POLICY ISSUE
INFORMATION

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FOR: The Commissioners

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SUBJECT: RESULTS OF THE INITIAL IMPLEMENTATION OF THE NEW REACTOR OVERSIGHT PROCESS

PURPOSE:

This Commission paper presents the results and lessons learned from the first year of implementation of the new reactor oversight process (ROP). In addition to a discussion and evaluation of the lessons learned, this paper provides the Commission with the status of program changes made to date and those that are planned in the future.

This paper also serves as the program evaluation of the new ROP as specified in the NRC Fiscal Year 2000 Strategic Plan. Further, the paper updates the status of several long term items identified in Commission paper SECY-00-0049, "Results of the Revised Reactor Oversight Process Pilot Program," dated February 24, 2000. The staff's response to the Commission's direction in the SECY-00-0049 Staff Requirements Memorandum (SRM) dated May 17, 2000 is also included. Finally, this paper responds to several recommendations for initial implementation made by the Pilot Program Evaluation Panel as noted in the "Final Report of the Pilot Program Evaluation Panel," dated December 21, 1999.

SUMMARY:

The staff employed many activities during ROP initial implementation to collect internal and external stakeholder feedback and comments and to evaluate the new oversight process for

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lessons learned. As part of this effort, the staff performed a program self-assessment that utilized objective measures and pre-determined criteria to assess the performance of the ROP. Internal feedback and comments from NRC staff were obtained through periodic meetings between Headquarters and regional staff, regional and site visits by Headquarters staff, the use of a formal feedback process, and a staff survey. Feedback and comments on the ROP from external stakeholders were solicited through monthly public meetings, a Lessons Learned Public Workshop held at the end of initial implementation, and a *Federal Register* notice. Finally, an Initial Implementation Evaluation Panel (IIEP) was established by the Agency in accordance with Federal Advisory Committees Act (FACA) requirements to serve as an advisory committee to the Agency.

Based on the results of the staff survey and other feedback received during initial implementation, internal stakeholders generally had a more positive view of the ROP following the first year of implementation than they had following the 6-month pilot program, and showed a marked increase in their understanding and acceptance of the ROP. They felt that the process provides appropriate regulatory attention to licensees with performance problems and is an effective risk-informed approach to oversight. However, internal stakeholders did express several concerns with the ROP. For example, a majority of internal stakeholders indicated that the significance determination processes (SDPs) are not easy to use. Inspectors were concerned that the threshold was too high for documenting findings that could be precursors to more significant issues and with how cross-cutting issues are addressed in the ROP framework. A significant percentage of internal stakeholders continue to express concern regarding the ROP's ability to provide appropriate identification of declining safety performance in a timely manner.

In general, external stakeholders indicated that the ROP improved consistency, reduced unnecessary regulatory burden, and increased the predictability of Agency actions. The industry, and many public stakeholders, perceived the ROP as being more objective and understandable, with an increase in regulatory focus on risk significance. Industry and public stakeholders also had numerous comments and concerns targeted at improving various parts of the ROP. For example, many felt that the characterization of safety significance by the SDPs was slow and complex to the point of being burdensome. The industry also strongly felt that inconsistencies and overlap in the safety system unavailability performance indicator definitions (e.g., between the ROP and Maintenance Rule) need to be addressed. Feedback from public stakeholders was mixed. While some members of the public believe that the ROP is overall a more effective oversight process, others felt that the ROP is poorly focused, will not identify declining performers in a timely manner, will not result in adequate assurance of safe reactor operation, and view the new ROP as a step backwards.

The IIEP reviewed the results and lessons learned for ROP initial implementation and concluded that the ROP is a notable improvement over the previous licensee performance assessment program. The IIEP determined that the ROP has made progress toward achieving the Agency's four performance goals. The panel recommended, however, that the staff take certain actions to ensure that it achieves the Agency performance goals in the long-term, and consider other actions to improve the process. Most of the IIEP conclusions and recommended actions were consistent with the staff's evaluation of the results of initial implementation.

In addition to utilizing feedback to provide insights regarding the efficacy of the ROP, the staff took advantage of situations encountered during initial implementation to identify lessons

learned and improvement opportunities. For example, following the February 2000 steam generator tube failure at Indian Point Unit 2 (IP2), NRC inspectors identified what was characterized as a Red inspection finding associated with the licensee's previous steam generator tube examination. This issue, in combination with other existing performance concerns, placed IP2 in the Multiple/Repetitive Degraded Cornerstone column of the Action Matrix which resulted in a supplemental inspection effort under the guidance of inspection procedure (IP) 95003. This was the first experience under the new program with a plant in this column and the first full exercise of this supplemental inspection procedure. This experience highlighted that the resources associated with providing oversight for a plant in the Multiple/Repetitive Degraded Cornerstone column of the Action Matrix are significant and will challenge the region's ability to perform routine inspections at other sites. Additionally, an extensive effort was necessary to appropriately interact with external stakeholders. As a result of specific lessons learned, adjustments to resource estimates and planning models were made and changes were made to strengthen inspection procedures and guidance.

In response to a Yellow Alert and Notification System Reliability performance indicator (PI) at Kewuanee, supplemental inspection efforts identified significant weaknesses in the licensee's efforts to promptly address the underlying performance issue. The specific actions taken by the licensee eventually returned the PI to the licensee response band (i.e., Green) after four quarters (the PI was Yellow for two quarters, then White for one quarter, before becoming Green the following quarter). This was the first time that supplemental inspection had identified inadequate corrective actions under the new program. The staff is strengthening the program guidance in this area to ensure that the performance issue remains open until the licensee has responded sufficiently to address the issue.

Finally, the operational safeguards response evaluation (OSRE) findings at Quad Cities Station identified significant weakness in the physical protection SDP. In response, the staff developed, and the Commission approved, an interim SDP that is currently in use. Development of a final revised physical protection SDP is currently underway.

Based on its assessment of stakeholder feedback and the results and lessons learned from initial implementation, the staff has developed a much greater level of confidence that the ROP has met the Commission's direction to develop an oversight process that is more objective, risk-informed, understandable, and predictable. The ROP has been substantially exercised such that the staff has gained valuable insights on many aspects of the ROP and identified issues that were not revealed during the pilot program. The staff recognizes that the ROP will continue to require close scrutiny and oversight and established a self-assessment program that will identify additional areas for improvement. The staff, as part of the Agency Action Review process, will continue to report to the Commission on an annual basis the results of its self-assessment and any significant changes to the ROP.

As it is currently designed and implemented, the resource requirements for the ROP are comparable to the requirements for the previous oversight program, and the ROP can be completed with the resources currently allocated. Potential areas for resource efficiencies have been identified based on the results of the staff's evaluation of ROP initial implementation, and savings resulting from these potential efficiency gains will be incorporated into the resource projections for future years. However, these will need to be weighed against emerging programs and policies that may impact future resources.

BACKGROUND:

On January 8, 1999, the staff issued SECY-99-007, "Recommendations for Reactor Oversight Process Improvements," forwarding the staff's recommendations for a revised reactor oversight process for commercial nuclear power plants. On March 22, 1999, the staff issued SECY-99-007A, "Recommendations for Reactor Oversight Process Improvements (Follow-up to SECY-99-007)," that forwarded to the Commission additional information on the concepts for the ROP, and presented the staff's plans for a 6-month pilot of the revised oversight processes at two sites per region. The June 18, 1999, SRM on SECY-99-007 and SECY-99-007A approved the scope and concepts for the ROP, approved the staff plan for the pilot program, and provided additional issues and Commission comments for the staff to consider when evaluating the pilot program results.

The results and lessons learned from the pilot program were documented in Commission paper SECY-00-0049, "Results of the Revised Reactor Oversight Process Pilot Program," dated February 24, 2000. Based on the results of the pilot program, the staff recommended that the Commission approve initial implementation of the ROP at all operating commercial nuclear power plants (except for the D.C. Cook plant). The staff recommended that the D.C. Cook plant not be included in the initial implementation of the ROP at that time due to the licensee's continued efforts to implement corrective actions to address significant performance concerns and the increased Agency focus to monitor and evaluate these licensee efforts. Following the restart of both D.C. Cook units, the inspection manual chapter (IMC) 0350 Oversight Panel continued to provide oversight due to the lack of valid historical PI data, and the continuing need to assess operational performance and the effectiveness of the licensee's long term corrective actions. The status of the transition of D.C. Cook into the ROP will be discussed at the Agency Action Review Meeting in June 2001.

The SRM for SECY-00-0049 was issued on March 28, 2000, and approved initial implementation of the ROP as recommended by the staff. Initial implementation commenced on April 2, 2000. A follow-up to the SECY-00-0049 SRM was issued on May 17, 2000, and provided several additional issues for the staff to consider during initial implementation. This SRM also directed the staff to report on the implementation of the ROP results after the first year of use. This paper constitutes the staff response to that requirement.

DISCUSSION:

Initial Implementation Assessment Activities

During the first year of ROP implementation, the staff conducted many activities to evaluate the new oversight process for lessons learned and to collect internal and external stakeholder feedback and comments. A general discussion of the different means of assessing the efficacy of the ROP and a summary of the overall results follows. A detailed discussion of the evaluation and disposition of the stakeholder feedback and self-assessment results is provided in the attachments to this paper for each component of the ROP.

Internal Stakeholder Feedback

Internal feedback and comments were obtained using various methods, such as: (1) periodic meetings between headquarters and regional staff, (2) visits by headquarters staff to the regional and resident inspector offices, (3) the use of feedback forms to allow regional and headquarters staff to document questions and concerns on the various components of the ROP, and (4) an internal stakeholder survey conducted near the end of initial implementation.

Based on the staff survey results and other feedback received, internal stakeholders generally had a more positive view of the ROP following the first year of implementation than they had following the 6-month pilot program, and showed a marked increase in their understanding and acceptance of various components of the ROP. They felt that the process provides appropriate regulatory attention to licensees with performance problems, is objective, and is an effective risk-informed approach to oversight. Internal stakeholders did express several concerns with the ROP. A majority of internal stakeholders felt that the level of effort for conducting each inspection was not consistent with that estimated in the inspection procedures. Internal stakeholders were also concerned that the thresholds for documenting inspection findings were too restrictive and that the ROP does not appropriately integrate and provide insights into cross-cutting areas. The majority of internal stakeholders indicated that the SDPs are not easy to use, and did not believe they are based on clear standards. A significant percentage of internal stakeholders expressed concern regarding the ROP's ability to provide appropriate identification of declining safety performance before a significant reduction in safety margins occurs. The results of these site and regional visits, meetings, workshops, and staff survey are discussed in more detail in Attachment 1.

External Stakeholder Feedback

Comments and feedback on the ROP from external stakeholders such as public interest groups, industry representatives, and State and local government agencies were also solicited in many different ways. These included public working group meetings held at least monthly during initial implementation, evening public meetings at each of the power plants with local citizens, visits by headquarters staff to six sites per region, public forum meetings held in the vicinity of each regional office at the mid-point of initial implementation, regional management site visits, and a Lessons Learned Public Workshop held at the end of initial implementation. Finally, public comment on the initial implementation of the ROP was requested in *a Federal Register* notice (FRN).

In general, external stakeholders indicated that the ROP improved consistency, reduced unnecessary regulatory burden, and increased the predictability of Agency actions. The industry, and many public stakeholders, perceive the ROP as being more objective and scrutable, with an increase in regulatory focus on risk significance. Public and industry stakeholders were generally very positive about the use of the NRC external internet web page to provide pertinent reactor oversight information and assessment results in a timely and well organized manner.

Industry and public stakeholders did have numerous comments and concerns targeted at improving various parts of the ROP. For example, industry and some non-industry stakeholders generally are of the opinion that, with the development of additional PIs and the refinement of some existing PIs, there are additional opportunities for increased efficiencies,

such as the reduction in frequency of some inspections. On the other hand, other external stakeholders, particularly States, cautioned the NRC not to prematurely reduce inspection effort. The industry also strongly felt that inconsistencies and overlap between the ROP, Institute of Nuclear Power Operations (INPO), and Maintenance Rule indicator definitions for safety system unavailability need to be addressed. A number of industry and public stakeholders felt that the characterization of safety significance by the SDPs was slow and complex to the point of being burdensome.

Feedback from public stakeholders was mixed. Entities such as the Commonwealth of Pennsylvania and the Union of Concerned Scientists believe that the ROP is overall a more effective oversight process. Others, such as the State of New Jersey, believe that the ROP is poorly focused, will not identify declining performers in a timely manner, and will not result in adequate assurance of safe commercial nuclear reactor operation. Some public stakeholders even viewed the new ROP as a step backwards, and felt that the NRC has not communicated successfully with the public regarding NRC oversight activities and the safety performance of licensees. A summary of these various meetings, workshops, and FRN comments can be found in Attachment 2.

Self-Assessment Program

During initial implementation, the staff developed a self-assessment process to collect additional lessons learned and gain insights from the implementation of the ROP. This ongoing and continuous self-assessment process utilizes objective metrics and pre-determined criteria to monitor the performance of various aspects of the ROP.

In general, the self-assessment metrics indicate that the ROP has been successful in being more objective, risk-informed, understandable, and predictable than the previous process. However, the metrics were less conclusive regarding the performance of the ROP against the Agency's performance goals (maintain safety; increase public confidence; improve effectiveness, efficiency and realism of NRC activities and decisions; and reduce unnecessary regulatory burden) due to the limited and inconclusive data obtained during initial implementation. More time is needed to gauge the overall impact of the ROP on safety. The ROP self-assessment program is a continuous process that includes responding to noted deficiencies and incorporating improvements in an ongoing manner. Additional detail on the ROP self-assessment program and the results and lessons learned from initial implementation are discussed in Attachment 3.

Initial Implementation Evaluation Panel

The IIEP was established in accordance with FACA requirements to serve as an advisory committee to the Agency. This panel was comprised of a cross-disciplinary group of NRC, public, and industry stakeholders representing many different nuclear power interests. The purpose of the IIEP was to monitor and evaluate the results of the first year of initial implementation and to provide advice and recommendations to the Agency on reforming and revising the ROP. The results of the IIEP review are included as Attachment 4 to this paper.

Overall the IIEP concluded that the ROP is a notable improvement over the previous licensee performance assessment program, and that it should be continued. The IIEP determined that the ROP has made progress toward achieving the Agency's four performance goals. The panel

recommended, however, that the staff take certain actions to ensure that the Agency performance goals are met in the long-term, and to consider other actions to improve the process. Most of the IIEP conclusions and recommended actions were consistent with the staff's evaluation of the results of initial implementation. These panel recommendations were factored into the staff evaluation, and are addressed by the process changes described throughout this paper. These IIEP recommendations and conclusions, and a summary of the staff's actions in response, are discussed in more detail in Attachment 5.

Summary of Results and Actions

The following discussion provides the significant lessons learned from ROP initial implementation, process changes made resulting from the lessons learned, and remaining work needed to address longer term issues.

Performance Indicators

Feedback received on the PIs during initial implementation reemphasized industry concerns with potential unintended consequences with the scram PIs and NRC staff concerns with potential unintended consequences associated with the unplanned power change PI. The staff also received significant feedback on the definitions and thresholds for the safety system unavailability (SSU) indicators. The most significant SSU issues raised by stakeholders included: (1) the use of fault exposure hours (FEH), both known and estimated (t/2), (2) the impact of the thresholds on effective preventive maintenance, and (3) inconsistencies between the various programs that monitor the unavailability of safety systems (e.g., Maintenance Rule, Probabilistic Risk Assessments (PRA), INPO/World Association of Nuclear Operators (WANO) indicators, and ROP indicators). Additionally, several outstanding issues remained regarding the definitions and thresholds of some of the indicators, including the Alert and Notification System (ANS) reliability, the Protected Area Security Equipment Performance Index, and the use of reportable events in the security program performance indicators.

Several actions were taken prior to and during initial implementation to address these concerns and the lessons learned from both the 6-month pilot program and initial implementation. Many of the issues and lessons learned from the pilot program were addressed in Revision 0 to NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," issued March 28, 2000. In particular, the guidance for the SSU indicators was changed to resolve several of the FEH issues. During initial implementation, through the frequently asked question (FAQ) process, the guidance was clarified to describe the conditions under which on-line overhaul maintenance may be performed without counting unavailable hours. Also during initial implementation, most of the FAQs that had been resolved during both the 6-month pilot program and initial implementation were incorporated into Revision 1 to NEI 99-02, issued April 23, 2001. Additionally, a 6-month pilot program for two new indicators to replace the two scram PIs was completed in March 2001. The results are currently being evaluated against the criteria established in Regulatory Issue Summary (RIS) 2000-21, "Changes to the Unplanned Scram and Unplanned Scram with Loss of Normal Heat Removal Performance Indicator."

Several longer term actions are also planned to address many of these issues. The staff has worked with the industry and other external stakeholders to develop a replacement indicator for the "Unplanned Power Changes per 7,000 Critical Hours" PI and plans to pilot two potential

alternative indicators in the near future. In addition, the staff is working with the industry and external stakeholders to improve the SSU indicators by simplifying them, making them easier to understand, and increasing their compatibility with all uses (e.g., Maintenance Rule, PRA, INPO/WANO indicators, and ROP indicators).

Additional detail and discussion of the initial implementation results, lessons learned, and program changes made for PIs can be found in Attachment 6.

Inspection Program

Although much of the data collected for the self-assessment metrics are preliminary and only a limited set of definitive conclusions can be drawn from just one year of full implementation, the inspection program is generally meeting the established goals and measures. However, some lessons were learned and require additional work to resolve.

The majority of NRC internal stakeholders believe that inspection reports provide sufficient and proper information. However, a criticism from several external stakeholders was that many inspection reports didn't adequately document the bases for determining the significance of findings. An ongoing independent audit of inspection reports by the NRC staff confirmed this criticism. Inspectors noted that several inspection areas yielded issues whose significance could not be easily determined, or that could not be documented in inspection reports. The two most notable areas were security force-on-force exercises and Maintenance Rule inspections. The staff acknowledges that both areas require changes to the inspection procedures. As discussed later, the physical protection SDP and documentation thresholds have already been changed to address these issues.

Stakeholders expressed several other concerns and opinions regarding the inspection program. Many stakeholders felt that the use of collective dose as a screening criterion for inspection findings involving licensee as low as reasonably achievable (ALARA) programs could cause identical findings at different plants to be treated differently. Several industry stakeholders expressed interest in using licensee self-assessments to reduce the scope and effort of the baseline inspection program. Many internal stakeholders expressed dissatisfaction with what is perceived to be the reactive nature of the baseline inspection program and its reduced emphasis on finding the causal factors for problems.

During initial implementation, a few baseline inspection program procedures had to be significantly revised to modify their inspection scope, frequency, or level of effort. For example, midway through initial implementation, the staff revised IMC 0610*, "Power Reactor Inspection Reports," to clarify: (1) the thresholds for documenting inspection findings, (2) the definition of a "documentable" cross-cutting issue, and (3) the expectations for documenting the basis for the significance of findings.

Several additional baseline inspection program procedures currently are being changed to adjust the inspection scope, frequency, or level of effort (including some potential increases), based on lessons learned. For example: (1) the procedure for inservice inspections will be changed based on staff recommendations as described in the steam generator action plan and the lessons learned from the failed steam generator tube at IP2, (2) the maintenance effectiveness inspection procedure is being rewritten to make it more risk-informed and performance based, and (3) the approach to the periodic inspection of problem identification

and resolution (PI&R) is being changed to make the inspections more effective and efficient by allowing a more in-depth (albeit less frequent) assessment of a licensee's program, while emphasizing the routine follow-up of individual issues through a more focused review of PI&R samples throughout the year.

The staff also plans several longer term actions to address lessons learned. The Physical Protection inspection procedure will be revised over the next year to account for policy changes associated with this cornerstone. The staff will evaluate how licensee self-assessments in this area might be used to satisfy some of the requirements of the baseline inspection program. Likewise, the ALARA baseline inspection procedure and other program documents will be revised after the bases for determining what constitutes an ALARA inspection finding is re-analyzed. Additional effort is needed to evaluate the quality of staff efforts under the ROP, particularly the quality of inspection and the depth and scope of inspection preparation. These areas are difficult to measure but are important.

Additional detail and discussion of the initial implementation results, lessons learned, and program changes made for the inspection program are discussed in Attachment 7.

Significance Determination Process

The SDP was judged to be generally effective during initial implementation. The SDP focused NRC and licensee resources commensurate with the significance of findings, although further efficiency improvements need to occur. Inspection audit findings and stakeholder feedback indicated that some findings processed through the SDP may not have met the guidance for level of detail in documenting assumptions made during the analysis. Some public feedback continued to reflect their difficulty in understanding the bases for SDP results, particularly those that were based on licensee's risk analyses. Many stakeholders expressed concern regarding the difficulties experienced in using the reactor safety and non-reactor safety SDPs and with the effort and time needed to finalize the safety significance of issues.

The NRC staff will continue to work to improve the timeliness of the SDP process while ensuring that the final significance determination adequately portrays the safety significance of the issue. One of the strengths of probabilistic risk assessments is that uncertainties can be treated explicitly. In fact, the SDP process helps to reveal influential assumptions that are used to arrive at any particular significance determination. This openness is intended to provide greater ability for stakeholders to challenge the validity of the assumptions in order to increase the likelihood that invalid assumptions will not be used. Achieving convergence on influential assumptions and thereby narrowing the uncertainties is very important, since risk assessments having a range of uncertainty are ultimately evaluated against finite SDP thresholds under the ROP. The openness of the SDP process improves the defensibility and credibility of the SDP outcome. However, the resultant increase in the internal dialogue and interaction with external stakeholders extends the time spent in arriving at a final significance determination. A significant ongoing challenge with the SDP will be to balance the need for sufficient communication to allow the staff to make an appropriately informed significance decision and the need for timeliness of SDP results to support the performance assessment process. In spite of these difficulties, the SDP was generally found to enhance public confidence by accurately communicating information in a way that demonstrates that the NRC understands the plant's performance.

Some stakeholders also expressed concern regarding the lack of external events risk data, the lack of detailed guidance for assessing concurrent performance deficiencies, and the method to appropriately address long standing design basis deficiencies. There was also significant stakeholder feedback on the Occupational Radiation Safety and ALARA SDPs. The Occupational Radiation Safety SDP excluded all hot particle exposures, including whole body (deep dose equivalent), as well as skin dose from hot particles not subject to the enforcement discretion. The process screened out all ALARA issues identified at plants that have a rolling 3-year average collective dose below the screening criteria, which resulted in a number of unintended outcomes. Finally, the staff determined that the force-on-force inspection findings posed a significant challenge in applying the Physical Protection SDP (PPSDP). Specifically, weaknesses with the PPSDP methodology made the application of risk, as was originally intended, unsuitable in that the risk-informed approach to the PPSDP could routinely result in inappropriate NRC responses to certain OSRE findings.

The staff made several changes to the SDP as a result of lessons learned and the stakeholder feedback received during initial implementation. Revisions to the inspection reporting guidance completed during initial implementation are expected to help address the lack of detail seen in some inspection reports for documenting the assumptions used in reaching a significance determination. In addition, the staff has established an SDP instructional guide on the internal NRC web site that, when fully developed, will provide a wide spectrum of example performance issues and how they should be processed using the various SDP tools. The fire protection SDP was revised to provide additional information to enhance the inspectors' ability to assess functionality of fire protection defense-in-depth components and to provide guidance on the development of credible fire scenarios. The staff issued a Commission approved interim PPSDP to address significance determinations for findings identified during the force-on-force exercises. This interim SDP appropriately focuses the significance determination on security response and not on reactor recovery. Lastly, the development and issuance of the reactor safety SDP plant/site specific Risk-Informed Inspection Notebooks is expected to be completed during the Summer of 2001.

Several longer term efforts to continue improving the SDP are also in progress. Stakeholder concerns regarding ease of use are being addressed for fire protection, reactor safety and physical protection SDPs. Enhancements to the guidance are being evaluated with regard to applying combined risk results of multiple concurrent deficiencies in a manner that is commensurate with the ROP Action Matrix. The NRC Office of Research (RES) has been engaged to evaluate the scope of effort necessary to improve the capability of the Reactor Safety SDP by assessing the impact of external events on operating reactor safety related issues. Additionally, changes to the ALARA SDP screening criteria are being considered, including the possible elimination of the 3-year average collective dose threshold, and instead using that data as a means to adjust the baseline inspection effort. The staff continues to develop methodologies that will allow inspectors to develop realistic fire scenarios and improve the accuracy of site specific data used in the assessment of risk associated with findings. The staff will replace the interim PPSDP with a revised version that will be developed with internal and external stakeholder input.

Additional discussion and detail on the initial implementation results, lessons learned, and program changes for the SDP are described in Attachment 8.

Assessment

The assessment process proved to be objective and predictable with the actions taken by each regional office appropriate and consistent with the Action Matrix. No deviations from the Action Matrix were required during the first year of implementation. Most stakeholders agreed that the assessment process focused NRC resources on the areas of greatest safety significance and that the regulatory attention given to licensees with performance problems was appropriate. Stakeholders also generally agreed that assessment results were issued and posted on the external Agency Web page in a timely manner.

The staff received numerous issues for consideration from both internal and external stakeholders. For example, guidance had not been established on how the staff would treat instances in which significant weaknesses were found in licensee actions to respond to performance issues that resulted from a PI that crossed thresholds in a manner consistent with how similar weaknesses were treated for an inspection finding. Also, the use of “No Color” findings in the oversight process was not clear and had contributed to program inconsistencies.

Several program changes have been made to reflect lessons learned from implementing the new assessment process. The staff incorporated many of these lessons learned into revisions of IMC 0305 “Operating Reactor Assessment Program.” For example, the staff revised IMC 0305 to ensure that the EDO pre-approves all deviations from the Action Matrix, and that the Commission is informed of any such deviations.

Several longer term actions are also planned to address lessons learned. In particular the staff will continue to monitor the ROP to determine whether it would be appropriate to have a graded approach for removing inspection findings from consideration in the assessment process after adequate corrective actions are taken by the licensee. The staff will continue to evaluate appropriate actions to address the concerns with “No Color” findings and the appropriate Agency response to ineffective actions taken by a licensee in response to a performance deficiency identified by a PI. Additionally, the staff will implement any lessons learned from the End-of-Cycle Review Meetings, the Agency Action Review Meeting, and the annual public meetings with the licensees.

The results of initial implementation of the new assessment process, including lessons learned and program changes, are discussed in more detail in Attachment 9.

Enforcement

The NRC Enforcement Policy was revised on May 1, 2000, to incorporate the Commission's decision to authorize blanket discretion for potential 10 CFR 50.9 issues related to inaccurate licensee PI data submittals. This policy remained in effect through January 31, 2001. Although this blanket enforcement discretion expired, this does not impede the staff's ability to exercise enforcement discretion under Section VII.B.6 of the Enforcement Policy on a case-by-case basis for inaccurate or incomplete PI data. Additionally, the staff may consider exercising discretion under Section VII.B.6 for any new PIs developed. The Office of Enforcement (OE) will continue to work with NRR and the regional offices in determining whether enforcement discretion should be exercised for future PIs related to 10 CFR 50.9 violations.

During initial implementation, OE monitored the impact of the ROP on the timeliness with which the NRC staff processed significant inspection findings (i.e., White, Yellow, and Red) and associated violations, if applicable. Analysis of the timeliness data for the SDP and enforcement process shows that there has been an increase in the amount of time that it takes to process findings under the revised ROP. As of the end of initial implementation phase, the average process time for all cases was 98 days, compared to an average of 75 days achieved in FY 1999 for processing escalated enforcement actions (under the previous process). A major contributor to the increase was the greater emphasis on risk analysis to support the significance characterization of inspection findings.

Experience with the Maintenance Rule Enforcement Review Panel during ROP initial implementation demonstrated that many of the Maintenance Rule issues identified were able to be dispositioned consistently without a formal panel meeting. In addition, under the ROP, Maintenance Rule findings have either been minor or, if more than minor, of very low safety significance (no greater than Green).

Many actions are planned to address these lessons learned. The staff will continue to pursue ways to make the SDP and enforcement processes more timely for evaluating and communicating safety significant issues. In the near term, the staff will issue revised Maintenance Rule enforcement guidance to establish a less formal review process.

Lessons learned from the first year of implementing the new enforcement policy for the ROP are discussed in further detail in Attachment 10.

Key Policy Issues

Commission paper SECY-00-0049 identified three “Issues of Note” which were issues that emerged from the 6-month pilot program that had a significant impact on the implementation of the ROP, and that the staff had not been able to resolve in a manner that adequately addressed the majority of stakeholder concerns. These issues involved: (1) the treatment of cross-cutting issues in the ROP, (2) role of Barrier Integrity cornerstone PIs in the ROP, and (3) how the ROP should treat performance issues that are outside the licensing and design basis of the plant. The staff committed to present these issues, the differing points of view, and the staff’s proposal for their resolution to the Commission for consideration. Additionally, SECY-00-0049 provided an update to several other key policy issues that needed to be considered and addressed as part of the ongoing implementation of the ROP. These issues included: (1) the impact of the “N+1" resident inspector staffing policy change on the implementation of the ROP, (2) the impact of the ROP on regional organization, including staff training needs, (3) the impact of implementing the ROP on the Agency’s allegation program, and (4) staff efforts to develop risk-based PIs and an industry trending program.

