ongoing program monitoring, the staff identified certain issues and actions to improve the SDP. A summary of the status of implementation issues is included in Attachment 5 and these issues are discussed in further detail below. In addition, the annual ROP performance metric report provides the data and staff analysis for each of the program area metrics (reference ADAMS Accession No. ML050670162).

Program Evaluation per Strategic Plan - The staff committed in Appendix B to the fiscal year (FY) 2004–2009 Strategic Plan to perform a program evaluation of the ROP in FY 2005, and one aspect of the program specifically noted in the scope of the evaluation was the effectiveness of the SDP. SDP effectiveness was evaluated as part of this self-assessment as detailed below. Therefore, the staff considers the commitment to evaluate the SDP completed. However, the staff will continue to evaluate SDP effectiveness in accordance with the annual ROP self-assessment program as described in IMC 0307 and will make ongoing program improvements.

Summary of Previous Self-Assessment - In SECY-04-0053, "Reactor Oversight Process Self-Assessment for Calendar Year 2003," the staff described the status of the SDP and the ongoing initiatives to improve SDP efficiency and effectiveness. Specifically, the staff used the SDP Improvement Plan to address key stakeholder recommendations, including those from the SDP Task Group, an audit by the Office of the Inspector General (OIG), and internal and external feedback. The most significant of the plan's objectives completed in calendar year (CY) 2003 was the benchmarking of all site-specific risk-informed inspection notebooks. The timeliness of final significance determinations had improved in CY 2003, but did not meet the established goal. The staff anticipated continued challenges in CY 2004 with SDP timeliness in certain areas, particularly fire protection issues and SDP issues that involve complex engineering analyses. Several stakeholders expressed concern that the SDP results do not translate to the same level of significance across all cornerstones. Additionally, concerns expressed by external and internal stakeholders regarding the fire protection and shutdown operations SDPs resulted in significant changes to those processes.

Ongoing SDP Improvements - In CY 2004, the staff continued to implement initiatives to improve the SDP process and improve timeliness in issuing final SDP results. In particular, the staff continued to maintain the SDP Improvement Plan to incorporate stakeholder recommendations related to the enhancement of the SDP process and has made progress in many areas. The staff incorporated the SDP Improvement Plan into the Office of Nuclear Reactor Regulation (NRR) Director's Quarterly Status Report to increase management attention (ADAMS Accession No. ML043480029).

During the current period, the staff has made significant advances to complete the objectives of the SDP Improvement Plan. In particular, several important SDPs were revised or issued as new documents as discussed below. Three of the plan's objectives have been placed under the Risk Assessment Standardization Project (RASP) effort for resolution: (1) develop criteria for early recognition of the need for in-depth risk evaluation; (2) develop criteria for assessing licensee PRA quality; and (3) develop a low-power/shutdown operations model. These initiatives will continue to be tracked in the SDP Improvement Plan.

Status of Individual SDPs - During this period, the following SDPs were available to all stakeholders:

- IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations"
- IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process"
- IMC 0609, Appendix C, "Occupational Radiation Safety Significance Determination Process"
- IMC 0609, Appendix D, "Public Radiation Safety Significance Determination Process"
- IMC 0609, Appendix F, "Fire Protection Significance Determination Process"
- IMC 0609, Appendix G, "Shutdown Operations Significance Determination Process"
- IMC 0609, Appendix H, "Containment Integrity Significance Determination Process"
- IMC 0609, Appendix I, "Operator Requalification Human Performance Significance Determination Process"
- IMC 0609, Appendix J, "Steam Generator Tube Integrity Findings Significance Determination Process"

Five of these nine appendices (A, F, G, H, and J) are risk-informed based on changes to core damage frequency. Appendices B, C, D, and I are more deterministic. In CY 2004, the staff issued two new SDPs, Appendix G (shutdown operations) and Appendix J (steam generator tube integrity), issued major revisions to Appendices F (fire protection) and H (containment integrity), and made minor revisions to Appendix A (reactor safety at-power). Training of inspectors and Senior Reactor Analysts (SRAs) on the implementation of these

SDPs was completed before or as the documents were issued. In addition, the staff is currently developing SDPs covering the areas of maintenance rule implementation and spent fuel storage.

The fire protection SDP was significantly revised in May 2004. The technical effort to fully revise the fire protection SDP was led by a contractor from Sandia Laboratories, with significant contributions from the NRC staff, including NRR, the Office of Research (RES), and regional specialists. There were several attachments to the SDP, including a worksheet for recording the Phase 1 review and more specific guidance for particular scenarios and analyses. All regional inspectors expected to participate on fire protection team inspections and at least one SRA from each region participated in the 3-day training course specifically designed for implementation of the SDP. Improvements are expected in the timeliness of finalizing fire protection issues using the new SDP. The containment integrity SDP was also significantly revised to make it more user friendly and risk-informed. Initial feedback from external and internal stakeholders for these SDP changes has been positive.

The staff issued the shutdown operations SDP in May 2004. This SDP included three attachments: the first attachment consisted of Phase 1 operational checklists for pressurized water reactors (PWRs) and boiling water reactors (BWRs), and the second and third attachments were Phase 2 SDP templates for PWRs and BWRs during shutdown. Before issuing these documents, the staff held a public workshop in January 2004. Comments received from this workshop were included as appropriate in the templates and the associated basis document. The new SDP allows the assessment of inspection findings identified during plant shutdown to be done by regional SRAs instead of relying on NRR staff for all findings during plant shutdown.

The staff also issued the steam generator tube integrity SDP in May 2004. The document provides guidance for a Phase 2 assessment and criteria for the inspectors to determine when a Phase 3 evaluation should be considered. The maintenance rule implementation SDP is in the final review process and is scheduled to be issued during the second quarter of CY 2005. The spent fuel storage SDP is under development. A new completion date for this SDP will be established during the second quarter of 2005.

SDP Timeliness - The timeliness of final significance determinations is one of the critical measures of SDP effectiveness. The existing timeliness goal is that final significance determinations will be completed within 90 days after the issuance of the inspection report detailing the finding. The percentage of completed findings meeting the goal has declined from CY 2003, remaining below the percentage goal. This decline is due in part to the impact of closing several of the longstanding issues as discussed further in the performance metric discussion. Several significant initiatives relied upon by the staff to improve the timeliness, such as the revised fire protection SDP and improvement in the containment SDP, have been completed. However, due to the short time period since those documents became available in June 2004, their impact on improving timeliness is not yet known. Since fire protection issues were a significant contributor to the delays in resolving findings, the staff expects improvements with the availability of the new SDP. The impact of the fire protection SDP on the time it takes to resolve issues will be assessed during the next 12-month period.

The staff also recognizes that the new and revised SDPs will not fully resolve the timeliness issues. Therefore additional initiatives are being considered. These include expanding the definition and scope of Phase 2, improving guidance on risk-informed decision making based

on the best available information within agreed-upon time constraints, and grading the timeliness requirements based on the complexity and risk significance of the finding. Additionally, the staff is considering revising the 90-day timeliness metric to include the average time to finalize all greater-than-green findings. As a result of these changes, the staff anticipates notable improvement in SDP timeliness but recognizes continued challenges ahead. The objectives outlined in the SDP Improvement Plan are designed to enhance the tools needed for the continued improvement in timely arrival at a final significance determination.

During the last period the staff revised the SDP guidance to allow preliminary categorization of potentially significant finding as "potentially greater than green," rather than a specific color. For the current period the staff monitored the impact of the change on timeliness. Of the three findings preliminarily designated in the choice letter as greater than green, two were finalized within the timeliness guidelines with no appreciable improvement in the overall timeliness of finalizing findings. The staff will continue to monitor the effectiveness of this change as more cases are run through the new process.

Staff Response to Commission SRM of December 2004 - On December 9, 2004, the Commission was briefed by the staff on the status of key reactor safety and licensing activities. On December 23, 2004, the Commission issued a staff requirements memorandum (SRM) that requested that the staff perform certain actions, two of which were related to the SDP (see SRM-M041209). As a result, the staff provided up-to-date information to the Commission on the timeliness of SDP evaluations during February 2005. Specifically, the staff provided a list of findings for which the SDP evaluation exceeded 180 days and the reasons for the delay in completing the evaluation.

The second request was for the staff to provide the Commission with an evaluation of the effectiveness of recent changes made to improve the timeliness of the fire protection SDP. As discussed above, inspectors and SRAs have indicated that the new fire protection SDP issued in May 2004 is providing the expected guidance for evaluating the significance of fire protection findings. A formal evaluation will be conducted to determine whether the SDP meets its intended purpose, including facilitating timely significance evaluations. The results of this evaluation will be included in the CY 2005 ROP self-assessment Commission paper.

Phase 2 SDP Notebooks and SPAR Models - Initial efforts to benchmark and standardize the Phase 2 risk-informed inspection notebooks (herein referred to as the notebooks) have been completed. However, there were important lessons learned during the early stages of the benchmarking effort, resulting in a better product as the process matured. All 71 notebooks had been revised and issued as Revision 1 by September 30, 2003. Also, the associated benchmark reports for each notebook were posted to the NRR internal Web page for NRC staff use. In retrospect, it became important to standardize all benchmarked notebooks to match the quality of the last notebooks benchmarked (approximately the last third completed). This standardization effort is currently underway and will be completed in 2005, at which time Revision 2 of the risk-informed notebooks will be issued. The Revision 2 notebooks will address any major changes in the licensees' probabilistic risk analyses (PRAs) to date. It is expected that the notebooks will continue to be evaluated and updated in response to future licensee-implemented changes to plants and the PRA models.

Each Revision 2 notebook will include or reference basic pre-solved tables. These tables will identify the value of each sequence when a particular component or human action is degraded.

A spreadsheet for each notebook will be completed and available for staff review and use after release of the Revision 2 notebooks. Each spreadsheet contains approximately 40 to 50 plant-specific key components and operator actions. The selected items were components and equipment issues typically encountered in inspection activities through the ROP or tested the notebook's model and logic. The spreadsheet and corresponding pre-solved table represent the solution and answer key to these items. In addition, the staff will incorporate large early release frequency (LERF) risk aspects in both the notebooks and the associated spreadsheets. The pre-solved tables are expected to be completed by the end of CY 2005.

As discussed above, the staff continues to make improvements to the Phase 2 notebooks through the previously described benchmarking and standardization effort to provide increased levels of reliability and predictability with results that are understood by all stakeholders. Additionally, the Office of Nuclear Regulatory Research (RES) has completed development of all Level 1 Revision 3i Standardized Plant Analysis Risk (SPAR) models and has coordinated with NRR to schedule onsite quality assurance (QA) reviews during notebook benchmarking visits to develop a more reliable Phase 3 SDP analysis tool for at-power internal events. Development of SPAR models for issues related to low power/shutdown conditions, LERF, and external events is also planned and included in the RASP.

The SPAR models have evolved from the event tree-based models originally developed for the Accident Sequence Precursor (ASP) Program. This evolution process has resulted in the SPAR models being developed independently of the licensees' PRAs. Subsequent benchmarking of the SPAR models against licensee PRAs revealed differences between the baseline core damage frequencies (CDFs) estimated by the SPAR models and the corresponding baseline CDFs obtained with the licensees' PRAs. The staff determined that most differences are influenced by generic modeling issues but some are attributed to plant-specific issues. The staff ranked the modeling issues based on their relative impact on the baseline CDF and the number of plants affected by each issue. The most recent update of the Revision 3 SPAR models includes a set of limitation screens for each model. This recent feature of the SPAR models provides the analyst/user with an understanding of how the results of an analysis performed with the specific SPAR model should be interpreted in light of the outcome of the benchmarking of the SPAR model against the licensee's PRA.

Consideration of the contribution to overall risk due to external events is a requirement of the SDP for findings that may be greater-than-green. The method for performing this portion of the analysis is currently developed on a case-by-case basis, which has been an additional challenge to meeting SDP timeliness goals. Development of a methodology which could be used to account for the added risk contribution from external events is under consideration by a task group. Based on a pilot program, the task group is evaluating the two potentially viable methodologies. An assessment tool incorporating one of the methodologies for use by inspectors and SRAs is several years away. A simple methodology that would help inspectors evaluate the risk contribution from external initiators as part of the reactor safety Phase 2 process is also being contemplated but is not currently available.

OIG Audit and SDP Task Group - The NRC's Office of the Inspector General (OIG) completed an audit of the SDP, as documented in OIG-02-A-15, "Review of NRC's Significance Determination Process," dated August 21, 2002. The OIG recommended various refinements to help ensure the successful implementation of the SDP. The audit yielded 11 recommendations, which the staff incorporated into the SDP Improvement Plan for tracking

purposes. The staff provided two updates to the OIG, most recently in January 2005. Upon review of the January 2005 update, the OIG agreed to close all recommendations based on the significant progress in the SDP.

In addition, the agency established the SDP Task Group in late 2002 to complete an independent and objective review of the SDP. The SDP Task Group developed 30 recommendations generally aimed at improving the Phase 2 evaluations using the risk-informed inspection notebooks. To date, the staff has revised the SDP guidance or other portions of the ROP to incorporate 26 of the task group's recommendations. The staff is tracking the four remaining recommendations using the SDP Improvement Plan. Two of the recommendations, addressing licensee PRA quality and guidance for more detailed risk evaluations, continue to be evaluated for potential implementation.

SDP Performance Metrics - The staff maintains nine metrics to monitor the quality of the SDP. The following five metrics met their established criteria: (1) the SDP results are predictable and repeatable and focus stakeholder attention on significant safety issues, (2) the SDP outcome is risk-informed and accepted by stakeholders, (3) SDP tools for evaluating inspection findings reflect current plant design and licensee operating practices, (4) the resources expended (direct charges and support activities) are appropriate, and (5) the appropriateness of regulatory impact from the SDP. Four of the nine SDP metrics failed to meet program expectations, including: (1) final significance determinations are timely, (2) results of the same color are perceived by the public to translate to the same level of significance for all cornerstones, (3) the inspection staff is proficient and find value in using the SDP, and (4) SDP results are communicated accurately to the public.

The percentage of final significance determinations completed within 90 days of transmitting the inspection report detailing the finding, decreased from 73 percent in FY 2003 to 48 percent for this period, falling well below the intermediate goal of 80 percent set for FY 2004. However, if the closure of the 15 backlogged issues is removed from the timeliness equation, the result for final significance determinations opened during the 2004 reflects a 78 percent completion rate within 90 days. The longstanding open issues were mostly due to the lack of adequate SDP tools, and the effects of the improved and new SDPs are not yet reflected in the results. Additional improvements are expected from the standardized notebooks, the pre-solved Phase 2 tables, and the enhanced training regimen associated with each new SDP and SDP revision. The staff is also considering important changes to how the timeliness metric is measured, including a timeliness goal that will reflect the complexity and potential risk significance of the issues.

The continued negative perception by the majority of external survey respondents that the SDP results do not translate to the same level of significance across all cornerstones resulted in a second failed metric. In particular, the emergency preparedness and public radiation safety SDPs were thought to be deterministic and not appropriately characterized by risk insights. The staff believes that a relative parity has been achieved among the cornerstones, based on the potential impact on public health and safety and the designated NRC response to specific findings. However, the staff's inability to effectively clarify the staff's objectives and criteria on this issue to the stakeholders over a period of several years needs to be evaluated.

The 2004 internal survey indicated that the inspection staff continues to express skepticism regarding its proficiency in using the SDP. Although the numbers improved over the previous survey from 2004, the satisfaction levels remain below staff expectations for SDP training, SDP usability, clarity of program documents, and the appropriateness of resource expenditures. Therefore, the resultant metric was not met. Each of these measures is expected to improve as the staff becomes more proficient with the revised and new SDPs, the standardized risk-informed inspection notebooks, and the Phase 2 pre-solved tables.

The metric monitoring the accuracy of postings on the public Website has a goal of zero errors. There were three inaccurate postings on the public Website during this period as a result of inadequate quality control while making entries to the Website. Appropriate corrections were implemented and these instances appear to be isolated occurrences. Additionally, IMC 0306 requires that all reports that update the status of an issue be assigned a report number and associated with the original finding to provide traceability of an issue from discovery to final resolution. These reports include the initial inspection reports, final significance determinations, supplemental inspection reports, and any other reports that discuss the specific issue. NRR identified several instances where this practice was not being followed and is working with the regions to resolve these specific issues and prevent their recurrence in the future.

The staff continues to pursue these issues and expects to realize improvements as the process evolves. The staff continues to address these and other issues through the SDP Improvement Plan.

Internal Survey Results - Several inspectors continued to express concerns regarding the viability of SDP results as timely and reliable indicators of licensee performance. The comments are based on personal experience and generally converge on the following as shortcomings of the process:

- The sum of SDP-generated significance for findings as assessed in accordance with the Action Matrix is generally not reflective of the licensee's performance. The reason for this is mostly due to the process failure to account for minor and green findings in the overall assessment.
- The SDP documents continue to be overly complex for the average inspector.
- The original intent of the process to risk-inform inspection findings was not fully achieved. Instead the process developed into a risk-based assessment.