With regard to the impact on the ROP of the January 2000 resident inspector staffing policy change (i.e., “N+1" to “N”), the staff concluded that baseline inspections can be accomplished with “N” resident staffing at dual unit sites with some assistance from region-based inspectors. Sites that continued to be staffed at “N+1" at dual unit site tended to expend a level of effort commensurate with site staffing, not program requirements. However, the staff believes that it is still too soon to determine the full impact of the change in the resident staffing policy. The early indications are that the “N” staffing policy will challenge regional management to provide

extended training, rotational assignments and other professional development opportunities for the resident inspector staff at multi-unit sites.

The status of all of these key policy issues is discussed in more detail in Attachment 11.

D.C. Cook Transition Plan

Prior to the initial implementation of the ROP in April 2000, the licensee for D.C. Cook requested a delay in the implementation of the ROP at that site. The basis for the licensee's request was to minimize the impact of the transition to the new oversight process on plant staff, which at that time was focused on Unit 2 restart activities. Both D.C. Cook units had been shutdown since September 1997, and IMC 0350, "Oversight of Operating Reactor Facilities in an Extended Shutdown Condition," was being implemented by the NRC. As discussed in SECY-00-0049, the NRC staff approved the delay in ROP implementation at D.C. Cook until after the Unit 2 restart.

With the startup of the Unit 2 reactor in June 2000, the NRC began implementation of the ROP baseline inspection program and the revised assessment process. Specifically, the baseline inspection program was implemented with additional inspections conducted in areas where PI data was either not available or was under development. Due to the extended outage, PIs that rely on plant operating history could not be fully developed. The SDP was utilized to evaluate inspection findings and the Action Matrix was considered in determining necessary follow up actions. In addition, under the cognizance of the IMC 0350 Oversight Panel, inspections were conducted in specific areas that needed to be evaluated to assess the restart readiness of D.C. Cook Unit 1. Following the restart of D.C. Cook Unit 1 in December 2000, the IMC 0350 Oversight Panel continued to provide oversight of D.C. Cook because of the lack of validity in the historical PI data, and the continuing need to assess operational performance and the effectiveness of the licensee's long term corrective actions. This augmented baseline inspection program will continue at D.C. Cook until sufficient PI data has been accumulated to permit "normal" implementation of the ROP. The status of the transition of D.C. Cook into the ROP will be discussed at the Agency Action Review Meeting (AARM) to be held in June 2001. In addition, to support the increased baseline inspection effort, the D.C. Cook resident office continues to be staffed at the "N+1" level.

Staff Response to SECY-00-0049 Staff Requirements Memorandum (SRM)

The SECY-00-0049 SRM, dated May 17, 2000, listed several issues that the Commission requested the staff to consider during the first year of ROP implementation, including: (1) the EDO should pre-approve all deviations from the ROP Action Matrix, (2) the staff should emphasize the importance of licensee corrective action programs in ongoing communication efforts, and (3) the staff should ensure that the threshold for documenting inspection observations is clearly understood and consistently applied. The staff has considered all of these issues, along with the lessons learned from the ROP initial implementation, in determining oversight process changes and improvements. Many of these issues were described previous sections of this paper. All of these issues, along with recommendations of the Pilot Plant Evaluation Panel, are discussed in detail in Attachment 12.

RESOURCES:

As a result of the first year of ROP implementation, the staff has concluded that the resources budgeted for initial implementation of the new oversight process were appropriate. Specifically, the results of initial implementation indicated that: (1) current regional resources were adequate to carry out the ROP effectively and to achieve its stated objectives, (2) the current regional resource model, modified based on the results of the first year of ROP implementation, provided reasonably accurate estimates of regional resource requirements to implement the ROP, and (3) overall ROP resource requirements during initial implementation were comparable to the overall requirements in the previous program, although the resources were allocated differently.

Based on the lessons learned to date, the staff believes that it would be premature to forecast further reductions in the resources to implement the ROP. As discussed below, the staff does believe that there are opportunities for continued efficiency gains in several areas. These areas will be assessed and reported to the Commission with the ROP self-assessment results, following the second year of implementation of the new program. It is important to note that actual resource expenditures are directly related to industry and individual plant safety performance.

Future resource reductions may be possible in the ROP through continued efficiency gains as a result of: (1) the elimination of start-up costs, (2) inspection preparation time decreasing as staff becomes more familiar with process and procedures, (3) improved documentation methods (such as implementation of quarterly integrated inspection reports in all regions for routine inspections), (4) the use of SDP workbooks at all sites, and (5) reduced frequency and level of activities related to licensee performance assessment. Resource savings may also be achieved if ongoing staff review and evaluation recommends a reduction in the scope and/or frequency of major team inspections or other baseline inspections.

The NRC has already implemented reductions in resource expenditures for reactor oversight (inspection and performance assessment) over the past five years to reflect improved industry performance and anticipated efficiencies in NRC oversight. Prior to the initial implementation phase of the ROP, the Commission approved the staff's recommendation not to make additional resource adjustments to the inspection and assessment programs until adequate experience was gained with the revised ROP. A full year of implementation beyond the 6-month pilot program was planned to obtain reliable data on which to estimate the resources needed to accomplish individual inspections as well as to execute the overall oversight process. Two fundamental issues were addressed in assessing the ROP resource requirements, specifically: (1) whether the ROP could be completed within the estimated resources, and (2) whether the ROP is more efficient in resource utilization compared with the previous inspection and assessment programs.

In order to assess the resource requirements of the revised ROP, new Regulatory Information Tracking System (RITS) codes were developed, and detailed guidance was provided to the regional staff so that staff time spent on specific direct and indirect activities in the ROP could be more accurately tracked. A comparison of the actual hours expended for baseline inspection activities under the ROP to the initial estimates for single-, dual-, and triple-unit sites shows that, with the exception of the two triple-unit sites, the actual resource requirements to accomplish direct inspection, inspection preparation and documentation, and plant status

activities were less than initial estimates. However, indirect activities (e.g., inspection-related travel, communication activities including stakeholder interface, significance determinations, and regional technical support) were greater than expected and increased the overall workload substantially. Although these indirect activities were not tracked separately between the baseline and supplemental inspection program areas, much of the indirect effort involved necessary support to baseline inspection activities.

The total direct inspection effort expended on plant-specific inspection during this first year was reasonably close to the initial estimate; however, the resource allocations in this area need to be refined. The inspection effort to address plants in the Regulatory Response column of the Action Matrix were significantly lower than estimated, while the inspection effort to address the plants in the Degraded Cornerstone column were accurately estimated. At IP2, the only case involving a plant in the Multiple/Repetitive Degraded Cornerstone column of the Action Matrix, the magnitude of effort required for supplemental inspection and to provide oversight of the licensee's performance improvement plan was unanticipated and significant. The Agency's response to IP2 not only consumed considerable effort for direct inspection and inspection preparation and documentation, but also significantly increased the expenditures of other indirect activities.

A comparison was also made of the overall resource expenditures of the ROP during the first year of implementation with the resources expended under the previous oversight program for the same time period prior to initial implementation. It should be noted that such a comparison is difficult and problematic because neither the 52 weeks prior to or following the start of initial implementation can be considered typical, and the two oversight programs differed significantly (e.g., no Systematic Assessment of Licensee Performance (SALP) and substantial ROP development effort). Notwithstanding this concern, the first year of implementing the ROP resulted in the staff using slightly more resources overall than what was applied to the oversight process in the prior year. As expected, the staff applied more resources in executing the baseline inspection program than the previous core inspection program, and less resources in conducting plant specific inspections (reactive and supplemental) than in the past (which includes regional initiative).

Several other factors may impact future ROP resource requirements that are difficult to estimate. These include: (1) institutional inefficiencies that may result from full implementation of "N" resident inspector staffing policy (e.g., potentially greater inspection preparation and travel time), (2) reduced inspector efficiency due to increasing the number of vacancies filled by entry level employees, (3) large demands on inspectors caused by unplanned issues and events that result in significant plant specific inspections, and (4) the potential need for additional inspection resources due to increases in the number of independent spent fuel storage installation (ISFSI) facilities.

The staff will continue to collect additional data in order to improve the resource model. Areas of consideration for potential model refinement include: (1) anomalies in regional resource usage (e.g., increased travel requirements for Region IV inspectors; additional resources for dual-unit sites that are significantly different in design, vintage or management), (2) impacts of plants with multiple degraded cornerstones, (3) explicit inclusion of indirect inspection activities, and (4) more accurate data for performance assessment expenditures.

Additional detail on the ROP resource analysis can be found in Attachment 13.

CONCLUSIONS:

The first year of implementation has improved the NRC staff's confidence that the ROP is capable of ensuring adequate protection of public health and safety through a more objective and risk-informed approach to the oversight of commercial nuclear power plant operation. The initial implementation phase of the ROP did not identify any significant aspects of licensee performance that were not adequately covered through the combination of PIs and inspection. The use of risk-informed safety thresholds for both PIs and inspection findings allowed the NRC and licensees to focus their respective resources on issues with the most safety significance. NRC actions specified by the assessment process Action Matrix were appropriate for the safety concerns identified. The submittal of PIs by the licensees provided performance data that were more timely and relevant than what was available under the previous oversight process. Information was more readily accessible to the public through the posting of the PIs and inspection findings on the NRC's internet web page. The bases for NRC actions were more easily understood through the use of the assessment process Action Matrix.

Initial implementation results indicated a notable shift in inspection resource expenditure, with more time required for inspection preparation, and less time required for inspection documentation. However, overall program resources, including inspection, assessment, enforcement, inspection preparation and documentation time, were comparable to the requirements in the previous program. Currently budgeted regional resources are adequate to carry out the ROP effectively and achieve its stated objectives.

Based on industry and internal NRC feedback, the regulatory burden associated with the ROP appears appropriate. Though more licensee resources were required to support the data collection and reporting associated with PIs, this burden increase was offset by changes in the inspection, assessment, and enforcement processes. These changes allowed licensees to focus their resources more efficiently on issues with the greatest safety significance. Industry representatives felt that the SDP in particular provided the means for both the NRC and its licensees to better utilize their resources.

As described in Attachment 4, the IIEP concluded that the ROP should be continued because it is a notable improvement over the previous licensee performance assessment program, and that the ROP has made progress toward achieving the NRC's four performance goals. However, the panel also recommended that the staff take certain actions to ensure that they continue to achieve the Agency's performance goals in the long-term, and to consider other actions to improve the process. Most of the IIEP conclusions and recommended actions were consistent with the staff's evaluation of the results of initial implementation.

Even with the success achieved during ROP initial implementation, it is still too early to judge the impact of the ROP in several areas. For example, it will take more than one year of experience and data to understand the full impact of the ROP on overall industry performance and determine whether cross-cutting issues can cause a rapid decline in performance without prior indication through PIs and inspection. As described in Attachment 11, the staff is working to develop a trending program to provide a means to monitor overall industry performance. Additionally, several issues have been identified which warrant improvements to the ROP to address lessons learned from the first year of implementation. While many changes have

already been made, others involve longer term actions to develop and enhance the process. The following are the most significant long term actions planned by the staff:

Performance Indicators

- Begin a pilot program in July 2001 for a replacement unplanned power changes indicator entitled “Unit Power Reductions per 7,000 Critical Hours.”

- Continue to work with the industry to improve the existing SSU indicators to simplify them, make them more consistent between the various programs that monitor the unavailability of safety systems (e.g., Maintenance Rule, PRA, INPO/WANO indicators, and ROP indicators), and make them more risk-informed.

Inspection Program

- Continue to evaluate and, as necessary, revise the guidance for documenting inspection findings to ensure that significance thresholds are consistently applied.

- Revise the Physical Protection cornerstone inspection procedure and its attachments to account for significant changes and new policies in physical security.

- Continue to clarify the basis for evaluating ALARA inspection findings and will revise the associated inspection procedure as needed.

- Refine the estimates for the inspection effort and budget models based on experience, continued data collection and analysis of future changes in the inspection program scope. Additional effort is needed to evaluate the quality of staff efforts under the ROP, particularly the quality of inspection and the depth and scope of inspection preparation.

- Evaluate how licensee self-assessments might be used to satisfy some requirements of the baseline inspection program without compromising overall outcome goals, including public confidence.

SDP

- Issue the plant specific Reactor Safety SDP notebooks, including the Phase 2 worksheets.

- Continue work to revise the ALARA SDP.

- Replace the interim Physical Protection SDP with a revised SDP that will be developed with internal and external stakeholder input.

- Continue to devise methodologies that will allow inspectors to develop realistic fire scenarios and improve the accuracy of site specific data used in the assessment of risk associated with fire protection findings, such as fire ignition frequency.

- Develop a process to evaluate the risk significance of plant shutdown issues.

- Improve the capability to assess the impact of external events on operating reactor safety related issues.

- Enhance the guidance provided for the assessment of concurrent deficiencies.

Assessment

- Develop additional guidance on how to address the situation where supplemental inspection for PIs indicate that there are substantive inadequacies in a licensee's root cause evaluation or corrective actions.

- Continue to evaluate how historical licensee performance issues should be treated by the Action Matrix.

- Determine whether a graded approach for removing inspection findings from consideration in the Action Matrix is appropriate.

- Continue to monitor "No Color" findings during the ongoing inspection report review process and evaluate changes in program guidance, as appropriate, to minimize their use.

- Implement lessons learned from the Spring 2001 end-of-cycle activities, such as the End-of-Cycle assessments, the Agency Action Review Meeting, and the annual meetings with licensees.

Enforcement

- Continue to pursue ways to make the SDP and enforcement processes more timely in evaluating and communicating safety significant issues.

- Discontinue the special treatment of Maintenance Rule issues when the staff has determined that the revised Maintenance Rule enforcement guidance is sufficient and is being implemented in a consistent manner among the regions.

Inspector Staffing

- Develop criteria for the Regional Administrators, in consultation with NRR, to allocate additional inspection resources to accommodate certain sites for other than performance related issues (e.g., unique design or organization features).

- Develop appropriate ROP self-assessment metrics to monitor and trend inspector demographics and program quality (e.g., inspector training time).

- Continue to refine the ROP regional resource model to look for additional efficiencies.

Based on its assessment of stakeholder feedback and the results and lessons learned from initial implementation, the staff has developed a much greater level of confidence that the ROP has met the Commission's direction to develop an oversight process that is more objective, risk-informed, understandable, and predictable. The ROP has been substantially exercised such that the staff has gained valuable insights on aspects of the ROP and identified issues that were not revealed during the pilot program. The staff recognizes that the ROP will continue to require close scrutiny and oversight and has established a self-assessment program that will identify those areas for improvement. The staff, as part of the Agency Action Review process, will continue to report to the Commission on an annual basis the results of its self-assessment and any significant changes to the ROP.

COORDINATION:

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

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

/RA/

William D. Travers
Executive Director
for Operations

Attachments:
1. Internal Stakeholder Communication and Feedback
2. External Stakeholder Comment and Feedback
3. ROP Self-Assessment Program
4. IIEP Final Report
5. Staff Response to the IIEP Final Report
6. Performance Indicators
7. Inspection Program
8. Significance Determination Process
9. Assessment Process
10. Enforcement Process
11. Key Policy Issues
12. ROP Initial Implementation Commitments
13. ROP Resource Analysis

Appendices:
A. Cross-cutting Issues
B. Resident Inspector "N+1" Policy
C. Staff Training Initiatives

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ACCESSION NO.: ML011410551

* See previous concurrence ** Concurred via e-mail
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INTERNAL STAKEHOLDER COMMUNICATION AND FEEDBACK

Task Lead: August Spector, NRR/IIPB

Attachment 1

Internal Stakeholder Communication and Feedback

Introduction

During the first year of ROP implementation, the staff expended a great deal of effort in providing information to inspectors and their managers, and obtaining feedback on the ROP and its implementation. Inspection Program Branch (IIPB) staff developed a Communication Plan that outlined activities designed to enhance understanding of the ROP among internal stakeholders. Activities conducted included stakeholder workshops and lessons-learned meetings, training courses that dealt with specific aspects of the new program, weekly regional conference calls, and management counterpart meetings. These activities provided stakeholders the means to submit questions and feedback about the process. In addition, an internal ROP Web site was made available to all NRC staff. These activities have served to improve the staff's understanding and acceptance of the revised ROP. The communication plan will be revised to reflect ongoing activities related to the ROP. Below is a more detailed discussion of key communication activities conducted during the initial implementation period.

Training Courses

The NRC Technical Training Center (TTC) developed and presented a special training course entitled "Reactor Inspection and Oversight Program (G-200)." This course was attended by 342 regional attendees, and 96 Headquarters attendees from November 1999 through August 2000. The courses were presented in each region and Headquarters, and at the TTC. The course included topic areas representing each component of the ROP. Participants used case studies, program procedures, and job-aids in interactive exercises.

The training program was designed to provide inspectors knowledge and skill in the new process in a timely manner before initial implementation, and follow-up training during the early stages of initial implementation.

Training support will be an ongoing effort with the development of additional courses and workshops. The staff formed a working group to review, assess and modify inspector training and qualification requirements to ensure current and future inspectors are adequately trained to effectively implement the ROP. Training initiatives are discussed in more detail in Appendix C of this paper.

Use of Internal ROP Web Site

An internal Web site (ROP Digital City) was developed and maintained to disseminate ROP information in a timely and efficient manner, to provide internal stakeholders awareness of current changes in the ROP, and to facilitate feedback. This site provided regional and Headquarters staff draft inspection procedures, inspection manual chapters, and internal memoranda. Web links to additional Web sites were provided to simplify retrieval of information.

Weekly Conference Calls

NRR and regional managers and staff conducted a weekly conference call to discuss issues related to the ROP and to plan for upcoming activities. NRR participants included managers and

staff from IIPB and concerned staff from other NRR divisions and NRC offices. Regional participants included Division of Reactor Projects (DRP) and Division of Reactor Safety (DRS) Division Directors, Branch Chiefs, and concerned staff members. These sessions were invaluable in reviewing the week's activities, preparing for future activities, discussing open issues, and providing feedback on program implementation.

Counterpart Meetings and Briefings

Headquarters and regional managers and staff participated in counterpart meetings to review and address emerging implementation issues and plan future programmatic direction. These meetings were attended by the regional DRP/DRS division directors and the IIPB branch chief and selected staff. In addition, IIPB and the DRP/DRS division directors participated in a video conference with the Deputy Regional Administrators to ensure their awareness of program status and to obtain feedback regarding ROP implementation.

The regions conducted a variety of special meetings, briefings and internal lessons learned sessions designed to facilitate regional implementation of the ROP. Among these included courses on the management of change and inspector counterpart meetings.

Internal Lessons Learned Workshop

In March 2001, the staff conducted an internal lessons learned workshop. The purpose of the workshop was to discuss aspects of the ROP that challenged the staff during the first year of implementation. Regional and Headquarters managers identified proposed improvement actions, and those issues that called for external stakeholder input. These issues were subsequently discussed at the public External Lessons Learned Workshop held at the end of March 2001. In preparation for the internal workshop, "focus groups" consisting of regional technical staff, inspectors, managers and Headquarters technical staff were formed. Each focus group identified the issues of concern in their assigned area and proposed improvement actions.

Inspector Feedback

A formal feedback process was developed to enable inspectors and regional staff to provide NRR with information important to improving the ROP and its implementation. The feedback process is documented in Inspection Manual Chapter (IMC) 0801, "Program Feedback." IMC 0801 describes the feedback process and provides feedback forms to be used by the staff to document issues encountered in implementing the ROP. During the first year of implementation, IIPB received feedback related to all aspects of the ROP and from all regions. Approximately 340 feedback forms were received. Most feedback forms concerned issues related to interpretation of performance indicators (PIs) (80), significance determination process (SDP) interpretation (50), and inspection report documentation (35). Many of the comments and suggestions were found to be useful and were incorporated into the program during initial implementation. Other feedback raised issues that were complex in nature or for which it was necessary to hold action in abeyance until the end of initial implementation in order to enable the program office to evaluate a broader range of data from all four regions before making changes to the program (e.g., suggested changes to procedure scope and resource estimates.) The information gained from the use of ROP program feedback forms was invaluable in making modifications to procedures and process related to initial implementation of the ROP.

Site Visits by Headquarters Staff

During the months of October and November 2000, IIPB conducted visits to six reactor sites in each region. The purpose of these site visits was to provide an opportunity for the resident and regional inspection staff and licensee managers to provide first-hand feedback on the ROP.

During these visits, the inspection staff and licensee managers discussed their experiences and observations regarding implementation of the ROP. There was a consensus on many aspects of the ROP. Overall the ROP was considered to be meeting the criteria described by the Commission when they directed the staff to revise its approach to nuclear power plant oversight. The ROP was considered more risk-informed, objective, understandable, and predictable. The increased emphasis on risk-informing processes, such as the areas of emphasis in the inspection program and the application of the SDP, focused both Agency and licensee resources and attention more appropriately on areas of risk and safety importance.

The feedback received from these site visits provided useful information that helped staff shape the issues that were eventually forwarded for discussion at the internal and public External Lessons Learned Workshops held in March 2001. Feedback indicated that the staff had mixed views regarding the efficacy of the ROP. Some NRC staff and managers were skeptical of the ability of the ROP to maintain safety and enhance public confidence. Inspectors expressed concern related to the thresholds for documenting issues that could be precursors to more significant issues in inspection reports and the manner in which cross-cutting issues are addressed in the ROP framework. Several inspectors expressed the view that the process left them unable to firmly engage licensees on lower level issues that may be predictive of future problems. Resident inspectors noted that the risk-informed baseline inspection program had eliminated much of the peripheral, less important inspection activities found in the previous inspection program. Many licensees also expressed the view that inspector efforts were more focused on areas important to safety, thus licensee resources would be more appropriately applied. However, several also noted that they did not see any notable reduction in overall regulatory burden associated with the ROP. In addition, the IIPB staff sought specific information on how well its feedback process was working and how well the training associated with the ROP prepared inspectors for carrying out the process. While there had been improved initial response to issues raised through the feedback process by IIPB, some inspectors were concerned that it was not always clear if issues received appropriate consideration. It was noted that feedback forms were not always submitted in a timely fashion by the regions when issues or questions on ROP guidance or processes arose in the field. Many times direct verbal communication with the Headquarters program office was necessary, therefore resulting in inefficient feedback.

Initial training on the ROP was viewed as positive. However, opportunities for additional training on ROP related topics such as the SDP, inspection report preparation, and specific inspection procedures were noted as desirable.

The insights obtained as a result of the site visits have been included in the appropriate ROP area in order to improve ROP efficiency and identify needed improvements.

Internal Stakeholder Feedback Surveys

In March 2001, IIPB staff conducted a survey of those individuals within NRC who were involved with the ROP initial implementation. The majority of respondents agreed that the ROP provides a realistic approach to oversight, and assures that plants are being operated safely. They consider that the process provides appropriate regulatory attention to licensees with performance problems, is objective, and is an effective risk-informed approach to oversight. Compared to the previous process, most respondents considered the new ROP to have increased predictability, consistency, clarity, objectivity, timeliness, and efficiency. It is more risk-informed and reduces unnecessary administrative burden on the NRC. Respondents agree that the ROP has resulted in a reduction of unnecessary regulatory burden on stakeholders.

In January 2001 IIPB conducted a training program needs analysis survey among regional staff. This survey requested information about staff perception of the ROP training activities provided to the regions. The majority of respondents indicated that training was offered in a timely manner and provided the necessary skill and knowledge required for implementation of the ROP.

In November 1999, at the end of the 6-month pilot program, IIPB conducted a survey to obtain feedback from staff who were familiar with the ROP at that time. When comparing this survey with the March 2001 survey, respondents generally indicated more positive ratings after the initial implementation year compared to the pilot program period. The majority of respondents showed a marked increase in their understanding and acceptance of various components of the ROP, including the SDP, the baseline inspection program, the assessment program, PIs, and internal and external communication activities.

Although some NRC inspectors may have initially indicated skepticism of the significant changes being brought about by the new program, the end-of-program 2001 survey indicates a much higher level of acceptance, and a better understanding and familiarity with the ROP. The 2001 survey data indicates that generally NRC internal stakeholders who have been involved with the implementation of the new program and are familiar with its processes have more positive acceptance than those who were surveyed after the pilot program initiative in 1999.

Survey Results

March 2001 Survey

In the March 2001 survey, a total of 234 responses were received. This represented a 43% return rate. Respondent replies were anonymous. Demographic data was kept on location, position, grade, and length of service. The survey solicited responses in five major topic areas: overall program, inspection program, assessment process, performance indicators, significance determination process. All questions were rated on a four point scale (strongly agree, agree, disagree, strongly disagree). An “unable to answer” choice was also provided. In addition, space was provided at the end of the questionnaire for additional comments.

The results of the five survey sections are provided below.

> *The numbers in parentheses in the summary below represent the combined percentage of respondents who endorsed the stated view.*

Section: Overall

The majority of respondents agreed that the ROP is a realistic approach to oversight (79%), and assures that plants are being operated safely (88%). They consider that the process provides appropriate regulatory attention to licensees with performance problems (74%), is objective (85%), and is an effective risk-informed approach to oversight (82%).

Compared to the previous process, the ROP increases predictability (75%), consistency (84%), clarity (70%), objectivity (79%), timeliness (78%), efficiency (75%) and to a lesser extent, effectiveness (57%). It is more risk-informed (96%) and reduces unnecessary administrative burden on the NRC (69%). Respondents agree that the ROP has resulted in a reduction of unnecessary regulatory burden on stakeholders (79%).

Respondents consider the information on plant performance provided on the ROP Web site to be timely (91%), understandable (written in plain English) (89%), accurate (90%), easily retrievable (86%), and adequate to keep NRC internal stakeholders informed (77%). Respondents further agree that the information provided by the NRC appropriately keeps the public informed of the Agency oversight activities related to the plants (74%).

Respondents believe that the ROP provides appropriate communication effectiveness through the use of plain language in official correspondence such as inspection reports and letters to licensees (74%) and there is appropriate inspector and licensee communication (83%).

Although respondents agree that responses from feedback forms sent to Headquarters are generally understandable (written in plain English) (67%) and accurate (65%), the majority of respondents did not believe the feedback process is timely (66%) or that feedback addresses the issues raised (55%).

Section: Inspection Program

Respondents agree that the baseline inspection program appropriately inspects for and identifies risk-significant issues (78%) which lead to objective findings whose significance can be clearly documented (71%). They consider that inspection reports are communicated accurately (89%) and in a timely fashion (95%). To a lesser extent, respondents consider the baseline inspection program report format adequately communicates relevant information to the licensees (63%), the public (60%), and to internal NRC stakeholders (56%).

Respondents strongly agree that the baseline inspection program procedures are adequate to address intended cornerstone attributes (81%), are clearly written (75%), place sufficient emphasis on planning (82%), adequately sample risk important aspects of each inspectable area (76%), and are conducted at an appropriate frequency (73%). They believe that the baseline inspection program provides appropriate coverage of plant activities and operations important to safety (63%). Less than half of the respondents consider that the level of effort for conducting each inspection is consistent with that

estimated in the inspection procedures (47%). The majority of respondents agreed that the resources needed to oversee licensees using the ROP are appropriate (61%).

Respondents agreed that the supplemental inspection procedures provide sufficient information to confirm the adequacy of a licensee's root cause and corrective action effort (69%). *It should be noted that 88 respondents did not (were "unable to answer") provide a rating to this question. This may indicate that they did not have sufficient knowledge of this area to provide a "rating".*

The majority of respondents disagreed or strongly disagreed that the ROP appropriately integrates and provides insights into cross-cutting areas (70%). Some inspectors suggested that cross-cutting issues should be documented in inspection reports and that additional inspection should be considered to address events that may have cross-cutting implications or are not adequately covered by baseline inspection, PI, or SDP activities.

Section: Assessment Process

Respondents agreed that the assessment process provides an appropriate range of actions for safety issues (82%). The majority of respondents felt that the assessment process provides for timely resolution of issues commensurate with safety significance (76%), focuses resources on areas of greatest safety significance (80%), provides objective levels of assessment (84%), and understandable thresholds (74%). Respondents felt that the new assessment process minimizes duplication and rework in preparation of assessment meetings such as mid-cycle, end-of-cycle, agency action review, and public meetings (88%),

Respondents indicated that the ROP provides sufficient attention to licensees whose performance is in the licensee response band (74%). However, they indicated less agreement regarding the ROP's ability to provide appropriate identification of declining safety performance before there's a significant reduction in safety margins (53%). Respondents indicated that the issuance of non-cited violations (NCVs) and relying on the licensee's corrective action program provides for an adequate approach to resolve issues of very low safety significance (i.e., Green findings) (80%). Respondents indicated less agreement that the assessment process applies appropriate enforcement actions (67%).

Respondents believe that the timeliness goals specified in IMC 0305 for documentation, data collection, etc. can reasonably be met (91%). *It should be noted that 57 respondents did not (were "unable to answer") provide a rating to this question. This may indicate that they did not have sufficient knowledge of this area to provide a "rating," because fewer staff were involved with assessment and all assessments have not been completed (i.e., end of year, agency action reviews, etc.)*

Section: Performance Indicators

Respondents agreed that the PIs provide useful information on risk-significant areas (79%), are clearly defined (72%), understandable (78%), and help to maintain safety (72%). They consider that PIs do provide an appropriate level of overlap with inspection findings (74%).

Possibly due to the newness of the ROP, respondents showed less agreement as to performance indicators providing an adequate indication of declining safety performance (53%) and that the ROP may foster long-term self-improvement by licensees (56%).

Respondents considered that performance indicators enhanced public confidence (65%), however, *sixty-nine (69) no responses ("unable to answer") were given to this question. This may indicate skepticism on the part of internal stakeholders or lack of knowledge of how the public understands the program.*

Section: Significance Determination Process

Respondents agree that SDP results correctly characterize the risk-significance of inspection findings (71%). They agree that the SDP focuses NRC attention on safety-significant issues (79%) and provides a basis for effective communication of inspection findings to licensees (77%), and to a lesser extent to the public (59%).

The majority of respondents consider the SDP to provide for consistent results (72%), are verifiable (84%), realistic (70%), and provide accurate results (65%). To a lesser extent. respondents agreed that the SDP is based upon clear standards (53%) and on the completeness of SDP results (54%).

The majority of respondents indicated that the significance determination process reactor safety SDPs and non-reactor safety SDPs are not easy to use (60% and 64% respectively). *It should be noted that 25 and 127 respondents respectively did not (were "unable to answer") provide a rating to these two questions. This may indicate that they did not have sufficient knowledge of this area, especially non-reactor SDPs, to provide a "rating".*

Demographic Summary

Respondents were requested to indicate four demographic issues: length of service with NRC, location, position title, and grade. A statistical analysis was made to compare respondent demographics for each question in order to show differences within each demographic category.

The data indicated some disparity between regions in how they viewed particular areas, such as the perception that the ROP increases effectiveness and objectivity, the response to feedback forms, procedures used in the baseline inspection program, resources utilized in the assessment process, and the SDPs ability to yield consistent results. Many of these disparities are a result of varying experience with the new process, uniformity of training activities, and specific plant issues. Generally, regional respondents (inspection staff and technical staff) are favorable toward the ROP, although they do remain skeptical of particular issues. Regional line managers, Headquarters technical or program staff, and Headquarters line managers were shown to be more positive in their views regarding the new process. The data indicated that staff who have been employed by NRC for less than five years indicated some dissatisfaction with the understandability and

responsiveness of internal feedback from feedback forms submitted to the region and Headquarters.

Training Activities Survey of January 2001

In January 2001, IIPB conducted a training program needs analysis survey among regional staff. This survey, completed by 147 respondents, requested information about staff perception of the ROP training activities provided to the regions. This survey found inspectors considered the training in the new ROP was offered in a timely manner (76%), to have adequately explained the basis for the oversight process change (85%), and communicated the roles of resident inspectors (72%) and regional inspectors (75%) in the new process. Inspectors considered the courses to have provided the necessary skill and knowledge required for implementation of baseline inspection procedures (68%) and understanding of performance indicators (58%), but only 49% agreed/strongly agreed the necessary training was provided related to the assessment program. Most inspectors indicated that training in the use of the SDP and inspection report documentation was inadequate (62% and 70% respectively). These two areas have been under continual development during the initial implementation period. Once these activities are finalized, additional refresher training will be provided.

Comparison of March 2001 and November 1999 Surveys

At the end of the 6-month pilot program (November 1999) the staff conducted an internal Program Survey designed to obtain feedback on the perceptions of those who were familiar with the ROP at that time. This survey garnered responses from 94 respondents, primarily from the regions. The data from the two surveys were compared. Although the questions asked in both surveys were not completely identical (the pilot program survey was not as extensive, utilized a five point scale as opposed to the four point scale, thus eliminating the neither agree/disagree option found to be uninterpretable in the November 1999 survey, and the wording of some questions was modified in the March 2001 survey) the surveys were similar enough in a number of areas to permit a comparison. The survey data presented below provides the combined agree/disagree response for those question similar in both surveys.

When comparing those questions similar in both surveys, respondents generally indicated more positive ratings after the initial implementation year compared to the pilot program period. The majority of respondents showed an increase in their understanding and acceptance of various components of the ROP, including the SDP, the baseline inspection program, the assessment program, PIs, and internal and external communication activities.

The majority of respondents to the 2001 survey agreed that the ROP provides appropriate assurance that plants are being operated safely (88% in 2001 vs. 49% in 1999) and that the ROP provides appropriate regulatory attention to licensees with performance problems (74% in 2001 vs. 41% in 1999). The majority of respondents consider that the ROP provides objectivity to the oversight process (85% in 2001 vs. 69% in 1999), that the baseline inspection program has the ability to identify risk-significant issues (78% in 2001 vs. 54% in 1999), and to produce adequate inspection to address cornerstone attributes (81% in 2001 vs. 55% in 1999). Respondents' rating of the new ROP compared to the previous process with regard to predictability, consistency, clarity, and objectivity of our inspection program improved as compared to those responding to the end-of-pilot survey (78% in 2001 vs. 56% in 1999).

As compared to those in 1999, respondents to the 2001 survey indicated much higher acceptance related to performance indicators providing useful information on risk significant areas (79% in 2001 vs 10% in 1999). The ability of PIs to provide an indication of declining safety performance showed an increase (53% in 2001 vs. 24% in 1999). Compared to the pilot survey, the majority of respondents to the initial implementation survey considered the SDP results to correctly characterize risk significance of inspection findings (71% in 2001 vs. 32% in 1999). A majority of respondents to the 2001 survey consider the new program to provide enhanced internal and external stakeholder information for keeping the public informed of the NRC's regulatory program (74% in 2001 vs. 41% in 1999). They considered the new ROP Web site to contribute to improved communications by providing internal and external stakeholders adequate information (77% in 2001 vs. 56% in 1999). Respondents indicated increased satisfaction toward the assessment program and the Action Matrix to provide an appropriate range of actions for safety issues (82% in 2001 vs. 51% in 1999). They further agreed that the assessment program is timely and efficient (76% in 2001 vs. 41% in 1999). Respondents were more positive related to the issuance of NCVs and the ability of the licensees corrective action program to provide an adequate approach to resolving issues of low safety significance (80% in 2001 vs. 73% in 1999).

Although NRC inspectors may have initially indicated skepticism of the significant changes being brought about by the new program, the end-of-program 2001 survey strongly indicates more acceptance, and a better understanding and familiarity with the ROP. The 2001 survey data indicates that, in general, NRC internal stakeholders who have been involved with the implementation of the new program and are familiar with its processes have more positive acceptance than those who were surveyed after the 6-month pilot program initiative in 1999. The data indicates that the staff considers the ROP to be heading in the direction specified in the Agency Strategic Plan. Specific feedback gained from these surveys has been considered in modifications to each area of the ROP.

EXTERNAL STAKEHOLDER COMMENT AND FEEDBACK

Task Lead: Leon Whitney, NRR/SPLB

Attachment 2

External Stakeholder Comment And Feedback

Introduction

This section contains a description of the initiatives implemented to solicit and obtain external stakeholder comment and feedback and a summary of the results of these efforts.

Summary

NRC staff made a concerted effort to continue and improve on the initiatives implemented during the pilot program to keep external stakeholders informed and to provide frequent and ongoing opportunities to submit comment and feedback. These initiatives included the external Web page, a *Federal Register* notice (FRN), and numerous forums during which public, industry, and governmental stakeholders were participants.

The staff utilized a FRN to inform the public of Agency activities and to solicit input on the initial implementation of the ROP. The elicited feedback was utilized in the ROP self-assessment program discussed in a separate section. To ensure widespread participation, copies of the notice were mailed to all individuals and organizations that had participated in previous forums or had previously submitted comments. A summary of the response to the public comment FRN is discussed later in this attachment.

Generally, overall FRN feedback indicated that initial implementation of the ROP was successful. The ROP is perceived to be an improvement over the previous processes in many respects. It has improved regulatory consistency, reduced overall regulatory burden, and improved the predictability of Agency actions. The industry is confident that the new ROP is providing adequate assurance that reactor plants are being operated safely, that sufficient regulatory attention is being given to licensees with performance problems, and that the new ROP has the potential to develop into an improved and more effective program. The industry perceives the process as being more objective and understandable, with an increase in regulatory focus on risk significance, and a reduction in regulatory burden. Industry feedback indicates that the NRC staff has maintained adherence to the new ROP as designed throughout the pilot and initial implementation periods of the new program.

In the view of industry, as expressed in their FRN responses, licensees and industry organizations have been afforded adequate opportunity to provide input and comments on the new ROP, and to become involved in the ROP development process. Industry and some other responding organizations, such as the Union of Concerned Scientists and the State of Pennsylvania, indicated that the NRC has conscientiously sought public participation in the development of the new ROP. Despite providing an overall positive view of the ROP, industry had many comments targeted at improving the ROP, most addressing the performance indicators (PIs) and the significance determination process (SDP). Industry considers certain portions of the SDP to be too complex (especially for the public to understand), and overall the SDP is viewed as a work in progress.

The FRN responses of the Union of Concerned Scientists and the Commonwealth of Pennsylvania were more mixed regarding the new ROP. Their respective responses provided selective observations and suggestions for ROP improvement.

The State of New Jersey, and the public interest groups Three Mile Island Alert and EFMR Monitoring Group, were much less favorable regarding the new ROP. They expressed the belief that the ROP is poorly focused, will not identify declining performers (at least in a timely manner), and will not result in adequate assurance of safe commercial nuclear reactor operation. TMI Alert, EFMR Monitoring Group, and Mr. Marvin Lewis of Philadelphia, Pennsylvania indicated that the new ROP is a step backwards. EFMR Monitoring Group was critical of the NRC's performance in communicating with the public regarding NRC oversight activities and the safety performance of licensees. EFMR Monitoring Group stated that the NRC staff's public outreach has missed the mark at the local community level (near the TMI and Peach Bottom sites). The State of New Jersey expressed its frustration at the NRC's apparent lack of attention to its numerous comments.

External stakeholder feedback has been factored in to the spectrum of IIPB efforts to improve the new ROP.

Communication and Feedback Initiatives

IIPB staff developed a Communication Plan that outlined activities designed to enhance the understanding of the ROP among external stakeholders. Activities conducted included public meetings at each power plant site, lessons learned workshops, monthly public meetings with the industry and concerned stakeholders, establishment of an external Web site, and publication of a plain language NUREG that explained the new process.

In general, public and industry stakeholders expressed appreciation of the Agency's efforts to provide information on the ROP and to consider stakeholder input. The staff will continue to conduct outreach activities, including routine public working meetings to discuss on-going process development and revision, public meetings with citizens near power plants to provide current plant status under the ROP and results, FRNs to solicit public comment, and continued improvement and updating of the external Web site. The staff will also consider additional Agency outreach activities in order to keep members of the public local to plant sites cognizant of NRC's mission, role, and activities.

The Office of Public Affairs, in conjunction with NRR, published an updated revision of NUREG-1649, "Reactor Oversight Process," in April and July 2000. This plain language pamphlet will be periodically reviewed to determine if it should be revised to reflect process changes and updates.

Subsequent to initial implementation, the communication plan will be revised to reflect ongoing activities related to the ROP.

Below is a summary of key communication activities conducted during initial implementation.

ROP Web page

The staff has continued to maintain the ROP Web page. The primary goals of the ROP Web page are to provide ROP information to internal and external stakeholders that is timely, useful, accurate, and user-friendly. The ROP Home page (http://www.nrc.gov/NRR/ OVERSIGHT/-index.html) serves as the primary gateway into the vast array of information available regarding reactor oversight. It provides introductory remarks, a direct feedback mechanism, and hyperlinks

to several subpages, including the plant assessment results, ROP program documents, ROP meeting notices and summaries, and a “plain English” description of the ROP. The Plant Assessment Results page (http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/index.html) provides the most recent information on the performance of the nation's nuclear power plants, using PIs and NRC inspection findings to determine the applicable Action Matrix column for each plant. In addition, the staff continues to make changes to improve the effectiveness of the Web information. The most notable Web improvements include the development of summary matrices for the PIs, inspection findings, and Action Matrix designations, and providing information on the Initial Implementation Evaluation Panel process and results.

The staff has solicited and received feedback on the effectiveness of the ROP Web page in meeting its goals primarily through workshops, surveys, and direct feedback from the Web page itself. The majority of the feedback, from both internal and external stakeholders, has been very positive, although there have been some suggestions for improvement.

Specific comments of note on the ROP Web page and staff actions planned or taken include:

(1) Plant performance should be organized by a top-down approach starting with an overview of each plant’s performance based on the Action Matrix outcomes, with all of the site-related documents linked to the individual site pages.

The Action Matrix Summary Page (http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/-actionmatrix_summary.html) was developed and has been revised to afford stakeholders a top-level view of relative performance for all plants, with the ability to drill down into more detailed individual plant performance information.

(2) It is confusing to portray “No Color” findings as blue on the Web pages.

The Web pages have been revised to replace the blue color with a gray color. The broader issue regarding the use of “No Color” findings is addressed in the assessment attachment (Attachment 9).

(3) The public’s focus has been on performance indicators due to their predominant exposure on the Web pages.

The structure and format of the Web pages were improved to emphasize that the staff’s assessment of plant performance and resultant actions are based on both inspection findings and PIs.

(4) Enhance the use of plain English to make the ROP information more understandable.

The ROP Web pages have been improved to make them more user-friendly and understandable to our stakeholders, though the staff recognizes that continued improvements in this area are warranted and plans to add more “plain English” descriptions in the future.

(5) For only approximately one third of the inspection findings on the NRC Web site was it possible for knowledgeable representatives of a public interest organization to reconstruct the logic path which culminated in the finding's color.

The staff plans to improve the Web page design and inspection report writeups to more clearly describe the finding and its significance. The staff is continuing to monitor inspection report documentation to ensure improvements are made with respect to clear descriptions and rationales utilized in arriving at the final significance of issues (see Attachment 7, Inspection Program). In addition, the staff plans to improve Web page linkages to make it easier to navigate to associated or supporting information.

The staff will continue to solicit and make improvements to its ROP Web page to ensure that it is a useful communication tool in providing accurate and timely ROP information to all stakeholders.

Public Meeting Outreach Efforts

The staff conducted public meetings at least monthly during initial implementation to discuss ongoing development and address implementation issues, including responding to frequently asked questions (FAQs) associated with the PI guidance contained in NEI 99-02, "Regulatory Performance Indicator Guideline". These meetings were working sessions between the staff and the Nuclear Energy Institute, industry representatives, public interest groups, and interested members of the public. These meetings were an important vehicle for continuing to provide openness to the development and implementation of the process and being responsive to external stakeholder concern. Much information was shared with all participants in an effort to keep the public informed of staff activities.

During the first few months of initial implementation, the staff conducted evening public meetings at each of the power plant sites. The purpose of these meetings was to orient local citizens with the ROP. During each meeting, the staff explained the Agency's mission and role, explained why the Agency revised its process, and described how the new process worked. A presentation template was developed for use by regional staff presenters to ensure that consistent key messages were provided.

The staff also conducted interim lessons learned workshops in each region in the Fall of 2000. These 1-day public meetings were organized in cooperation with industry representatives to assist the staff in gaining input from industry and regional staff and to address specific questions that were of importance to stakeholders.

During the months of October and November 2000, the NRR staff conducted a series of visits to sites in each region. The purpose of these site visits was to solicit feedback on the ROP. These one day visits involved six sites in each region where both resident inspector staff and licensee management were asked to discuss their experiences and observations regarding implementation of the ROP. Following the site visits, regional management was asked to provide similar information. There was general consensus on many aspects of the ROP that were considered successes relative to its implementation to-date. There were also several areas that were generally considered to require more information to make an informed judgement or required additional effort to revise or modify the process. Lessons learned from these visits were used to develop focus areas for subsequent working meetings.

The staff conducted a public External Lessons Learned Workshop, March 26-28, 2001, to bring together the NRC and external stakeholders to discuss, review, and develop recommendations associated with key issues that have emerged during the first year of initial implementation of the new ROP. Specific topic areas discussed during that workshop included: reactor safety performance indicators, fire protection, radiation safety, cross-cutting and problem identification and resolution, maintenance effectiveness, physical protection, assessment and enforcement, and communication issues. Other issues raised at this workshop by external stakeholders have been documented and are being reviewed by the staff. A copy of the meeting minutes for this workshop are available on the NRC ROP Web site.

The staff gave presentations at a variety of workshops and courses sponsored by various nuclear oriented associations and universities. The staff also made presentations at several international conferences and met with foreign visitors to the NRC.

Comments from the Federal Register Notice

The outreach FRN was issued on January 10, 2001, soliciting public comments regarding suggestions for topics to be considered in the March 2001, public External Lessons Learned Workshop and on the first year of initial implementation of the ROP. The deadline for ROP comments was April 13, 2001.

With respect to the first year of initial implementation of the ROP, the FRN requested responses to 17 specific questions related to two general ROP areas: (1) the efficacy of the overall process, and (2) specific ROP program areas. The NRC received 14 sets of external comments in response. The responses were utilized in the ROP self-assessment program, described in a separate section of this paper. The most salient comments received, and the staff response, are discussed in more detail in the individual attachments of this paper for each of the oversight processes. While each comment has not been addressed, all comments were appropriately considered in the staff's efforts to make process refinements based on the entire spectrum of stakeholder comments received.

FRN ROP comments were received from the following:

- Union of Concerned Scientists (UCS)
- Nuclear Energy Institute
- Entergy Operations, Inc.
- Exelon Generation Company, LLC
- Southern California Edison
- Dominion (Virginia Electric Power Company)
- Rochester Gas and Electric
- Tennessee Valley Authority
- Strategic Teaming and Resource Sharing (STARS) (representing TXU Electric, AmerenUE, Wolf Creek Nuclear Operating Corporation, Pacific Gas and Electric Company, and STP Nuclear Operating Company)
- Pennsylvania Department of Environmental Protection
- New Jersey Department of Environmental Protection
- Three Mile Island Alert
- EFMR Monitoring Group

- Mayor of Auburn, Nebraska
- Mr. Marvin Lewis

Eleven overarching themes were synthesized from the FRN comments. These were:

- Industry, and some non-industry, respondents were generally satisfied with the new ROP, but had specific suggestions for improvement. Industry, and some non-industry, responders appreciated the consistency and predictability of the new ROP's inspection, SDP and assessment components. Further, industry respondents were optimistic regarding the new ROP's potential to develop into an improved and more effective program. However, given this overall positive view, these respondents still had specific comments on how to improve the new ROP.

- Some non-industry responders did not have confidence in the new ROP. Some non-industry responders stated that the new ROP is poorly focused, does not identify declining performers, and does not result in adequate assurance of safe commercial nuclear reactor operation. TMI Alert, EFMR Monitoring Group and Mr. Lewis view the new ROP as a step backwards. However, no respondents from industry concurred in this viewpoint.

- Some non-industry respondents had the opinion that the NRC has not successfully communicated with the public regarding NRC oversight activities and the safety performance of licensees (possibly, in part, due to the complexity of certain aspects of the new ROP, such as the Significance Determination Process). One public interest group (EFMR Monitoring Group) stated that the NRC staff's public outreach has missed the mark at the local community level in the Three Mile Island and Peach Bottom site areas.

- Respondents were generally satisfied with the content and utility of the new ROP Web pages. Industry and peer regulatory body respondents were concerned that the Web pages may tend to create confusion and erroneous conclusions when accessed by non-experts in the nuclear field.

- Industry, and some non-industry, respondents stated that the NRC has conscientiously sought public participation in the development of the new ROP. However, the State of New Jersey expressed frustration at the NRC's perceived lack of attention to its numerous comments.

- The PI component of the new ROP received a large variety of critical comments focused on its improvement.

- Industry, and some non-industry, responders expressed the opinion that resolving overlap and/or inconsistencies between NRC, WANO, Maintenance Rule, and probabilistic safety assessment (PSA) reporting requirements is of urgent importance.

- Although it is a "work in progress," the SDP was considered by industry, peer regulatory body and public interest groups to be an improvement over past inspection finding significance determination efforts. However, some SDP methodologies in certain subject areas were considered to be slow, and can be complex to the point of being burdensome. Further, these respondents stated that sometimes SDP methodologies are technically

beyond inspector's implementation skills, and some methodologies are not fully developed.

- UCS stated that the ROP does not provide sufficient regulatory attention to utilities with performance problems. TMI Alert was concerned that the NRC has stated that a given reactor plant can have multiple Red PIs and continue to operate ("there are no failing grades" in performance assessment). The State of New Jersey broadly criticized the assessment process (while conceding its risk focus) as complicated, cumbersome and difficult to use, forcing interested persons to "piece together the performance puzzle." Industry indicated that it was pleased with the assessment process, but offered specific criticisms and suggestions for improvement.

- No public interest group, peer regulatory body or industry responding organization stated that the overall regulatory burden associated with the new ROP has increased inappropriately, and most respondents believe that the overall regulatory burden has decreased. Industry had specific suggestions for further reducing regulatory burden. UCS stated that the burden associated with information reporting associated with PIs is necessary. It was the Commonwealth of Pennsylvania's view that the licensee's reporting effort was considerable, but this effort was offset by other changes brought by the new ROP. Industry stakeholders stated that overall regulatory burden has been reduced, but saw opportunities for increased efficiencies (e.g., combined programmatic inspections across multiple sites, inspection frequency reductions, NRC acceptance of licensee self-assessments in lieu of NRC inspections, and integrated PI, WANO, and Maintenance Rule information reporting requirements). TVA pointed out that, for previously SALP Category 1 licensees, regulatory burden may have increased even though overall industry regulatory burden appears to have decreased under the new ROP. TVA saw radiation protection inspection and parallel PI data collection as combining to result in an unnecessary increase in regulatory burden. TVA endorsed a change from "N+1" to "N" ("N" = number of reactor units per site) resident inspectors using public risk per reactor unit as justification.

- Industry stated that periods of enforcement discretion are appropriate when new PIs and major ROP process changes are piloted or initially implemented nation-wide. In a related vein, the industry endorsed the pilot process as an appropriate means of testing changes to the new ROP.

The specific FRN questions, and summaries of the replies provided by the respondents, are provided below:

I. Questions related to the efficacy of the overall process:

1. Does the ROP provide adequate assurance that plants are being operated safely?

NEI indicated that the new ROP is ensuring safe reactor operation. However, the responding public and a peer regulatory organization did not fully agree. The State of New Jersey stated that the credibility of the PI system is suspect due to it's sparse non-Green performance indications, there are too few inspection hours allocated within the new ROP, relatively few non-Green inspection findings are developed, and that a significant portion of inspection findings are licensee self-identified (a concern echoed by Mr. Lewis). EFMR Monitoring Group alone stated that onsite inspection and oversight has been reduced under the new ROP. UCS recommended that the staff study the correlation between inspection hours and the identification of inspection findings (to better focus the inspection component of the new ROP).

2. Does the ROP provide sufficient regulatory attention to utilities with performance problems?

Industry stated that the new ROP provides sufficient regulatory attention to utilities with performance problems. UCS did not agree, citing a specific instance involving a steam generator tube integrity issue Red finding at Indian Point 2 (although the Red finding indicated a "significant reduction in safety margin," the NRC waived the 30-day deadline so that Consolidated Edison could focus on unit restart and power ascension). The State of New Jersey's position is that the attention paid to licensees with performance problems is too narrow.

3. Does the ROP reduce unnecessary regulatory burden on licensees?

All respondents were of the opinion that regulatory burden has decreased overall, and, in many cases, has increased appropriately in some narrow areas (e.g., PI reporting). However, some respondents considered certain SDP methodologies in certain subject areas to be slow, and complex to the point of being burdensome (e.g. fire protection SDP). Industry had numerous suggestions for decreasing regulatory burden further. [These suggestions are provided in answer sets elsewhere within this section.]

4. Does the ROP improve the efficiency, effectiveness, and realism of the regulatory process, focusing NRC resources on those issues with the most safety significance?

NEI stated that the greatest improvement in inspection focus is in the reactor safety area, where the PIs and reactor SDP have permitted the NRC and licensees to allocate resources based on safety significance. NEI also stated that the gains in inspection focus efficiency, effectiveness and realism have been less pronounced in the radiation protection, physical security and safety system design inspection areas. TVA commented that there appears to be an unwarranted

increase in inspection hours in the area of radiation protection, and TVA and Entergy commented that the “N+1" resident inspector policy leads to uneven routine inspection burden for single-unit facilities. Peer regulatory bodies, public interest groups and general members of the public did not respond directly to this question.

5. Has the public information associated with the ROP been appropriate to keep the public informed, in a timely manner and understandable fashion, of NRC activities related to plant safety?

The State of New Jersey was satisfied with inspection report issuing goal of about a month (for resident and regional DRS reports), as well as the staff’s performance in meeting that goal. However, the State of New Jersey had the opinion that non-Green inspection findings take too long to assess, and the quarterly availability of PI and inspection finding information makes the information less than current (making the new ROP a lagging assessment program). Industry, public interest groups, and general members of the public did not respond to this question.

6. Does the ROP increase the predictability, consistency, clarity and objectivity of the NRC’s oversight activities?

Industry stated that the ROP increases the predictability, consistency, clarity and objectivity of the NRC’s oversight activities. Industry also commented that the information is timely and the program is transparent. However, TVA stated that it has not observed “very appropriate regulatory responses” for issues identified in the non-reactor safety cornerstones where less risk-based PIs and SDPs exist.

7. Has the public been afforded adequate opportunity to provide input/comments and involvement in the ROP development process?

Although no respondent except EFMR Monitoring Group was critical of the NRC’s overall outreach effort (EFMR believing that, on the local level, the NRC has not been successful), a variety of respondents had suggestions on how better to conduct public meetings, obtain public and industry feedback on the ROP, and display information, choose content, and display inspection report results on the Web pages. The Commonwealth of Pennsylvania observed that the SDP is a complex and complicated process for the public to understand [and therefore the SDP is considered by the Commonwealth of Pennsylvania to be a de facto barrier to public understanding of the regulatory process]. The Commonwealth of Pennsylvania pointed out the potentially confusing dichotomy between licensee “Excellence” and the NRC’s “Maintaining Safety” goals for members of the public. The State of New Jersey was critical of the difficulty it has had in putting the overall reactor licensee performance picture together under the new ROP.

8. Has the NRC been responsive to input/comments provided by the public regarding the ROP development process?

Industry stated that the NRC has been responsive to input by the public during the ROP development process. However, the State of New Jersey complained that its numerous comments have had little impact on the ROP development process. Public interest groups and general members of the public did not respond directly to this question.

9. Please provide any additional (brief) information or issues related to the reactor oversight process.

NEI and TVA were satisfied with the usefulness of the NRC Web pages, and expressed appreciation for instances in which inspectors had provided verbal, informal feedback on plant operations. TVA was satisfied with the objectivity of the annual licensee/NRC ROP meetings. NEI and responding reactor licensees had numerous comments on how to improve the new ROP and the process surrounding it's further development. Public interest groups and general members of the public did not respond directly to this question.

II. Questions related to specific ROP program areas

1. Do the performance indicators or other aspects of the ROP create unintended consequences? (Please comment on the potential of unintended consequences associated with the counting of manual scrams in the Initiating Event Cornerstone Performance Indicators.)

NEI commented that increased regulatory oversight of planned unavailabilities of equipment can have a number of unintended consequences, elaborating that it is important that licensees not be unwisely penalized for taking appropriate actions to operate their plants in a safe and economical fashion (e.g. conducting unplanned mitigating system unavailabilities). Entergy commented that the NRC PI for safety system unavailability may encourage more "stacking" of system maintenance during online maintenance (in order to manage the indicator) than might be appropriate from a risk perspective.

STARS commented that the Mitigating Systems PIs measure only unavailability and are not a balance between unavailability and reliability. STARS commented that maintenance on mitigating systems during (licensing basis approved) allowed outage times (AOTs) may result in White PI values and additional inspections, even though the AOT would have been obtained by demonstrating adequate protection to the health and safety of the general public.

STARS took exception to the practice within the current ALARA SDP to equate the accuracy of ALARA job planning dose estimates directly to safety and safety significance, since the dose estimates are set low to encourage proper worker behaviors. STARS points out that this can be perceived as creating an unintended disincentive to ALARA planning goals.

TVA commented that experiences with the treatment of estimated fault exposure time (t/2 time) have shown that this metric can arbitrarily raise the regulatory significance of certain issues.

The State of New Jersey responded that, unfortunately, the ROP is becoming a two tiered system: plants that are all Green, and plants that are not all Green. Licensees focus great effort on getting non-Green findings reduced in color. The State of New Jersey continued that the unintended consequence is that plant owners will do everything possible to eliminate any PIs or change inspection findings that are not Green. This minimizes the role of the inspectors in the process.

2. Do any aspects of the ROP inappropriately increase regulatory burden? (Please comment on any unnecessary overlap between ROP reporting requirements with those associated with INPO, WANO, or the Maintenance Rule.)

Non-industry respondents stated that the regulatory burden associated with PI reporting requirements is appropriate. NEI stated that overall regulatory burden decreased under the new ROP. All industry respondents recommend early integration of WANO, INPO, Maintenance Rule and NRC PI information reporting requirements. NEI and Rochester Gas and Electric suggested decreasing regulatory burden by reducing PI inspection effort, and offered a number of other specific suggestions targeted at reducing current regulatory burden under the new ROP. TVA points out that previously “SALP 1" (top performing) reactor plants may have experienced an increase in regulatory burden under the new ROP. UCS stated (without elaboration) that necessary regulatory burden may have been reduced as an unintended consequence of reducing unnecessary regulatory burden. The Commonwealth of Pennsylvania stated that some members of the public continue to be skeptical of the idea of “reducing regulatory burden” on licensees [presumably these members of the public do not see such reduction as an appropriate feature or concern of the regulatory process].

3. Is the Significance Determination Process (SDP) usable and does it produce consistent and accurate results?

Although industry stated that the SDP process generally produces consistent and accurate results, industry had numerous suggestions for improving the various SDP methodologies and the SDP implementation process. There was general agreement among all respondents that portions of the SDP (e.g., fire protection) are time consuming and complex, and completion and distribution of the Phase 2 Worksheets for the Reactor Safety SDP is a much needed improvement. UCS stated that information provided by licensees during the SDP process should be subject to 10 CFR 50.9 sanctions (just like licensee provided PI information). UCS stated that the SDP process is too slow. UCS stated that the SDP does not provide consistent and accurate results, and provided two inspection finding case histories from Beaver Valley Unit 1 to make the case that the SDP is

fundamentally flawed (in that it permits inadequate justifications for designating findings as Green).