In summary, the concerns expressed by internal stakeholders, generally inspectors, have not changed from the 2002 survey results. However, corrective actions were developed and incorporated into the SDP Improvement Plan using the results of the 2002 survey and the recommendations resulting from the OIG audit and the SDP Task Group. Significant changes have been made by revising existing SDPs such as the fire protection SDP and issuing new SDPs such as the shutdown operations SDP, as previously described in this document. In addition, the commitment to complete training on any new or significantly revised document before issuance is another program improvement implemented during this period. Since the use of the SDPs is infrequent, the survey does not reflect the impact of these recent improvements and the staff believes that many of the inspectors' concerns have been addressed in these changes.

External Survey Results - Participants in the external ROP survey included 11 industry representatives, 6 State or local government agencies, and 4 private citizens or public interest groups. Several respondents specifically answered 'no' to achieving equivalency between the cornerstones when risk informing findings. Most respondents believe that the structure for risk informing reactor safety-related findings tends to produce consistent results for similar issues. However, many respondents indicated that the SDP did not yield equivalent results for issues of similar significance in all ROP cornerstones. Some SDPs, mostly in the emergency preparedness and public radiation safety cornerstones, were thought to be deterministic and not appropriately characterized by risk insights.

More detail on the results of the internal and external surveys is provided in Attachment 6. Further staff analysis of the survey responses is included in the annual ROP performance metric report (reference ADAMS Accession No. ML050670162).

Self-Assessment Conclusions - In conclusion, the SDP continues to serve as an essential component of the ROP, although continued improvements are needed. Although timeliness in reaching final significance remains a challenge, the revised and new SDPs with the associated training, the standardized risk-informed inspection notebooks, the Phase 2 pre-solved tables, the enhanced SPAR models, and other SDP process changes are all intended to achieve efficiencies and streamline the process. The staff will continue to monitor planned SDP improvements and developments via the SDP Improvement Plan.

Assessment Program Evaluation

Scope and Objectives - The staff of the U.S. Nuclear Regulatory Commission (NRC) performed an evaluation of the assessment program in accordance with Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program." The staff used self-assessment metrics and other pertinent information to provide insights regarding the effectiveness of the Reactor Oversight Process (ROP) in fulfilling the regulatory principles of being predictable, understandable, objective, and risk-informed, and in supporting the NRC's 2004 performance goals of maintaining safety, enhancing public confidence, making regulatory activities more effective, efficient, and realistic, and reducing unnecessary regulatory burden. The staff also obtained input from internal stakeholders through an internal survey, counterpart meetings, focus groups, and the internal feedback process. In addition, the staff obtained external feedback through a *Federal Register* notice (FRN) solicitation for comments and through periodic meetings with the industry and other stakeholders.

Based on the metric results, stakeholder feedback, and other lessons learned through ongoing program monitoring, the staff identified certain issues and actions to further improve the assessment program. A complete listing of implementation issues and their status is included in Attachment 5. In addition, the annual ROP performance metric report provides the data and staff analysis for each of the program area metrics (reference ADAMS Accession No. ML050670162).

Summary of Previous Self-Assessment - In SECY-04-0053, "Reactor Oversight Process Self-Assessment for Calendar Year 2003," the staff described the status of the ROP assessment program and identified issues for staff action over calendar year 2004. Among the more significant issues identified in the SECY paper and the subsequent staff requirements memorandum (SRM) were the need to better define the thresholds for substantive cross-cutting issues, to evaluate the causes for ROP Action Matrix deviations and identify appropriate changes to the ROP, and to improve the standardization and transparency of agency actions associated with plants exiting increased oversight columns of the Action Matrix. The latest revision of IMC 0305, "Operating Reactor Assessment Program," dated December 21, 2004, addresses these issues, as well as incorporating lessons learned from the previous mid-cycle and end-of-cycle review meetings as discussed below.

Program Changes To Address Commission Comments - As a result of last year's Commission briefing on the results of the Agency Action Review Meeting (AARM), the Commission identified five issues as noted in the SRM dated May 27, 2004 (M040504B). Four of these issues were in the assessment program area. Specifically, the Commission noted that (1) the staff should continue efforts to better define thresholds for identifying and responding to substantive cross-cutting issues, (2) the staff should evaluate the causes for any Action Matrix deviations and identify changes to the ROP that may obviate the need for deviations in the future, and substantive changes should be provided to the Commission for approval prior to incorporation into the ROP, (3) the staff should inform the Commission when deviations from the Action Matrix are granted and highlight plants for which such deviations are granted at the annual AARM Commission meeting, and (4) the staff should improve the standardization and transparency of the process for plants to exit from increased oversight columns in the Action Matrix, and standardize the process for requesting and documenting deviations from the Action

Matrix. All of these issues were addressed in CY 2004 and have been closed based on the following activities and revisions to the process.

SECY-04-0053 noted that the staff had revised the guidance regarding substantive cross-cutting issues in each revision of IMC 0305 in order to incorporate lessons learned from implementation during the previous mid-cycle or end-of-cycle review meeting, and that the staff plans to continue monitoring regional implementation of this guidance and making adjustments, as necessary. The staff has further evaluated cross-cutting issues and discussed the effectiveness of recent changes with regional division directors in June 2004 and again in August 2004. Based upon these discussions, the staff revised IMC 0305 to provide more detailed criteria for determining if a substantive cross-cutting issue exists and more specific guidance on how this determination is documented and followed up by the regional offices.

Following the recent end-of-cycle review meetings in February 2005, the staff concluded that the guidance was more consistently implemented across the regions. Lessons learned were noted during these end-of-cycle review meetings and there was significant industry interest in this area during the most recent Regulatory Information Conference. As a result, the staff plans to further revise IMC 0305 and IMC 0612 in order to support the mid-cycle review meetings scheduled for August 2005. Anticipated improvements include providing examples or screening criteria to define a minimum threshold for assigning a cross-cutting element to a finding, better definitions of the human performance bins, and revisiting the exit criteria for substantive cross-cutting issues.

The staff further revised IMC 0305 to require that all deviations be evaluated to identify potential program improvements, and that substantive program changes be provided to the Commission for approval prior to incorporation into the ROP. In addition, IMC 0305 now specifies that the Commission shall be informed of all deviations after approval from the Executive Director for Operations and annually at the Commission meeting on the results of the AARM.

The staff reviewed the causes of the five Action Matrix deviations since the beginning of the ROP to identify potential program improvements. As a result, the staff identified a need to clarify followup activities for plants that are exiting the multiple/repetitive degraded cornerstone column of the Action Matrix, and revised the guidance to provide for greater transparency and standardization of staff actions as plants transition out of increased oversight columns of the Action Matrix. This revision allows the regional offices to utilize some of the actions that are consistent with the multiple/repetitive degraded cornerstone or degraded cornerstone columns of the Action Matrix for a period of one year after the original findings have been closed out. These actions, which do not constitute a deviation from the Action Matrix, include senior management participation at periodic meetings and site visits that are focused on reviewing the results of licensee improvement initiatives such as efforts to reduce corrective action backlogs and progress in completing the Performance Improvement Plan, limited IP 95003 and CAL followup inspections beyond the baseline inspection program, senior management attendance at the annual public meetings, and signature authority for the subsequent assessment letters.

AARM Lessons Learned - Although the AARM and related meetings and papers were effective this past year, the staff identified several areas for improvement to increase their effectiveness in future years. The staff initiated modest improvements in several distinct areas pertaining to the significant steps leading up to and following the AARM, including the ROP

self-assessment SECY paper, the industry trends program, the end-of-cycle and end-of-cycle summary meetings, preparations and conduct of the AARM, and the subsequent Commission meeting on the results of the AARM. These recommended improvements were provided to the Office of the Executive Director for Operations (OEDO) and senior NRC management and were incorporated into existing guidance, as applicable.

Status of DBLLTF Items - The DBLLTF recommended that the staff identify alternative mechanisms to independently assess plant performance as a means of self-assessing NRC processes (reference DBLLTF item 3.3.3.1). The staff revised IMC 0305 to address this concern. Specifically, the revision requires that the mid-cycle and end-of-cycle review meetings consider conclusions of independent assessments such as the Institute of Nuclear Power Operations (INPO) and the International Atomic Energy Agency (IAEA) Operational Safety Review Team (OSART) inspections in order to self-assess the NRC's inspection and assessment processes.

The DBLLTF also recommended that the staff perform a sample review of the plant assessments conducted under the interim Plant Performance Review (PPR) assessment process (from 1998 through 2000) to determine whether there are plant safety issues that have not been adequately assessed (reference DBLLTF item 3.3.3.2). As a result, the staff performed an audit of eight PPRs conducted between 1997 and 1999. The audit was conducted by reviewing the PPR packages used during the internal NRC meeting and correlating all the negative statements made in the PPR packages to inspection reports. Furthermore, the staff reviewed appropriate inspection reports in order to see if negative conclusions in the PPR packages were followed up and if the issue could potentially be indicative of hidden equipment issues. The audit concluded that, while some minor documentation problems did exist, no potentially hidden equipment issues were identified.

IMC 0350 Process Improvements and Implementation - As noted in last year's self-assessment, the staff committed to monitoring the effectiveness of the significant revisions to IMC 0350, "Oversight of Operating Reactor Facilities in a Shutdown Condition with Performance Problems," that were made to address recommendations from the DBLLTF and to incorporate other lessons learned and clarifications. Specifically, the DBLLTF recommended that the NRC should develop guidance to address the impacts of implementing IMC 0350 as they relate to regional organizational alignment and resource allocation (reference DBLLTF item 3.3.5.4), and that the NRC should revise IMC 0350 to permit its implementation without first having established that a significant performance problem exists (reference DBLLTF item 3.3.4.4). As a result, IMC 0350 now provides a comprehensive correlation between aspects of the ROP and the IMC 0350 process, enhances the structure of the inspection approach for IMC 0350 plants, and includes an entry condition based on a significant operational event without first having established that a significant performance problem exists.

Davis-Besse remained the only plant under the IMC 0350 process during CY 2004. Although the plant was approved for restart in March 2004, the Davis-Besse Oversight Panel continues to monitor plant activities utilizing enhanced inspection oversight coverage in accordance with IMC 0350 and a confirmatory order. Since no additional plants have been considered for IMC 0350 oversight since the implementation of the DBLLTF recommendations, only a limited effectiveness review could be performed. However, feedback from the Davis-Besse Oversight Panel and other stakeholders indicates that the procedural and budgetary changes have been effective in addressing the concerns noted by the DBLLTF. In addition, in accordance with the

guidance in IMC 0350, the Davis-Besse Oversight Panel is developing a report on recommended improvements to the process based on additional lessons learned. The staff plans to revise IMC 0350 in CY 2005 to address these recommendations and further improve the process.

Cross-Cutting Issues Assessment - During formulation of the ROP, the staff hypothesized that weaknesses in the cross-cutting areas of human performance, problem identification and resolution, or safety conscious work environment would be detected through performance indicators or baseline inspections prior to a facility's performance level degrading to an unacceptable level (i.e., Column V of the Action Matrix). The staff confirmed this hypothesis as part of the CY 2000 and 2001 ROP self-assessments by analyzing events classified as significant through the NRC's Accident Sequence Precursor (ASP) program, as well as facilities that reached the degraded cornerstone column of the Action Matrix. However, a similar assessment performed during CY 2002, including the performance issues at Davis-Besse associated with the erosion of the reactor vessel head, raised questions regarding the original cross-cutting issue hypothesis. In the 2002 self-assessment, the staff stated that additional work would be needed to decide whether a more direct way is needed to assess and react to performance weaknesses in the cross-cutting areas of problem identification and resolution and safety conscious work environment (as well as safety culture).

A review was not performed as part of the CY 2003 self-assessment because there were few newly analyzed ASP events or plants that reached the degraded cornerstone column of the Action Matrix. Also, the staff was in the process of responding to the recommendations raised by the Davis-Besse Lessons Learned Task Force (DBLLTF), some of which were directly related to the staff's failure to recognize cross-cutting performance issues.

In response to the DBLLTF recommendations, actions were taken to:

- strengthen the inspection guidance related to licensee corrective action programs
- enhance inspector training on the importance of maintaining a questioning attitude
- enhance communications between inspectors and regional management regarding plant performance issues

Also, as directed by the Commission, the staff is currently evaluating ways to more directly assess licensee safety culture. In addition, as part of the Commission-directed Engineering Pilot Inspection Program, the staff will assess whether a new cross-cutting issue in engineering is warranted. The results of the engineering pilot program assessment will be communicated to the Commission later this calendar year. In aggregate, the above program enhancements, together with the ongoing engineering and safety culture assessments, should be sufficient to respond to the issues identified by the DBLLTF. However, a common theme in both the internal and external surveys and at the 2005 Regulatory Information Conference was that the agency needs additional guidance for substantive cross-cutting issues. The staff continues to analyze the area of cross-cutting issues as part of the annual self-assessment to ensure that the fundamental ROP hypothesis is confirmed and that these issues are adequately addressed.

Assessment Program Performance Metrics - For the period covered by this self-assessment, all of the performance metrics in the assessment area met their established criteria or goals with the exception of the number of Action Matrix deviations (AS-1), which increased in CY 2004 compared to the past few years. The staff has taken measures to address this concern by

making changes to the process as previously discussed. The other assessment program metrics that met their criteria include: (1) the number of significant departures from the requirements of IMC 0305 and IMC 0350, (2) the appropriateness of actions taken for greater than green performance indicators and findings, (3) the number and scope of any additional actions recommended at the Agency Action Review Meeting (AARM), (4) the number of timeliness goals for the assessment program that are not met, (5) the timeliness and availability of assessment letters in ADAMS and the NRC's Web site, (6) the number of revisions to IMC 0305 and IMC 0350, (7) the timeliness of completing supplemental inspections for risk significant PIs and inspection findings, and (8) the number of instances in which plants move more than one column to the right in the Action Matrix from one quarter to the next. There are also two other metrics, which are discussed below, that evaluate feedback received from internal and external stakeholders.

Internal Survey Results - Participants in the internal survey were asked if the assessment process (1) provides an appropriate range of actions for safety issues, (2) provides for timely resolution of issues commensurate with safety significance, (3) applies appropriate enforcement actions, (4) focuses resources on areas of greatest safety significance, (5) minimizes duplication of work in preparation of assessment meetings, (6) provides objective levels of assessment, (7) provides understandable thresholds, (8) takes appropriate action for performance issues for those licensees outside of the licensee response column of the Action Matrix, and (9) provides assessment reports that are communicated effectively through the use of plain English. The participants responded positively to all nine questions with the percentage of positive responses increasing for eight of the questions from the internal survey discussed in SECY-03-0062, dated April 21, 2003. Specifically, positive response rates varied from 66 to 85 percent for the questions discussed above. A common theme from the survey's written comments was that the guidance for identification and disposition of substantive cross-cutting issues is unclear.

External Survey Results - Participants in the external ROP survey included 4 private citizens or public interest groups, 11 industry representatives, and 6 State or local government agencies. The participants were asked (1) if the ROP takes appropriate actions to address performance issues for those licensees that are outside of the licensee response column of the Action Matrix, and (2) if the information contained in assessment reports is relevant, useful, and written in plain language.

The industry and the majority of the State and local agencies generally agreed that actions taken by the NRC for plants outside of the licensee response column have been appropriate. However, one State was critical of the timeliness and scope of NRC supplemental inspections. One public interest group responded positively but maintained that improvement was warranted in the agency's followup to deficiencies in the cross-cutting areas. This survey participant recommended that the NRC develop a mechanism, such as a greater than green finding, to allow early NRC engagement of licensees when a substantive cross-cutting issue is identified and to clearly delineate NRC actions in the assessment letter. The level of external stakeholder satisfaction in this area was generally positive and similar to the previous external surveys.

The industry and the majority of the State and local agencies agreed that the information contained in assessment reports is relevant, useful, and written in plain English. However, one State regulator was critical of the scope and length of discussions in the assessment letters. One public interest group stated that the assessment letters contained too much boilerplate

information and lacked clear distinction between the best performing plants and the worst performing plants. The level of external stakeholder satisfaction in this area was generally positive and similar to the previous external surveys.

More detail on the results of the internal and external surveys is provided in Attachment 6. Further staff analysis of the survey responses is included in the annual ROP performance metric report (reference ADAMS Accession No. ML050670162).

Future Plans - Future staff work on the assessment program over the next year will include monitoring the effectiveness of recent changes to IMC 0305. Specifically, the staff plans to closely monitor the effectiveness of revised guidance for (1) defining the threshold for a substantive cross-cutting issue as well as agency followup actions, (2) staff actions when Point Beach and Perry plants transition out of increased oversight columns of the Action Matrix, and (3) considering conclusions of independent assessment such as the Institute of Nuclear Power Operations (INPO) and the International Atomic Energy Agency (IAEA) Operational Safety Review Team (OSART) inspections in order to self-assess the NRC's inspection and assessment processes during the mid-cycle and end-of-cycle review meetings. The staff will also seek to further improve guidance related to cross cutting issues.

Self-Assessment Conclusions - Overall, the assessment program is meeting the agency's goals of maintaining safety, using NRC resources efficiently and effectively, and enhancing public confidence. The program is also meeting the objectives established for the ROP of being objective, risk-informed, understandable, and predictable.