4. Are there areas of unnecessary overlap between the inspection program and the performance indicators?

NEI commented that there is unnecessary overlap in the area of radiation safety inspection and the Occupational Exposure Control Effectiveness PI.

5. Does the ROP assessment program provide timely, consistent, and relevant assessment information?

Compared to the previous SALP process, the industry was satisfied with the quality and timeliness of assessment information, although industry would appreciate it if inspection report information on the Web were issued more timely than quarterly. The State of New Jersey viewed the ROP as a "lagging" assessment program, that suffers somewhat from its information being posted on the Web generally one quarter after the information was first developed. STARS had specific comments on restructuring the Action Matrix to better weight the Reactor Safety strategic performance area.

6. Has the NRC implemented the ROP as defined by program documents?

NEI stated that the NRC is following the Action Matrix without exception, and in general appears to be following its new ROP process procedures. However, NEI commented that it has seen inconsistencies across the NRC regions. It is NEI's interpretation that this is in part due to the process being only a year old. STARS commented that throughout the pilot and initial implementation periods the staff endeavored to maintain strict adherence to the program as designed. Peer regulatory bodies, individual licensees, public interest groups, and general members of the public did not respond directly to this question.

7. Please provide any additional (brief) information or comments on other program areas related to the reactor oversight process. Other areas of interest may be: the treatment of cross-cutting issues in the ROP, the risk-based evaluation process associated with determining event response, and the reduced subjectivity and elevated threshold for documenting issues in inspection reports.

NEI agreed with the ROP key premise that weaknesses in cross-cutting issues will manifest themselves in PIs and inspection findings. NEI endorsed the proposed PI replacement for counting automatic and manual scrams, and concurs that these new PIs will place the emphasis on the proper area. TVA and NEI did not believe that manipulation of the unplanned power change PI is occurring. Industry and the Commonwealth of Pennsylvania had numerous comments targeted at future improvements to the new ROP. UCS commented that the exclusion of design deficiencies from the safety system unavailability PI non-conservatively inflates safety system availability numbers. Three Mile Island Alert was concerned that the

NRC has stated that a given reactor plant can have multiple Red PIs and continue to operate.

ROP SELF-ASSESSMENT PROGRAM

Task Lead: Alan Madison, NRR/IIPB

Attachment 3

Reactor Oversight Process Self-assessment Program

Background

The reactor oversight process (ROP) development model presented in SECY-99-007, "Recommendations for Reactor Oversight Process Improvements," dated January 8, 1999, included an ongoing self-assessment process that would utilize objective measures and pre-determined criteria to monitor the performance of the ROP. During the 6-month ROP pilot program, criteria were established to evaluate the results of implementing each of the components of the ROP at the pilot plants. In addition, the staff employed a number of methods to obtain internal and external stakeholder feedback. The results of these efforts were used by the staff and the Pilot Program Evaluation Panel (PPEP) to aid in determining the efficacy of the new process and the advisability of proceeding to initial implementation. The ROP transition plan presented in SECY-00-0049, "Results of the Revised Reactor Oversight Process Pilot Program," dated February 24, 2000, stated that the staff would continue to perform program self-assessments to collect additional lessons learned and gain insights from the new oversight process.

Development

Employing the lessons learned from the pilot program, the staff began development of a program for monitoring the major components of the ROP. The major components of the ROP are: (1) the performance indicators, (2) the inspection program, (3) the significance determination process (SDP), and (4) the assessment process. The ROP self-assessment program utilizes eight criteria. The first four criteria monitor the ROP's ability to be: (1) objective, (2) risk-informed, (3) understandable, and (4) predictable. These criteria derive from the original design objectives of the ROP. The other four criteria monitor the ROP's ability to: (1) maintain safety, (2) increase public confidence, (3) make NRC activities and decisions more effective, efficient, and realistic, and (4) reduce unnecessary regulatory burden on stakeholders. These criteria derive from the Agency's performance goals as outlined in the Strategic Plan.

Via a series of facilitated working meetings involving selected program experts from the Office of NRR, the Office of Enforcement, and the Office of Research (RES), the staff first developed a set of questions with the objective of defining the ROP performance information necessary to assure achievement of each criteria. Subsequent meetings focused on developing metrics to measure or indicate ROP performance with respect to each question. The proposed criteria, questions and metrics were presented to regional and Headquarters management for review and comment. Following incorporation of their comments, the results were presented to the Initial Implementation Evaluation Panel (IIEP) for review and comment. The resultant criteria and metrics were issued for implementation on October 18, 2000. The first set of partial data was collected during November and December 2000, and the IIEP was briefed on initial results on January 10, 2001.

Self-Assessment Metrics

As part of implementing a Planning, Budgeting, and Performance Management (PBPM) process, the Agency has developed program-level operating plans, that include performance measures

and targets. The ROP self-assessment program is not meant to replicate or replace this activity, however, many of the same or similar measures and criteria are used.

The proposed metrics rely on information from various sources, including the Reactor Program System (RPS), the inspection program, periodic independent audits, stakeholder surveys, and public comment. In addition to the metrics developed for each major component of the ROP, metrics of a more general nature have been developed utilizing stakeholder feedback to gauge overall performance.

With the exception of stakeholder surveys, *Federal Register* notice responses, and some audit results, data is collected quarterly. Stakeholder surveys and *Federal Register* notices will be issued periodically, as appropriate. Also, periodic equipment trending reports issued by RES are reviewed to identify additional insights into ROP performance.

The data are compared to specific, pre-established criteria and an analysis of its meaning or programmatic impact is completed. Thus a favorable comparison of data to criteria would indicate the ROP met the process goals and objectives and likely no programmatic changes would be recommended. However, in the event of an unfavorable comparison, more analysis would be required to determine causal factors and develop planned process improvements.

Success criteria for each of the performance metrics have been established. In most cases, success is defined as an improving trend. Quantitative success criteria for many of the performance metrics could not be developed, because of the newness of the ROP and the resultant lack of data needed to establish thresholds. For these metrics, baseline data was collected and will be used to monitor trends and establish thresholds for action, as appropriate. Consequently, success of the first year of implementation can not be assessed by the metrics alone.

Reports

Two types of reports will be issued. Each quarter, graphical presentations of performance metrics, including current data compared with established criteria, and a summary of self-assessment performance metric outcomes that highlight any areas of concern and proposed corrective actions will be issued. Each year the staff will also issue an annual report, consisting of an overall summary and several attachments. The overall summary report will address the following areas: (1) efficacy of the ROP, (2) industry performance trends, (3) resource expenditures, (4) public interaction, and (5) any other considerations. The first annual report will be issued by June 30, 2001. All reports will be made available on the ROP internal and external Web sites.

Conclusions

While it is too early to draw detailed conclusions from the self-assessment data collected to date, some general statements can be made regarding the efficacy of the ROP. In general, the ROP has been successful in being more objective, risk-informed, understandable, and predictable than the previous process. In addition to other objective measures, comments received from internal and external stakeholders support this conclusion and represent an improving trend in perception of performance since initial implementation. In contrast, internal stakeholders are critical of the training provided prior to initial implementation and of the responsiveness by Headquarters staff

to regional feedback. The remaining criteria: maintain safety, increase public confidence, improve effectiveness, efficiency and realism of NRC activities and decisions, and reduce unnecessary regulatory burden, are harder to determine and will require additional time to assess. For example, the impact on safety of any regulatory approach cannot be gauged quickly, since: (1) many factors affect safety, (2) there is some normal variation in indicators, (3) there is usually a significant lag time between a regulatory change and the full manifestation of its impact, and (4) conditions that potentially impact safety may exist for some time before detection (e.g., design and latent errors). However, it should be noted that the ROP self-assessment program is a continuous process that includes responding to noted deficiencies and incorporating improvements in an on-going manner.

It should also be noted that the self-assessment program itself is still undergoing development and review. New metrics may be added to provide a more complete picture and some metrics may be eliminated if found to not provide an accurate indication of ROP performance. ROP self-assessment program changes will be identified in the annual report.

Insights based on the results to date regarding individual aspects of the ROP are discussed in the attachments of this paper focused on performance indicators, inspection program, significance determination process, and assessment.

IIEP FINAL REPORT

Attachment 4

REACTOR OVERSIGHT PROCESS

INITIAL IMPLEMENTATION EVALUATION PANEL

FINAL REPORT

MAY 10, 2001

ADAMS ML011290025

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EXECUTIVE SUMMARY

On May 17, 2000, the Commission directed the NRC staff to convene a panel under the Federal Advisory Committee Act to evaluate the first year's implementation of the Reactor Oversight Process (ROP). The Initial Implementation Evaluation Panel (IIEP) was established on October 17, 2000. The panel met six times between November 2000 and April 2001.

The IIEP has concluded that the ROP is a notable improvement over the previous licensee performance assessment program and should be continued. The reactor oversight process has made progress toward achieving the Agency's four performance goals: 1) maintain safety, 2) increase public confidence, 3) increase regulatory effectiveness and efficiency, and 4) reduce unnecessary regulatory burden. In addition, the process provides a more objective, risk-informed, predictable, and understandable approach to the oversight of commercial nuclear reactor facilities.

The NRC and the nuclear industry expended substantial time and effort communicating with their staff members and public stakeholders about the process changes and paradigm shifts embodied in the ROP. Although the change-management tools used to communicate and carry out the changes were generally successful, the panel identified continuing tension as a result of three changes in regulatory philosophy: maintaining safety rather than improving safety, applying risk-informed regulation rather than deterministic regulation, and using indicative measures of performance rather than predictive measures of performance. To a large extent, stakeholder concern with these regulatory changes are common denominators for the various issues identified by the panel. The tension created by these underlying changes has affected the degree to which the performance goals of the ROP can ever be fully achieved according to various stakeholders' perspectives about what constitutes a successful oversight process. On the other hand, it is this tension that helps to ensure that the NRC, the industry, and public stakeholders will continue to engage in creative dialogue focused on the safe operations of nuclear power reactors. The panel considers the interaction among stakeholders throughout the development process, and going forward, to be an important feature of the ROP. Continued management attention is needed to sustain genuine and substantive interaction among stakeholders, mindful of the challenges and creative potential inherent in the tensions of the complex nuclear regulatory environment.

An ancillary common concern raised by the panel members in evaluating the specific issues discussed in the report is the continuing need for sufficient resources to maintain the formal processes and infrastructure for the ROP. NRC resources are needed to evaluate, pilot, communicate, and implement future enhancements and ensure regional consistency. Although the staff has learned many lessons from the first year's implementation and has already made numerous changes, there are many issues to be resolved and still other issues to be discovered as the ROP continues to evolve. The many issues regarding the significance determination process reflect the degree of change in the use of risk insights in the ROP and the substantial work that remains to complete development of the staff's suite of tools.

The panel considered the following recommendations as high priority:

- Establish a formal program and assign sufficient resources to enhance communications necessary for improving the ROP. The program should accumulate lessons learned, provide multiple and diverse opportunities for comment to all internal and external

stakeholders, respond to stakeholders' comments, and have a process for making timely process changes.

- Revise the ROP communication plan to include outreach activities designed to inform the public about the process and its relationship to the Agency's mission of protecting the public health and safety. Appropriate resources should be provided to revise and implement the communication plan. Evaluate additional improvements to the information on the ROP Web page to improve and simplify public access to the information. Identify methods, using stakeholder input, to improve public outreach efforts.

- Establish a structured ongoing program to evaluate long-term ROP effectiveness and to test ROP assumptions. As a minimum, this includes integrating the insights of the ROP self-assessment program and the overall assessment of industry performance. The staff should also consider periodically engaging internal and external stakeholders to independently assess the ROP.

- Continue the efforts of the cross-cutting issues task force and clarify the ROP guidance on the identification and disposition of cross-cutting issues.

- Evaluate lessons learned from initial implementation to achieve parity in the treatment of risk-significant inspection findings and crossed performance indicator thresholds. The evaluation should verify that the outcomes from the performance indicators and inspection findings accurately reflect the significance of the issues. The staff should consider addressing this issue by adjusting the Green/White thresholds or modifying the Action Matrix.

- Ensure that the staff's ROP self-assessment program identifies and evaluates any unintended consequences or unnecessary regulatory burden caused by the performance indicators and that changes are made where appropriate.

- Expedite the efforts to resolve the concerns about the safety system unavailability performance indicators and implement any needed revisions to NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," to achieve consistency with other applications.

- Evaluate the inspection approach for the physical protection cornerstone and revise the inspection program as necessary after the pending safeguards performance assessment pilot program and the physical security rulemaking are completed.

- Validate and issue the revised reactor safety significance determination process Phase 2 worksheets.

- Continue efforts to obtain improved and standardized risk analysis tools for the reactor analysts.

- Review lessons learned from use of the fire protection significance determination process, and improve the risk characterization tool to make it more meaningful, effective, and efficient.

- Continue development of an improved physical protection significance determination process.

- Evaluate the need for other significance determination tools. The staff should carefully evaluate any potential changes against the Agency's goals. For example, a new significance determination process that increases regulatory burden should have a corresponding benefit in maintaining safety or increasing the Agency's effectiveness.

- Evaluate lessons learned from initial implementation and revise the as-low-as-reasonably-achievable (ALARA) significance determination process as necessary.

- Evaluate a graded approach for resetting non-Green inspection findings as entry conditions into the Action Matrix.

- Evaluate and clarify the guidance on the designation, definition, and use of what are presently called "No Color" findings, and find a more appropriate term for these findings.

As part of its evaluation, the panel reviewed the staff's self-assessment program and the performance measures for the ROP. The panel concluded that the self-assessment program has the necessary elements to evaluate the ROP against the Agency's performance goals; however, the panel could not evaluate the effectiveness of the program given that the first year's assessment data are not yet available. Nevertheless, the panel found that, for the most part, the staff had identified the same issues the panel identified.

The IIEP had the benefit of information obtained during the first full year of nationwide implementation of the ROP. During the year, the oversight process elements were extensively exercised and many experiences that exemplified concerns and issues were available for the panel's consideration. The panel observed that the staff actively solicited stakeholder input throughout initial implementation, as it did during development and piloting of the ROP. The panel believes that the level of stakeholder involvement has been unprecedented for an NRC process change and is reflected in the quality of the process. Public workshops, public meetings near all facilities, surveys, and formal internal feedback processes were critical to the staff's efforts to further refine the ROP.

FINAL REPORT OF THE REACTOR OVERSIGHT PROCESS
INITIAL IMPLEMENTATION EVALUATION PANEL

Introduction

The NRC implemented, nationwide, a revised Reactor Oversight Process (ROP) for commercial nuclear power plant licensees on April 2, 2000. Background information on the development of the ROP and the results of the pilot program is given in Commission papers SECY-99-007, "Recommendations for Reactor Oversight Process Improvements," dated January 8, 1999, SECY-99-007A, "Recommendations for Reactor Oversight Process Improvements (Follow-up to SECY-99-007)," dated March 22, 1999, and SECY-00-049, "Results of the Revised Reactor Oversight Process Pilot Program," dated February 24, 2000. These Commission papers described the scope and content of performance indicator reporting, a new risk-informed baseline inspection program, a new assessment process, and revisions to the enforcement policy. Commission paper SECY-00-049 also described the results from the Pilot Program Evaluation Panel (PPEP), including a recommendation to proceed with initial implementation of the ROP at all power reactor facilities. On March 28, 2000, the Commission approved initial implementation of the ROP.

On May 17, 2000, in a staff requirements memorandum in response to SECY-00-049, the Commission directed the NRC staff to convene another evaluation panel under the Federal Advisory Committee Act to evaluate the first year's implementation of the ROP. The Initial Implementation Evaluation Panel (IIEP) was established on October 17, 2000. The purpose of the cross-disciplinary oversight panel was to independently monitor and evaluate the results of the first year's implementation of the ROP and provide advice and recommendations to the Director of the Office of Nuclear Reactor Regulation on reforming and revising the ROP (see Attachment 1). The panel, like the PPEP, was made up of a cross-section of stakeholders. An NRC senior resident inspector and a senior reactor analyst were added to the panel at the Commission's request. The NRC selected the panel members to represent the views of diverse groups that had an expressed interest in the changes to the ROP (see Attachment 2).

Approach and Objectives

The IIEP conducted six meetings during the first year's implementation of the ROP. All meetings were open to the public and all meeting material was placed in the NRC's public document room. Additionally, the meeting notices, summaries, and transcripts were placed on the NRC's ROP Web page. Attachment 3 is a bibliography of the significant documents on the panel's activities.

The IIEP worked as a management-level cross-disciplinary oversight group of experts to evaluate whether the new regulatory oversight process can be effectively carried out and whether it has achieved its overall objectives. The panel solicited and obtained additional views, to supplement the members' personal insights, from representatives of four States (New Jersey, Pennsylvania, Illinois, and Vermont), the Union of Concerned Scientists, the Nuclear Energy Institute (NEI), NRC resident inspectors, NRC senior reactor analysts, the NRC Office of Public Affairs, and McGraw-Hill (see Attachment 4). The NRC staff members directly involved in the process development reported on the status of the initial implementation and responded to questions and comments.

During the IIEP meetings, the panel discussed and generally agreed to the following objectives:

(1) Determine whether the ROP is achieving the following goals:

- Maintaining safety
- Increasing public confidence
- Increasing effectiveness and efficiency
- Reducing unnecessary regulatory burden
- Objective
- Risk-informed
- Predictable
- Understandable

(2) Determine whether the more significant problem areas of the ROP have been identified.

(3) Determine whether the NRC has developed a sound self-assessment program for the ROP and, if so, whether it includes mechanisms for self-correction.

To accomplish these objectives, each panel member was requested to provide a list of issues regarding implementation of the ROP. The panel member's issues were compiled, categorized, and integrated with other issues presented to the panel during its meetings. The issues were sorted according to the ROP elements they affected: performance indicators (P), inspection (I), significance determination process (S), and assessment and enforcement (A). Those issues that were identified as being pertinent to more than one element of the ROP were placed into an overall (O) category.

With a facilitator's assistance, the panel collectively evaluated the list of issues and developed group consensus on the description of each issue, its priority, the primary ROP performance goals affected, and the panel's recommendation for addressing the issue. The panel defined consensus in its bylaws as no one panel member dissenting from the position taken. In practice, this meant all panel members "could live with" the group position taken on the issue.

Each issue was assigned one of two priorities. The panel defined Priority 1 issues as those issues that should receive high priority. Priority 2 issues were defined as issues for the staff's consideration. Although the panel prioritized the various issues, it did not identify a timetable within which the staff should resolve the issues. The panel recognized the complexity of some issues and the need for additional time and information to evaluate solutions and the impacts of any proposed changes. Furthermore, the panel did not lower the priority of an issue because the staff was already resolving the issue. In developing its recommendations, the panel did not specify how to resolve the issues identified in this report. The staff resolved some of the issues the panel identified before the panel completed its activities. The panel did not include these issues in the report.

Panel Conclusions and Recommendations

The IIEP concluded that the ROP is a notable improvement over the previous licensee performance assessment program and should be continued. The reactor oversight process has made progress toward achieving the Agency's four performance goals: 1) maintain safety, 2) increase public confidence, 3) increase regulatory effectiveness and efficiency, and 4) reduce unnecessary regulatory burden. In addition, the process provides a more objective, risk-informed, predictable, and understandable approach to the oversight of commercial nuclear reactor facilities.

The NRC and the nuclear industry expended substantial time and effort communicating with their staff members and public stakeholders about the process changes and paradigm shifts embodied in the ROP. Although the change-management tools used to communicate and carry out the changes were generally successful, the panel identified continuing tension as a result of three changes in regulatory philosophy: maintaining safety rather than improving safety, applying risk-informed regulation rather than deterministic regulation, and using indicative measures of performance rather than predictive measures of performance. To a large extent, stakeholder concern with these regulatory changes are common denominators for the various issues identified by the panel. The tension created by these underlying changes has affected the degree to which the performance goals of the ROP can ever be fully achieved according to various stakeholders' perspectives about what constitutes a successful oversight process. On the other hand, it is this tension that helps to ensure that the NRC, the industry, and public stakeholders will continue to engage in creative dialogue focused on the safe operations of nuclear power reactors. The panel considers the interaction among stakeholders throughout the development process, and going forward, to be an important feature of the ROP. Continued management attention is needed to sustain genuine and substantive interaction among stakeholders, mindful of the challenges and creative potential inherent in the tensions of the complex nuclear regulatory environment.

- *Maintaining safety rather than improving safety:* One premise of the NRC's strategic plan is that the nuclear power industry's performance has improved substantially over the past 10 years and nuclear reactors, collectively, are operating above acceptable safety levels consistent with the Agency's Safety Goal Policy. The staff designed the ROP to maintain the current level of safety. The process is designed to improve safety performance before it falls below acceptable levels, not to continually improve the safety margins that currently exist. Some public stakeholders do not believe that current nuclear industry performance is sufficient to assure public health and safety without continual improvement. This could limit the public's confidence in the process.

- *Risk-informed regulation rather than deterministic regulation:* In many ways the ROP is ahead of the other regulatory processes in using risk insights. It is difficult to implement a risk-informed oversight process while in a deterministic regulatory framework. For example, the integration of the significance determination process with the NRC's assessment program puts both the inspector and licensee in a conflicting situation. The ROP focuses on risk-significant issues, but licensees must still comply with regulatory requirements that are not risk-informed. This conflict has contributed to many of the issues discussed in this report. An additional concern of public stakeholders is the perceived overreliance on existing risk analysis tools for regulatory decision making. Over the long term, the staff must continue risk-informing the regulations to close the gap between the regulatory framework and the oversight process.

- *Indicative measures of performance rather than predictive measures of performance:* The ROP, using performance indicator thresholds and the significance determination process, is an indicative process, whereas the previous performance assessment process attempted to be predictive by using performance issues of low safety significance to identify declining performance trends. A premise of the ROP is that the licensee's corrective action program best handles low-level performance trends and that a regulatory response is not required until a threshold is crossed. A related assumption is that a licensee will not normally pass directly from the licensee response column to the unacceptable performance column of the Action Matrix, giving the NRC time to respond

before plant performance becomes unacceptable. Many of the concerns about cross-cutting issues and inspection report thresholds come from skepticism about this assumption.

Though the panel focused on areas needing improvement, it noted many positive attributes and outcomes. We note some of these in the introductory comments on each ROP element.

The panel's recommendations are as follows:

- Establish a formal program and assign sufficient resources to enhance communications necessary for improving the ROP. The program should accumulate lessons learned, provide multiple and diverse opportunities for comment to all internal and external stakeholders, respond to stakeholders' comments, and have a process for making timely process changes. (O-1)

- Revise the ROP communication plan to include outreach activities designed to inform the public about the process and its relationship to the Agency's mission of protecting the public health and safety. Appropriate resources should be provided to revise and implement the communication plan. Evaluate additional improvements to the information on the ROP Web page to improve and simplify public access to the information. Identify methods, using stakeholder input, to improve public outreach efforts. (O-2)

- Establish a structured ongoing program to evaluate long-term ROP effectiveness and to test ROP assumptions. As a minimum, this includes integrating the insights of the ROP self-assessment program and the overall assessment of industry performance. The staff should also consider periodically engaging internal and external stakeholders to independently assess the ROP. (O-3)

- Continue the efforts of the cross-cutting issues task force and clarify the ROP guidance on the identification and disposition of cross-cutting issues. (O-4)

- Evaluate lessons learned from initial implementation to achieve parity in the treatment of risk-significant inspection findings and crossed performance indicator thresholds. The evaluation should verify that the outcomes from the performance indicators and inspection findings accurately reflect the significance of the issues. The staff should consider addressing this issue by adjusting the Green/White thresholds or modifying the Action Matrix. (O-5)

- Ensure that the staff's ROP self-assessment program identifies and evaluates any unintended consequences or unnecessary regulatory burden caused by the performance indicators and that changes are made where appropriate. (P-1)

- Expedite the efforts to resolve the concerns about the safety system unavailability performance indicators and implement any needed revisions to NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," to achieve consistency with other applications. (P-2)

- Continue the efforts to identify and evaluate improvements to performance indicators. The staff should thoroughly evaluate any significant changes to the performance indicators, following the structured process in Inspection Manual Chapter 0608,

"Performance Indicator Program." Further, the staff should evaluate the effect of any significant changes in the scope of information provided by performance indicators on the Action Matrix and the baseline inspection program, and should identify any additional costs and benefits. (P-3)

- Continue efforts to incorporate the answers to frequently asked questions into the performance indicator guidance document, NEI 99-02, and to make the answers more generic where possible. (P-4)

- Evaluate the inspection approach for the physical protection cornerstone and revise the inspection program as necessary after the pending safeguards performance assessment pilot program and the physical security rulemaking are completed. (I-1)

- Evaluate and revise guidance to inspectors as necessary to clarify and promote consistency in documenting inspections. Continue conducting periodic audits of inspection reports to identify and correct inconsistencies. The new documentation thresholds for issues that have a defined level of safety or regulatory significance are appropriate. Inspection observations and insights that do not reach the threshold should continue to be communicated verbally to licensees for their consideration. (I-2)

- Evaluate inspection findings and performance indicator results for the first year's implementation and determine the appropriate level of effort to adequately assess risk-significant areas in the baseline inspections. Modify the process as appropriate. (I-3)

- After further experience with the ROP, review the results and consider whether to waive certain parts of the baseline team inspections and let licensees assess themselves under defined circumstances. (I-4)

- Validate and issue the revised reactor safety significance determination process Phase 2 worksheets. (S-1)

- Continue efforts to obtain improved and standardized risk analysis tools for the reactor analysts. (S-2)

- Review lessons learned from use of the fire protection significance determination process, and improve the risk characterization tool to make it more meaningful, effective, and efficient. (S-3)

- Continue development of an improved physical protection significance determination process. (S-4)

- Evaluate the need for other significance determination tools. The staff should carefully evaluate any potential changes against the Agency's goals. For example, a new significance determination process that increases regulatory burden should have a corresponding benefit in maintaining safety or increasing the Agency's effectiveness. (S-5)

- Evaluate lessons learned from initial implementation and revise the ALARA significance determination process as necessary. (S-6)

- Use lessons learned from initial implementation to make the risk characterization process expedient, scrutable, and understandable to all stakeholders. (S-7)

- Use lessons learned from initial implementation to clarify the definition of a performance deficiency. (S-8)

- Evaluate a graded approach for resetting non-Green inspection findings as entry conditions into the Action Matrix. (A-1)

- Evaluate and clarify the guidance on the designation, definition, and use of what are presently called “No Color” findings, and find a more appropriate term for these findings. (A-2)

- Clarify the guidance on the objectives and structure of regulatory conferences and communicate this guidance to the external and internal stakeholders. (A-3)

- Develop clear guidance on how to handle multiple related inspection findings, and communicate the guidance to all stakeholders. (A-4)

The following five sections provide the consensus of the panel with respect to the description of the issues, the priority, the primary performance goals affected, and the panel’s recommendations. Where appropriate, the panel has referred to the recommendations of the Pilot Program Evaluation Panel when the two panels identified similar issues or made similar recommendations.

Panel members expressed two minority views:

(1) The initial implementation does not appear to demonstrate that the ROP has improved identification of design basis issues or validated recent initiatives to scope design basis issues. NUREG-1275, Volume 14, “Causes and Significance of Design-Basis Issues at U.S. Nuclear Power Plants,” draws a clear connection between the number of engineering (and design) inspection hours expended and the number of design basis issues discovered. However, the number of engineering inspection hours in the first year’s implementation has not yet been compiled, indicating to some observers that the staff is not focused on design basis issues under the new process. Public confidence will not be enhanced unless there is assurance that plants are properly designed, built as designed, modified only with proper analysis, and properly maintained including sufficient attention to "aging" phenomena. Uncertainties regarding design basis issues serve to undermine confidence in Probabilistic Risk Assessments and the concept of "maintaining" safety. In an October, 17, 1996 All Employees NRC meeting, Chairman Shirley Jackson opined that one reason for the events at Millstone was that ". . . we stopped doing design basis inspections too early, and relied on industry . . . without maintaining an appropriate regulatory focus to assess whether in fact they were dealing with the issue in a timely manner."

(2) The IIEP make-up was weighted with regulators and industry to the extent that common interest in moving the ROP forward, and other commonalties, may have limited the panel's perspective. Given the common working culture, it is not surprising that the IIEP critique was quite similar to the staff review group critique. Future panels might benefit from inclusion of some additional individuals from outside of the NRC-licensee set, for example,

attorneys with nuclear specialties or academics. Panel builders might also add to the quality of deliberation by a more even gender mix. While it enriches dialogue and broadens perspective to add members from public interest groups, adding only one or two with views likely to be quite alien to the remainder of the group on some issues is problematic in terms of free and meaningful consensus building.

Overall Reactor Oversight Process

The ROP is a notable improvement over the previous licensee performance assessment program and should be continued. The reactor oversight process has made progress toward achieving the Agency's four performance goals: 1) maintain safety, 2) increase public confidence, 3) increase regulatory effectiveness and efficiency, and 4) reduce unnecessary regulatory burden. In addition, the process provides a more objective, risk-informed, predictable, and understandable approach to the oversight of commercial nuclear reactor facilities. However, the panel identified the following issues that the staff should address:

Issue O-1: Process improvements and stakeholder feedback
Priority 1
Primary performance goals affected: Public confidence/effectiveness and efficiency

Issue description: As with any regulatory process, it is important that a formal infrastructure be established to allow for stakeholder comments and questions. The infrastructure should promptly review feedback and implement process improvements. The frequently asked questions process used in the performance indicator program is a good mechanism for raising and resolving licensee and inspector issues. This process promotes the open exchange of information and establishment of uniform and consistent guidance. Other elements of the ROP, such as the significance determination process, would benefit from a similar approach. This process should also include a mechanism for the public to retrieve information on past questions and answers and ensure that lessons learned and feedback information are communicated to the other regions.

The PPEP recommended continued feedback from inspectors and the ongoing modification of procedures during the industrywide implementation to assure that the procedures are clear and appropriately address the cornerstones.

Panel recommendation: Establish a formal program and assign sufficient resources to enhance communications necessary for improving the ROP. The program should accumulate lessons learned, provide multiple and diverse opportunities for comment to all internal and external stakeholders, respond to stakeholders' comments, and have a process for making timely process changes.

Issue O-2: Public access to ROP information
Priority 1
Primary performance goals affected: Public confidence/understandable

Issue description: It is important that the public have confidence that the ROP provides the regulator a means for accurately assessing the safety of plants and taking action where necessary and that the process and actions be effectively communicated to the public. Likewise, it is essential that the public have clear, unfettered access to accurate and meaningful information to be able to reach its own conclusions.

The staff made significant improvements to the public's access to plant performance information during the initial implementation period. The staff established a Web site that displayed information about the ROP. The public's response to the Web site was generally very positive. The panel observed that the staff actively solicited stakeholder input throughout initial

implementation, as it did during development and piloting of the ROP. Public workshops, public meetings near all facilities, and surveys provided opportunities for valuable input to the staff as they sought to further refine the ROP.

However, much remains to be done to make the ROP understandable and accessible to public stakeholders. At first, the public and media thought the new process relied solely on performance indicators because the indicators were highlighted on the Web page. The highlighting caused a few public stakeholders to believe that the NRC had abandoned the resident inspector program. Many stakeholders did not understand that insights from both performance indicators and inspection findings were used to assess overall licensee performance.

The staff has improved the structure and format of the Web pages to correct this perception. However, the Web pages need additional improvements. The ROP Web pages should start with overview information and provide layered access to more detailed information (i.e., links to the site-related documents). Site-specific pages could include a bulletin board with the status of enforcement items and inspections. This would enable the public to understand, without conducting exhaustive research, the status of important issues at the plant in their locale. A high-level summary would also provide a means to differentiate the performance of one plant from another. The timely posting of information is important to enhancing public confidence.

Panel recommendation: Revise the ROP communication plan to include outreach activities designed to inform the public about the process and its relationship to the Agency's mission of protecting the public health and safety. Appropriate resources should be provided to revise and implement the communication plan. Evaluate additional improvements to the information on the ROP Web page to improve and simplify public access to the information. Identify methods, using stakeholder input, to improve public outreach efforts.

Issue O-3: Long-term process effectiveness
Priority 1
Primary performance goals affected: Maintain safety/effectiveness and efficiency/public confidence

Issue description: The panel recognizes and agrees with the concern of members and stakeholders that there are limits to what may be learned from a 1-year test of the ROP. The staff should evaluate the long-term effectiveness of the process to determine whether the performance indicators and inspection findings identify poorly performing plants.

The significance determination process tools are a key element in ensuring the effectiveness of the ROP. However, the significance determination process Phase 2 worksheets were not available for much of initial implementation (see S-1).

The ROP is based on certain assumptions (e.g., that licensee corrective action programs are mature and support the basis for the licensee response band concept, that degraded performance will reveal itself by ever increasing significant issues and crossed performance indicator thresholds, and that all violations of NRC regulations do not require followup by the NRC). As sufficient information and experience is obtained, assumptions either will be confirmed or refuted. Whatever the result, there must be a validation process. In addition, there may be unintended consequences of the ROP elements such as with some performance indicators (see P-1). The final oversight process must focus on identifying issues of safety significance,

eliminating any underestimation of risk characterization determinations (false negatives), and minimizing overestimation of issues (false positives).

The PPEP recommended that the staff continue to monitor industrywide implementation to ensure that when a risk-significant event occurs, the event-specific response requires reevaluation of the performance indicators and inspection results to address whether they missed a cross-cutting or common-mode failure issue. The PPEP also concluded those process assumptions had not been tested sufficiently.

Panel recommendation: Establish a structured ongoing program to evaluate long-term ROP effectiveness and to test ROP assumptions. As a minimum, this includes integrating the insights of the ROP self-assessment program and the overall assessment of industry performance. The staff should also consider periodically engaging internal and external stakeholders to independently assess the ROP.

Issue O-4: Cross-cutting issues
Priority 1
Primary performance goals affected: Maintain safety/public confidence

Issue description: During the development of the ROP, and initial implementation, some inspectors were concerned about the identification and disposition of cross-cutting issues. The concern was that licensee performance in the cross-cutting areas of human performance, safety-conscious work environment, and problem identification and resolution could become degraded without being detected by the baseline inspection program and performance indicators. The ROP addresses cross-cutting issues by highlighting them in inspection reports when they are notable contributors to inspection findings or if an appreciable trend or pattern has emerged. The staff further amplifies these concerns in assessment letters to the licensee when the concerns constitute a substantive issue.

The current process does not have sufficient criteria, thresholds, and definitions of cross-cutting issues to ensure consistency in handling these issues. In addition, there is no predefined NRC action if the inspection program identifies a substantive cross-cutting issue such as a deficient corrective action program. The ROP does not provide for additional NRC engagement on cross-cutting issues unless they are contributing causes to performance indicators or inspection findings that have been characterized as White or greater. Some inspectors are also concerned about the lack of a process to handle low-level human performance trends when it appears that NRC actions could prevent the occurrence of a significant performance issue. The industry believes the ROP should focus on performance outcomes, of which cross-cutting issues are but one possible cause.

One premise of the ROP is that either performance indicators or inspection findings will detect degradation in the cross-cutting areas in time to allow for Agency action to protect the public health and safety. Early data obtained from initial implementation suggests that there is a correlation between cross-cutting issues and crossed thresholds consistent with the premise of the process (i.e., the number of cross-cutting findings per plant appears to increase as you move to the right in the Action Matrix).

The PPEP final report also highlighted the divergent views on the identification and disposition of cross-cutting issues.

Panel recommendation: Continue the efforts of the cross-cutting issues task force and clarify the ROP guidance on the identification and disposition of cross-cutting issues.

Issue O-5: Basis of Green/White thresholds
Priority 1
Primary performance goals affected: Public confidence/understandable

Issue description: The bases for the performance indicator Green/White thresholds are not risk-informed. The thresholds were selected to identify the 95-percent performance level (i.e., industry outliers). Since NRC action is the same for both White performance indicators and White inspection findings, which are risk-informed, several problems have resulted. First, the NRC and the licensee have a different perception of the impact and importance of White issues. Second, it is difficult to communicate to public stakeholders that a White performance indicator may not be risk-significant when the NRC increases its regulatory response according to the Action Matrix. This could impact public confidence in the NRC.

Panel recommendation: Evaluate lessons learned from initial implementation to achieve parity in the treatment of risk-significant inspection findings and crossed performance indicator thresholds. The evaluation should verify that the outcomes from the performance indicators and inspection findings accurately reflect the significance of the issues. The staff should consider addressing this issue by adjusting the Green/White thresholds or modifying the Action Matrix.

Performance Indicators

The integration of performance indicators into the ROP has provided objective measures for assessing licensee performance. Additionally, licensees can accurately report performance indicators without an excessive burden, and the public can easily understand the performance data. The initial implementation period has verified that the performance indicators can focus both licensee and NRC attention on issues that are either risk significant or relevant to promoting desired performance. However, the panel identified the following issues that the staff should address:

Issue P-1: Unintended negative consequences of performance indicators
Priority 1
Primary performance goals affected: Maintain safety/unnecessary regulatory burden

Issue description: The use of performance indicators may have unintended negative consequences when they measure both desirable actions and performance issues. This could lead to nonconservative decisions by licensees. In addition, NRC may impose unnecessary regulatory burden when it takes actions based, in part, on licensee actions that are desirable and appropriate.

The staff has noted that some licensees have altered normal operating and maintenance practices solely to avoid conditions that may contribute to crossing a performance indicator threshold. For example, the Unplanned Power Change performance indicator may cause a licensee to delay needed equipment repairs for 72 hours to avoid counting a power reduction. In contrast, a plant that appropriately conducts equipment repairs in a well-planned manner within 72 hours may be considered a poor performer. Another example is the Safety System Unavailability performance indicator, which includes unavailability time for planned preventive maintenance as well as unplanned corrective maintenance and equipment failures. A licensee may consider delaying discretionary maintenance if it is near the performance indicator threshold. Despite these concerns, there have not been any known instances to date of unsafe actions by a licensee because of the performance indicators.

Panel recommendation: Ensure that the staff's ROP self-assessment program identifies and evaluates any unintended consequences or unnecessary regulatory burden caused by the performance indicators and that changes are made where appropriate.

Issue P-2: Safety System Unavailability performance indicators
Priority 1
Primary performance goals affected: Maintain safety/risk-informed/understandable

Issue description: Many of the performance indicator frequently asked questions (FAQs) during initial implementation involved the safety system unavailability performance indicators definitions and guidance. The performance indicator definition of equipment unavailability is different from that used by other NRC and industry programs that monitor or consider unavailability of safety equipment (e.g., Maintenance Rule program and licensee's probabilistic risk assessments). The major hurdle in resolving this problem is determining whether the unavailability is to be measured against the design basis or the risk analyses (i.e., operable versus functional). For example, consideration of operator recovery actions are limited by this indicator but are allowed in other programs.

Other issues are how to treat fault exposure hours and what allowances should be made for planned overhaul maintenance when a quantitative risk assessment has been previously performed and approved by the NRC. The large number of generic and site-specific exceptions to what equipment unavailability is counted in these performance indicators has made them difficult to understand and may erode public confidence. Finally, these indicators also measure appropriate actions by the licensee, such as planned preventive maintenance, so there is a potential for unintended consequences (see P-1).

Panel recommendation: Expedite the efforts to resolve the concerns about the safety system unavailability performance indicators and implement any needed revisions to NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," to achieve consistency with other applications.

Issue P-3: New performance indicators
Priority 2
Primary performance goals affected: Maintain safety/risk-informed

Issue description: Some current performance indicators and associated thresholds do not directly correlate with risk. In addition, the panel found at least one unintended consequence of performance indicators, specifically the misunderstanding that can occur because the Green/White threshold for performance indicators is not related to risk, as with inspection findings (see O-5). This misunderstanding causes the application of the Action Matrix to sometimes appear inconsistent and calls into question the value of some performance indicators as an input to performance assessment. For example, some emergency preparedness and physical protection performance indicators do not directly correlate to risk to the public health and safety, but are rather intended to identify weaknesses in licensee programs. The staff specifically avoids the identification of such weaknesses in the more risk-focused cornerstone areas.

Panel recommendation: Continue the efforts to identify and evaluate improvements to performance indicators. The staff should thoroughly evaluate any significant changes to the performance indicators following the structured process in Inspection Manual Chapter 0608, "Performance Indicator Program." Further, the staff should evaluate the effect of any significant changes in the scope of information provided by performance indicators on the Action Matrix and the baseline inspection program, and should identify any additional costs and benefits.

Note: The panel cautions the staff not to eliminate a performance indicator solely because it does not provide risk-informed information. The performance indicator may provide information useful for other purposes (e.g., increasing public confidence, identifying programmatic issues). In this case, the staff may need to adjust the threshold.

Issue P-4: Frequently asked questions
Priority 2
Primary performance goals affected: Understandable/effectiveness and efficiency

Issue description: During initial implementation of the ROP, licensee and NRC staff members asked many questions regarding the performance indicator guidance. These questions were documented, answered, and posted on the NRC's ROP Web site. Although this was a useful approach for clarifying and interpreting the guidance in NEI 99-02, the large number of questions made it difficult for all stakeholders to understand the guidance on the performance indicators. In addition, the inspectors noted that some licensees used site-specific answers to the questions out of context when applying it to their specific situation.

Panel recommendation: Continue efforts to incorporate the answers to frequently asked questions into the performance indicator guidance document, NEI 99-02, and to make the answers more generic where possible.

Inspection

The new inspection process has been effective in focusing the NRC's inspection efforts on areas more important to risk and safety. The combination of baseline and supplemental inspections provides sufficient coverage of the attributes of the seven safety cornerstones. The planning for both the overall inspection effort at a given site and for the selection of individual procedural samples has been more risk-informed. The improvements in procedural guidance have focused NRC resources on reviewing and assessing performance as opposed to providing subjective views of various licensee processes and programs. The new procedural guidance, being more objective and risk-informed, has also improved the consistency among the regions and the individual inspectors. Since the outcomes of the new inspection program are more risk-informed, the dialogue between the licensee and NRC is now primarily focused on safety. However, the panel identified the following issues that the staff should address:

Issue I-1: Physical protection cornerstone inspections
Priority 1
Primary performance goals affected: Objective/unnecessary regulatory burden

Issue description: Licensees have expressed concern regarding the NRC's approach to inspecting the licensee's response to contingency events (i.e., force-on-force drills) and applying the physical protection significance determination process (see S-4). Before initial implementation, the staff removed the evaluation of force-on-force exercises from the baseline inspection procedure (71130.03 "Response to Contingency Events (Protective Strategy and Implementation of Protective Strategy") and continued the Operational Safeguards Response Evaluation (OSRE) inspections under inspection procedure 81110. The industry has proposed a pilot program for industry-conducted drills and exercises (SECY-01-0060). The industry has requested that self-assessment initiatives be considered as part of the inspection process similar to how the staff handles the evaluation of emergency drills in the emergency preparedness cornerstone.

Panel recommendation: Evaluate the inspection approach for the physical protection cornerstone and revise the inspection program as necessary after the pending safeguards performance assessment pilot program and the physical security rulemaking are completed.

Issue I-2: Inspection report documentation threshold
Priority 2
Primary performance goals affected: Public confidence/effectiveness and efficiency

Issue description: The staff significantly revised the guidance for documenting inspections under the ROP to provide a more structured approach for deciding the issues to be documented. NRC Inspection Manual Chapter 0610*, "Power Reactor Inspection Reports," changed the documentation threshold by eliminating discussions of positive performance attributes, minor violations, licensee-identified findings, and nonregulatory concerns (such as general weaknesses in programs or inspector observations) from the reports. The staff implemented these documentation changes, in part, to address industry concerns that subjective performance observations and inspector opinions in past reports were not based on regulatory requirements and did not correspond to any observable performance problems. In parallel with development of the ROP, the Office of Enforcement also developed improved guidance to clarify the threshold for minor violations. This guidance was incorporated into MC 0610*. With the higher threshold for

issues discussed in the inspection reports, some public stakeholders are concerned that they may receive less performance information than under the previous program. On the other hand, some stakeholders have noted that the more focused, albeit reduced, information in inspection reports allows for a more effective identification of significant regulatory and performance issues. Some inspectors are also concerned that they may miss low-level performance trends if they do not include them in the inspection reports. Stakeholders have also expressed a concern that the staff is not consistently implementing the new report documentation thresholds.

NRC Inspection Manual Chapter 2515, "Light Water Reactor Inspection Program - Operations Phase," endorses action by inspectors to provide licensees well-considered insights beyond those to be documented in the inspection report. Although the documentation threshold has changed, most licensees request that inspectors continue to share all of their observations at exit meetings. Since these observations do not meet the report documentation threshold, inspectors do not provide them to the public. This practice creates the appearance that relevant performance information is being intentionally withheld from the public. Some public stakeholders have suggested that all exit meetings should be open to the public to address this concern.

Panel recommendation: Evaluate and revise guidance to inspectors as necessary to clarify and promote consistency in documenting inspections. Continue conducting periodic audits of inspection reports to identify and correct inconsistencies. The new documentation thresholds for issues that have a defined level of safety or regulatory significance are appropriate. Inspection observations and insights that do not reach the threshold should continue to be communicated verbally to licensees for their consideration.

Issue I-3: Appropriate level of baseline inspection
Priority 2
Primary performance goals affected: Effectiveness and efficiency/unnecessary regulatory burden

Issue description: The inspection resource expenditures are about the same under the ROP as under the previous inspection program. The staff has noted wide ranges in actual resource expenditures, however, for certain procedures during the first year of implementation. Licensees have commented that specific cornerstones, such as occupational radiation exposure, appear to have too many resources applied when licensee performance trends and the previous inspection program are considered objectively (i.e., inspection resources have increased although overall occupational exposure has decreased).

The PPEP recommended that the resource levels required to plan and implement the baseline inspection program be evaluated during industry wide implementation, but cautioned that process effectiveness not be measured solely by increases or decreases in resource utilization. They also recommended that the appropriateness of the inspection frequency and scope continue to be assessed during industry wide implementation.

Panel recommendation: Evaluate inspection findings and performance indicator results for the first year's implementation and determine the appropriate level of effort to adequately assess risk-significant areas in the baseline inspections. Modify the process as appropriate.

Issue I-4: Use of licensee self-assessment information

Priority 2
Primary performance goals affected: Unnecessary regulatory burden/effectiveness and efficiency/public confidence

Issue description: In the previous inspection program, there were cases where the NRC did not conduct portions of specific team inspections if the licensee had conducted a rigorous self-assessment of the same area and placed the self-assessment in the public domain. The staff outlined this process in Inspection Procedure 40501, "Licensee Self-Assessments Related to Team Inspections." When NRC management approved the use of this procedure as an alternative to independent NRC inspection, the staff reviewed the scope and results of the licensee's self-assessment and the qualification of team members, and monitored ongoing portions of the licensee's review. The ROP has not provided this flexibility for reducing unnecessary regulatory burden. While this approach did not save a significant amount of NRC inspection resources, it reduced regulatory burden on the licensees, and the licensee staff gained a better understanding of their systems. However, it could reduce public confidence in the NRC as an independent regulator.

Panel recommendation: After further experience with the ROP, review the results and consider whether to waive certain parts of the baseline team inspections and let licensees assess themselves under defined circumstances.

Significance Determination Process

The significance determination process (SDP) has shown that risk information can be used in a systematic, practical, and repeatable manner. The SDP has given NRC inspectors an objective process for consistently characterizing inspection findings, and it has provided the NRC with improved tools for prioritizing emergent issues and selecting individual inspection samples. The SDP has focused both NRC and licensee attention on the risk associated with identified issues, as opposed to focusing attention and resources on the compliance implications. However, the panel identified the following issues that the staff should address:

Issue S-1: SDP Phase 2 Worksheets
Priority 1
Primary performance goals affected: Effectiveness and efficiency/unnecessary regulatory burden

Issue description: The primary tools to be used by field inspectors in determining the risk significance of reactor safety cornerstone inspection findings, the Phase 2 worksheets, were not available to the inspectors during initial implementation. The draft Phase 2 worksheets did not accurately reflect the current site probabilistic risk assessments and equipment configurations and needed to be revised. It was necessary for the regional risk analysts to perform resource-intensive Phase 3 analyses of all potential non-Green reactor safety issues to determine the risk significance of findings. The lack of adequate Phase 2 worksheets negatively affected the effectiveness and efficiency of the ROP during the first year.

The PPEP highlighted the importance of having plant-specific SDP worksheets before industrywide implementation.

Panel recommendation: Validate and issue the revised reactor safety SDP Phase 2 worksheets.

Issue S-2: Quality of NRC PRA tools
Priority 1
Primary performance goals affected: Maintain safety/public confidence

Issue description: The ROP relies on the quality and consistency of the probabilistic tools used by the NRC risk analysts and inspectors for their risk characterizations and decisions. Currently, the NRC relies heavily on the individual plant probabilistic risk assessments developed by the licensees, but the quality of these tools varies. The lack of validated Phase 2 worksheets magnified this concern during initial implementation (see S-1). For some findings that reached the Phase 3 analysis stage, the licensees with state-of-the-art tools felt penalized when the staff used their less sophisticated results to determine the risk significance of an issue. Their concern was predictability, since the calculated risk significance may have been greater with a less sophisticated tool. The lack of defined standards for methods and models also hampers the staff's ability to obtain timely and consistent results when evaluating findings.

Panel recommendation: Continue efforts to obtain improved and standardized risk analysis tools for the reactor analysts.

Issue S-3: Fire Protection SDP
Priority 1
Primary performance goals affected: Effectiveness and efficiency/understandable

Issue description: The application of the fire protection SDP during the first year showed that it was excessively complex and subjective. This has limited its usefulness as a tool in evaluating some fire protection findings. Besides the complexity of the fire protection SDP, the resulting risk characterization of the findings did not seem consistent with findings in other cornerstone significance determinations.

Panel recommendation: Review lessons learned from use of the fire protection SDP, and improve the risk characterization tool to make it more meaningful, effective, and efficient.

Issue S-4: Physical Protection SDP
Priority 1
Primary performance goals affected: Effectiveness and efficiency/risk-informed

Issue description: The physical protection SDP was initially aligned to the reactor safety SDP. The staff found that the process was problematic in several cases during initial implementation. The SDP results seemed inconsistent with the actual risk significance. The staff made interim revisions to the physical protection SDP to incorporate direction contained in Staff Requirements Memorandum COMSECY-00-0036 dated January 25, 2001.

Panel recommendation: Continue development of an improved physical protection SDP.

Issue S-5: Development of SDPs for other areas
Priority 1
Primary performance goals affected: Effectiveness and efficiency/predictable

Issue description: Substantial work is needed to complete the suite of SDP tools. During the first year's implementation, the established SDP did not provide an effective tool for evaluating all inspector findings in certain areas (e.g., the staff identified the need for effective significance determination tools concerning shutdown, containment, and external events). The staff cannot easily assess other process-oriented inspection findings, such as those involving inadequate application of the Maintenance Rule, with the existing SDP unless there is a measurable impact on plant equipment.

Panel recommendation: Evaluate the need for other significance determination tools. The staff should carefully evaluate any potential changes against the Agency's goals. For example, a new SDP that increases regulatory burden should have a corresponding benefit in maintaining safety or increasing the Agency's effectiveness.

Issue S-6: ALARA SDP
Priority 1
Primary performance goals affected: Effectiveness and efficiency/unnecessary regulatory burden

Issue description: During initial implementation, the staff experienced problems when using the ALARA SDP. The SDP screened out all issues identified at plants that had a 3-year average collective dose equal to or below the screening criteria based on the median industry performance. The unintended consequence of this SDP structure is that the inspectors cannot document the occurrence of an ALARA failure at these better performers in the inspection report, but they document the identical finding at a plant above the screening criteria. In addition, the staff designed the SDP structure to evaluate the licensee's performance in ALARA on a per job basis, but did not define a job. Another potential unintended consequence is that some licensees may estimate exposure in a very conservative manner during ALARA planning. Some stakeholders have commented that the SDP screening criteria are an inappropriate de facto definition of ALARA for occupational doses at nuclear power plants.

Panel recommendation: Evaluate lessons learned from initial implementation and revise the ALARA SDP as necessary.

Issue S-7: Process for evaluating and communicating SDP conclusions
Priority 2
Primary performance goals affected: Effectiveness and efficiency/understandable/public confidence

Issue description: Using an SDP to place all inspection insights into a risk-informed context has been beneficial, but it has resulted in challenges. The breadth of potential issues and the uniqueness of each plant's design and associated risk profile are leading to a highly complex and time-consuming process that is challenging public confidence. The experience with implementation of the SDP during the first year has been that the final risk characterizations are often untimely and the process is not always transparent to the licensees and external stakeholders.

Inherent to the SDP is the fact that regional risk analysts and inspectors discuss technical information and risk analysis assumptions with the licensee's technical staff. These discussions are used to ensure the NRC's risk analysis is technically sound, but they have given the perception to many stakeholders that the finding is being debated out of the public view. Several public stakeholders have expressed concern that "negotiations" occur between the NRC staff and licensees during the risk characterization process. Public stakeholders have also observed that the communication of the basis for the final risk significance determination is not clear in all inspection reports, and does not always provide sufficient information for any interested party to independently reconstruct the analysis. Some stakeholders have suggested that all of the information used in the SDP, including licensee probabilistic risk assessments, should be docketed.

The time and resources committed to process individual potential non-Green issues have been higher than expected, and many final determinations have not met the Agency's timeliness goals. The guidance concerning Agency decisions emphasizes risk-based criteria as opposed to risk-informed. This could encourage protracted "PRA battles" that will hold up NRC actions and could

reduce the public's confidence in the new process's effectiveness and efficiency. Stakeholders have observed that excessive time is also spent resolving disagreements regarding Green inspection findings, which appears contrary to being risk-informed and efficient.

The PPEP noted that the staff needs to shorten the turnaround time for Phase 3 evaluations. The PPEP also recommended that the process for interactions between the NRC and licensee during SDP evaluations be better defined, and that attention be focused on explaining the basis for color assignments.

Panel recommendation: Use lessons learned from initial implementation to make the risk characterization process expedient, scrutable, and understandable to all stakeholders.

Issue S-8: Definition of a performance deficiency
Priority 2
Primary performance goals affected: Public confidence/maintain safety

Issue description: Early in the implementation of the ROP, the staff developed guidance in NRC Inspection Manual Chapter 0609, "Significance Determination Process," that required inspectors to demonstrate a licensee performance deficiency before entering the SDP. This policy caused concern among some inspectors because the NRC might appear to be overlooking risk-significant issues simply because it had not established a clear performance deficiency. In addition, the staff had difficulty developing a licensee performance deficiency if the licensee could not establish a root cause for an equipment failure. There is a potential to erode public confidence by giving the appearance that the NRC is not taking consistent actions on risk-significant issues.

Panel recommendation: Use lessons learned from initial implementation to clarify the definition of a performance deficiency.

Assessment and Enforcement

The assessment process associated with the ROP has effectively reduced the subjectivity of the previous assessment process. The use of a predetermined Action Matrix, that places objective performance indicators and inspection findings in a risk-informed context, has made the determination and communication of NRC actions more streamlined and predictable. This has improved public confidence by providing a clear road map for understanding Agency-licensee interactions and regulatory decisions. Enforcement actions are now performance-based, with an emphasis on placing the significance of the noncompliance into a safety context and ensuring that the licensee is taking corrective actions. The response of the Agency is more timely under the new assessment scheme than under the previous process. However, the panel identified the following issues that the staff should address:

Issue A-1: Length of time inspection finding is included in Action Matrix
Priority 1
Primary performance goals affected: Unnecessary regulatory burden/understandable

Issue description: According to NRC Inspection Manual Chapter 0305, "Operating Reactor Assessment Program," a non-Green inspection finding is normally carried forward in the assessment program (i.e., Action Matrix) for a total of four calendar quarters. Performance indicators are recalculated quarterly. Licensees have proposed that there be a graded approach for how long findings remain active rather than the fixed 1 year. Considering the risk significance of the various findings, it may be beneficial to establish a graded approach for resetting inspection findings in the Action Matrix.

Panel recommendation: Evaluate a graded approach for resetting non-Green inspection findings as entry conditions into the Action Matrix.

Issue A-2: "No Color" inspection findings
Priority 1
Primary performance goals affected: Understandable/public confidence

Issue description: The ROP has proceduralized the use of "No Color" findings. The role of "No Color" findings, however, is not clear and has contributed to process inconsistencies and confusion among many stakeholders. "No Color" findings are associated with specific extenuating circumstances listed in NRC Inspection Manual Chapter 0610*. These findings typically address regulatory issues that are more than minor violations, but do not meet the threshold for entry into the existing cornerstone significance determination process. These issues do not receive a severity level or color and, therefore, the NRC does not characterize their importance. Early in the process, the staff guidance was nonspecific and the result was the appearance of a new finding classification.

Licensees are concerned that these findings may be inappropriately used to artificially inflate the significance of individual issues; likewise, they believe that many of the issues do not warrant inclusion in inspection reports. External stakeholders have noted that the staff has established a new undefined category of findings. Furthermore, "No Color" findings are colored blue on the NRC's Web page, and their role in the process is not understandable.

Panel recommendation: Evaluate and clarify the guidance on the designation, definition, and use of what are presently called “No Color” findings, and find a more appropriate term for these findings.

Issue A-3: Purpose of the Regulatory Conference
Priority 2
Primary performance goals affected: Public confidence/effectiveness and efficiency/understandable

Issue description: The purpose of a regulatory conference is to gain a complete understanding of the risk significance of an inspection finding and to obtain information pertinent to understanding any apparent violations. During initial implementation of the ROP, stakeholders noted that the objectives of the regulatory conferences were not clear. The structure of the regulatory conferences was very similar to that of the enforcement conferences in the previous program. The regulatory conference discussions sometimes focused more on enforcement and corrective actions rather than on the determination of the risk significance of the issue. Additionally, licensee and NRC managers have expressed discomfort with holding public meetings concerning a potentially risk-significant issue and not including all potential decision-makers.

Panel recommendation: Clarify the guidance on the objectives and structure of regulatory conferences and communicate this guidance to the external and internal stakeholders.

Issue A-4: Multiple related inspection findings
Priority 2
Primary performance goals affected: Unnecessary regulatory burden/effectiveness and efficiency

Issue description: It is not clear how the NRC should disposition multiple inspection findings that are related to the same technical problem or root cause. For example, would it be appropriate to characterize an inspection finding involving five related issues (3 Green, 1 White, 1 Yellow) as one finding or five separate findings? If they are handled as separate findings, the NRC response, as determined by the Action Matrix, will be different from if they are considered one finding. Experience has shown that significant events and conditions are often caused by multiple performance failures.