Status of Implementation Issues

SECY-04-0053, "Reactor Oversight Process Self-Assessment for Calendar Year 2003," dated April 6, 2004, included a listing and status of previous issues related to implementation of the Reactor Oversight Process (ROP) for which additional actions were planned by the staff. SECY-04-0053 also discussed commitments and actions that the staff had planned as a result of the ROP self-assessment for calendar year (CY) 2003. Those issues that were closed during CY 2003 as noted in SECY-04-0053 were not carried forward into this year's self-assessment. The Commission also directed the staff to consider additional issues as detailed in several staff requirements memoranda (SRMs). The Davis-Besse Lessons Learned Task Force (DBLLTF), the Office of the Inspector General (OIG), the Efficiency Focus Group, the Advisory Committee on Reactor Safeguards (ACRS), the Significance Determination Process (SDP) Task Group, and other interested stakeholders have also produced reports with recommended improvements to the ROP program.

During the CY 2004 self-assessment period, the staff resolved many of these issues and made progress toward resolving several others. The issues in each program area that were discussed in the above-noted documents along with their status as of the completion of the CY 2004 self-assessment are summarized below. Those issues that were closed during CY 2004 are so noted and will not be carried forward into next year's self-assessment. The Reference column denotes the origin of each issue and/or the last official document that the issue was discussed in. The staff actions to address the issues listed below are discussed in the respective program area assessments or in other areas of the paper, as noted in the Status column.

Issue	Reference	Status
Performance Indicator (PI) Program		
Improvements to address problems in the Safety System Unavailability (SSU) PI (e.g., the Mitigating Systems Performance Index)	SECY-04-0053	In progress, see Attachment 1
Potential unintended consequences of the Unplanned Power Change PI	SECY-04-0053	On hold, see Attachment 1
Develop improved Barrier Integrity cornerstone PIs	SECY-04-0053, DBLLTF item 3.3.3.3	In progress, see Attachment 1
Clarify the guidance for the Safety System Functional Failure (SSFF) PI	SECY-04-0053	In progress, see Attachment 1
Review ACRS recommendations concerning the white/yellow and yellow/red thresholds	SECY-04-0053, SRM dated 12/20/01	Under consideration, see Attachment 1
Pursue the development of PIs for the cross-cutting issues	SECY-04-0053	In progress, see Attachment 1

Issue	Reference	Status
Continue to evaluate the Scrams with Loss of Normal Heat Removal PI	SECY-04-0053	In progress, see Attachment 1
Continue reassessment of the PI program, including the need to develop new indicators to supplement or replace the existing indicators, enhancements to the FAQ process, and whether some PI thresholds should be performance-based rather than risk-informed	SECY-04-0053	In progress, see Attachment 1
Review INPO's final product regarding Consolidated Data Entry	SECY-04-0053	Closed, see Attachment 1
In developing improved, risk-informed PIs, the staff should try to recover the MSPI efforts before initiating new efforts. The staff should work with stakeholders to develop clear requirements for PIs so the PIs are indicative of performance within the related cornerstone of safety	SRM dated 05/27/04	In progress, see Attachment 1
Perform an evaluation of the usefulness of current performance indicators for enhancing agency planning and response	FY 2004–2009 Strategic Plan, Appendix B, and NRR's management control plan (ref. ML043370410)	Closed, see Attachment 1
Inspection Program		
Develop inspection guidance pertaining to reactor coolant system unidentified leakage	SECY-04-0053, DBLLTF item 3.2.1.2	Closed, see Attachment 2
Ensure that licensee procedures provide adequate guidance for the identification of reactor coolant pressure boundary leakage	SECY-04-0053, DBLLTF item 3.2.1.3	Closed, see Attachment 2
Develop inspection guidance to ensure the adequacy of PWR plant boric acid corrosion control programs	SECY-04-0053, DBLLTF item 3.2.2.1	In progress, see Attachment 2
Develop inspection guidance for the verification of the implementation of owners groups' commitments	SECY-04-0053, DBLLTF item 3.2.3.2	Closed, see Attachment 2
Develop inspection guidance to assess repetitive or multiple technical specification action statement entries	SECY-04-0053, DBLLTF item 3.3.1.2	Closed, see Attachment 2

Issue	Reference	Status
Evaluate inspection guidance pertaining to refueling outage activities	SECY-04-0053, DBLLTF item 3.3.4.1	Closed, see Attachment 2
Strengthen inspection guidance for reviewing operating experience	SECY-04-0053, DBLLTF item 3.3.4.2	Closed, see Attachment 2
Provide more structured and focused inspections to assess licensee employee concerns programs and safety-conscious work environment	SECY-04-0053, DBLLTF item 3.3.4.5	Superceded/ Closed, see Attachment 2
Reassess the basis for the cancellation of the inspection procedures that were deleted by Change Notice 01-017	SECY-04-0053, DBLLTF item 3.3.4.7	Closed in early 2005, see Attachment 2
Establish program expectations and metrics to satisfy minimum resident inspector staffing levels	SECY-04-0053, DBLLTF item 3.3.5.3	Closed, see Attachment 9
Ensure the adequacy of site staffing and modify policy as necessary	SECY-04-0053	Closed, see Attachment 9
Communicate proposed revisions to engineering design inspections in a separate Commission paper	SECY-04-0053	Closed, pilot ongoing, see Attachment 2
Conduct pilot program to ascertain feasibility of the licensee self-assessment process	SECY-04-0053	On hold, see Attachment 2
Revise inspection guidance and lift moratorium on associated circuit inspections	SECY-04-0053	Closed, see Attachment 2
Develop inspection procedures on how to inspect for boric acid corrosion and stress corrosion cracking, and train inspectors before issuing the procedures	SECY-04-0053	Closed, see Attachment 2
Report the results of the pilot inspection program used to evaluate the effectiveness of the baseline inspection procedure consolidation effort	SECY-04-0053	In progress, see Attachment 8
Reconsider personnel staffing policies and continue aggressive hiring strategies by all four regions to avoid staffing shortfalls	SECY-04-0053	Closed, see Attachment 8
Perform a program review to understand the reasons for regional differences in expenditure rates and identify best practices for conducting inspections	SECY-04-0053	In progress, see Attachment 8
Continue to monitor RI demographics and report to the Commission	SECY-04-0053, SRM dated 04/08/98	Ongoing, see Attachment 9

Issue	Reference	Status
Streamline and automate the data collection process for the inspector “quality-of-life” metrics and incorporate them in the IMC 0307 process	SECY-04-0053	Closed, see Attachment 9
Enhance the ROP treatment of cross-cutting issues to more fully address safety culture	SRM dated 08/23/04	Ongoing, see Attachment 2
Evaluate the effectiveness of the significant revisions to the problem identification and resolution (PI&R) and fire protection inspection procedures (IPs) and adjustments to several other IPs regarding procedure scope, frequency, and level of effort. Continue to improve major program guidance (IMCs, IPs) as a result of stakeholder feedback and lessons learned	NRR commitment in its management control plan (ref. ML043370410)	In progress, see Attachment 2
Monitor the impact and effectiveness of actions taken in FY 2004 to increase the availability of fully qualified inspectors (i.e., the increased regional budget for operating reactor inspection activities and the revised resident inspector policy to allow early assignment of new resident and senior resident inspectors to a site)	NRR commitment in its management control plan (ref. ML043370410)	Closed, see Attachments 2 and 8
Perform an evaluation of the efficiency of the agency’s baseline inspection program	FY 2004–2009 Strategic Plan, Appendix B, and NRR’s management control plan (ref. ML043370410)	Closed, see Attachment 2
Significance Determination Process		
Validate and issue plant-specific risk-informed inspection notebooks, including the Phase 2 worksheets	SECY-04-0053	In progress, see Attachment 3
Continue efforts to obtain improved and standardized risk analysis tools for the risk analysts	SECY-04-0053	Ongoing, see Attachment 3
Develop an SDP for plant shutdown issues	SECY-04-0053	Closed, see Attachment 3
Develop an SDP for steam generator tube integrity	SECY-04-0053	Closed, see Attachment 3
Develop SDPs for maintenance and spent fuel	SECY-04-0053	In progress, see Attachment 3

Issue	Reference	Status
Improve the capability to assess the impact of external events on operating reactor safety-related issues	SECY-04-0053	Under consideration, see Attachment 3
Assess the impact of the policy change for preliminary categorization of findings as “potentially greater than green”	SECY-04-0053	In progress, see Attachment 3
Continue to monitor and make planned SDP improvements via the SDP Improvement Plan	SECY-04-0053, Director’s Quarterly Status Report	In progress, see Attachment 3
Provide up-to-date information to the Commission on the timeliness of SDP evaluations.	SRM dated 12/23/04	Closed, see Attachment 3
Perform an evaluation of the effectiveness of the recent changes made to improve the timeliness of the fire protection SDP	SRM dated 12/23/04	In progress, see Attachment 3
Perform an evaluation of the effectiveness of the significance determination process	FY 2004–2009 Strategic Plan, Appendix B, and NRR’s management control plan (ref. ML043370410)	Closed, see Attachment 3
Assessment Program		
Provide a more predictable standard or criterion for determining what constitutes a substantive cross-cutting issue	SECY-04-0053	Closed, see Attachment 4
Monitor the effectiveness of the guidance for removing plants from the multiple/repetitive degraded cornerstone column of the Action Matrix	SECY-04-0053	Closed, see Attachment 4
Identify alternative mechanisms to independently assess plant performance	SECY-04-0053, DBLLTF item 3.3.3.1	Closed, see Attachment 4
Perform a sample review of the plant assessments conducted under the interim PPR assessment process	SECY-04-0053, DBLLTF item 3.3.3.2	Closed, see Attachment 4
Continue to assess combination of inputs and length of time for consideration in the Action Matrix to ensure appropriate agency response	SECY-04-0053	Ongoing, see Attachment 4

Issue	Reference	Status
Continue to analyze cross-cutting issues	SECY-04-0053	Ongoing, see Attachment 4
Monitor effectiveness of IMC 0305 and IMC 0350 changes	SECY-04-0053	Closed, see Attachment 4
Perform a cross-cutting issue assessment	SECY-04-0053	Closed, see Attachment 4
The staff should continue efforts to better define thresholds for identifying and responding to substantive cross-cutting issues	SRM dated 05/27/04	Closed, see Attachment 4
When deviations from the action matrix occur, the staff should evaluate the causes for the deviations and identify changes to the ROP, as appropriate, that may obviate the need for deviations in the future	SRM dated 05/27/04	Closed, see Attachment 4
The staff should inform the Commission when deviations from the action matrix are granted and highlight plants for which such deviations are granted at the annual AARM Commission meeting	SRM dated 05/27/04	Closed, see Attachment 4
As part of the normal self-assessment process, the staff should improve the standardization and transparency of the process for plants to exit from increased oversight columns in the action matrix	SRM dated 05/27/04	Closed, see Attachment 4
The staff should standardize the process for requesting and documenting deviations from the action matrix	SRM dated 05/27/04	Closed, see Attachment 4
Communication Activities and Other Program Issues		
Conduct an independent survey by a qualified contractor of the impact of the NRC's activities on reactor licensees' operations	SECY-04-0053, SRM dated 01/30/02	Closed, see Attachment 7
Report regulatory impact results in the next annual ROP self-assessment Commission paper, rather than by separate correspondence	SECY-04-0053	Closed, see Attachment 7
Evaluate the need and feasibility for a public workshop	SECY-04-0053	Closed, see main body

Issue	Reference	Status
Provide ROP refresher training to managers and staff members	SECY-04-0053, DBLLTF item 3.3.4.6	Closed, see main body
Continue to make enhancements to the ROP feedback process	SECY-04-0053	In progress, see main body
Develop an electronic support system for inspectors to help inspectors perform their jobs more efficiently	SECY-04-0053	In progress, see main body
Continue to explore IT technologies to gain inspector efficiencies	SECY-04-0053	In progress, see main body
Conduct the next internal survey in the fall of 2004	SECY-04-0053	Closed, see Attachment 6
Perform a program evaluation of the ROP in FY 2005 as delineated in Appendix B to the FY 2004–2009 Strategic Plan	FY 2004–2009 Strategic Plan, Appendix B, and NRR’s management control plan (ref. ML043370410)	Closed, see main body
Perform a complete evaluation of the performance measures in both the ROP self-assessment program and the NRR operating plan and revise them as necessary to support the new Safety Performance Measures	NUREG-1100, Volume 21, dated February 2005 (e.g., the Green Book)	Closed, see main body

Stakeholder Survey Results

Consistent with the guidelines prescribed by Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program," the staff conducted both an external and an internal survey during this self-assessment cycle to solicit and analyze stakeholder feedback regarding the effectiveness of the Reactor Oversight Process (ROP). All of the external survey questions and resultant responses, and several of the internal survey questions and responses, contributed directly to the annual ROP performance metrics. A general analysis of the stakeholder responses is summarized below, while a more detailed analysis is available in the annual ROP performance metric report (reference ADAMS accession number ML050670162) and the applicable performance area discussions in Attachments 1 through 4 to this paper.

External Survey

The staff published a survey in a *Federal Register* notice on October 25, 2004, to obtain external stakeholder input regarding the effectiveness of the Reactor Oversight Process (ROP). The survey requested responses to 19 specific questions corresponding to specific ROP performance metrics as defined in IMC 0307. This solicitation of public comments has been issued each year since ROP implementation in 2000.

In previous years, survey respondents often gave feedback that was unrelated to areas that the NRC solicited information about; hence, the staff has been unable to trend and sometimes even assess the cumulative results. As a result, the survey was modified this year to allow for "multiple choice" answers so that the respondents' comments more directly related to the questions asked. In addition, each of the first 19 questions requested that respondents gauge their experiences and opinions using the ROP during both initial and current implementation. Following each of the specific questions, survey participants were further requested to elaborate on their multiple choice ratings with specific thoughts or concerns and to offer their opinion for possible improvements. Additional information and comments related to the ROP that were not directly captured by the specific questions were expounded on in question 20.

The external survey is more subjective than the internal survey, and therefore does not lend itself to the more detailed statistical analysis that was performed on the internal survey. As noted above, the staff made some modifications to the external survey this year to enable a more objective comparison of current stakeholder satisfaction on specific issues as compared to satisfaction after initial implementation, and thus a more objective look at trends in perception to support the metric analyses. The results of the external survey and the staff's plans to address the insights gained are discussed below.

In an effort to solicit feedback on the implementation of the ROP, the staff (1) mailed approximately 700 surveys directly to stakeholders, (2) placed a direct link to the survey information on both the ROP Web page and the "Documents for Comment" page of the NRC's external Web site, and (3) issued a press release and posted it on the NRC's external Web site.

The external surveys were sent out a month earlier than last year to ensure that stakeholders had ample time to participate. Unfortunately, the Agencywide Documents Access and Management System (ADAMS) Publicly Available Records System (PARS) was unavailable to

the public due to a security review of documents that could potentially contain sensitive information. For approximately 6 weeks of the comment period, external stakeholders were unable to access PARS. On December 7, 2004, PARS was partially restored and available for public viewing; thus, the NRC granted an additional 30 days for those stakeholders that needed additional time to secure public documents for the purpose of participating in the survey.

Survey Response - The NRC received 21 responses to the FRN issued in October 2004 from individuals and/or organizations listed chronologically in the order received below. The ADAMS accession number is given in parenthesis after the respondent's name.

- < Union of Concerned Scientists (ML043150198)
- < T. Gurdziel, Private Citizen (ML043210419)
- < Region 5/6 Emergency Management, NE (ML043230584)
- < Alabama Emergency Management Agency (ML043230586)
- < First Selectman Connecticut, Town of Waterford (ML043230590)
- < M. Mulligan, Private Citizen (ML043350273)
- < Minnesota, Department of Public Safety (ML043350267)
- < Union of Concerned Scientists (2nd submittal) (ML043480285)
- < Prairie Island Nuclear Generating Plant (ML043550216)
- < State of New Jersey, Department of Environmental Protection (ML043620075)
- < Pennsylvania Department of Environmental Protection (ML043620080)
- < Nuclear Management Company (ML043620068)
- < Blue Ridge Environmental Defense League (ML043620071)
- < Entergy Operations (ML043620073)
- < Region IV Utility Group (ML043650145)
- < Duke Energy (ML043650168)
- < Southern California Edison (ML043650149)
- < Tennessee Valley Authority (ML043650450)
- < Nebraska Public Power District (ML043650153)
- < Exelon Generation Company and AmerGen Energy Company (ML043650154)
- < Nuclear Energy Institute (ML050050419)
- < Strategic Teaming and Resource Sharing (ML050120343)

The Union of the Concerned Scientists (UCS) commented twice, hence one response was not counted. UCS's first response acknowledged the group's inability to do a meaningful review due to the unavailability of ADAMS, but ADAMS was restored soon thereafter and UCS resubmitted a second comprehensive response.

Survey Results - The results are similar when comparing respondent satisfaction from initial to current ROP implementation. There were no dramatic improvements or declines. Approximately two-thirds of the respondents answered the survey questions, while over three-quarters of those that responded provided additional comments. The survey responses were generally in line with responses from previous years, as were the number and distribution of the responses. Based on a review of the responses, there were three distinct categories of external stakeholders. Approximately half of the 21 responses came from NEI or utilities endorsing the NEI response, 6 came from State or local agencies, and 4 came from public interest groups or members of the public. The opinions and experiences of the collective stakeholders vastly differ, but at times run parallel or coincide. Several repetitive areas that the

staff identified as stakeholder concerns were related to the PI program, the SDP, and the assessment program, as further discussed below.