Panel recommendation: Develop clear guidance on how to handle multiple related inspection findings, and communicate the guidance to all stakeholders.

ROP Self-Assessment Program

Through briefings to the IIEP by the NRC staff and review of the preliminary self-assessment metrics, the panel evaluated the ROP self-assessment program to determine whether the developed program was sound and whether it included mechanisms for self-correction. The staff developed the self-assessment program to determine whether the ROP is meeting its objectives (including the Agency's performance goals), to gather information about overall industry performance, and to develop information to support possible improvements. The self-assessment program includes more than 75 metrics for measuring the success of the overall ROP and how effectively it supports the four ROP elements (performance indicators, inspection program, significance determination process, assessment program). The metrics are aligned to the ROP objectives (risk-informed, predictable, understandable, objective) and the Agency's performance goals (maintain safety, increase public confidence, increase effectiveness and efficiency, reduce unnecessary regulatory burden). The staff evaluates the metrics on a periodic basis using information from various sources, including the inspection program, performance indicators, periodic audits, stakeholder surveys, and public comments.

Based on the timing of the panel's activities and the parallel collection and assessment of self-assessment data, limited data and results were available for the panel to review. Although the panel acknowledges the significant efforts of the staff in developing the self-assessment program, it is best described as a noteworthy work in progress, that may require further enhancements and refinements based upon the evaluation of the data collected. Although individual panel members provided comments to the staff for consideration in further defining and revising the individual metrics, the panel, as a whole, took no consensus position on the overall adequacy and acceptability of the metrics. They are, even now, continuing to be refined by the staff and the data for assessing their overall efficacy were not available. Nevertheless, the panel concluded that the self-assessment program has the necessary elements to evaluate the ROP against the Agency's performance goals. The panel, however, could not evaluate the effectiveness of the program given that the first year's assessment data was not yet available. The panel was encouraged by the fact that, for the most part, the staff had identified the same issues the panel identified.

IIEP CHARTER

UNITED STATES NUCLEAR REGULATORY COMMISSION CHARTER
REACTOR OVERSIGHT PROCESS INITIAL IMPLEMENTATION EVALUATION PANEL

1. The Committee's official designation:

   Reactor Oversight Process Initial Implementation Evaluation Panel (IIEP)

2. The Committees objectives and the scope of its activity:

   The NRC has implemented a revised reactor oversight process (ROP) for commercial nuclear power plant licensees. The ROP is described in NRC Inspection Manual Chapter 2515. Background information on the development of the ROP is contained in Commission papers SECY-99-007, "Recommendations For Reactor Oversight Process Improvements," dated January 8, 1999, SECY-99-007A, "Recommendations For Reactor Oversight Process Improvements (Follow-up to SECY-99-007)," dated March 22, 1999, and SECY-00-049, "Results of the Revised Reactor Oversight Process Pilot Program," dated February 24, 2000. These Commission papers describe the scope and content of performance indicator reporting, a new risk-informed baseline inspection program, a new assessment process, and revisions to the enforcement policy. Commission paper SECY-00-049 also describes the results from the Pilot Program Evaluation Panel (a previous Federal Advisory Committees Act (FACA) panel), including a recommendation from the panel to proceed with initial implementation of the ROP at all power reactor facilities. On March 28, 2000, the Commission approved initial implementation of the ROP, and on May 17, 2000, the Commission directed the NRC staff to convene another evaluation panel under FACA to evaluate the first year of implementation of the ROP. The staff has established this IIEP in response to the Commission's directions.

   The IIEP will function as a cross-disciplinary oversight group to independently monitor and evaluate the results of the first year of initial implementation of the ROP and provide advice and recommendations to the Director of the Office of Nuclear Reactor Regulation on reforming and revising the ROP. IIEP meetings will be announced to the public in advance and (unless closed according to the provisions of FACA) open to the public. Subject to the Freedom of Information Act, all material made available to or prepared for or by the IIEP will be made available to the public. Meetings will be transcribed and meeting summaries will be prepared following each meeting to document the results of the meetings. The transcripts and meeting summaries will be publicly available.

   The IIEP will evaluate the ROP results against performance measures. The IIEP will provide a written report containing an overall evaluation of the ROP to the Director of the Office of Nuclear Reactor Regulation. This report will include the consensus views of the panel, or the majority and minority views when panel consensus cannot be achieved. The NRC staff will use the IIEP evaluation as a major input to its deliberative process to determine what modifications, if any, are needed to the ROP following initial implementation.

3. The period of time necessary for the Committee to carry out its purpose:
   Nine months

4. The NRC official to whom this Committee will report:

Committee Chairman
Loren Plisco
Director, Division of Reactor Projects
Region II

5. The NRC office and individual responsible for providing support for the Committee:

   Office of Nuclear Reactor Regulation

   Designated Federal Official
   John Monninger
   Technical Assistant, Associate Director for Inspection & Programs
   Office of Nuclear Reactor Regulation

6. A description of the duties for which the Committee is responsible, and if such duties are not solely advisory, a specification of the authority for such functions:

   The panel will provide advice and recommendations only.

7. The estimated annual operating costs, in dollars* and staff years, for the Committee:

   a. $120,000 (*Includes travel and per diem)

   b. 0.50 FTE

8. The estimated number and frequency of the Committee meetings:

   Approximately 3 meetings will be held, on an as needed basis, during the period the panel is in existence.

9. Organization - The IIEP will create any subcommittees which may be necessary to fulfill the IIEP's mission. In addition, NRC and IIEP will establish such operating procedures as are required to support the group, consistent with the Federal Advisory Committee Act, as amended.

10. The Committee's termination date, if less than two years from the date of establishment:

    July 31, 2001

11. Charter Filing Date:

    October 17, 2000

/RA/

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Andrew L. Bates
Advisory Committee Management Officer
Office of the Secretary of the Commission

IIEP MEMBERS

In selecting members for the Initial Implementation Evaluation Panel, the NRC considered interested persons and groups with professional, technical, or personal qualifications or experience that could contribute to the functions and tasks of the panel. The NRC considered several factors in appointing IIEP members, including (1) the requirements in 10 CFR Part 7, "Advisory Committees," directing balance in advisory committee membership in terms of the points of views represented and the functions to be performed, (2) Commission direction in the staff requirements memorandum for SECY-00-0049 for a panel with a cross-section of stakeholders similar to those who participated in the original evaluation panel, and with the addition of at least one resident inspector and one senior reactor analyst, (3) a desire for independence from the NRC office responsible for development and oversight of the ROP (Office of Nuclear Reactor Regulation) and a focus on those stakeholders most affected by the ROP, and (4) a desire to provide both continuity and new perspectives in terms of the individual panel members selected.

Panel Members

Loren Plisco, NRC, Region II (Chairman)
Randolph Blough, NRC, Region I
Kenneth Brockman, NRC, Region IV
Richard Borchardt, NRC, Office of Enforcement*
Mary Ferdig, Benedictine University; Ferdig, Inc.**
Steve Floyd, Nuclear Energy Institute
David Garchow, PSEG Nuclear LLC
Richard Hill, Southern Nuclear Operating Company
Rod Krich, Exelon Corporation
Robert Laurie, California Energy Commission
David Lochbaum, Union of Concerned Scientists**
James Moorman, NRC, Region IV (Senior Resident Inspector)
Steven Reynolds, NRC, Region III
Edward Scherer, Southern California Edison
James Setser, Georgia Department of Natural Resources
Raymond Shadis, New England Coalition on Nuclear Pollution**
James Trapp, NRC, Region I (Senior Reactor Analyst)

Support to the Panel

Facilitator: Francis X. Cameron - NRC, Office of the General Counsel
Designated Federal Official: John D. Monninger - NRC, Office of Nuclear Reactor Regulation

* Richard Borchardt was originally appointed to the panel and participated in all panel activities through the fourth meeting of February 26-27, 2001. Subsequently, he was appointed to the position of NRR Associate Director for Inspection and Programs and assumed those duties as of March 19, 2001. In recognition of the desire for independence in panel membership from NRR, Mr. Borchardt decided to recuse himself from panel activities effective April 2, 2001.

** David Lochbaum was originally appointed to the panel and participated in the first panel meeting on November 1-2, 2000. He resigned from the panel on November 6, 2000. On December 4, 2000, Mary Ferdig and Ray Shadis were appointed to the panel.

BIBLIOGRAPHY OF PANEL ACTIVITIES

1. Results of the Revised Reactor Oversight Process Pilot Program, SECY-00-049, February 24, 2000, ADAMS ML003683227

2. Staff Requirements Memorandum on SECY-00-0049, "Results of the Revised Reactor Oversight Process Pilot Program (Part 2)," May 17, 2000, ADAMS ML003715823

3. IIEP Charter, October 17, 2000, ADAMS ML003760300

4. Letter to General Services Administration, October 17, 2000, ADAMS ML003760307

5. Letter to Library of Congress, October 17, 2000, ADAMS ML003760327

6. Letters to Congressional Oversight Committees, October 17, 2000, ADAMS ML003763800

7. First IIEP Meeting Summary and Transcript, November 1-2, 2000, ADAMS ML003774521

8. Second IIEP Meeting Summary and Transcript, December 11-12, 2000, ADAMS ML010090359 & ML010530300

9. Third IIEP Meeting Summary and Transcript, January 22-23, 2001, ADAMS ML010530104

10. Fourth IIEP Meeting Summary and Transcript, February 26-27, 2001, ADAMS ML010880350

11. Fifth IIEP Meeting Summary and Transcript, April 2-3, 2001, ADAMS ML011140513

12. Sixth IIEP Meeting Summary and Transcript, April 25, 2001, ADAMS ML011280333

13. Final IIEP Report, May 10, 2001, ADAMS ML011290025

SOURCES OF PANEL INFORMATION

December 11-12, 2000

Bill Sherman, Vermont Department of Public Service
Gary Wright, Illinois Department of Nuclear Safety

January 22-23, 2001

Joseph Brady, NRC Senior Resident Inspector
Sonia Burgess, NRC Senior Reactor Analyst
Stephen Campbell, NRC Senior Resident Inspector
Jeffrey Clark, NRC Senior Resident Inspector
Steven Jones, NRC Senior Resident Inspector
William Jones, NRC Senior Reactor Analyst
Jill Lipoti, New Jersey Department of Environmental Protection
James Trapp, NRC Senior Reactor Analyst
Dennis Zannoni, New Jersey Department of Environmental Protection

February 26-27, 2001

Victor Dricks, NRC Office of Public Affairs
Steve Floyd, Nuclear Energy Institute
Rich Janati, Pennsylvania Department of Environmental Protection
Judith Johnsrud, ECNP, Sierra Club
Steve Kerekes, Nuclear Energy Institute
David Lochbaum, Union of Concerned Scientists
Jenny Weil, McGraw Hill's *Inside NRC*

STAFF RESPONSE TO THE IIEP FINAL REPORT

Attachment 5

Staff Response to the IIEP Final Report

Introduction

In its final report, included as Attachment 4 to this paper, the Initial Implementation Evaluation Panel (IIEP) presented its evaluation of the results of the first year of implementation of the reactor oversight process (ROP). The overall panel conclusion was that the ROP is a notable improvement over the previous oversight process, and it should be continued. The ROP has made progress toward achieving the Agency's four performance goals. The panel recommended, however, that the staff take certain actions to ensure they achieve the Agency performance goals in the long-term, and consider other actions to improve the process.

Most of the IIEP conclusions and recommended actions were consistent with the staff's evaluation of the results of ROP initial implementation. These panel recommendations were factored into the staff evaluation of the ROP, and are addressed throughout this paper. The IIEP recommendations, and a summary of staff actions, are discussed below. The reference number following each recommendation refers to the issue number in the IIEP report.

- **Establish a formal program and assign sufficient resources to enhance communications necessary for improving the ROP. The program should accumulate lessons learned, provide multiple and diverse opportunities for comment to all internal and external stakeholders, respond to stakeholders' comments, and have a process for making timely process changes. (O-1)**

  Inspection Manual Chapter (IMC) 0307, "Reactor Oversight Process Self-Assessment Program," describes the formal program developed by the staff to continue open communication with all stakeholders to enhance the ROP. The ROP self-assessment program, and additional background on its development during the first year of ROP implementation, is also described in Attachment 3 to this paper.

  As described in IMC 0307, on a periodic basis the self-assessment program collects information from various sources, including the Reactor Program System (RPS), the inspection program, the performance indicator (PI) program, additional industry level PIs, periodic independent audits, internal and external stakeholder surveys, and public comment. Based on this information, an assessment of ROP success in the programmatic areas of PIs, inspection program, significance determination process, and assessment will be performed. In addition, an assessment of overall ROP efficacy will be made and recommendations for program improvement will be developed.

  The staff will continue to evaluate ways to improve the ROP self-assessment program, including how best to respond to stakeholder comment and feedback.

- **Revise the ROP communication plan to include outreach activities designed to inform the public about the process and its relationship to the Agency's mission of protecting the public health and safety. Appropriate resources should be provided to revise and implement the communication plan. Evaluate additional improvements to the information on the ROP Web page to improve and simplify**

public access to the information. Identify methods, using stakeholder input, to improve public outreach efforts. (O-2)

Throughout initial implementation, the staff made a concerted effort to continue and improve on the initiatives implemented during the ROP pilot program to keep the public informed and to provide frequent and ongoing opportunities to submit comment and feedback. The staff developed a Communication Plan that outlined the activities designed to enhance the understanding of the ROP among all external stakeholders. The communication tools used by the staff included the external Web page, a *Federal Register* notice, and numerous forums during which public, industry, and governmental stakeholders were participants.

As described in Attachment 2, the staff is working to update the Communication Plan to reflect ongoing activities related to the ROP and will continue to look for ways to improve public outreach based on lessons learned from the first year of ROP implementation.

- **Establish a structured ongoing program to evaluate long-term ROP effectiveness and to test ROP assumptions. As a minimum, this includes integrating the insights of the ROP self-assessment program and the overall assessment of industry performance. The staff should also consider periodically engaging internal and external stakeholders to independently assess the ROP. (O-3)**

  As described in Attachment 3, the staff has developed a periodic self-assessment process to evaluate the effectiveness of the ROP on an ongoing basis and to test program assumptions. In addition to the metrics developed for each major component of the ROP, metrics of a more general nature have been developed utilizing stakeholder feedback to gauge overall performance. Industry level performance metrics are also being developed and will be part of the self-assessment program. Both the self-assessment metrics and the industry level performance metrics evaluate the efficacy of the fundamental premises of the ROP that form the basis of the program. Although not planned for the upcomng year, the staff will consider engaging internal and external stakeholders in the future to independently assess the ROP.

- **Continue the efforts of the cross-cutting issues task force and clarify the ROP guidance on the identification and disposition of cross-cutting issues. (O-4)**

  The cross-cutting issues task force is continuing its effort to address many of the issues discussed in Appendix A of this paper pertaining to the treatment and role of cross-cutting issues in the ROP. Several additional planned actions regarding the evaluation of the role of cross-cutting issues in the ROP are also discussed in Appendix A. In particular, during periodic reviews of issued inspection reports, the staff will evaluate whether cross-cutting issues are being adequately identified and documented during inspection activities. As part of the self-assessment metrics developed for assessing the ROP, the staff will review the circumstances surrounding plants that jump two or more columns in the Action Matrix to see if these performance weaknesses were due to cross-cutting issues, and if so, whether inspections or PIs have identified similar concerns. And during annual ROP self-assessment, the staff will evaluate whether the ROP allowed for sufficient NRC

engagement at facilities that reached the degraded cornerstone column of the Action Matrix.

- **Evaluate lessons learned from initial implementation to achieve parity in the treatment of risk-significant inspection findings and crossed performance indicator thresholds. The evaluation should verify that the outcomes from the performance indicators and inspection findings accurately reflect the significance of the issues. The staff should consider addressing this issue by adjusting the Green/White thresholds or modifying the Action Matrix. (O-5)**

  Lessons learned from implementing the ROP indicated that risk-significant inspection findings and crossed PI thresholds had parity in the oversight process and received an appropriate Agency response as determined by the assessment process Action Matrix. The staff will continue to evaluate this issue as part of the ongoing ROP self-assessment, and will adjust Green/White thresholds or the columns of the Action Matrix as appropriate.

- **Ensure that the staff's ROP self-assessment program identifies and evaluates any unintended consequences or unnecessary regulatory burden caused by the performance indicators and that changes are made where appropriate. (P-1)**

  The staff has established specific metrics and success criteria in the ROP self-assessment program to periodically assess the PI program to identify and evaluate any instances of unintended consequences or unnecessary regulatory burden. The self-assessment program is discussed in Attachment 3 of this paper, and described more fully in IMC 0307.

- **Expedite the efforts to resolve the concerns about the safety system unavailability performance indicators and implement any needed revisions to NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," to achieve consistency with other applications. (P-2)**

  As described in Attachment 6, an NRC/Industry working group has been created to take a clean-slate approach to the SSU indicators to produce a set that is simpler, easier to understand, compatible with all intended uses, and more risk-informed than the current indicators. This effort will start by defining the objective of the indicators and will construct a new indicator from the ground up, including reevaluation of the changes already made to accommodate several of the issues associated with the unavailability PIs.

- **Continue the efforts to identify and evaluate improvements to performance indicators. The staff should thoroughly evaluate any significant changes to the performance indicators, following the structured process in Inspection Manual Chapter 0608, "Performance Indicator Program." Further, the staff should evaluate the effect of any significant changes in the scope of information provided by performance indicators on the Action Matrix and the baseline inspection program, and should identify any additional costs and benefits. (P-3)**

  As described in Attachment 6 to this paper, the staff is continuing to pursue several efforts to evaluate improvements to the PIs, such as ongoing efforts by the NRC/Industry working

group to develop improvements to the unavailability PIs. Any proposed changes to the PI program will be handled in accordance with the requirements of IMC 0608, which the staff issued on April 12, 2001. As described in IMC 0608 any new or revised PIs would be evaluated for their impact on the other parts of the ROP, including the affect on the baseline inspection program and evaluating the additional costs and benefits associated with the change.

- **Continue efforts to incorporate the answers to frequently asked questions into the performance indicator guidance document, NEI 99-02, and to make the answers more generic where possible. (P-4)**

  Revision 1 to NEI 99-02 was issued on April 23, 2001, and incorporated numerous frequently asked questions (FAQs) that were generated during the first year of ROP implementation. As described in IMC 0608, NEI 99-02 will continue to be updated periodically, as appropriate, to clarify the PI reporting guidance based on insights from the ongoing resolution of FAQs.

- **Evaluate the inspection approach for the physical protection cornerstone and revise the inspection program as necessary after the pending safeguards performance assessment pilot program and the physical security rulemaking are completed. (I-1)**

  As described in Attachment 7, the Physical Protection cornerstone inspection procedure (IP 71130) and its attachments will be revised over the next year to account for the significant changes and new policies in physical security. The feedback from external stakeholders on the 10 CFR Parts 26 and 73 rulemaking and the OSRE program, along with internal inspector feedback on the baseline inspection program, will form the basis for drafting the revisions to the inspection procedure. The staff also will write a new attachment to the inspection procedure to inspect the industry's self-assessment program.

- **Evaluate and revise guidance to inspectors as necessary to clarify and promote consistency in documenting inspections. Continue conducting periodic audits of inspection reports to identify and correct inconsistencies. The new documentation thresholds for issues that have a defined level of safety or regulatory significance are appropriate. Inspection observations and insights that do not reach the threshold should continue to be communicated verbally to licensees for their consideration. (I-2)**

  Since January 2001, the staff has been auditing inspection reports issued by the regions to determine whether the regions are documenting inspection results in accordance with the requirements of IMC 0610*, "Power Reactor Inspection Reports." The focus of these audits has been on determining whether the appropriate threshold was applied to document a finding, evaluating whether the safety significance of findings is clearly documented, and whether "No Color" findings are being properly used and placed in the proper context. These inspection report audits are performed as part of the periodic ROP self-assessment discussed earlier, and will continue beyond initial implementation. Based on these audit results, the staff will evaluate and revise the guidance for documenting inspection findings as necessary to ensure consistency.

General inspection policies are described in IMC 2515, "Light-Water Reactor Inspection Program - Operations Phase." As discussed in IMC 2515, communicating inspection observations is an integral and important part of every inspection, whether done daily during the course of an inspection, or periodically with status meetings. Observations or insights that do not reach the threshold for describing in an inspection report as defined by IMC 0610* should be conveyed to the licensee for its consideration, but are not to be used in the NRC's reactor assessment program.

- **Evaluate inspection findings and performance indicator results for the first year's implementation and determine the appropriate level of effort to adequately assess risk-significant areas in the baseline inspections. Modify the process as appropriate. (I-3)**

  Based on lessons learned from the first year of implementing the ROP, a number of baseline inspection program procedures are being changed to adjust the inspection scope, frequency, or level of effort as appropriate. The inspection procedures being revised include inservice inspection, 10 CFR 50.59 review, maintenance effectiveness, ALARA, and problem identification & resolution. Additional detail on the procedures being revised, and the basis for the revision, is provided in Attachment 7 to this paper.

- **After further experience with the ROP, review the results and consider whether to waive certain parts of the baseline team inspections and let licensees assess themselves under defined circumstances. (I-4)**

  As described in Attachment 7, the staff will continue to evaluate how licensee self-assessments could be used in satisfying some requirements of the baseline inspection program.

- **Validate and issue the revised reactor safety significance determination process Phase 2 worksheets. (S-1)**

  The development and issuance of the reactor safety SDP plant/site specific Risk-Informed Inspection Notebooks, including the Phase 2 worksheets, is currently ongoing. All of the 70 notebooks are scheduled to be completed and issued for use by the end of July 2001. Following issuance, the last important step remaining is a benchmarking process that compares the results of the SDP Phase 2 notebooks with the licensee risk model results to ensure that the SDP is generally conservative. The benchmarking process continues at a rate of two site visits per month. Additional detail regarding the issuance of the Phase 2 worksheets can be found in Attachment 8.

- **Continue efforts to obtain improved and standardized risk analysis tools for the reactor analysts. (S-2)**

  The improvement and standardization of the ROP risk analysis tools is an ongoing major effort associated with all of the SDPs. For several of the SDPs (e.g., fire protection, safeguards, ALARA) the improvement effort is mostly being performed by the NRC staff, while other SDP improvements such as reactor safety and shutdown risk involve both the

staff and the experts of a national laboratory. Details of the ongoing and planned improvements can be found in Attachment 8.

- **Review lessons learned from use of the fire protection significance determination process, and improve the risk characterization tool to make it more meaningful, effective, and efficient. (S-3)**

  Based on initial implementation lessons learned, the staff revised the fire protection SDP to incorporate additional information to enhance the inspectors' ability to assess functionality of fire protection defense in depth components such as fire brigade, automatic detection, and protection performance. The staff continues to develop the methodologies that will allow inspectors to determine fire scenario development and improve the accuracy of site specific data used in the assessment of risk associated with findings, such as ignition frequency. The results of these efforts will undergo functional evaluation and are expected to be made available to the inspectors by the end of 2001. Additional information regarding lessons learned from implementing the fire protection SDP can be found in Attachment 8 of this paper.

- **Continue development of an improved physical protection significance determination process. (S-4)**

  The staff determined that the Physical Protection SDP (PPSDP), with its link to the reactor safety SDP, can over-estimate the risk significance of an issue, and therefore lead to a higher level of NRC response and engagement than is warranted. The problem is most noticeable when processing a deficiency through the PPSDP that is identified by a force-on-force exercise. To remedy the problem the staff determined that the PPSDP has to be revised. However, while a longer term effort to revise the PPSDP is underway, the staff, with the approval of the Commission, issued an interim SDP. Details of the interim guidance were provided to the Commission in COMSECY-00-0036, which addresses significance determinations for findings developed during multiple scenarios in force-on-force exercises.

- **Evaluate the need for other significance determination tools. The staff should carefully evaluate any potential changes against the Agency's goals. For example, a new significance determination process that increases regulatory burden should have a corresponding benefit in maintaining safety or increasing the Agency's effectiveness. (S-5)**

  Currently, all SDP related improvement efforts are designed to streamline and simplify the process, thereby increasing inspector efficiency and reducing regulatory burden. For example, a proposal to create a Maintenance Rule SDP is under review and consideration will be given to assure that the appropriate balance between maintaining safety and any increase in regulatory burden is achieved.

- **Evaluate lessons learned from initial implementation and revise the ALARA significance determination process as necessary. (S-6)**

As described in Attachment 8 of this paper, the staff is taking several actions to revise the ALARA SDP based on ROP initial implementation lessons learned. The staff will revise the Radiation Exposure Control section of the Occupational Radiation Safety SDP to clarify how the SDP reflects the Commission's policy on enforcement discretion for skin over-exposures from hot particles (or discrete radioactive particles). Additionally changes are being considered to the screening question for the ALARA SDP and to use the 3-year average collective dose comparison to adjust the baseline inspection effort.

- **Use lessons learned from initial implementation to make the risk characterization process expedient, scrutable, and understandable to all stakeholders. (S-7)**

  The staff continues to evaluate the causes for not meeting the SDP guidelines for expediency (timeliness) during initial implementation. Enhanced SDP tools and continued experience with the process should provide some improvements in this area. Ongoing and longer term improvements, including improving the scrutability of assumptions, should make the process more understandable in general to all stakeholders. Additional detail regarding these process improvements can be found in Attachment 8.

- **Use lessons learned during initial implementation to clarify the definition of a performance deficiency. (S-8)**

  ROP initial implementation demonstrated that inspectors were generally able to identify licensee performance deficiencies associated with appropriately characterized issues. However, a specific definition of licensee performance deficiency has not been fully developed by the staff. Such a definition is under discussion, with proposals expected to be presented to regional management and inspectors at future inspector counterpart meetings.

- **Evaluate a graded approach for resetting non-Green inspection findings as entry conditions into the Action Matrix. (A-1)**

  As described in Attachment 9, the staff discussed this issue with both internal and external stakeholders at the External Lessons Learned Workshop held in March 2001. The staff will take the feedback received at the workshop and continue to evaluate the ROP to determine whether a graded reset approach for inspection findings is appropriate.

- **Evaluate and clarify the guidance on the designation, definition, and use of what are presently called "No Color" findings, and find a more appropriate term for these findings. (A-2)**

  The staff also discussed this issue with both internal and external stakeholders at the External Lessons Learned Workshop. As described in Attachment 9, the workshop participants could not reach consensus on a appropriate means to deal with "No Color" findings. As an interim measure, the group recommended that the Agency: (1) address the perception problems with "No Color" findings, (2) continue to monitor "No Color" findings and adjust program office guidance to minimize the number of these findings, and

(3) evaluate these findings to determine if they represent a weakness in the ROP. Over the longer term, the staff will also evaluate the role of "No Color" findings in the ROP.

- **Clarify the guidance on the objectives and structure of regulatory conferences and communicate this guidance to the external and internal stakeholders. (A-3)**

  As described in Attachment 9, the staff has developed several actions to clarify the objective and structure of regulatory conferences. These actions include conducting the meetings in such a manner as to ensure that the safety significance is discussed first and having someone besides the regional enforcement coordinator open the meetings.

- **Develop clear guidance on how to handle multiple related inspection findings, and communicate the guidance to all stakeholders. (A-4)**

  As described in Attachment 8, the staff is working to improve the guidance provided for the assessment of concurrent deficiencies. The existing guidance in IMC 0609, "Significance Determination Process," provides for concurrent performance deficiencies to be assessed collectively to determine total contribution to change in the core damage frequency (CDF). However, each concurrent performance deficiency should be assigned a color individually. When multiple issues stem from the same common cause, risk analysis techniques account for the potentially greater risk significance of the combined issues (i.e., delta CDF or delta large early release frequency (LERF)). However, in all cases the assessment process Action Matrix was designed to combine multiple issues for determining the appropriate NRC response. Although it is expected that in most cases the regulatory response will not differ if multiple issues are treated either in combination or independently, ROP guidance is being evaluated for enhancement with regard to applying combined risk results of multiple issues in a manner that is appropriate for use in the ROP Action Matrix.

PERFORMANCE INDICATORS

Task Lead: Don Hickman, NRR/IIPB

Attachment 6

Performance Indicators

Open Issues Addressed

There were several open issues and commitments that the staff continued to evaluate and work on during ROP initial implementation. Several of the issues involved longer term items that the staff identified in Commission paper SECY-00-0049 as needing additional work following initial implementation. The Commission directed the staff to consider several additional issues in the SECY-00-0049 Staff Requirements Memorandum (SRM) dated May 17, 2000. And several recommendations for staff consideration during initial implementation were made by the Pilot Program Evaluation Panel (PPEP) in their final report. The issues and recommendations for the inspection program are as follows:

SECY-00-0049

Consistency of Performance Indicator Definitions: There are a number of programs that collect similar performance data, including the Reactor Oversight Process (ROP) Performance Indicator (PI) program, Probabilistic Risk Assessment (PRA) programs, the Maintenance Rule, and the Institute of Nuclear Power Operations (INPO)/World Association of Nuclear Operators (WANO) performance indicator program. The NRC staff and the industry agree that, to the extent practical, there should be common definitions of performance indicators for all uses. More importantly, there should be one data set reported by licensees that can meet the needs of all of the above programs. The NRC has developed common definitions wherever possible. The staff has also communicated with INPO/WANO and the industry in an effort to move toward common definitions. Because the ROP PI program is an evolving one (toward plant-specific, more risk-informed indicators), there may be some inconsistencies that can only be worked out when all elements are in place. In the meantime, the staff continues to work with industry to reduce the differences. There is currently a significant effort underway with industry (including INPO and WANO) to develop a common definition and a common data set for the Safety System Unavailability indicators, which are the ones that have produced the most questions and concerns during initial implementation.