PI Program Results - Although most of those that answered the survey questions believe that PIs promote plant safety, some public citizens groups are losing confidence in the ability of PIs to promote safety. This is attributed to licensee's discovery of "loop holes" in the PI process. A respondent wrote that when a licensee wants to avoid a white, yellow, or red PI, a question can be asked to challenge the basis of the PI, resulting in the specific PI result being undetermined until the issue is resolved. Also, the Alert and Notification System and Unplanned Power Changes PIs were noted as easily manipulated. These same views were shared with at least one State agency. In contrast, the industry primarily believed that the mix of the PI Program in conjunction with the inspection program promotes plant safety. However, the Scrams with Loss of Normal Heat Removal PI is thought to contribute to the program's lack of clarity and definition as evidenced by several frequently asked questions (FAQs) being under review for the past 2 years.

Inspection Program Results - Nearly all respondents agreed that the inspection reports were useful, were clearly written, and provided a better understanding of plant operations. Few of the written comments related to the inspection program.

SDP Results - The significance determination process had an unfavorable response from the majority of those that answered the survey. Many respondents indicated that the SDP did not yield equivalent results for issues of similar significance in all ROP cornerstones. The public citizens groups and State organizations appear to agree that the SDP is more relaxed now than when the ROP was first implemented. The industry overwhelmingly expressed concerns about the timeliness of the SDP. The effort expended was thought to be an over-application of licensee resources for an extended period of time to address potential issues. Further, the amount of risk significance across the seven cornerstones is thought to be disproportionate. Some SDPs, mostly in the emergency preparedness and public radiation safety cornerstones, were thought to be deterministic and not appropriately characterized by risk insights.

Assessment Program Results - In the area of addressing performance issues, the industry and the majority of the State and Local agencies generally agreed that actions taken by the NRC for plants outside of the licensee response column have been appropriate. One State agency was critical of the timeliness and scope of NRC supplemental inspections. One public interest group responded positively, but maintained that improvement was warranted in the agency's followup to deficiencies in the cross-cutting areas. The majority of respondents that answered the survey questions, including the utilities and the majority of the State and local agencies, agree that the information in the assessment reports is relevant, useful, and written in plain English. However, one State regulator was critical of the scope and length of discussions in the assessment letters. Also, a couple of licensees expressed concerns about the basis and closure process for substantive cross-cutting issues identified in these assessment letters. One public interest group stated that the assessment letters contained too much boilerplate information and did not clearly distinguish between the best performing plants and the worst performing plants.

Overall ROP Results - The majority of the respondents agreed that the ROP (1) is predictable and reasonably objective, (2) is risk-informed, (3) is understandable and written in plain English, (4) is effective, efficient, and realistic, (5) ensures openness in the regulatory process,

(6) provides sufficient opportunities for the public to participate in the process, (7) has been implemented as defined, and (8) reduces unnecessary regulatory burden. To a lesser extent, respondents agree that the ROP provides adequate regulatory assurance when combined with other NRC regulatory processes that plants are being operated and maintained safely, while also citing the problems at Davis-Besse and a few other plants as examples of the ROP's failure to detect performance weaknesses in a timely manner.

The two questions that received the most negative comments, and resulted in their respective metrics not being met, were whether the NRC is responsive to public inputs and comments on the ROP (metric O-15) and whether the ROP results in unintended consequences (metric O-18). Although a vast majority of respondents agree that the NRC has been responsive to public inputs, including several State and local agencies and members of the public, those that disagree feel that the NRC's response has been slow or inadequate. Many stakeholders continue to believe that although the ROP minimizes unintended consequences, some aspects of the ROP have the potential to result in unintended consequences, specifically citing the Scrams with Loss of Normal Heat Removal PI and the Safety System Unavailability PIs as examples.

Cross-Reference Between Survey Questions and Performance Metrics - In addition to the general analysis above, staff analysis of the specific responses is included in the applicable portions of the program area evaluations in Attachments 1 through 4 to this paper as well as in the annual ROP performance metrics report (reference ML050670162). The following table provides a convenient cross-reference between the question number on the survey and the ROP performance metric that the question specifically supports. It is also indicated whether the metric criterion was met based on the survey responses and staff's analysis.

Survey Item	Question	Metric	Met?
1	Does the PI program minimize the potential to take actions that adversely impact plant safety?	PI-4	yes
2	Does appropriate overlap exist between the PI program and the inspection program?	PI-6	yes
3	Is the reporting of PI data efficient?	PI-7	yes
4	Does NEI 99-02 provide clear guidance regarding PIs?	PI-8	yes
5	Is the information in inspection reports useful to you?	IP-11	yes
6	Does the SDP yield equivalent results for issues of similar significance in all ROP cornerstones?	SDP-5	no
7	Does the NRC take appropriate actions to address performance issues?	AS-9	yes
8	Is the information contained in assessment reports relevant, useful, and written in plain English?	AS-10	yes

Survey Item	Question	Metric	Met?
9	Are the ROP oversight activities predictable and reasonably objective?	O-1	yes
10	Is the ROP risk-informed, in that the NRC's actions are graduated on the basis of increased significance?	O-3	yes
11	Is the ROP understandable and are the supporting documents clear and written in plain English?	O-5	yes
12	Does the ROP provide adequate regulatory assurance that plants are being operated and maintained safely?	O-7	yes
13	Does the ROP improve the efficiency, effectiveness, and realism of the regulatory process?	O-11	yes
14	Does the ROP ensure openness in the regulatory process?	O-13	yes
15	Has the public been afforded adequate opportunity to participate in the ROP and provide inputs and comments?	O-14	yes
16	Has the NRC been responsive to public inputs and comments on the ROP?	O-15	no
17	Has the NRC implemented the ROP as defined by program documents?	O-16	yes
18	Does the ROP reduce unnecessary regulatory burden on licensees?	O-17	yes
19	Does the ROP minimize unintended consequences?	O-18	no

NRC Response to External Feedback - As noted above, the staff reviewed all of the survey responses and evaluated the stakeholder comments as part of this annual self-assessment. Staff analysis is included in this attachment, in the applicable portions of the program area evaluations in Attachments 1 through 4, and in the annual ROP performance metrics report.

However, a common concern expressed by survey respondents is that the NRC has been unresponsive to external stakeholders that provide comments and feedback to the NRC in response to the annual FRN survey. Many believe that the resulting ROP Commission paper does not directly address the comments or that the NRC response is slow. As a result, the staff plans to consolidate the comments by question and provide a comprehensive response to each question. For example, the staff will consolidate all of the comments for question 1 from the survey regarding whether respondents believe the PI program minimizes the potential to take actions that adversely impact plant safety. An analysis and the staff's response to the specific question will then be provided. This will be repeated for each of the survey questions.

As in previous years, the staff will acknowledge receipt of each FRN response by correspondence indicating that the staff has considered and generally addressed the comments in this paper, as appropriate. This paper, the annual ROP performance metric report, and the consolidated response will be posted to the ROP Web page and sent along with the acknowledgment letters to each survey respondent.

Internal Survey

An internal survey was completed in November 2004 to solicit and analyze stakeholder feedback regarding the effectiveness of the Reactor Oversight Process (ROP). The internal surveys are conducted on a biennial basis, this being the fourth such survey. Previous surveys were conducted in December 2002 (in the third year of ROP implementation), in March 2001 (in the initial year of ROP implementation), and in November 1999 (during the pilot phase).

A total of 209 responses were received from internal Nuclear Regulatory Commission (NRC) stakeholders, including resident and senior resident inspectors, regional-based inspectors and staff, senior reactor analysts, regional and headquarters line management, and headquarters technical and program staff employees.

The respondents selected answers from a computer-based program in ten major topic areas: (1) demographics, (2) overall ROP process, (3) ROP vs. previous process, (4) ROP Web page, (5) assessment process, (6) inspection program, (7) performance indicators, (8) significance determination process, (9) feedback forms, and (10) other issues. The final section of the survey provided space to expound or make additional comments. All respondent replies were anonymous and each question had five possible answers (strongly agree, agree, disagree, strongly disagree, and unable to answer). Respondents selected "unable to answer" if they did not know enough about the topic to make an informed judgment.

The results of the survey sections are provided below. Note that the numbers in parentheses in the summaries below represent the combined percentage of respondents who endorsed the stated view versus the opposing view. Responses of "unable to answer" were not factored into these percentages.

Demographic Summary - 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. Almost one half (45 percent) of the respondents are regional-based inspectors or staff, including senior reactor analysts, and nearly one third (29 percent) are resident/senior resident inspectors. The remaining responses (26 percent) are from regional management and headquarters technical or program staff. Region 1 (30 percent) represents close to one-third of the respondents and the rest of the regions were nearly equal: Region II (20 percent), Region III (18 percent), Region IV (21 percent). Headquarters personnel accounts for 11 percent of the respondents.

The majority of respondents are grade 14 or 15 (54 percent) with 41 percent coming from grade 13 or below. Only 5 percent of the respondents are SES or SLS-level civil servants. More than half (57 percent) of those surveyed have more than 10 years of service with the NRC and 14 percent have between 5 to 10 years service, and the remaining respondents represent more than one-fourth (29 percent).

Overall ROP - The majority of respondents indicate that the ROP generally provides appropriate assurance that plants are being operated safely (84 percent), appropriate regulatory attention to licensees with performance problems (81 percent), and a realistic approach to oversight process (75 percent). Respondents further agree that the ROP provides appropriate objectivity to the oversight process (81 percent). Over half (57 percent) of the internal stakeholders agree that the ROP provides appropriate identification of declining safety performance before there is a significant reduction in safety margins.

Respondents believe that the ROP provides an effective risk-informed approach to oversight (74 percent), provides sufficient attention to licensees whose performance is in the licensee response band (i.e., appropriateness of the baseline inspection and performance indicators for these licensees) (81 percent), and provides appropriate communication through the use of plain language in official correspondence (e.g., inspection reports, letters to licensees) (79 percent). Additionally, the stakeholders agree that the ROP provides appropriate inspector and licensee communication (86 percent) and that the ROP is understandable and the procedures and output products are clear and written in plain English (72 percent).

There were 10 questions included in this area of the survey. The percentage of respondents who agreed increased for 8 of the 10 questions and the percentage in agreement decreased for 2 questions when compared to the 2002 survey. The most central value (median) of the distribution of the total percentage for each question is 80 percent. The average (mean) percentage is 77 percent.

ROP vs. Previous Process - Compared to the previous process, the majority of the respondents agree that the current ROP generally increases consistency (84 percent) and is more risk-informed (90 percent). Additionally, they believe that the new ROP increases predictability (75 percent), objectivity (79 percent), and clarity (77 percent). Internal stakeholders also believed that the new ROP increases efficiency (71 percent) and maintains safety (78 percent). To a lesser extent, respondents feel that the current ROP increases timeliness (67 percent) and realism (63 percent). Slightly over half of the respondents agree that the new ROP increases effectiveness (55 percent). Exactly half of the respondents agree that unnecessary administrative burden on the NRC has been reduced with the current ROP (50 percent). Twenty to 25 percent of the respondents were unable to answer these questions because they did not have experience with the previous oversight process.

There were 11 questions included in this area of the survey. The percentage of respondents who agreed increased for 4 of the 11 questions and the percentage in agreement decreased for 7 questions when compared to the 2002 survey. The most central value (median) of the distribution of the total percentage for each question is 75 percent. The average (mean) percentage is 72 percent.

ROP Web Page - With respect to the information on plant performance (e.g., inspection reports, PI data, Plant Issues Matrix (PIM) data, etc.) provided on the ROP Web site, the vast majority of the respondents agree that the information is accurate (92 percent), timely (90 percent), and understandable (written in plain English) (89 percent). Additionally, the respondents believe that the information is adequate to keep NRC internal stakeholders informed (87 percent) and is organized for easy retrievability (84 percent).

There were 5 questions included in this area of the survey. The percentage of respondents who agreed increased for 4 of the 5 questions and the percentage in agreement decreased for one question when compared to the 2002 survey. The most central value (median) of the distribution of the total percentage for each question is 89 percent. The average (mean) percentage is 88 percent.

Assessment Process - Respondents agree that the assessment process provides an appropriate range of actions for safety issues (80 percent). Almost two-thirds (66 percent) of the respondents agree that the assessment process provides for timely resolution of issues commensurate with safety significance. Slightly more than seventy percent (71 percent) of the respondents felt that the assessment process applies appropriate enforcement actions.

Over three-quarters (81 percent) of respondents agree that the assessment process focuses resources on areas of greatest safety significance. Approximately three-quarters of the respondents (73 percent) agree that the assessment process minimizes duplication/rework in preparation for assessment meetings (i.e., mid-cycle, end-of-cycle, agency action review, public meetings).

The majority of the respondents agree that the assessment process provides objective levels of assessment (84 percent) and the agency takes appropriate actions to address performance issues for those licensees outside of the licensee response column of the Action Matrix (85 percent). Slightly more than three-quarters of the respondents (77 percent) believe that the assessment process provides understandable thresholds.

There were 8 questions included in this area of the survey. The percentage of respondents who agreed increased for 7 of the 8 questions and the percentage in agreement decreased for one question when compared to the 2002 survey. The most central value (median) of the distribution of the total percentage for each question is 79 percent. The average (mean) percentage is 77 percent.

Inspection Program - The vast majority of the respondents agree that the baseline inspection program inspection reports are communicated in a timely fashion (93 percent). A high percentage of the respondents believe that reports were communicated accurately (87 percent). More than three-quarters of the internal stakeholders believe that the baseline inspection program appropriately inspects for and identifies risk-significant issues (79 percent), and provides appropriate coverage of plant activities and operations important to safety (77 percent). But only one-half of the respondents perceive the level of effort for conducting each inspection to be consistent with that estimated in the inspection procedure (51 percent). Nearly three-quarters of the respondents believe that the baseline inspection program leads to objective findings whose significance can be clearly documented (73 percent).

There were 6 questions included in this area of the survey. The percentage of respondents who agreed increased for 3 of the 6 questions, the percentage in agreement decreased for 2 questions, and remained the same for one question when compared to the 2002 survey. The most central value (median) of the distribution of the total percentage for each question is 78 percent. The average (mean) percentage is 77 percent.

Inspection Procedures - A high percentage of the respondents believe that the baseline inspection program procedures are adequate to address intended cornerstone attributes

(86 percent), are conducted at an appropriate frequency (85 percent), and adequately sample risk important aspects of each inspectable area (80 percent). Many of the respondents felt that inspection procedures are clearly written (73 percent). Over three-fourths of those surveyed believed that the inspection procedures place sufficient emphasis on planning (78 percent).

There were 5 questions included in this area of the survey. The percentage of respondents who agreed increased for 4 of the 5 questions and the percentage in agreement decreased for one question when compared to the 2002 survey. The most central value (median) of the distribution of the total percentage for each question is 80 percent. The average (mean) percentage is 80 percent.

Performance Indicators - The majority of the respondents believe that the performance indicators were understandable (87 percent). Additionally, many believe that they were clearly defined (79 percent) and provide an appropriate level of overlap with the inspection program (78 percent). Two-thirds of the respondents believe that the performance indicators provide useful information on risk-significant areas (67 percent) and help to maintain safety (68 percent).

Slightly over half of the respondents agree that the performance indicators increase public confidence (57 percent). Only 45 percent of the respondents believe that the performance indicators provide an adequate indication of declining safety performance.

There were 7 questions included in this area of the survey. The percentage of respondents who agreed increased for 6 of the 7 questions and the percentage in agreement decreased for one question when compared to the 2002 survey. The most central value (median) of the distribution of the total percentage for each question is 68 percent. The average (mean) percentage is 69 percent.

Significance Determination Process (SDP) - Many of the respondents agree that the SDPs provide basis for effective communication of inspection findings to the licensee (78 percent) and focuses NRC attention on safety-significant issues (75 percent). More than half of the respondents agree that the SDP provide consistent results (63 percent) and basis for effective communication of inspection findings to the public (60 percent).

Less than one-half (only 41 percent) of the respondents agree that program guidance documents are clear, resource expenditures are appropriate, and non-reactor safety SDPs are easy to use. To a lesser extent, approximately one-third of the respondents believe that the reactor safety SDPs are easy to use (36 percent) and SDP training is effective (38 percent).

There were 9 questions included in this area of the survey. The percentage of respondents who agreed increased for 8 of the 9 questions and the percentage in agreement remained the same for one question when compared to the 2002 survey. The most central value (median) of the distribution of the total percentage for each question is 41 percent. The average (mean) percentage is 53 percent.

SDP Results - Over three-fourths of the respondents believe that the SDP results were verifiable (76 percent). Approximately two-thirds of the respondents believe that the SDP results correctly characterize the risk-significance of inspection findings (66 percent), are accurate (66 percent), and are realistic (69 percent).

Fewer respondents agree that SDP results are timely (49 percent). Only slightly more than half of the respondents believe that these results are based upon clear standards (56 percent).

There were 6 questions included in this area of the survey. The percentage of respondents who agreed increased for 5 of the 6 questions and the percentage in agreement remained the same for one question when compared to the 2002 survey. The most central value (median) of the distribution of the total percentage for each question is 66 percent. The average (mean) percentage is 64 percent.

Feedback Forms - Many respondents believe that the feedback forms were understandable and written in plain English (77 percent) and were accurate (76 percent). Many fewer of the respondents agree that the responses to feedback forms sent to headquarters are timely (47 percent). Nearly two-thirds of the respondents believe that the feedback forms are responsive and address the issues raised (60 percent). Approximately one-half of the respondents were unable to answer these questions because they did not have experience using the feedback process.

There were 4 questions included in this area of the survey. The percentage of respondents who agreed increased for all 4 of the 10 questions when compared to the 2002 survey. The most central value (median) of the distribution of the total percentage for each question is 68 percent. The average (mean) percentage is 65 percent.

Impact of Policy Change from N+1 to N - Two-thirds of the respondents believe that since the policy change from N+1 to N, non-IMC 1245 training provided to effectively implement the ROP is adequate (67 percent) and rotational opportunities are available to assist in professional development (66 percent). To a lesser extent, the respondents agree that training provided to effectively implement the ROP is adequate (64 percent).

There were 3 questions included in this area of the survey. This is a new area added to the 2004 survey. The most central value (median) of the distribution of the total percentage for each question is 66 percent. The average (mean) percentage is 66 percent.

Other Issues - A high percentage of the respondents believe that the timeliness goals specified in IMC 0305 for documentation and data collection can reasonably be met (83 percent) and the supplemental inspection procedures provide sufficient information to confirm the adequacy of a licensee's root cause and corrective action effort (82 percent).

Many survey respondents also agree that the information provided by the NRC appropriately keeps the public informed of the agency oversight activities related to the plants (77 percent) and that issuing NCVs and relying on licensee's corrective action program provides an adequate approach to resolve issues of very low safety significance (i.e., green findings) (74 percent). Respondents further agree that resources needed to oversee licensees using the ROP are appropriate and that the ROP has resulted in a reduction of unnecessary regulatory burden on external stakeholders, but to a lesser extent (60 percent).

Less than one-half of the respondents agree that the ROP fosters long-term self-improvement by licensees (48 percent) and the ROP appropriately integrates and provides insights into cross-cutting areas (46 percent).

There were 8 questions included in this area of the survey. This area represented various aspects of the ROP (i.e., resources, oversight, SDP, NCVs, etc.). The percentage of respondents who agreed increased for 4 of the 8 questions and the percentage in agreement decreased for 4 questions when compared to the 2002 survey. The most central value (median) of the distribution of the total percentage for each question is 67 percent. The average (mean) percentage is 66 percent.

Common Themes from Specific Internal Comments - In the free-form comments section of the survey, the respondents acknowledge that the ROP is not a perfect process and has shortcomings, but note that it is a vast improvement to the previous assessments conducted under the subjective Systematic Assessment of Licensee Performance (SALP). Several concerns stem from the reactor vessel head degradation at Davis-Besse. Although that event happened in early 2002, several comments focused on the ability of the ROP to detect the next Davis-Besse, thus questioning adequate oversight. In parallel, only 57 percent of the respondents agree that the ROP provides appropriate identification of declining safety performance before there is a significant reduction in safety margins.

Two other areas that received considerable criticism in the comments were the SDP and the inspection program. Additionally, the PI program received a moderate amount of criticism.

The SDP was thought to be too complex and time consuming and did not provide timely results. Specifically, several respondents believed that too much time and effort was spent obtaining and analyzing data to determine the color of a finding. The use of risk to guide the disposition of an event was believed to be inherently limiting. There was also a great deal of criticism of the timeliness of the fire protection SDP findings. The need for SDP training was also a recurring concern.

The inspection program comments were broad and far reaching across the baseline inspection program. Many respondents expressed dissatisfaction with the sampling required in inspection procedures. There were too many minimum samples and not enough time to “get out” in the plant to gain a thorough understanding of what is going on in the plant. On the other hand, some felt that sampling of routine activities yields little to no useful information about licensee performance. Since there is such a broad sampling range and depth of inspection, some felt there is little consistency in implementing the procedures.

Another area of the inspection program that received numerous comments was inspecting maintenance activities. Respondents believed that additional focus in baseline inspections should be dedicated to maintenance activities and compliance with the maintenance rule. A procedure to focus inspections on observing emergent repairs to systems important to safety would be invaluable and could even prevent maintenance errors. Inspection of ongoing maintenance activities in the field to verify and validate maintenance performed in accordance with procedures and technical manual guidance is not within the scope of the procedure.

Performance indicator comments, while not overwhelmingly critical, were consistent. Some respondents believed that the credibility of the thresholds was compromised because the thresholds were set too high and failed to provide viable plant performance information. For example, less than one percent of the plants cross the greater than green threshold, although it was anticipated at the start of the ROP that approximately five percent of the plants would cross the greater than green threshold for each PI. This situation has affected respondents’

confidence in the effectiveness of the PI program. Additionally, some respondents believe that the PIs are easily manipulated since they are not clearly defined, resulting in interpretations by the licensee that potentially mask actual performance.

Two other themes from the comments were that the handling of cross-cutting issues is unclear and inadequate and that inspector feedback is not adequately addressed and resolved.

Comparison of December 2002 and November 2004 Surveys - The staff last conducted an internal survey in December 2002. Responses to the December 2002 survey were generally favorable. The majority of respondents indicated that the ROP provided appropriate assurance that plants were operated safely and that appropriate regulatory attention was provided to licensees with performance problems, resulting in a realistic approach to oversight. However, some stakeholders believed that the ROP was inadequate because it did not identify the vessel head degradation at Davis-Besse and that the SDP had not been effective.

The December 2002 survey received participation from 236 respondents representing headquarters and the regional offices. The November 2004 survey results experienced a 12 percent participation decline to 209 respondents; nevertheless the results represent a good cross-section of ROP users. The data from the two surveys was compared. The questions asked in the surveys were not completely identical although the surveys were similar enough to permit a comparison. For instance, the recent November 2004 survey made minor changes to the wording of some of the questions, added a new section on the impact of the policy change from N+1 to N, and deleted a few questions from some sections. The survey data presented below provides the combined agree/disagree response for those questions from both surveys. The "unable to answer" responses are not included in the percentage calculations of agreement and disagreement when comparing between the two surveys.

Overall, there were marginal improvements and declines in level of agreement (on average 5 percent to 6 percent) across all areas of the ROP as compared to the 2002 survey results. The vast majority of the questions showed an increase in stakeholder satisfaction when compared to previous results. Several areas of the ROP experienced a significant increase in the double-digit range from 10 percent to 18 percent. Specifically, the respondents further agree that the inspection program provides appropriate coverage of plant activities and operations important to safety (up 10 percent), the assessment process provides for timely resolution of issues commensurate with safety significance (up 10 percent), the performance indicators are understandable (up 11 percent) and enhance public confidence (up 10 percent), the reactor safety SDPs are easy to use (up 16 percent), the non-reactor safety SDPs are easy to use (up 15 percent), responses to feedback forms are timely (up 17 percent) and accurate (up 12 percent), and the ROP Web page is adequate to keep NRC internal stakeholders informed (up 13 percent). The only question that resulted in a decrease of greater than 10 percent in stakeholder agreement is that the ROP reduces unnecessary administrative burden on the NRC (11 percent).

Each of the nine major topic areas demonstrated overall improvement and an increase in stakeholder satisfaction when compared to the previous survey. The topic area that showed the greatest improvement was feedback forms. Every question regarding the feedback forms showed an improvement over the previous survey (4 out of 4), with an average increase of over 10 percent. Two other sections that significantly improved were the SDP and performance indicators. The SDP sections showed improvement in 12 out of 15 questions with an average

increase of nearly 7 percent. Performance indicators had an improvement in 6 out of 7 questions with an average increase of over 6 percent. Two other sections that also demonstrated improved performance were the assessment process and the overall ROP. The assessment process had an improvement in 7 out of 8 questions with an average increase of about 3 percent, while the overall ROP had an improvement in 8 out of 10 questions with an average increase of about 3 percent. The four remaining topic areas (the ROP vs previous process, the ROP web page, the inspection program, and other issues) had the majority of the questions improving with average increases less than 3 percent.

Internal Survey Summary - Of the ten topic areas of the 2004 survey, the average percentage of agreement in five of those areas is over 70 percent (four are over 75 percent). The median is either 80 percent or very close to that percentage. For the other five topic areas, average percentages of agreement range from 69 percent to 53 percent. The predominant median is 68 percent. Four of the median percentages are in the 60's (i.e., 66 percent, 67 percent, 68 percent, 68 percent) and one is 41 percent.

This agreement suggests that most of the respondents believe that plants are being operated safely, that appropriate regulatory attention is provided to licensees with performance problems, that the oversight process is objective, that the current ROP is more risk-informed, increases consistency, and has an appropriate range of actions for safety issues, and that the inspection program inspects for and identifies risk-significant issues. Some insights to the minority opinion (25 percent) or unfavorable percentage came from the 71 respondents that provided comments.

Stakeholder Survey Conclusions

The responses from the surveys of both internal and external stakeholders were generally in line with responses from previous years, as were the number and distribution of the responses. The responses were generally positive, with concerns being raised primarily in the following areas:

- The effectiveness of the PI program in identifying performance outliers.
- The timeliness and complexity of the SDP.
- The proper scope and focus of the baseline inspection procedures.
- The handling of cross-cutting issues.

Accordingly, these items correspond to our future focus for program improvements as outlined in the SECY paper conclusion.

The feedback from these surveys has been or will be considered in modifying the appropriate areas of the ROP. Further discussion and analysis of the survey results are included in the applicable portions of the program evaluations in Attachments 1 through 4 to this paper as well as in the ROP performance metric report (reference ML050670162).

Regulatory Impact Summary

BACKGROUND:

In 1989, the NRC conducted a comprehensive regulatory impact survey. The results of this survey and corrective actions were reported in SECY-91-172, "Regulatory Impact Survey Report—Final," dated June 7, 1991. On December 20, 1991, the Commission issued a staff requirements memorandum requesting that the staff develop a process for obtaining continual feedback from licensees and report the feedback on the process to the Commission each year.

The staff described the continual feedback process in SECY-92-286, "Staff's Progress on Implementing Activities Described in SECY-91-172, Regulatory Impact Survey Report—Final," dated August 18, 1992. The feedback process requires the regional division directors and their deputies to solicit informal feedback from their licensee counterparts during routine visits to reactor sites. The managers record this feedback and forward the feedback forms to the Office of Nuclear Reactor Regulation (NRR). The regions and NRR then evaluate the identified concerns and take any necessary corrective actions. NRR evaluates this feedback along with other feedback, such as from limited-scope surveys, to determine appropriate generic followup actions. This process, which was implemented in October 1992, has given licensees frequent opportunities to comment on regulatory impact.

In response to the "Nuclear Regulatory Review Study" by Towers Perrin dated October 1994, the NRC implemented two additional feedback paths on July 11, 1995. Specifically, the Office of the Executive Director for Operations (OEDO) established a formal process by which power reactor licensees' senior officials could report directly to the OEDO any regulatory actions that they considered inappropriate. In addition, each region developed a process for dealing with concerns related to inappropriate regulatory actions by the NRC staff. Through this process, the regions receive, act on, resolve, or forward to other authorities (e.g., the NRC's Office of the Inspector General (OIG)) allegations of inappropriate actions by members of the NRC staff who are involved in inspections or other matters related to NRC-licensed activities.

This paper reports on feedback received from licensees from September 1, 2003, through August 31, 2004.

DISCUSSION:

From September 1, 2003, through August 31, 2004, the staff received feedback from 77 reactor licensees on 256 issues. The staff also received feedback from the Regulatory Information Conference in March 2004. Of the comments received, 77 percent were favorable and 23 percent were unfavorable. The comments fell into four main categories: formal communication with licensees, inspector performance, security and safeguards activities, and the Reactor Oversight Process (ROP). The following sections summarize the feedback received, the staff's evaluation, and the proposed improvement actions.

A. Solicited Feedback

(1) Formal Communication With Licensees

Feedback

Almost one-half of the licensees' comments concerned the effectiveness of communication between the NRC staff and licensees. About 85 percent of the licensees' comments on communication with the NRC staff were favorable (the same percentage as last reported). 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 (such as disagreement with the staff's characterization of inspection issues or licensee actions) and unclear expectations about the numerous regulatory changes in the safeguards and security area.

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. This conclusion is based on the large number of routine interactions between the NRC and its licensees, combined with the large number of favorable comments and the small number of unfavorable comments received during the past year.

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

(2) Inspector Performance

Feedback

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

Licensees viewed inspections performed by resident and region-based inspectors (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 made unfavorable comments on what they perceived as untimely inspector notifications during a team inspection. The first issue was when licensee senior management was notified that the licensee was having difficulty providing requested inspection documents and the second issue was when management was notified of inspection findings that were identified late in the inspection.

Evaluation and Action

The staff concludes that inspectors were generally professional and maintained effective working relationships. The percentage of favorable comments received this year was about the same as reported last year.

NRC management continues to emphasize to the staff the importance of proper behavior and demeanor. Standards for staff professionalism and behavior are addressed in NRC's Organizational Values and in the Principles of Good Regulation. These expectations are reinforced by senior NRC managers in inspector counterpart meetings, workshops, and training courses. The NRC's ongoing emphasis on proper behavior should result in improved working relationships between inspectors and licensees. The staff will continue to closely monitor the performance of inspectors.

(3) Security and Safeguards Activities

Feedback

Eight percent of the comments received related to the NRC's security and safeguards activities and all these comments were unfavorable. Commenters expressed concerns with the lack of stability and the number of regulatory changes in this area. Specifically, licensees complained that the number of changes led to unclear expectations, that some changes were not necessary, and that the changes added costs.

Evaluation and Action

The Office of Nuclear Security and Incident Response (NSIR) has placed a high priority on communicating with licensees and other Federal agencies, including the Department of Homeland Security, the Homeland Security Council, the Federal Bureau of Investigation, and the intelligence community. These communications include responding to the changing elevated threat environment, reviewing and approving revised security plans for all 104 nuclear power reactors, and clarifying requirements and expectations for orders issued since September 11, 2001.

Even though implementation of the revised security plans and NRC's planned inspections of the plans provide more stability in the requirements and more oversight of security, other efforts, such as additional actions for compensatory measure B.5.b and redevelopment of the physical protection cornerstone of the ROP, will continue to contribute to further changes in this area.

(4) Reactor Oversight Process (ROP)

Feedback

About five percent of the licensees' comments concerned the ROP, and about half of those comments were favorable. Licensees praised the staff's oversight process as effective and an improvement over the previous process. However, half the comments were unfavorable regarding specific program elements, especially the significance determination process (SDP). One licensee expressed concern with the extensive analysis needed to resolve SDP issues, and another complained that including plant modifications in SDP evaluations represented a disincentive to implementing future plant modifications.

Evaluation and Action

The staff concludes that while the ROP continues to be an improvement over the previous process, additional improvements are needed. This view is validated by other sources of industry and public feedback that strongly support the ROP.

The staff recognizes that improvements in certain SDPs for the reactor safety strategic performance area present a significant challenge, especially achieving the proper balance between the level of effort needed to evaluate inspection findings and timeliness and the need to reduce the complexity of evaluating shutdown and fire protection inspection findings.

NSIR revised and tested new SDPs for the physical protection cornerstone in 2004 and is in the process of resolving industry comments and issuing the SDPs for use. The new SDPs address industry and staff concerns with the interim SDP currently being used and incorporate the recently implemented routine force-on-force performance evaluations.

The staff continues to implement the SDP Improvement Plan to improve SDP evaluations and the staff's proficiency in using the SDP. The staff also continued to revise existing SDPs based on lessons learned and feedback from internal and external stakeholders. Management is focused on SDP improvements and these actions are captured in the NRR Director's Quarterly Status Report.

The staff continues to closely monitor the effectiveness and implementation of the ROP. The staff will continue to hold monthly working-level public meetings with external stakeholders to discuss the status of and improvements to the process.

B. Inappropriate NRC Action Reported to the OEDO or Regional Administrators

As described in the Background section, the NRC has a procedure for resolving concerns raised by licensees regarding perceived inappropriate regulatory action by the NRC staff. During this reporting period, the OEDO did not receive any reports of inappropriate behavior by NRC employees; however, 12 cases were reported to the regions by power reactor licensees.

Feedback

Of the four cases reported to Region I, one was substantiated in part and three were not substantiated. Of the four cases reported to Region II, one was not substantiated and the other three were dismissed after initial review. The one case reported to Region III was substantiated. Of the three cases reported in Region IV, two were substantiated in part, and one was determined not to be a complaint against the staff. The vast majority of cases involved professional performance issues, such as the inspector's professional skills in conducting inspections or communicating with licensee personnel.

Evaluation and Action

The total number of cases reported in each region has decreased significantly from the 31 cases reported in 1997 and the 26 cases in 1998. For the last 6 years, the number of reported cases has been relatively stable, fluctuating between 8 to 12 cases a year.

The regional offices will continue annual assessments in this area in accordance with Management Directive 8.17, "Licensee Complaints Against NRC Employees."

C. Licensee Survey

The Commission approved the conduct of an independent survey of utility managers (SRM-COMNJD-02-0001). The objective of the survey was to augment NRC's normal communication channels to gain insights into the impact of regulatory activities. The staff reported the results of the survey to the OEDO and made them publically available on the NRC Website.