Process for Changing, Adding, or Deleting Indicators: During initial implementation, some changes to PIs became necessary to provide consistency among plants and with other regulatory requirements. Inspection Manual Chapter (IMC) 0608, “Performance Indicator Program,” was developed to provide a deliberate, formal process for PI program changes to ensure that they are carefully thought through and achieve the desired objective. The IMC 0608 process was used during initial implementation to address questions from stakeholders and to develop and evaluate potential replacement indicators (see Manual Scram Issue below).

Guidance on How to Handle a Plant in an Extended Non-Regulatory Shutdown: When a plant has been shut down for an extended period, some PIs no longer provide useful information about that plant’s performance (e.g., Unplanned Scrams per 7,000 Critical Hours, Unplanned Power Changes per 7,000 Critical Hours). IMC 0608 defines an extended shutdown and references Inspection Procedure 71150, “Discrepant or Unreported Performance Indicator Data,” for guidance on how to monitor plant

performance through inspection during extended shutdowns when some performance indicator data is not meaningful.

Guidance and Thresholds for RCS Activity and Leakage: These two indicators are intended to monitor the integrity of the fuel cladding and the primary coolant system, the first two barriers to the release of radioactive fission products. But because of differences in the method and frequency of licensee measurements of these parameters, as well as licensee actions to control them, they do not necessarily indicate the true condition of the barriers. In accordance with the PI change process, the staff plans to work with external stakeholders to improve the RCS Activity indicator, including improving calculational methods and thresholds, to more accurately reflect fuel cladding barrier performance.

Guidance on Unplanned Power Changes per 7,000 Critical Hours: For this PI, an unplanned power change is one that was initiated less than 72 hours following the discovery of an off-normal condition. The staff is concerned about unintended consequences resulting from this 72 hour requirement. There have been instances during initial implementation when a licensee has deferred corrective maintenance for more than 72 hours to avoid counts in this indicator. Accordingly, the NRC and industry have agreed to pilot an NRC proposed replacement PI entitled “Unit Power Reductions per 7,000 Critical Hours,” that counts most power reductions in average daily power level of greater than 20 percent. This eliminates the distinction between “planned” and “unplanned,” which the staff has not considered to be an important aspect of the indicator. The pilot will also include an alternate PI proposed by industry that would count power reductions due to equipment problems or operator errors. The NRC and industry plan to begin the pilot of the possible replacement indicators in the near future.

Guidance on the Relationship of Fault Exposure Hours to Operability and Reportability: Fault exposure hours (FEH) are used in the Safety System Unavailability (SSU) performance indicators in two ways: to indicate the hours a train was unavailable due to an undetected, failed condition (an appropriate use in an unavailability indicator), and to provide an indication of the reliability of the monitored trains to start and run (as a surrogate for a reliability because there is none in the SSU). The SSU indicators have generated more Frequently Asked Questions (FAQs) and concerns than any other, many of them related to fault exposure hours. Responding to these questions on specific events or conditions has taken considerable time on the part of both the staff and the industry. Many issues, including site-specific concerns, have been resolved using the FAQ process. While incorporating reliability indicators could provide better indication of equipment performance and would reduce the need for FEH, it would not totally eliminate them from the unavailability indicators. The staff has, in cooperation with the industry, begun a significant effort to revise the SSU indicators to improve their ability to identify risk-important events or conditions.

Protected Area Security Equipment Performance Index Definition: Some stakeholders have questioned the use of security guard compensatory hours as a measure of security equipment performance rather than the unavailable hours of the equipment. An NRC/Industry working group reexamined this issue and concluded that compensatory hours are easier to collect, adequate for the intended purpose of the PI, and have proven successful during initial implementation. Therefore there is no need to change the PI.

Guidance on Security-Related Reportable Events: The Physical Protection Cornerstone indicators for Personnel Screening Program Performance and Fitness-for-Duty Program Performance have been considered to be ineffective at identifying declining performance prior to major programmatic problems. Due to resource limitations, the NRC/Industry working group was not able to undertake an effort to develop alternate indicators for security-related reportable events during the past year.

Guidance for Loss of Key Control/Surveys: The NRC/Industry working group addressed the issue regarding the need for guidance related to loss of key control/surveys. This guidance was incorporated into the Nuclear Energy Institute (NEI) guidance document, NEI 99-02, Revision 1, "Regulatory Assessment Performance Indicator Guideline."

Guidance on Alert and Notification System (ANS) Reliability: Public stakeholders, licensees and inspectors have expressed a concern that the ANS Reliability PI does not include known periods of unavailability. The national standard for evaluating ANS performance is FEMA-REP-10, 1985, "Guide for the Evaluation of Alert and Notification Systems for Nuclear Power Plants," which has been used by many licensees for 15 years. Since FEMA-REP-10 uses reliability as the measure for evaluating ANS performance, the staff considered it to be appropriate to use the same measure in the ANS PI, especially since there has been no indication that the guidance of FEMA-REP-10 was inadequate. Nevertheless, the NRC did consider using an alternate performance indicator that would count unavailable hours. This effort was abandoned as unfeasible due to the variety of systems, test methods, and procedures throughout the industry that would greatly complicate the PI and produce results that are not comparable from plant to plant. However, the lack of an unavailability PI does not mean that there is important information not captured by the ROP. Baseline Inspection Procedure 71114.02, "Alert and Notification System Testing," would be expected to identify repetitive or significant ANS outages and to assess the associated corrective actions for adequacy.

Impact of Multi-Unit Sites or Multi-Input Indicators on Site-Wide Indicators: The staff committed to monitor site-wide indicators in light of the concern expressed by some that good performance at one unit of a multi-unit site, or in one part of a multi-input PI, could mask poor performance at the other unit or in the other part of the PI. The NRC has reviewed the use of site-wide indicators for multi-unit sites in the Emergency Preparedness, Occupational Radiation Safety, and Physical Protection cornerstones, and multi-input indicators in the latter two cornerstones, for possible masking of performance issues, with the following results:

> *Emergency Preparedness Cornerstone* - The concern is that good performance in the Drill/Exercise Performance PI at one unit (or crew), or in one part of the PI (e.g., protective action recommendation (PAR) development) could mask poor performance at the other unit (or another crew), or in another part of the PI (e.g., classification or notification). The staff has reviewed the EP data from initial implementation and not found any evidence that masking occurred, although the potential exists. However, the ROP is more likely to reveal a masking problem than previously, since, in the past, only one crew's performance was observed every two years, and the same team could perform in sequential exercises. Also, Baseline Inspection Procedure 71114.05 "Correction of Emergency Preparedness Weaknesses and Deficiencies," addresses the potential for masking. The

procedure directs inspectors to review the licensee's identification and correction of drill performance problems with emphasis on classification, notification and PAR development. Masking of significant problems should be revealed through review of critique results and subsequent corrective actions. The staff believes that the ROP adequately addresses the potential for masking poor performance.

Occupational Radiation Safety Cornerstone - The radiation protection program at a site is a site-wide program. Every unit at a multi-unit site is assessed a PI count for each occurrence captured by the PI, regardless of the unit in which it occurred, and the site value is same as the unit value. Therefore "good" performance in one Unit cannot mask "poor" performance in another. Also, because the Green/White threshold for this PI is low (>2 occurrences), "good" performance in one area (i.e., exposure control) is unlikely to mask "poor" performance in another area (i.e., Technical Specification high radiation area compliance).

Physical Protection Cornerstone - The physical protection program at a site is a site-wide program. Every unit at a multi-unit site is assessed the same PI values, and the site value is same as the unit value. Therefore "good" performance in one unit cannot mask "poor" performance in another. The Protected Area Security Equipment Performance Index is a multi-input PI, and good performance of the closed circuit televison cameras can, and has, masked poor performance of the intrusion detection system. The staff has proposed a resolution to this problem and is working with industry to incorporate a change to the PI.

SECY-00-0049 SRM

Manual Scrams: In a letter to Chairman Meserve dated May 19, 2000, Mr. Joe F. Colvin of NEI, Mr. James T. Rhodes of INPO, and Mr. Zack T. Pate of WANO expressed their concern about the possibility of unintended consequences that may result from the use of an indicator that counts manual reactor scrams. In the SECY-00-0049 SRM, the Commission noted that the staff has commenced a dialogue with industry on the issue and directed the staff to expeditiously report to the Commission potential resolutions to the concern. Accordingly, the staff has worked with industry to develop replacements for both the "Unplanned Scrams per 7,000 Critical Hours" and the "Scrams With Loss of Normal Heat Removal" performance indicators. Those replacements are intended to collect the same information as the current indicators in a way that minimizes the potential that an operator could be influenced to not scram the reactor to avoid a count against a PI. The indicators are entitled "Unplanned Reactor Shutdowns per 7,000 Critical Hours" and "Unplanned Reactor Shutdowns With Loss of Normal Heat Removal." An unplanned reactor shutdown is defined as follows:

> ... the shutdown of the reactor in response to off-normal conditions or events by the unplanned addition of negative reactivity by any means (e.g., insertion of control rods, boron, or opening reactor trip breakers). Unplanned reactor shutdowns are those that bring the reactor from criticality to a shutdown mode within 15 minutes of commencing to insert negative reactivity.

In accordance with the formal PI change process, the staff and industry conducted a pilot for these two indicators that commenced in October 2000 and was completed with the data submission for March 2001 that was received by the NRC on April 23, 2001. The results are currently being evaluated against pre-determined criteria, which comprise the following: (1) differences between the data collected for the Unplanned Reactor Shutdowns per 7,000 Critical Hours PI and those collected for the Unplanned Scrams per 7,000 Critical Hours PI; (2) comparability of the data reported for the Unplanned Reactor Shutdowns With Loss of Normal Heat Removal PI and both the Unplanned Scrams With Loss of Normal Heat Removal PI and the appropriate sections of NUREG/CR-5750, "Rates of Initiating Events at U.S. Nuclear Power Plants, 1987 - 1995;" (3) the ability of licensees to report the requested data accurately and with minimal need for clarification; (4) the ability of each alternate PI to reduce the potential for unintended consequences without introducing other unintended consequences; and (5) whether there are minimal changes in reporting burden for licensees. In addition, the NRC's databases at the Idaho National Engineering and Environmental Laboratory and the Oak Ridge National Laboratory are being utilized to identify previously reported events that would not be captured by the proposed replacement indicators. Upon completion of the evaluation, the staff will make a determination regarding implementation of the replacement indicators.

PPEP Final Report

Early Performance Indicator Verification Inspections: The Pilot Program Evaluation Panel recommended that verification inspections of the performance indicators be conducted early in initial implementation for the non-pilot plants. Accordingly, Temporary Instruction 2515/144, Revision 1, was issued early in initial implementation for resident inspectors at each non-pilot plant to review the licensee's PI data collection and reporting process to determine whether the licensees are appropriately implementing the NRC/Industry guidance.

Resolve the Issues Regarding the Appropriateness and Thresholds of Several Indicators: At the end of the pilot program, there were outstanding issues concerning the following indicators and their thresholds that have been addressed as described:

ERO Drill/Exercise Performance (DEP) and Drill Participation Indicators: NEI 99-02, Revision 0, included language explaining that these two indicators are linked. That is, for key ERO members who are responsible for classification, notification or PAR development to get credit in the ERO Drill Participation PI, their performance must be assessed and must contribute to the DEP PI value. The issue of linkage between the DEP PI and ERO PI was largely resolved early during initial implementation. However, the linkage was not apparently universally understood and, in a few instances, was misinterpreted or overlooked. The clarity of the linkage was improved in NEI 99-02, Revision 1, and NEI committed to conduct further industry training to ensure understanding. The indicators allow the licensee to run as many drills as deemed necessary, above a minimum set by regulation. If performance is declining toward the White band, licensees have generally used this option rather than to allow the PI to cross the threshold.

ANS Reliability Indicator: The concern expressed by public stakeholders, licensees and inspectors about the appropriateness of the ANS Reliability PI is

discussed above. There was also a concern about the thresholds for this indicator. The thresholds were established by expert opinion, based on 60 plant-years of data. The Green/White threshold was set at 94 percent in recognition of the typically high ANS reliability. When this threshold was developed, only one plant was below the threshold and one near it. Therefore the threshold was deemed to accurately reflect the performance level at which greater NRC involvement in licensee maintenance of the ANS was appropriate. This premise was borne out during initial implementation. The number of White indicators has been about the expected rate of 5 percent, and they were primarily due to problems with ANS maintenance. The Yellow band threshold was set at 90 percent, the reliability value that requires a formal corrective action plan to be filed with FEMA. Although no member of the NRC/Industry EP working group was aware of an ANS with annual reliability so low, one did occur during initial implementation. This poor reliability could have been masked under the normal FEMA reporting scheme because ANS statistics for that plant would have been combined with a neighboring plant. Inspection of the associated corrective actions revealed a poor root cause analysis and poor corrective action implementation by the licensee, which indicated that the threshold was appropriate.

Protected Area Security Equipment Performance Index: As described above, the NRC/Industry working group examined the use of unplanned unavailable hours in lieu of compensatory hours in this PI and concluded that there is no need to change. Also, as described above, this PI is a multi-input PI and the staff has proposed a resolution to the masking problem. In addition, both the White band and Yellow band thresholds, that had been a concern during the pilot program, were changed when the historical data provided by all plants prior to the start of initial implementation was evaluated. The staff determined that the Green band should be widened by adjusting the Green/White threshold from 0.05 to 0.08. The Yellow band was eliminated because the NRC/Industry working group agreed that posting a guard when security equipment is inoperable does expend additional resources but generally provides adequate compensation so that a degraded condition does not exist. The working group also agreed that human compensation measures, while effective in the short-term, may become degraded after an extended period of time due to the inability of a human to remain at a full attentiveness level. The human tendency to continue to expect no activity after a significant period of no activity is a factor that may lead to a degraded condition as well. Therefore, the performance indicator has been determined to provide a valid indication for a site's protected area perimeter security systems.

Containment Leakage Indicator: As a consequence of several significant problems with this indicator, it was removed from the program prior to initial implementation. The problems included infrequent measurement of leakage (typically, only during refueling outages), lack of a common method among licensees for measuring leakage, and untimely (after-the-fact) indication of containment integrity.

Treatment of Significant Events: The steam generator tube failure at Indian Point Unit 2 raised questions about the need for a PI to monitor steam generator tube performance

during plant operation. While such a PI could be developed, the staff determined that it would not provide useful information and the effort was therefore terminated.

Self-Assessment Metric Results

The ROP self-assessment program evaluates the overall success of the ROP being objective, risk-informed, understandable, and predictable as well as its success in meeting the Agency's performance goals of maintaining safety, increasing public confidence, making NRC activities and decisions more effective, efficient, and realistic, and reducing unnecessary regulatory burden on stakeholders. On a periodic basis, the self-assessment program collects information from various sources, including the Reactor Program System (RPS), the inspection program, the PI program, additional industry level PIs, periodic independent audits, stakeholder surveys, and public comment. Based on this information, an assessment of ROP success is performed in the programmatic areas of performance indicators, inspection, significance determination process, and assessment. Listed below are discussions of the self-assessment metrics associated with the PI program. Due to the lack of historical data, an in-depth analysis is not possible in most cases. However, where appropriate, some conclusions were reached.

Measures for the PI program were developed as part of the overall assessment of the ROP. The measures demonstrate attributes of the PI program that were designed to give feedback in key areas that monitor performance. Those attributes, a description of the measures, and a summary of the preliminary self-assessment results follow.

Objective, Understandable, Predictable

These attributes are all closely linked. The staff determined that the PI program would be considered objective, understandable, and predictable based on the number of: (1) significant deviations that cross thresholds and (2) discrepancies in licensees reporting PI data, plus the volume of questions regarding interpretations of PI guidance. These attributes were met as determined by successful achievement of the following measures:

a. The low number of significant deviations that crossed thresholds.

   Significant deviations that crossed a threshold remained low during the entire first year of initial implementation. Two instances were cited while conducting PI verification inspections. The first occurred in the first quarter of initial implementation and the second was in the fourth quarter. (Significant deviations are defined as reporting inaccuracies that would cause a PI to cross a threshold when corrected.)

b. The low number of discrepancies in reporting PI data plus the volume of questions regarding interpretations (internal and external frequently asked questions).

   Reporting discrepancies trended downward from the initial implementation period, with a "spike" upward in the third quarter of 2000. This was primarily due to problems with the SSU PI guidance. The staff is currently addressing this issue, hence the reporting discrepancies are approaching stability, as seen from quarter to quarter.

Maintains Safety

The PI program maintains safety by: (1) tracking, trending, evaluating, and characterizing PIs that cross multiple thresholds (i.e. Green to Yellow or Red) to allow timely interaction and (2) surveying licensees for feedback regarding undesirable actions taken in order to remain within the Green band. While it is too early to draw conclusions on the success of this attribute, positive feedback obtained on these measures are as follows:

a. Quarterly reporting on the number of multiple crossed thresholds.

   During the first quarter of initial implementation, one PI (High Pressure Safety Injection) crossed multiple thresholds. The remainder of the full year of the implementation of the ROP saw a decreasing trend resulting in zero multiple thresholds crossed.

b. Minimizing potential for licensee actions taken in response to the PI program that adversely impact plant safety.

   Responses to internal surveys on the PI program revealed that respondents agreed that the PIs provide useful information on risk-significant areas (79%), are clearly defined (72%), understandable (78%), and help to maintain safety (72%).

Efficiency, Effectiveness, Realistic

The attribute: efficiency, effectiveness, and realistic used five measures to obtain feedback to monitor performance: (1) information is provided in a timely manner, (2) the process remains stable over time, (3) the information is reported accurately, (4) timely indication received of declining safety performance, and (5) minimizing potential for licensee actions taken in response to the performance indicator that adversely impacts plant safety. The last three of these five measures share the same success criteria as the objective, understandable, predictable (Measure 3), and maintains safety attributes (Measures 4 and 5). The attribute was considered met based on successful achievement of the aforementioned and the following measures:

a. The ability to provide information in a timely manner, which was measured by:

   Tracking late PI postings on the NRC's external Web site

   PI postings are due on the external Web site within five weeks of the end of each quarter. To date, there have been no late PI submissions.

b. Process stability over time, which was measured by:

   The number of changes made to the existing PIs. The expectation was to have low numbers of PI changes, with a stable or decreasing trend.

   To date, two proposed changes to PIs have been pilot tested. The staff is currently conducting an evaluation to determine if the proposed changes to the unplanned scram and unplanned scram with loss of normal heat removal PIs warrant replacement.

Enhances Public Confidence

The PI program enhances public confidence by assuring that accurate and understandable information is provided in a timely manner. This attribute uses four measures. Three of the four measures share the same measures previously achieved in the objective, understandable, and predictable; and the efficient, effective, and realistic attributes. While it is too early to draw conclusions on the success of this attribute, positive feedback obtained on this measure is as follows:

a. Results of an external survey of stakeholders perception on the clarity of the guidance contained in NEI 99-02.

   External stakeholders offered a wide variety of comments, most of them related to the effectiveness of the PIs in ensuring that declining performance is identified before safety is compromised. Industry representatives agreed with a key premise of the ROP, that weaknesses in cross-cutting issues, such as the corrective action program, will manifest themselves in the PIs as well as in inspection findings. An industry monitoring group tacitly endorsed the PIs by submitting a petition to the NRC to make reporting of the indicators mandatory. The State of New Jersey, however, pointed out that the ability of PIs to find performance problems is suspect because they are consistently and overwhelmingly Green.

Reduces Unnecessary Regulatory Burden

While all respondents to internal and external surveys associated with the ROP indicated that they believed that unnecessary regulatory burden has decreased overall, external stakeholders held the view that regulatory burden in the area of the PI program had increased, but increased in an appropriate manner. The staff concluded that this attribute had been met because the appropriate increase in burden associated with PI data collection was, on balance, a contributor to the overall reduction of unnecessary regulatory burden associated with the ROP.

External survey results, as well as interaction with license and industry stakeholders at public meetings and during IIPB staff visits to license facilities, indicate that licensees are concerned with the duplication of reporting requirements between the PI program, the Maintenance Rule, and INPO/WANO. The staff is working closely with its stakeholders through the ROP Industry Working Group to resolve these data reporting issues.

Stakeholder Feedback (Internal/Public/Industry)

Most of the feedback on PIs was provided by resident and region-based inspectors, and by the industry through FAQs. Much of this input concerned the SSU indicators. In addition, some industry managers perceived the potential for negative consequences from counting manual scrams, and the staff had concerns about the unintended consequences of the Unplanned Power Changes per 7,000 Critical Hours PI. Also, inspectors and their managers provided feedback on the extent of licensees' efforts to avoid a White PI.

The most significant SSU issues include (1) credit for operator recovery actions, (2) treatment of support system unavailable hours, (3) counting unavailable hours for on-line maintenance, (4) removal of large blocks of fault exposure hours (FEH) due to a single event, (5) the use of non-conservative default values for the hours a train is required, (6) the use of FEH, both known and estimated (t/2), (7) the impact of the thresholds on effective preventive maintenance, and (8) inconsistencies between the various programs that monitor the unavailability of safety systems (e.g., Maintenance Rule, PRA, INPO/WANO indicators, and ROP indicators). All of these issues have been discussed in the staff's monthly public meetings with NEI and industry representatives. Those discussions have resulted in changes to the program to address the first four issues, as described in the following section. Resolution of the four remaining issues has been more difficult. Therefore, a new NRC/Industry working group has been created to take a clean-slate approach to the SSU indicators to produce a set that is simpler, easier to understand, compatible with all intended uses, and more risk-informed than the current indicators. This effort will start by defining the objective of the indicators and will construct a new indicator from the ground up, including reevaluation of the changes made to accommodate the first four issues. (The last unresolved issue on the list above - the inconsistencies between the various programs that monitor the unavailability of safety systems - is discussed in detail in the section on Consistency of PI Definitions under SECY-00-0049 above).

Some industry managers are concerned about the potential for negative consequences from counting manual scrams. This issue is discussed in detail in the section on Manual Scrams under Staff Requirements Memorandum on SECY-00-0049 above.

Some internal stakeholders are concerned about the potential for unintended consequences in the use of the Unplanned Power Changes indicator. The issue is discussed in detail in the section on Guidance on Unplanned Power Changes per 7,000 Critical Hours under SECY-00-0049 above.

A concern stated by some in the industry, in response to a *Federal Register* notice requesting comments on the first year of initial implementation, was that the PI verification inspection could place an unnecessary regulatory burden on licensees. The stated reason for this is that some inspectors are trying to find undercounts in the SSU indicator in amounts that are so small as to not be worth the effort of the inspector or the licensee to resolve. The staff believes that, given the importance placed on the PIs, verification is necessary. Inspections have discovered situations where increased licensee attention is warranted. As a part of resource tracking, the staff is monitoring effort devoted to PI verification and will make warranted adjustments. Thus far, it appears that a slight increase may be warranted.

Perhaps a more significant source of burden of the PI program is generated by the perception of many licensee that performance outside the licensee response band will have unacceptable consequences that must be avoided if at all possible. The concern that licensees express to the NRC is that a White PI puts them one more White PI or inspection finding away from a degraded cornerstone, which would result in a significantly increased NRC supplemental inspection. In addition, licensees are apprehensive about a public reaction that could result in unfavorable publicity, increased insurance rates, and lower bond ratings. Because of these concerns, some licensees, to avoid crossing the Green/White threshold, are striving for zero counts in those indicators where any count is bad. This has caused several licensees to go well beyond what the staff considers reasonable, in performing engineering analyses, simulator exercises, or tests of mockups of plant conditions, to prove that a train would have functioned. This puts a heavy

burden on resident inspectors to investigate licensees' responses to determine if they are acceptable. This issue has had a significant impact on the PI program through increased numbers of FAQs and regional feedback forms that must be resolved, through increased inspector hours to review the licensee's actions to avoid PI counts, and through increased Headquarters staff time to respond to telephone and e-mail correspondence concerning the appropriateness (or lack thereof) of the licensees actions. The staff will continue to evaluate these concerns and take appropriate action.

In late 2000, the Union of Concerned Scientists (UCS), pursuant to 10 CFR 2.802, submitted a petition for rulemaking to the NRC . The requested rule would require nuclear plant owners to submit the PI information needed for the ROP. This petition was noticed in the *Federal Register*. The petition and responses to the *Federal Register* notice are under review by the staff.

The UCS also is concerned about not including design errors in the SSU. (This issue is being addressed in the NRC/Industry SSU working group described above.) Other stakeholders believe that the indicators are not definitive and the thresholds are not appropriate or that both indicators and thresholds should be plant-specific. It is important to remember that the ROP includes baseline inspections along with performance indicators to determine when the NRC should engage the licensee. It is also important to remember that the ROP is a living program, and it is the NRC's intent to make both the indicators and the thresholds more plant-specific and more risk-informed as the program matures.

The State of New Jersey questioned the credibility of indicators that show 99% of the plants in the Green band, a number that may be obtained when looking at the PI results for a single quarter. Thresholds were based upon identifying approximately 5% of plants as outliers in one year. This was done for the IE and MS cornerstones only and for the three year period from 1995 through 1997. If 1% of the indicators are non-Green in one quarter, then up to 4% may be non-Green for one year (this can only be determined by looking at the performance of individual plants). For the other cornerstones, the thresholds were set based on expert opinion, that, with a few adjustments, turned out to be quite accurate. In some cases, such as the Protected Area Security Equipment Performance Index and Emergency Preparedness Drill Participation, licensees responded and fixed programs that had not been effective. These are PI program successes that caused licensee performance to improve over what it was in 1995 through 1997. Hence the number of non-Green indicators in those cornerstones has gone down. It is expected that licensees will respond by devoting more resources to performance measures that are being tracked and made publicly available. Therefore we would expect performance to improve over time in each of the indicators.

Program Changes Made as a Result of Lessons Learned

The SSU indicators were changed as follows:

- Credit for operator recovery actions was expanded to allow credit for recovery from operator errors and equipment malfunctions. The latter has generated a number of questions and resulted in some licensee actions that are well beyond what was intended.

- A provision was added that allowed licensees who perform on-line maintenance to not count those hours as unavailable if the licensee has in place a quantitative risk

assessment that demonstrates that the increase in risk is small. This was done to allow licensees to perform on-line maintenance and not count unavailable hours if the risk is comparable to doing that maintenance while shut down, when the hours would also not be counted.

- A provision was added to allow the removal of FEH for blocks of FEH of 336 hours or greater due to a single event after 4 quarters have elapsed, if the licensee has competed all necessary corrective action and the NRC has inspected and closed out the issue. This will reset the indicator so that future problems could cross the threshold and result in supplemental inspection.

Long-term Program Changes Planned

Plans for long-term changes to the PI program include the following:

- Evaluate the results of the two Initiating Events Cornerstone pilots for possible replacement of the three indicators in this cornerstone (Scrams, Scrams with Loss of Normal Heat Removal, and Unplanned Power Changes).

- Work with industry to improve the existing SSU indicators to simplify them, make them easier to understand, more compatible with all uses, and more risk-informed; and evaluate the RBPIs as possible additions to or replacements for the SSU indicators.

- Continue to work on the barrier indicators (RCS activity, RCS leakage, and a containment PI) to improve the usefulness of those indicators.

- Work with industry to remove the potential to mask poor performance in the protected area security equipment index PI.

- Improve the usefulness of the Personnel Screening Program Performance and the Fitness-for-Duty/Personnel Reliability Program Performance indicators. These PIs count reportable events, which have been considered ineffective in identifying declining performance.

INSPECTION PROGRAM

Task Lead: Steve Stein, NRR/IIPB

Inspection Program

Open Issues Addressed

There were several open issues and commitments that the staff continued to evaluate and work on during ROP initial implementation. Several of the issues involved longer term items that the staff identified in Commission paper SECY-00-0049 as needing additional work following initial implementation. The Commission directed the staff to consider several additional issues in the SECY-00-0049 Staff Requirements Memorandum (SRM) dated May 17, 2000. And several recommendations for staff consideration during initial implementation were made by the Pilot Program Evaluation Panel (PPEP) in their final report. The issues and recommendations for the inspection program are as follows:

SECY-00-049

- Evaluate during initial implementation and beyond the supplemental and event response portions of the inspection program; collect feedback on how cross-cutting issues are handled by the inspection program; evaluate and incorporate feedback into the program and continue to improve the program to ensure it provides sufficient information to assess cornerstone attributes.

- Issue a supplemental inspection procedure for human performance and continue to assess the adequacy of the supplemental portion of the inspection program.

- Evaluate the need for additional inspections of fuel movement during operations.

SECY-00-049 SRM

- Ensure the threshold for documenting observations is clearly understood and that observations do not undermine consistent and objective inspection and enforcement.

PPEP Final Report

- Ensure program effectiveness is not measured solely based on resource utilization.

- Evaluate significant events for insights into effectiveness of inspection program results.

Self-Assessment Results

The ROP self-assessment program evaluates the overall success of the ROP being objective, risk-informed, understandable, and predictable as well as its success in meeting the Agency's performance goals of maintaining safety, increasing public confidence, making NRC activities and decisions more effective, efficient, and realistic, and reducing unnecessary regulatory burden on stakeholders. On a periodic basis, the self-assessment program collects information from various sources, including the Reactor Program System (RPS), the inspection program, the ROP performance indicator (PI) program, additional industry level PIs, periodic independent audits, stakeholder surveys, and public comment. Based on this information, an assessment of ROP success is performed in the programmatic areas of PIs, inspection, significance determination

process (SDP), and assessment. Listed below are discussions of the self-assessment metrics associated with the inspection program. The metrics do not directly measure the quality of inspections and one year of implementation may not be sufficient to draw conclusive results. However, where appropriate, some conclusions were reached.