Feedback

Overall, the survey results indicated that utility managers were generally satisfied with NRC regulatory activities, except in the area of fire protection. 60 percent of the responses expressed satisfaction (either generally satisfied or very satisfied), 23 percent were neutral, 10 percent were unsatisfied (generally dissatisfied or very dissatisfied), and the remaining 7 percent considered the activities "not applicable."

Utility managers expressed the greatest satisfaction with the quality of inspections and inspection reports, followed by communications during formal meetings, workshops, and conferences. Managers expressed the least satisfaction in the fire protection area, the only area that received higher levels of dissatisfaction than satisfaction.

Evaluation and Actions

While the survey was useful in generating specific feedback on a broad range of NRC activities, it provided few new insights regarding ROP activities. The survey results were similar to those received through other communication initiatives, such as the annual external ROP survey (published in a *Federal Register* notice and mailed to almost 700 external stakeholders), monthly ROP meetings, the ongoing regulatory impact process, and the Licensing Action Task Force. Since the survey duplicates existing communication channels, the staff does not plan to administer future surveys based on the resources involved and the few insights gained.

D. Additional Feedback

In addition to soliciting feedback from licensees during site visits, the staff routinely provides opportunities for the industry to report on the impact of NRC programs and processes. During the current reporting period, the staff received feedback at the Regulatory Information Conference (RIC) in March 2004. Topics discussed at the RIC included the ROP, fire protection issues, safeguards and security issues, communications, grid stability, license renewal, and emergent technical topics. During a breakout session of the RIC, licensees from each region discussed issues of interest with the responsible regional administrator. No new issues were identified that have not already been discussed in this Commission paper.

The staff has made improvements to address regulatory impact concerns and continues to make progress in eliminating activities and practices that inappropriately affect licensees' operations. The staff will continue to solicit, evaluate, and address feedback, identify and resolve specific and generic concerns related to the impact of the NRC's regulatory actions on licensees' operations, and report any significant concerns to the Commission.

ROP Resources

Summary of 2004 Resources Used

A summary of staff resources expended for the Reactor Oversight Process (ROP) during the first five annual review periods is provided in Table 1. The five periods are the first year of ROP implementation and fiscal years (FY) 2001 through 2004.¹

Total staff effort during the first two periods, the first year of ROP implementation and FY 2001, remained relatively constant at 5,623 hours per site and 5,531 hours per site, respectively. However, in SECY-03-0062, "Reactor Oversight Process Self-Assessment for Calendar Year 2002," the staff reported a significant reduction in the staff hours expended for the ROP in 2002, with the bulk of the reduction in baseline inspection activities. A number of events during the 2002 inspection cycle challenged the ability of the NRC staff to complete the required baseline inspections. These challenges required regional staff to implement short-term coping strategies that resulted in reduced baseline inspection effort in completing the program.

The challenges experienced in 2002 continued into 2003; however, effective staff intervention in 2003, in the form of assistance from other NRC offices and continuation of the coping measures, significantly reduced the impact. Increases in the regional inspection budget in 2004 and action by regional offices in filling open inspector positions prevented the difficulties experienced in 2002 and 2003 from extending to the 2004 inspection cycle.

The inspection effort in 2004 increased noticeably over 2003. Overall staff effort was 9.1 percent greater in 2004 than in 2003. An increase was evident in all areas of the ROP except for plant specific inspections.

Baseline inspection effort in 2004 was 9.2 percent higher than in 2003. This increase was fairly evenly distributed among all baseline procedures except for IP 71152B, the biennial inspection of Problem Identification and Resolution, where the increase was approximately 25 percent. Effort for this procedure increased both in the number of sites inspected in 2004 and the average effort per site. However, it should be noted that this procedure was revised in September 2003 and the estimated effort to complete the procedure increased approximately 20 percent.

Effort for plant-specific inspections decreased 7.8 percent from approximately 24,600 hours in 2003 to 22,700 hours in 2004.

A significant increase was also seen in the 2004 inspection effort for safety issues and generic safety issues inspections (SIs and GSIs). This increase is the result of the continuing high level of inspection activity associated with temporary instructions issued in 2003 and in 2004 for

¹ The ROP is implemented on a calendar year basis; however, the staff obtained and reported resource data on a fiscal year basis in order to meet the schedule requirements for this paper. There is no reason to believe that the results would be significantly different if the staff collected and reported resource data on a calendar year basis.

issues related to safeguards, material accountability, containment sump blockage, and reactor vessel head and vessel head penetrations.

The effort expended in 2004 for performance assessment increased slightly. The relatively stable level of effort in this area reflects an established process for performance assessment activities. The effort reported for the "other activities," such as inspection-related travel, is typically a function of the effort expended for direct inspection and usually tracks the direct inspection effort.

Because of its balanced distribution among all elements of the ROP, the increased inspection effort in 2004 cannot be attributed to any one factor. It is most likely the result of increased regional inspection staffing levels of approximately 15 full time equivalents (FTE) in FY 2004 and increases in the number of qualified inspectors as recent new hires and regional Nuclear Safety Professional Development Program (NSPDP) graduates enter the inspector workforce.

Since 1995, inspection resource use has decreased significantly, specifically direct inspection effort has decreased approximately 30 percent. However, the staff believes that resource savings are reaching a limit as available efficiencies are exhausted. Future resource savings may only be possible through significant revisions of the ROP. A number of initiatives, such as the revised engineering inspections and the baseline program reevaluation, are currently underway to determine if resource efficiencies or improved effectiveness can be achieved.

ROP Resource Model/ Regional Inspection Budget

A number of adjustments were made to the ROP resource model as a result of experience gained during the 2002 and 2003 inspection cycles:

- Resources for supplemental and reactive inspections have been increased by 15 FTE to provide for regulatory oversight of a plant under IMC 0350, followup activities to verify licensees' improvement plans pursuant to Inspection Procedures 95002 and 95003, and plant-specific inspections required by current events.
- Resources for performance assessment activities have been increased by 4.8 FTE.
- Program development resources have been reduced by 2 FTE.

These changes are reflected in the regional inspection budget for FY 2004 and beyond. Issues related to inspection resources are reviewed as part of the ongoing ROP self-assessment and resources are adjusted as required by program needs. One item that will be reevaluated is the impact on plant status activities of the increased PI&R effort in all baseline inspection procedures.

In SECY-04-0053, "Reactor Oversight Process Self-Assessment For Calendar Year 2003," the staff committed to address the resource issues associated with the site status of Millstone. The current resource model treats Millstone Units 2 and 3 as two single-unit sites instead of one dual-unit site. This treatment allocates additional inspection resources to Millstone to address unique site features and historical circumstances that are currently being resolved. Indian Point Units 2 and 3 are similarly treated as two single-unit sites.

Region I has reviewed the inspection data and model for the Millstone, Indian Point, Nine Mile Point, and Beaver Valley sites as part of an overall reevaluation of inspection resource requirements for a number of dual-unit sites that are unique due to design, vintage, or operational differences between the units. For Millstone, Nine Mile Point, and Beaver Valley, Region I has recommended that NRR approve a unique site model to account for anticipated ROP implementation challenges. This model is currently under evaluation. For Indian Point, Region I recommends maintaining the current two single-unit site model as site consolidation efforts progress. Region I and NRR will periodically assess potential efficiencies as licensees at unique sites continue to implement integration strategies.

This “unique site” approach may also apply to Arkansas Nuclear One, Units 1 and 2. The impact of this unique site model on regional inspection resource requirements and the resulting implications for the regional inspection budget will be discussed in regional division director counterpart meetings during the 2005 inspection cycle. If this approach is deemed favorable, it will be factored into the ROP resource model for future budget formulation.

ROP Efficiency Focus Group

In November 2001, the staff established the ROP Efficiency Focus Group, consisting of experienced staff from the regions and the Office of Nuclear Reactor Regulation (NRR), to explore ways to gain new efficiencies in the ROP. After evaluating a number of ideas, the focus group selected two suggestions for near-term implementation: (1) to explore less resource-intensive alternatives to the annual performance assessment meeting for plants in the licensee response column of the Action Matrix, and (2) to review the baseline inspection procedures to identify areas where consolidation is possible.

The staff has pursued both of these suggestions. In 2003, the staff revised IMC 0305 to allow increased flexibility in scheduling the annual performance assessment meeting for plants in the licensee response and regulatory response columns of the Action Matrix throughout the entire assessment period. At the discretion of regional management, the staff may now schedule annual assessment meetings for these plants within 6 months of issuing the annual assessment letter.

The suggestion to consolidate the baseline inspection procedures has been undertaken initially for four groups of procedures and has been implemented in a pilot inspection program at selected sites in each region. The results of the pilot inspections are currently being analyzed and will be reviewed and discussed in a regional division director counterpart meeting in 2005. If resource savings are realized and effectiveness is maintained, the inspection consolidation may be extended to other baseline procedures.

In addition to this pilot program, the staff is reviewing the effectiveness of the individual baseline inspection procedures and the current baseline inspection program in its entirety. The review examines the scope, frequency, productivity, and costs of the existing individual baseline inspection procedures to determine if resource savings or improved effectiveness can be gained by eliminating, revising, or combining the existing procedures. This review is described in the Inspection Program evaluation in Attachment 2 of this paper. Any decision related to the pilot consolidation program will be made in concert with this ongoing effort.

2004 Inspection Cycle

The challenge to complete the baseline inspection program at all reactor sites in 2002 was primarily attributable to a shortage of qualified inspectors and the diversion of inspection resources intended for baseline inspections to respond to unanticipated emerging events and external demands. The challenge existed primarily in Regions I and III due to the effort required in these regions to address events at Indian Point 2 and Davis-Besse, respectively. The fallout from these events impacted the other two regions to a lesser extent and continued into the 2003 inspection cycle.

Regional management implemented a number of short-term coping strategies to complete the baseline inspection program in 2002 and 2003. In addition, NRR, Region II, and Region IV provided a total of 121 staff-weeks to assist in inspections at Regions I and III (90 staff-weeks to Region III and 31 staff-weeks to Region I). Further inspection assistance was provided by contractor support and re-employment of three annuitants who used to be regional inspectors. As a result, the 2003 baseline program requirements were met in all regions.

The regional inspection budget was increased by approximately 15 FTE to provide permanent relief. Additionally, in 2003 the staff revised the resident inspector policy to allow early assignment of new resident and senior resident inspectors to a site. The new policy allows the regional administrator to assign a permanent resident inspector up to 12 months before the planned departure of the incumbent resident inspector. Similarly, the regional administrator can now assign senior resident inspectors up to 6 months before the planned departure of the incumbent. Regional management also implemented actions to reduce inspector vacancies through active recruiting, training new hires, and over-hiring in anticipation of retirements, attrition, and staff movement.

The revised resident inspector staffing policy and additional regional FTEs improved the site staffing levels with experienced and qualified resident inspectors in CY 2004 and alleviated the resource burden in completing the baseline inspection program. All four regions completed their baseline inspections in 2004 using existing regional resources without the coping measures that were necessary the previous two inspection cycles. However, regions continue to experience unanticipated, emerging events and external demands resulting from power uprates, spent fuel storage, extended recovery efforts, and safety conscious work environment issues.

Program Improvements

A number of initiatives currently underway may provide resource savings and improved program effectiveness.

- Review of baseline procedures and baseline inspection program

The review examines the scope, frequency, productivity, and costs of the existing individual baseline inspection procedures to determine if resource savings or improved effectiveness can be gained by eliminating, revising or combining the existing procedures.

- Pilot engineering inspections

The staff initiated a pilot program to improve the ability to identify significant design issues at commercial nuclear power plants, including development of a new inspection procedure. The program responds to lessons learned from past inspections and events, and is intended to provide a more focused inspection of engineering activities, thereby improving the effectiveness of the current engineering inspections.

- Continued effort to streamline the SDP process and improve timeliness per the SDP Improvement Plan

The ongoing initiatives to improve SDP efficiency and effectiveness are continuing. The staff maintained the SDP Improvement Plan to address key stakeholder recommendations.

Additional notebook enhancements are planned. The next significant step in the enhancement of the phase 2 process for reactor safety findings will be the development of the pre-solved Phase 2 tables, which is currently scheduled for completion by the end of CY 2005.

- Pursue and evaluate credit for licensee self-assessment

The staff is considering allowing licensees to substitute a self-assessment for specific, predetermined NRC baseline inspections, as long as the self-assessment is conducted in accordance with an NRC-approved industry self-assessment process. The NRC would still monitor these self-assessments, but the staff anticipates that there could be significant resource savings to the NRC and its licensees for these inspectable areas. The NRC plans to conduct a pilot program to ascertain the feasibility of the licensee self-assessment process.

- Pilot program of the Mitigating Systems Performance Index (MSPI)

The staff completed a one-year pilot program of the Mitigating Systems Performance Index (MSPI) in early 2004. In SECY-04-0053, the staff documented several technical MSPI issues that were unresolved at the completion of the MSPI pilot. The issues have since been addressed or resolved and the staff has agreed to move forward with MSPI implementation. Currently, the staff and industry are working together to address implementation issues for the MSPI. The current tentative target date for full implementation is January 2006.

- Continued hiring by all four regions, as needed, to avoid staffing shortfalls

These initiatives are being pursued as part of the ongoing long-term ROP program improvement efforts.

During the 2004 inspection cycle, the staff also initiated an effort to review regional inspection practices. The objectives of this effort are:

- To understand the reasons for regional differences in resource expenditure rates for the ROP and to identify best practices in conducting inspections.
- To ensure selected regional policies and practices are consistent with program policy.

- To solicit regional feedback on headquarters' support to the regions and to recommend improvements.

The plans and objectives for this regional benchmarking effort are currently being reviewed by NRR management. The staff expects to complete this effort during the first half of 2005.

Table 1
Resources Expended
(Total Staff Effort Expended at Operating Power Reactors)

	52 weeks initial implementation 4/2/00-4/1/01	52 weeks FY 2001 9/24/00-9/22/01	52 weeks FY 2002 9/23/01-9/21/02	52 weeks FY 2003 9/29/02-9/27/03	52 Weeks FY 2004 9/28/03-9/25/04	% ¹ FY03-04
Baseline/Core						
Direct Inspection Effort	128,447	130,330	119,884	123,027	133,028	8.1%
Inspection Prep/Doc	115,935	109,227	91,385	91,230	100,904	10.6%
Plant Status	<u>43,751</u>	<u>46,191</u>	<u>44,228</u>	<u>46,755</u>	<u>51,073</u>	<u>9.2%</u>
Subtotal	288,133	285,748	255,497	261,012	285,005	9.2%
Plant Specific Inspections						
Direct Inspection Effort	11,295	8,436	9,354	14,647	12,720	(13.2%)
Inspection Prep/Doc	<u>6,683</u>	<u>6,161</u>	<u>7,715</u>	<u>9,978</u>	<u>9,971</u>	---
Subtotal	17,978	14,597	17,069	24,625	22,691	(7.8%)
GSI/SI	2,416	918	1,718	3,953	7,293	84.5%
Performance Assessment	21,017	19,845	17,293	20,013	21,261	2%
Other Activities	47,190	49,471	43,627	48,058	54,040	12.4%
Inspection Related Travel						
Routine Communication						
Regional Support						
Enforcement Support						
Significance Determination Process						
Review of Technical Documents						
Total Staff Effort (regular + nonreg hrs)	376,734 hrs	370,579 hrs	335,204 hrs	357,661 hrs	390,290 hrs	9.1%
Total Staff Effort/Operating Site	5,623 hrs/site	5,531 hrs/site	5,003 hrs/site	5,338 hrs/site	5,825 hrs/site	

Resident Inspector Demographics and Staffing

This attachment provides the annual update on demographic data for inspectors assigned to the Nuclear Regulatory Commission's (NRC's) Resident Inspector Program, as the Commission requested in a staff requirements memorandum (SRM) dated April 8, 1998. The purpose of this analysis is to determine whether the agency's actions associated with the Resident Inspector Program have resulted in a stable or increasing resident experience base and to identify any necessary actions. The scope of this review has been expanded to include an analysis of site staffing and related resident inspector issues. Also included is a discussion of the deletion of the quality-of-life metrics and an analysis of the calendar year (CY) 2004 ROP internal survey questions capturing quality of life issues for inspectors.

Resident Inspector Demographic Data

The review of the demographics includes analysis of the overall program data for the resident inspector (RI) and senior resident inspector (SRI) groups. Tables 2 and 4 and Figures 1 and 2 summarize RI and SRI experience levels, respectively. Additionally, Figures 3 through 14 provide further analysis of the regions in each of the data categories. The months used for the statistical comparison are December 2000, November 2001, November 2002, November 2003, and November 2004. Median values were used for the comparisons.

The demographic analysis consists of five distinct data sets, including "NRC time," "total resident time," "qualified total resident time," "current site time," and "relevant non-NRC experience." These data sets align with the PR-1 through PR-5 metrics in Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program," and are defined as follows:

- "NRC time" is the total number of years the individual has accumulated as an employee of the U.S. Nuclear Regulatory Commission (NRC).
- "Total resident time" is the total number of years the individual has accumulated as an RI or SRI.
- "Qualified total resident time" is the time the individual has been assigned to an RI or SRI position after completing the reactor operations inspector qualification requirements of IMC 1245, "Inspector Qualification Program for the Office of Nuclear Reactor Regulation Inspection Program."
- "Current site time" is the total number of years spent as an RI or SRI at the current site.
- "Relevant non-NRC experience" is nuclear power experience acquired outside of the NRC. Examples of relevant non-NRC experience are operation, engineering, maintenance, or construction experience with commercial nuclear power plants, naval shipyards, Department of Energy facilities, and/or the U.S. Navy nuclear power program.

Analysis of 2004 RI Groups

Resident inspector demographic data for 2004 (see Table 2 and Figure 1) reflects a more stable RI population compared to data in 2003, during which time 27 new inspectors entered the program. The slight decline in NRC time reflects both the introduction of 14 new resident inspectors into the program and the departure of 6 experienced RIs.

Qualified total resident time and current site time increased as expected due to the hiring of 27 new resident inspectors in CY 2003. Relevant non-NRC experience and total resident time remained about the same. Of 74 resident inspector positions, 14 vacancies were filled in CY 2004. These vacancies were generally filled by persons who had not yet achieved full inspector qualifications, but were basic inspector certified under IMC 1245. This is indicative of a general practice of retaining new hires in the regional offices and certifying them to the basic level before assigning them to a site. Of the 14 new RIs, 11 had more than 3 years of relevant non-NRC experience indicating that a large number of experienced engineers entered the program.

Of particular note is that during 2004, only 6 RIs left RI positions, but all remained within the NRC. Three of the 6 were promoted to SRIs. This indicates that RIs are not leaving the agency but instead are being promoted or laterally transferred.

Trend Analysis of Relevant Non-NRC Experience for Personnel Entering the RI Program

The 2004 data indicates that experienced engineers entered the program as RIs. On average, the 14 new RIs had about 12 years of relevant non-NRC experience, compared to an average of 9 years in 2003.

Table 1 shows the percentage of new RIs with less than 3 years of relevant non-NRC experience from 1997 through 2004. The turnover rate in the RI population was 19 percent in 2004 compared to 36 percent in 2003. The turnover rate was based on 74 available RI positions and 14 inspectors entering the RI program during 2004.

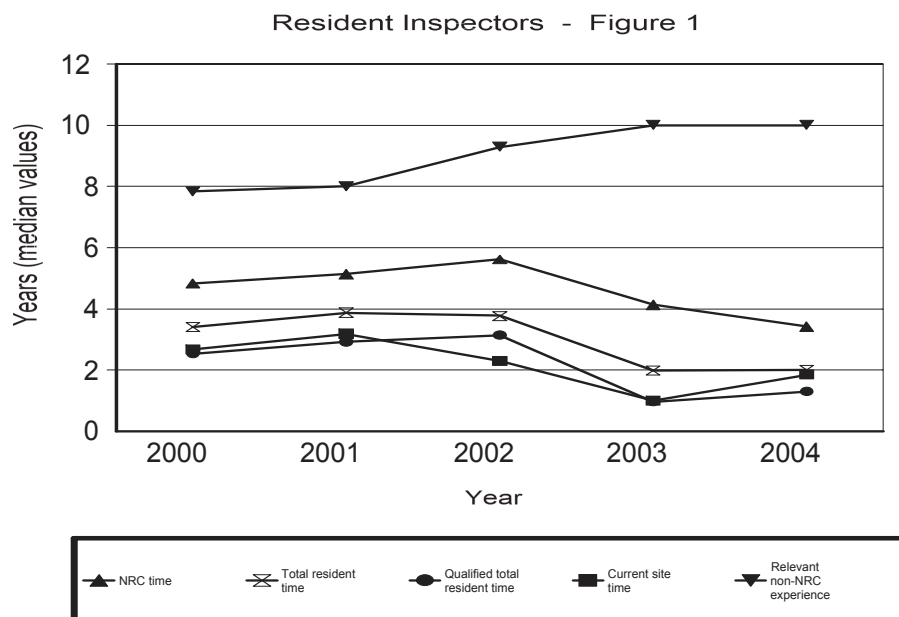
Table 1. Percentage of New RIs With Less Than 3 Years of Relevant Non-NRC Experience

1997	1998	1999	2000	2001	2002	2003	2004
6% (1/18)	12% (2/17)	0% (0/5)	31% (4/13)	6% (1/16)	20% (3/15)	30% (8/27)	21% (3/14)

NOTE: These percentages represent the ratio of RIs hired in that particular year who had fewer than 3 years of relevant non-NRC experience to the total number of RIs hired.

Table 2. Summary of RI Group Experience Levels (in years)						
		Dec. 2000	Nov. 2001	Nov. 2002	Nov. 2003	Nov. 2004
NRC time	average	6.26	6.21	6.39	5.34	5.60
	median	4.83	5.13	5.61	4.13	3.42
Total resident time	average	3.84	3.84	3.90	3.28	3.20
	median	3.41	3.87	3.77	1.99	2.00
Qualified total resident time*	average	3.15	3.11	3.14	2.50	2.48
	median	2.54	2.92	3.14	0.96	1.30
Current site time	average	2.54	2.74	2.86	1.64	2.18
	median	2.68	3.18	2.30	1.00	1.85
Relevant non-NRC experience	average	8.07	8.80	9.68	10.26	11.01
	median	7.83	8.00	9.29	10.00	10.00

*NOTE: "Qualified total resident time" counts time for RIs that are fully qualified under IMC 1245 but does not count time for RIs that are basic certified under IMC 1245. Inspection hours by RIs that are basic certified count against the baseline inspection program. Data collection was developed to capture fully qualified time because the basic certification program did not exist until 2002. Data presented under "total resident time" includes time spent as being basic certified.



Analysis of 2004 SRI Groups

The NRC experience levels for the SRI group (see Table 4 and Figure 2) increased in all areas except NRC time, which decreased due to the introduction of new SRIs into the program. The increases in total resident time, qualified total resident time, current site time, and relevant non-NRC experience reflect additional experience gained by the 20 new SRIs in 2003.

Table 3 shows that during 2004, 6 SRI positions were filled, down significantly from the 20 SRI positions filled in 2003. Filling the SRI positions created vacancies in the RI program, as evidenced by the hiring of 14 new RIs in 2004. Five SRIs left the program during this period. Three of these SRIs took lateral reassignments and two retired.

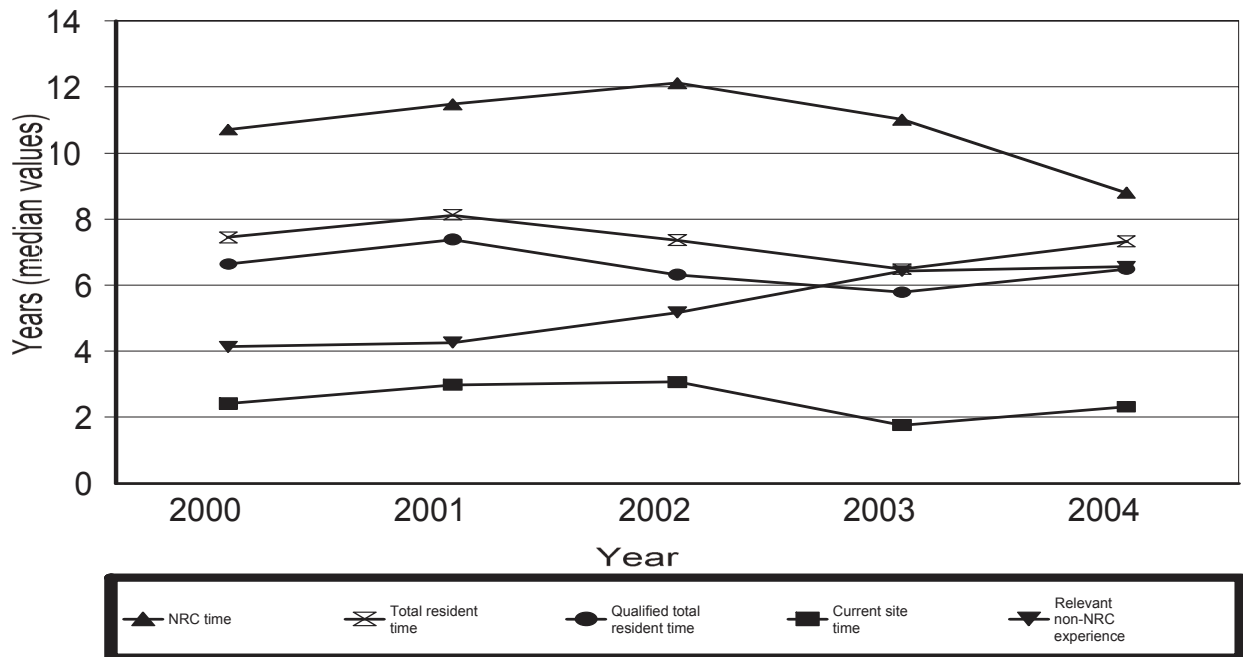
Table 3. RI and SRI Activity During 2004

Activity	RI	RII	RIII	RIV	Total
SRI positions filled	2	1	1	2	6
RI positions filled	1	6	4	3	14
SRI Movement					
SRI promotions to GG-15	0	0	0	0	0
SRI lateral reassignments	1	1*	0	1	3
SRI retirement	1	1	0	0	2
*Lateral reassignment to headquarters.					

NOTE: The number of positions filled does not necessarily equal the number of positions vacated during a given period because of the time involved in the recruitment process.

Table 4. Summary of SRI Group Experience Levels (in years)		Dec. 2000	Nov. 2001	Nov. 2002	Nov. 2003	Nov. 2004
NRC time	average	11.18	12.03	11.85	11.30	11.57
	median	10.70	11.47	12.11	11.00	8.80
Total resident time	average	8.07	8.66	8.17	8.22	8.22
	median	7.44	8.12	7.36	6.82	7.32
Qualified total resident time	average	7.27	7.94	7.36	7.40	7.42
	median	6.63	7.38	6.31	5.95	6.49
Current site time	average	2.84	2.96	2.90	2.44	2.68
	median	2.41	2.98	3.06	1.76	2.31
Relevant non-NRC experience	average	5.62	6.07	7.26	8.37	8.51
	median	4.13	4.25	5.17	6.42	6.55

Senior Resident Inspectors
(Program Total) - Figure 2



Deletion of the Quality-of-Life Metrics

In addition to the five resident demographic metrics in IMC 0307, there are currently five additional quality-of-life metrics, PR-6 through PR-10, as listed below.

- PR-6 Site Coverage Ratio
- PR-7 Non-IMC 1245 Training Time Ratio for Resident and Senior Resident Inspectors
- PR-8 Rotational Opportunities Ratio for Resident Inspectors
- PR-9 Non-IMC 1245 Training Time Ratio for Region-Based Inspectors
- PR-10 Rotational Opportunities Ratio for Region-Based Inspectors

These metrics were developed by the staff to address regional division directors' concerns that the conversion from the N+1 to N staffing policy was being implemented almost simultaneously with the launching of the new ROP. The combination of these two evolutions was seen as potentially detrimental to the region's ability to provide training and developmental opportunities for inspectors. During 2004, the regions and NRR agreed that the reason for the metrics was no longer an issue, and based on the difficulties and amount of resources required to collect the data, the staff decided to delete these metrics.

Site Staffing Metric

The site staffing data is intended to measure the permanent inspector staffing levels at each of the reactor sites for both RIs and SRIs in order to evaluate the agency's ability to provide continuity of regulatory oversight. The staff developed a new site staffing metric as a result of a recommendation by the Davis-Besse Lessons Learned Task Force (DBLLTF). Specifically, DBLLTF item 3.3.5.3 recommended that the staff "establish measurements for resident inspector staffing, including the establishment of program expectations to satisfy minimum staffing levels."

Data for this metric was pilot tested in CY 2004 and adjustments have been made based on the results of the pilot and a revised metric was issued to the regions in December 2004. Preliminary results of the pilot test data indicated that on average the sites were staffed 99 percent of the time either by permanent assignments or through rotational assignments with a minimum duration of 6 weeks. The data indicates a high level of staffing; however, it does not reflect instances where permanently assigned RIs or SRIs were away from their sites due to unplanned leave or on rotational assignments. Adjusting the data accordingly would reduce the average time for site coverage. For this reason, the metric was redesigned and will be reported on in the CY 2005 ROP self-assessment SECY paper.

The redesigned metric only applies to inspectors that have been assigned to the site permanently or through a rotation with a minimum duration of 6 weeks and who have attained at least a basic inspector certification status. The data will indicate the number of days a qualified RI and SRI were permanently assigned to the site during the month divided by the number of days in the month. Days spent in training, meetings away from the site, participation in team inspections, on leave, or other temporary duties will not be counted against the metric. The success criteria for the revised metric is 90 percent coverage for each site. Therefore, any single site that falls below 90 percent will be specifically evaluated as part of the ROP self-assessment process.

CY 2004 Internal Survey

Questions were added to the ROP internal survey to ensure that inspector training/rotational needs were considered and to get the feedback directly from the inspector population. Approximately two-thirds of the survey respondents indicated that since the policy change from N+1 to N, adequate IMC-1245 training is provided to effectively implement the ROP (64 percent) and non-IMC-1245 training is made available to assist in professional development (67 percent). Two-thirds of the respondents also agreed that rotational opportunities are available to assist in professional development (66 percent).

Conclusions

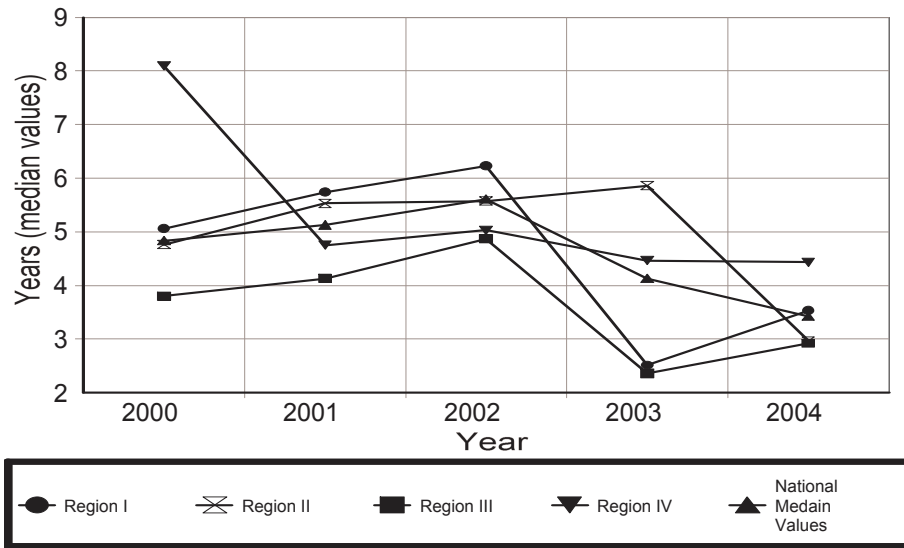
In summary, the staff concluded that:

- The RI and SRI staffing levels are generally good.
- The staffing turnover rate for CY 2004 was not excessive.
- The experience levels of both RIs and SRIs is relatively high.
- SRIs and RIs are provided adequate training/rotational opportunities.

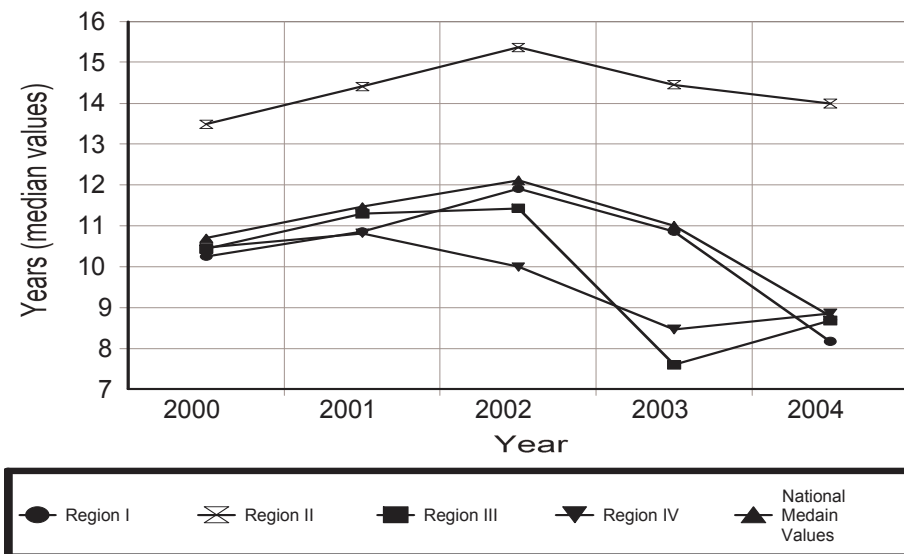
In conclusion, the program continues to attract and retain quality staff. Therefore, no resident inspector program changes are warranted at this time. The staff will continue to monitor the RI program.

NRC Time: NRC time for RIs remained about the same in Region IV, increased in Regions I and III, and decreased significantly in Region II. The decrease in Region II was due to the hiring of six of the new 14 RIs. NRC time for SRIs increased in Regions III and IV, decreased in Regions I and II.

NRC Time (RIs) - Figure 3

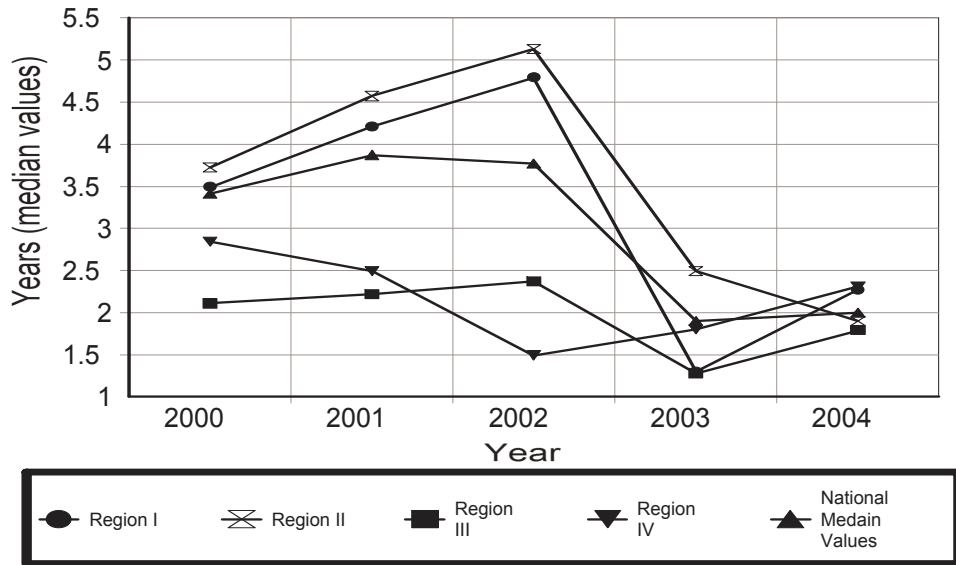


NRC Time (SRIs) - Figure 4

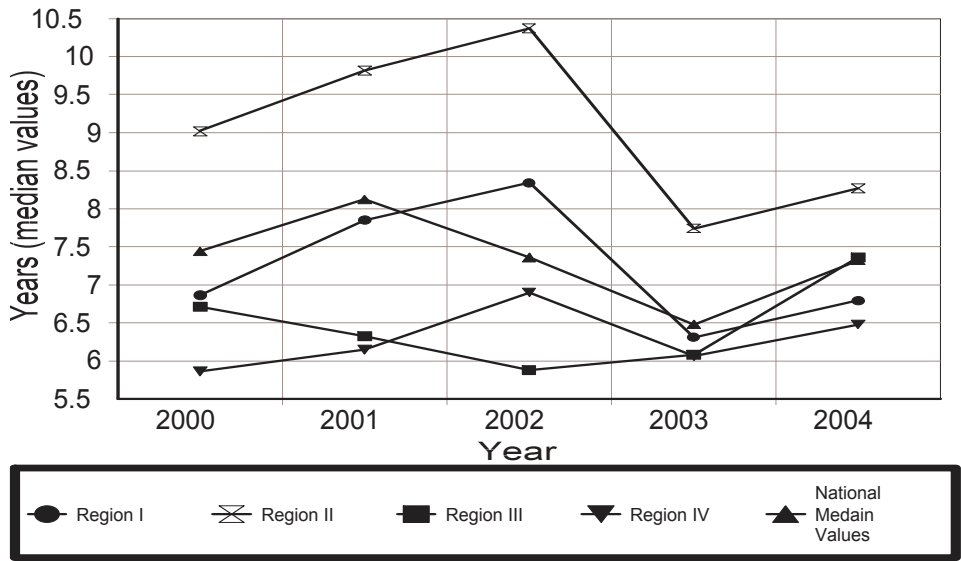


Total Resident Time: With the exception of Region II, all of the regions increased in total resident time for RIs. Region II experienced a slight decline due to the hiring of six of the 14 new RIs. All the regions reflected an increase in total resident time for SRIs.

Total Resident Time (RIs) - Figure 5

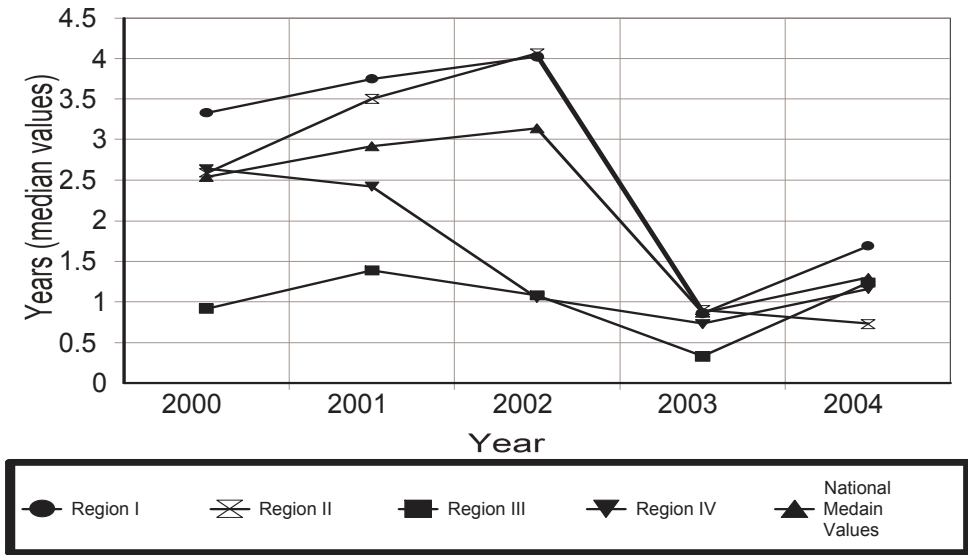


Total Resident Time (SRIs) - Figure 6

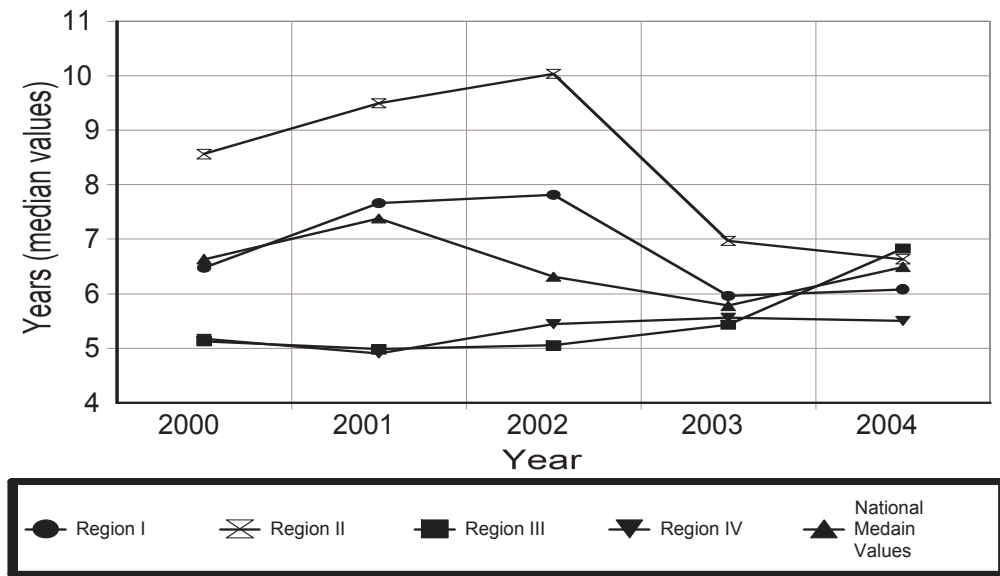


Qualified Total Resident Time: All the regions, except Region II, experienced an increase in qualified total resident time. Qualified total resident time for SRIs essentially remained the same for three regions, while Region III experienced an increase.

Qualified Total Resident Time (RIs)
Figure 7

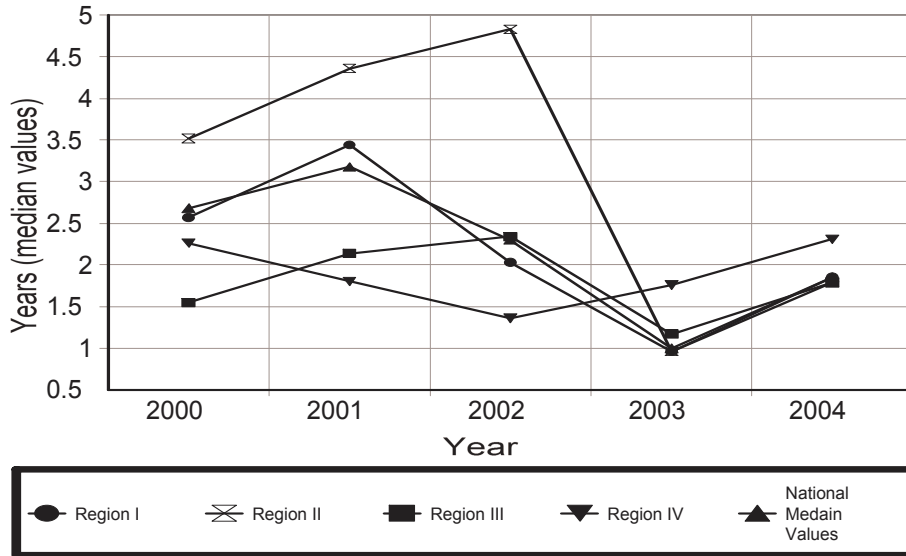


Qualified Total Resident Time (SRIs)
Figure 8

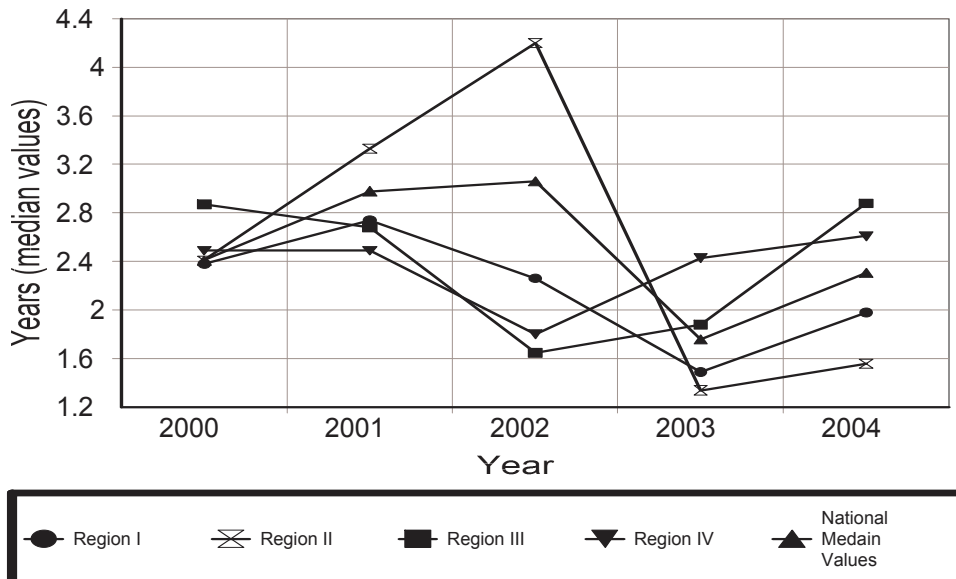


Current Site Time: Current site time increased for both the RI and SRI populations in all four regions. Current site time increased significantly in Regions I and II for the RI population.

Current Site Time (RIs) - Figure 9

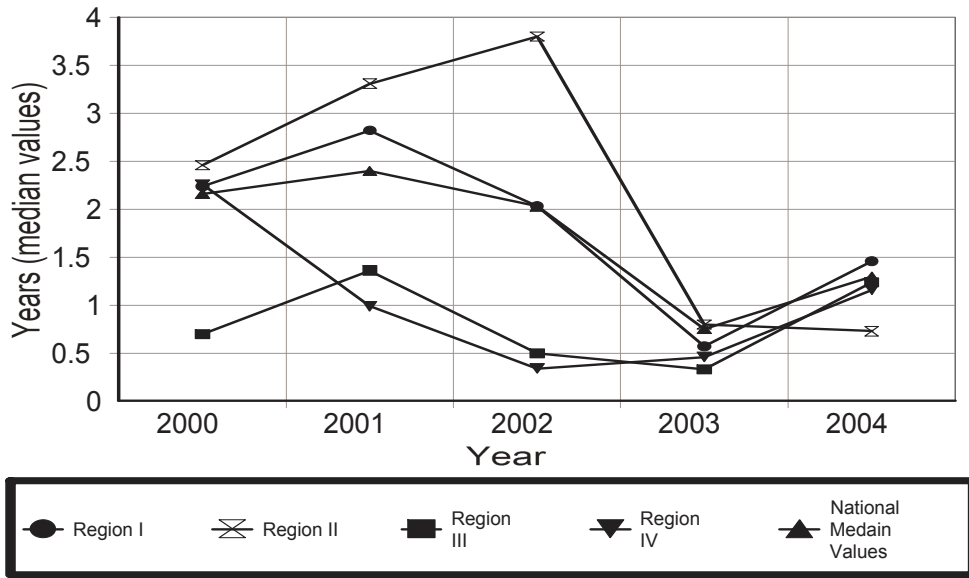


Current Site Time (SRIs) - Figure 10

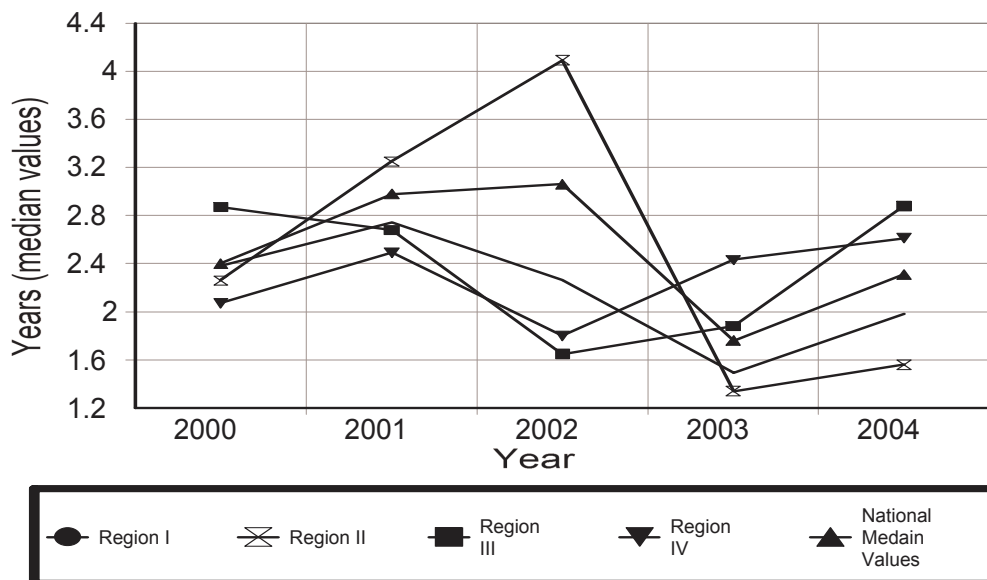


Qualified Current Site Time: The qualified current site time for RIs increased in all of the regions with the exception of Region II, which decreased slightly due to hiring the majority of the new RIs in CY 2004. Qualified current site time for SRIs increased for all the regions, with Region III experiencing the largest increase.

Qualified Current Site Time (RIs)
Figure 11

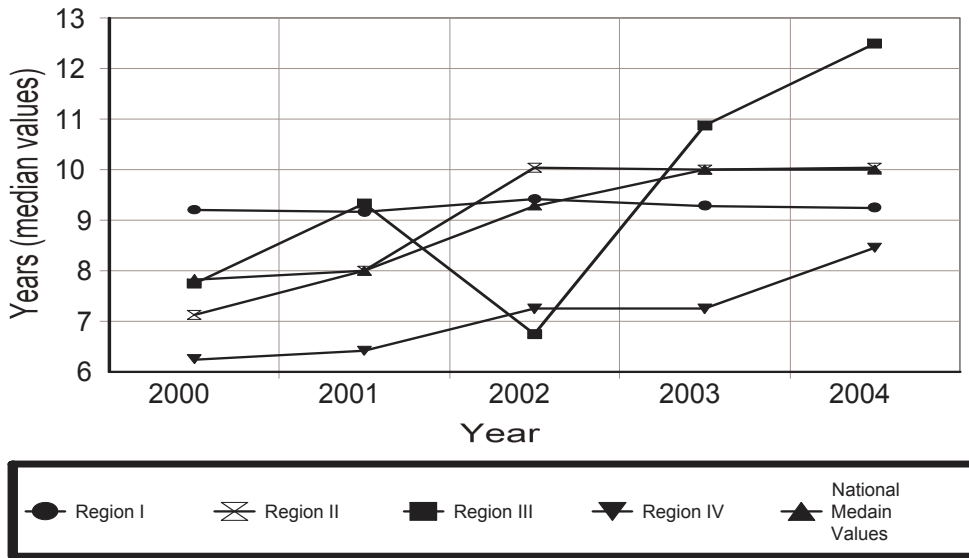


Qualified Current Site Time (SRIs)
Figure 12



Relevant Non-NRC Experience: Relevant non-NRC time for RIs remained the same for Regions I and II, with Regions III, and IV experiencing increases. Relevant non-NRC time for SRIs remained relatively stable with Regions II experiencing a slight increase and Region III experiencing a slight decrease.

Relevant Non-NRC Time (RIs)
Figure 13



Relevant Non-NRC Time (SRIs)
Figure 14