Objective

The program was developed to be objective and included guidance for establishing a minimum threshold for inspection findings and for explaining the objective basis for the significance of the findings. Therefore, the program's focus on objective findings and minimization of reliance on subjective matter is measured by how well findings that appear in inspection reports meet the program's guidance. Although the data is preliminary, it indicates that most of the issues being documented comply with the program's requirements for adequately explaining the significance and reasons for the findings, and therefore are objectively arrived at. The data also indicates that there is room for improvement. The guidance for documenting issues in inspection reports was changed significantly during initial implementation. The revised guidance clarified the thresholds for documenting findings and the expectations for documenting the significance of findings. Additional changes will be made based on lessons learned and feedback from inspectors and public stakeholders to continue to improve in this area.

The survey of internal stakeholders asked if the program fosters objective findings whose significance can be clearly explained. Almost three quarters of the respondents agree that the program does.

Risk-Informed

The risk-informed nature of the inspection program is indicated by several measures: (1) how well all findings that appear in inspection reports meet the program's guidance, (2) how well "No Color"[1] findings that appear in inspection reports meet the program's guidance, (3) the number of successful appeals of SDP determinations, (4) the number of changes to program documents that improve the risk-informed aspects of the program, and (5) the number of changes to baseline inspection program documents that affect scope of what is inspected or frequency of inspection. The measures are augmented by a survey of inspectors and other NRC staff associated with the ROP.

The preliminary data indicates that the baseline inspection program is risk-informed. Findings are generally documented as required by the program and few final SDP determinations are successfully challenged. However, the number of program documents that have been changed to improve the risk-informed nature of the program indicate that further improvements can be expected. The majority of NRC personnel surveyed believe the program is appropriately risk-informed.

[1]"No Color" findings are inspection issues whose significance can not be evaluated by the SDP and, therefore, can not be assigned a color.

Understandable

The ability of program requirements to be understood by the NRC staff responsible for implementing the program, and the ability of inspection reports to communicate relevant information are measured by responses to an internal survey. While the majority of those implementing the baseline inspection program find its procedures to be understandable, a large percentage do not. The staff's audit of inspection reports also finds that a large percentage of inspection findings are not clearly described in the reports.

Predictable

The inspection program is considered to be predictable if it is implemented as defined and if it is planned and conducted consistently across the regions. The measures used to determine predictability are: (1) the rate of completion of the baseline inspection program over the year, (2) the percentage of inspections whose schedules change, and (3) a comparison and analysis of inspection effort. The measures are augmented by a survey of inspectors and other NRC staff associated with the ROP.

Preliminary results indicate that the program was generally consistently applied across the regions. Although the rate of changes to inspection schedules varied during the year, it averaged under 9 percent overall. The largest number of changes (42 percent) were due to inspectors being unavailable or perturbations in schedules to accommodate a plant the region needed to focus on, such as Indian Point 2 (IP2) in Region I. Schedule changes to make the inspection efforts more effective or efficient, such as by combining inspections or because the licensee's schedule or program changed making site conditions inappropriate for the inspection, accounted for 22 percent of the changes. Changes made to accommodate a licensee (regulatory impact changes) accounted for 19 percent of the schedule changes. Another 6 percent of the changes were because of a conflict with another NRC inspection or meeting. The reasons for 10 percent of the changes were not identified. This level of schedule change was acceptable and the staff will continue to monitor it.

The resources used in implementing the program were close to the estimated resources. The analysis of resources for the ROP are discussed in ROP resources attachment to this paper.

Maintains Safety

The inspection program helps to maintain the current level of plant safety if the program covers all the areas deemed necessary for plant safety and the program is fully implemented. If the scope and depth of inspections are adequate and the program is fully implemented, then the program maintains safety. Therefore, this aspect of the program is measured by: (1) the number of program documents changed that effect the scope or frequency of inspection, and (2) the number of changes to inspection schedules for reasons other than regulatory impact. The measures are augmented by a survey of inspectors and other NRC staff associated with the ROP.

Only a small percentage of program documents were revised effecting the scope or frequency of inspection. In general the scopes were somewhat reduced or frequencies decreased (a biennial inspection in physical protection was changed to triennially). Although the rate of inspection schedules that changed varied during the year, it averaged under 9 percent of the total activities

scheduled. The survey of NRC personnel implementing the new program shows the majority of them find that the program covers activities important to safety and addresses the attributes of the cornerstones of safety.

Therefore, the staff concludes that the inspection program does contribute to maintaining plant safety.

Efficiency, Effectiveness, Realistic

How efficient the inspection program is measured by a comparison of resources, both direct effort by NRC inspectors and contractor support dollars. The program's effectiveness and whether it is realistic are measured by: (1) the number of changes to inspection schedules and the reasons for the changes, (2) the program's stability as evidenced by the number of significant changes to the program, and (3) the timeliness of issuing inspection reports and completing temporary instructions. The measures are augmented by a survey of inspectors and other NRC staff associated with the ROP.

The analysis of resources for this first year of implementation found that the regional resources were adequate to effectively carry out the ROP, including the inspection program. The data will be used to better estimate the resources necessary for future implementation of the program and to develop a more realistic budget model for inspection. See the ROP resources analysis attachment to this paper.

Changes were made to about 9 percent of the inspections scheduled during the year of initial implementation. The reasons for many of the changes (42 percent) were unavailable inspectors and making inspectors available for plants that two of the regions needed to focus on. About 13 percent of the changes were made to be more efficient and effective by combining inspections or assigning inspections to an inspector already on site. Another 8 percent of the changes were because a licensee changed its schedule or program, which made site conditions inappropriate for the inspection.

The number of change notices issued that significantly effected the program increased during initial implementation. Further significant changes are expected.

The majority of contracted support has been in the areas expected: design and fire protection for baseline team inspections. The only other contract support needed was mechanical and electrical engineering for the IP 95003 supplemental inspection at IP2.

Almost all inspection reports were issued within the program's timeliness requirements and temporary instructions were completed within deadlines. The temporary instruction for evaluating licensees' processes for reporting performance indicators had to be extended several months. The instruction was not performed at two plants because they had been shutdown and were not collecting data for the indicators.

The survey of NRC personnel implementing the ROP indicates that the baseline inspection program appropriately emphasizes inspection planning.

Although generally meeting the goals of efficiency, effectiveness, and realistic, the inspection program can be improved in these areas. The program should stabilize after the changes following the year of initial implementation have been incorporated into the program documents.

Enhances Public Confidence

Because public confidence is not measured directly, the self-assessment metrics are based on the premise that the inspection program enhances public confidence when information is timely and accurate. How well the program meets this goal is measured by: (1) the timely posting of inspection results on NRC's Internet Web site, (2) the number of inaccuracies in the posted and issued inspection material, and (3) a survey of inspectors and other NRC staff associated with the ROP. The preliminary data indicates that the posting of inspection results is timely and accurate. Only a few problems with posted information were identified and usually related to not properly updating the original Plant Information Matrix entries for findings after their significance had been finally determined.

Reduces Unnecessary Regulatory Burden

How well the inspection program, as part of the overall ROP, helps to reduce unnecessary regulatory burden on licensees is not directly measured. It is indicated by an analysis of comments from the industry and other public stakeholders received in response to a *Federal Register* notice request for comments. The general response from public stakeholders is that the overall burden of the ROP compared to the previous process has been reduced, although some of the public stakeholders do not see this as a good outcome. The industry attributes the reduction to better focus on risk significant issues and integration of enforcement into the assessment process.

Several industry stakeholders commented on areas for further reductions in unnecessary burden within the inspection program. These areas included decreasing the frequency of team inspections, combining inspections of programs that are common across a utility's different reactor sites, and using a licensee's self-assessments for satisfying baseline inspection program requirements. NEI stated that improvements in the focus, efficiency, and effectiveness of the inspection program were most notable in the reactor safety cornerstones and less pronounced in the radiation safety and physical protection cornerstones. One utility commented on the increase of inspection over the previous program in the radiation safety areas despite the advent of performance indicators for monitoring a licensee's performance, and NEI stated that the inspection and the occupational exposure effectiveness indicator unnecessarily overlap.

Although the overall burden has declined, the industry stakeholders commented on the increased inspection at what were previously considered superior performers (SALP category 1 plants). One utility commented on the seemingly inconsistent allocation of resources between single unit and dual unit plants, with single unit sites receiving a disproportionate amount of inspection. The change in the "N+1" resident policy was mentioned as a contributing factor; i.e., both single and dual unit plants have two resident inspectors. Conversely the State of New Jersey's comments stated that the level of inspection is too low and the ROP doesn't clearly define the appropriate levels based on performance. However, both the industry and State of New Jersey agree that the ROP focuses resources on risk significant issues.

Although the ROP has reduced overall burden on licensees and the inspection program is focusing the NRC and licensees on the more important issues, there are opportunities to improve the burden imposed on licensees by the inspection program. The areas recommended by industry for possibly reducing inspection burden have not yet been evaluated.

Evaluation of Supplemental Inspection Program

In SECY-00-049, the staff committed to evaluate the supplemental and event follow-up portions of the inspection program, as these portions of the program had not been sufficiently exercised during the pilot process. During the first year of initial implementation of the ROP, experience was gained with all three supplemental inspection procedures (IPs). IP 95001, "Inspection For One Or Two White Inputs In A Strategic Performance Area," which is performed at facilities that reach the regulatory response column of the Action Matrix, was used 30 times. IP 95002, "Inspection for One Degraded Cornerstone or Any Three White Inputs in a Strategic Performance Area," which is performed at facilities that reach the degraded cornerstone column of the Action Matrix, was used four times. And IP 95003, "Supplemental Inspection For Repetitive Degraded Cornerstone, Multiple Degraded Cornerstone, Multiple Yellow Inputs, Or One Red Input," which is performed at facilities that reach the Multiple/Repetitive Degraded Cornerstone column of the Action Matrix, was used once.

Throughout this first year of the ROP, NRR staff reviewed all supplemental inspection reports. The results of that review indicate a high degree of uniformity in the implementation of the inspections. The degree of uniformity can be largely attributed to the inspection report guidance contained in Inspection Manual Chapter (IMC) 0610*, "Power Reactor Inspection Reports," which requires the documentation of all supplemental inspection requirements, along with the inspector's findings for each requirement.[2] This guidance helps to enhance public confidence by providing a clearly documented NRC assessment of the licensee's evaluation and corrective actions associated with significant issues. The requirements for documenting supplemental inspections also ensure that the supplemental inspections are highly predictable.

Based on reviewing these inspection reports and feedback received from the staff conducting the inspections, the staff believes that the supplemental inspection program will be effective at maintaining safety. The supplemental inspections conducted during initial implementation have helped licensees improve the effectiveness of their root cause evaluations of risk significant issues. During several inspections, the NRC identified significant deficiencies in the licensee's evaluation of the issues. In some cases, these deficiencies were found to be programmatic and resulted in broad improvements to the licensee's corrective action program. By allowing licensee's the opportunity to first evaluate significant issues before the NRC intervenes with inspection, the supplemental inspection program also highlights the importance of our role as regulators and the licensee's role as operators of the facility.

The supplemental inspection program also seems to be very efficient. The 30 inspections conducted using IP 95001 totaled 852 hours of direct inspection effort. The four inspections conducted using IP 95002 totaled 739 hours and the one inspection conducted using IP 95003

[2]IMC 0610* contains specific guidance for documenting inspections using IPs 95001 and 95002. The reporting guidance is less constrictive for IP 95003 and the report form is left to the inspection team leader's customization because of the diagnostic nature of the inspection.

took 1724 hours. The total direct inspection hours charged to the supplemental inspections during the first year of the ROP were 3315, or an average of 32 hours for each of the 103 operating units. While a one-to-one comparison can not be made to the previous inspection program, the supplemental inspection effort under the ROP was significantly less than the plant-specific inspection effort under the previous program.

Evaluation of Event Follow-Up

Management Directive (MD) 8.3, "NRC Incident Investigation Program," was revised early this year to risk inform the Agency's response to significant operational events at power reactors. It provides three levels of event follow-up as a function of deterministic and risk criteria: Incident Investigation Teams, Augmented Inspection Teams (AITs), and Special Inspections. IP 93812, "Special Inspection," was issued to provide guidance on regional follow-up to events that needed more attention than a quick review under the baseline inspection program, but were not significant enough to warrant an incident investigation or augmented inspection. Baseline inspection procedure IP 71153, "Event Follow-Up," requires the inspector to evaluate licensee events in order to provide input regarding the deterministic and risk criteria, which assists management in deciding the level of NRC response.

During the first year of the ROP, a draft version of MD 8.3 was used until the revision was issued in March 2001 and the regions provided feedback in its use. The feedback resulted in including degraded conditions within the scope of significant operational events at power reactors, and revising IP 71153 to clarify that licensee notifications in accordance with 10 CFR 50.72 are one means of activating event follow up.

During the first year of the ROP, eight events at power reactors (one AIT follow-up and seven Special Inspections) required a follow-up inspection beyond the baseline inspection program, for a total direct inspection effort of 1926 hours. For most of these events, the region consulted with NRR's Inspection Program Branch (IIPB) regarding implementation of MD 8.3 and IP 71153 in determining the appropriate level of event follow-up. The staff's review of these events and follow-up validated the effectiveness of determining the level of event follow-up based on a combination of deterministic and risk criteria.

Stakeholder Feedback (Internal/Public/Industry)

The staff collected the majority of the feedback on the inspection program from several sources, including: (1) feedback forms from inspectors and other NRC staff, (2) a survey of NRC staff who were involved in the initial implementation of the ROP, (3) a *Federal Register* survey of the public and industry, and (4) public meetings held near Washington, DC and all four regions. In addition, about half way through initial implementation IIPB visited 24 sites and all four regions to interview resident and regional inspectors, licensees' staff, and regional managers.

The staff addressed questions and recommendations as feedback was received on individual procedures or other program documents. Many of the comments and suggestions were incorporated during initial implementation. Other feedback, such as estimated time necessary to complete a procedure, were held in abeyance until the end of initial implementation so the staff could evaluate a broader range of data from all four regions before making changes to the program.

A summary of the major feedback themes is as follows.

Clarity of Findings In Inspection Reports

Although the majority of stakeholders believe that inspection reports provide sufficient and proper information, a common criticism is that inspection findings in inspection reports don't always conform to program requirements for documenting the basis for determining the finding's significance. That guidance is in IMC 0610*, "Power Reactor Inspection Reports." The staff's audit of inspection reports confirms that a high percentage of findings are not adequately documented in reports. The staff is using the audit results to disseminate examples contrasting properly and improperly written findings to the inspectors and regions and to clarify the program guidance for writing inspection reports.

IMC 0610* also was the subject for many feedback forms from NRC inspectors. Of all of the program documents, the third highest number of feedback forms were written against the report writing guidance.[3] Many of the forms questioned implementation of the new aspects of documenting inspection findings in the ROP, such as cross-cutting issues, threshold for documenting issues, and licensee-identified violations, and pointed out seeming contradictions.

Two issues with documenting the results of inspections in the ROP were the subject of task groups and discussed at the External Lessons Learned Workshop in March 2001: (1) the role of cross-cutting areas and (2) "No Color" findings. The resolution of the issues are discussed in other attachments to this paper. The role of cross-cutting areas is discussed in the cross-cutting attachment and documenting "No Color" findings is discussed in the assessment process attachment.

Physical Protection Inspections

Much of the feedback from the first year of implementation related to challenges in determining the significance of and documenting findings from the inspection of force-on-force exercises. The staff got only limited experience using the ROP in overseeing security force-on-force exercises during initial implementation because the exercises was not initially inspected under the baseline inspection program. The SDP aspect of this concern is discussed in the significance determination process attachment to this Commission paper. The other aspect of this concern dealt with the scope and threshold criteria for the screening questions in IMC 0610*, that determine if an issue should be documented in an inspection report. The staff addressed these issues by implementing an interim physical protection SDP and a revision to the screening questions in IMC 0610*. A final SDP for physical protection will be issued upon additional feedback and experience gained over the upcoming year.

Another topic of feedback received concerned the nuclear power industry's proposal for a self-assessment program that would demonstrate the capability of a plant's physical protection contingency response to defeat a design basis threat, as prescribed by 10 CFR Part 73.

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[3] The document with the most feedback forms was IMC 0608, "Performance Indicator Program," because of the large number of questions raised regarding interpretation of the indicators. The individual SDP procedures also received many feedback forms, and when combined exceed the number received for IMC 0610*.

Feedback from the stakeholders regarding the Safeguards Performance Assessment (SPA) program focused on the revisions to the baseline inspection program necessary to provide sufficient regulatory oversight for the SPA program, and ensuring that the SPA program parallels and complements the current 10 CFR 73.55 rulemaking effort.

Maintenance Rule Inspections

Feedback from inspectors indicated that the frequency and level of effort for IP 71111.12, "Maintenance Rule Implementation," were too high and that the programmatic aspects of this inspection were neither risk-informed nor met the minimum threshold for documenting findings in an inspection report. Based on the results of IP 71111.12 inspections, the most significant finding can only be classified as very low significance (Green). As a result, inspectors questioned the value of the procedure and suggested that it be enhanced. As originally written, IP 71111.12 verifies the licensee's implementation of its Maintenance Rule program (i.e., it is compliance based) and doesn't verify the effectiveness of the licensee's maintenance efforts (i.e., performance based). Only minor comments were received from inspectors on other baseline inspection procedures related to maintenance effectiveness.

A maintenance effectiveness focus group, consisting of regional senior resident inspectors and staff from NRR and OE, reviewed this issue, developed several recommendations for improvements, and discussed the issue and recommendations at a public workshop in March of this year. One of the group's recommendations was to revise IP 71111.12 to have the inspectors evaluate equipment performance issues, such as availability and reliability preferably relating to trains of high safety-significant systems not covered by PIs and systems with negative performance trends or known equipment performance problems. Other recommendations included adding requirements and guidance into the annual problem identification and resolution inspection procedure, IP 71152, to determine the adequacy of licensee's corrective actions in addressing performance issues associated with maintenance errors and Maintenance Rule implementation issues. The staff is incorporating the focus group's recommendations into the procedures.

Inspection of ALARA Programs

Many stakeholders were concerned with the baseline inspection program's use of collective dose as a screening criteria for inspection findings for as low as reasonably achievable (ALARA) programs. Some stakeholders believed it was inappropriate that the screening criteria (a 3-year rolling average) could cause identical findings at different plants to be treated differently. Such findings would not be documented in inspection reports for plants below the criteria and documented for plants above the criteria. Plants above the criteria also could be susceptible to entering the Degraded Cornerstone column of the Action Matrix from findings during one outage.

The issues with the ALARA inspection and findings were discussed at the public workshop in March 2001. The discussions resulted in several approaches and suggestions for changes to the ALARA portion of the baseline inspection program. These approaches included removing the significance criteria from the screening criteria (Group 2 questions in IMC 0610*); developing a new Group 2 screening question for ALARA to clarify that the basis for a finding in this area is a breakdown in or failure to implement the ALARA Program resulting in "unintended dose"; and using the 3-year rolling average for collective dose to adjust the level of effort of the baseline

inspection for individual plants. The staff is evaluating the approaches and will make any necessary changes to the program to implement the approaches taken.

Industry stakeholders have consistently commented on the increased level of inspection effort over the previous program in the radiation safety area, even with the advent of a performance indicator. The estimated inspection hours will be revised after the ALARA baseline inspections have been restructured.

Refueling and Other Outage Activities

In SECY-00-0049, the staff stated that lessons learned from using the refueling and outage activities inspection procedure and its adequacy in addressing spent fuel cooling systems would be incorporated into the procedure. The staff also committed to evaluate the need for additional inspections of fuel handling during power operations during the first year of implementing the ROP.

The spent fuel pool cooling system is integral to decay heat removal for shutdown safety, but is not covered by the Shutdown Operations SDP. The staff is evaluating how to incorporate this area in the SDP. In addition, the staff is evaluating how the SDP should address inspection procedures for independent spent fuel storage installations.

The staff evaluated feedback from inspectors, and revised the baseline inspection program procedure to address areas such as the scope of outage activities to inspect, estimated resources to conduct the inspection, and inconsistencies between inspection requirements and licensee technical specifications. Some feedback indicated that the procedure needs to focus on areas that are addressed by the Shutdown Operation SDP and are more risk significant. The next procedure revision will address this, primarily by eliminating areas that are not addressed by the SDP.

Other Feedback

Several industry stakeholders have expressed interest in using self-assessments in anticipation of major baseline inspections to either find significant issues before the NRC finds them, or to reduce the scope and effort of the baseline inspection. Currently, the staff's practice is to not take credit for licensee efforts in satisfying baseline program requirements, at least until the NRC has had sufficient experience in implementing the new program.

The baseline inspection program was designed to be indicative and focused on results, not predictive and focused on causes. However, a common theme in the comments received with the internal stakeholders survey is a dissatisfaction with what is perceived to be the reactive nature of the baseline inspection program and it's reduced emphasis for finding the causal factors for problems. Many respondents stated that allowing inspectors to document minor issues (those below the level of very low significance) and their causes would be useful in predicting problems in areas such as human performance before they manifest themselves in other ways, such as failed equipment. The Commonwealth of Pennsylvania, in its response to the *Federal Register* notice, also expressed its view that the baseline inspection program should focus more on cross-cutting areas.

The latest survey of NRC personnel can not be statistically analyzed against the 1999 survey conducted of those who implemented the pilot program, but some general comparisons can be made. For those questions that were comparable, the responses were generally the same or showed some improvement. The largest improvement was in the responses to the questions about whether inspection reports communicate relevant information to the public and licensees. Another area of marked improvement was the responses to the question about whether the baseline inspection procedures adequately address cornerstone objectives.

One of the comments from the Nuclear Energy Institute (NEI), in its response to the *Federal Register* notice, was that the baseline inspection program's verification of PIs could become overly burdensome if not properly managed. NEI cites as an example inspectors who focus on uncovering time that should have been counted as part of a PI of such short durations as to be insignificant to the reported indicator. The objective of verifying PIs in the baseline inspection program is to sample the raw data being used to calculate the indicators to provide assurance of the indicators' accuracy without reconstructing the reported numbers. The inspection procedure for verifying PIs, in conjunction with IMC 0610*, emphasizes finding and reporting information that is significant enough to cause an indicator to cross thresholds, and doesn't allow documenting conditions that could not appreciably affect the indicators. Therefore, the program provides a disincentive for inspectors to focus on insignificant factors. In addition, the staff's review of this aspect of the baseline inspection program indicates that the focus of PI verification inspections is usually appropriate although the resources necessary to complete the verifications are higher than originally estimated.

Program Changes Made as a Result of Lessons Learned

During the year of initial implementation, the following program documents were changed in response to feedback and lessons learned:

- IMC 0610*, was revised to clarify: (1) the thresholds for documenting inspection findings, (2) what constitutes a documentable cross-cutting issue, and (3) documenting the basis for significance of findings. Agency decisions about "No Color" findings will affect the guidance in IMC 0610*, which will be revised to implement the decisions. Examples of properly and improperly documented findings from past inspection reports will be added to the manual chapter.

- A supplemental inspection procedure (IP 71841, "Human Performance") for evaluating corrective actions for human performance deficiencies was issued on December 12, 2000. (SECY-00-049 commitment)

- The baseline inspection procedure for following up events (IP 71153) was revised to compliment the risk-informed aspects of MD 8.3.

- The baseline inspection procedure for refueling and other outages (IP 71111.20) was revised to clarify its basis for fuel movement and to add guidance on the increased risk during such times.

- The baseline inspection procedure IP 71111.13, "Maintenance Risk Assessment and Emergent Work Control," was revised to incorporate 10 CFR 50.65 (a)(4) rule

requirements and inspection guidance. A supplemental inspection procedure (IP 62709, "Configuration Risk Assessment and Risk Management Process") for performing independent assessment of the conditions associated with 10 CFR 50.65 (a)(4) implementation problems was issued on December 28, 2001.

A number of baseline inspection program procedures are being changed based on the staff's review of initial implementation. The procedures whose scope, frequency, or level of effort are being changed significantly include the following:

- The procedure for inservice inspections will be changed based on staff recommendations in the steam generator action plan and the lessons learned from the steam generator tube failure at Indian Point 2. At multi-unit sites, the inspection will be conducted at every refueling outage for each reactor unit instead of at one unit during an outage about every two years. Additional inspection requirements will be added for pressurized water reactors with older steam generators.

- The inspection frequency for evaluating licensees' programs that implement 10 CFR 50.59 will be changed from annual to biennial because the inspection is more effective when combined with other design related inspections that are conducted every two years. An initial evaluation of licensee's meeting the recently revised rule will be accomplished with a one-time temporary instruction inspection.

- The Maintenance Rule inspection procedure (IP 71111.12) is being rewritten to make it more risk-informed and performance based.

- The ALARA procedure will be revised after the staff restructures the screening and significance criteria for ALARA findings.

- The annual problem identification and resolution inspection will be changed to biennial. Other changes to the baseline inspection program will ensure continued oversight of this cross-cutting area every year. The changes will make the inspections more effective and efficient by allowing a more in-depth (albeit less frequent) assessment of a licensee's program while emphasizing routinely following up individual issues. (See the cross-cutting attachment to this paper.)

Long-term Program Changes Planned

The Physical Protection cornerstone baseline inspection program procedure (IP 71130) and its attachments will be revised over the next year to account for any changes in policy or regulations. The feedback from external stakeholders on the 10 CFR Parts 26 and 73 rulemaking and the OSRE program, along with internal inspector feedback on the baseline inspection program, will form the basis for drafting the revisions to the inspection procedure. The staff also is developing a new inspection procedure on the NRC's oversight of the SPA pilot program. The staff is considering any scheduling efficiencies between the SPA pilot program inspection procedure and the baseline inspection program.

Refinements to the estimates for the inspection effort and budget models will continue as a result of these changes in inspection program scope.

The staff needs to evaluate how licensee self-assessments could be used in satisfying some requirements of the baseline inspection program.

The staff is publically meeting with stakeholders to restructure the assessment of ALARA findings (screening criteria and significance criteria) and will revise the associated inspection program documents to accommodate the consensus outcomes.

SIGNIFICANCE DETERMINATION PROCESS

Task Lead: Peter Koltay, NRR/IIPB

Attachment 8

Significance Determination Process

Open Issues Addressed

There were several open issues and commitments that the staff continued to evaluate and work on during ROP initial implementation. Several of the issues involved longer term items that the staff identified in Commission paper SECY-00-0049 as needing additional work following initial implementation. The Commission directed the staff to consider several additional issues in the SECY-00-0049 Staff Requirements Memorandum (SRM) dated May 17, 2000. And several recommendations for staff consideration during initial implementation were made by the Pilot Program Evaluation Panel (PPEP) in their final report. The issues and recommendations for the Significance Determination Process (SDP) are as follows:

SECY-00-0049

- The staff will continue to evaluate NRC risk analyst staffing needs throughout the first year of implementation. It is anticipated that additional risk analyst expertise will be needed to augment the regional senior reactor analysts (SRAs) on a long-term basis.

  Three senior residents were selected for the training program for regional SRAs. Additionally, twelve region based staff were selected to receive advanced risk training that will enable them to perform and interpret basic quantitative risk analyses.

- The staff will continue to evaluate the efficacy of the various SDPs.

  This is an ongoing process. The staff has continued to evaluate the efficacy through continuous monitoring of the process. Additional details on completed and planned changes to the SDP process are provided under Program Changes Made as a Result of Lessons Learned section of this document.

- The staff has planned to visit each plant site to discuss the plant-specific SDP Phase 2 worksheets with the licensee. The objective of these visits is to ensure that the individual plant examination (IPE)-based SDP worksheets are modified as needed to include any plant changes since the IPE was written or any new risk insights generated by the licensee's most current risk analysis.

  The site visits have been completed. The resulting changes will be incorporated into the worksheets and the documents will be issued for use by the inspectors by the end of July 2001.

- The staff initiated a longer-term effort to develop a Phase 2 SDP process for issues affecting reactor safety during shutdown conditions will continue beyond initial implementation.

  This is an ongoing activity utilizing the expertise of a national laboratory.

- An integrated review of inspector training requirements is being conducted to better align the NRC training courses in reactor technology, regulatory practices, and probabilistic

risk assessment (PRA) to support the revised reactor oversight program. An evaluation of the type of training needed on new or significantly revised SDPs will be made after development of these are complete.

This is an ongoing activity.

- The current SDP does not explicitly address certain categories of violations of 10 CFR 50.65 (Maintenance Rule).

  A proposal to develop an SDP addressing Maintenance Rule (a)(4) violations is under review.

- The staff will develop an SDP for licensed operator re-qualification inspection issues.

  The “Operator Requalification Human Performance Significance Determination Process” was issued as Appendix I to MC 0609 in December of 2000.

SECY-00-0049 SRM

- The staff should continue to work with NRC stakeholders to resolve the "Performance Issues Outside Licensing and Design Basis" issue while maintaining its appropriate sensitivity to backfitting implications. The staff should specifically discuss this issue when they report to the Commission on the results of the first year of ROP implementation.

  Four examples of licensee performance outside the licensing or design basis of the plant were addressed during this period. Although no compliance issues existed, the Agency was able to take appropriate action through the assessment process and supplemental inspection to address the safe significance of the issues. No backfitting evaluations were performed during the period.

PPEP Final Report

- The independent SDP review panel should be maintained during and following industry-wide implementation to continue to reinforce and ensure desired consistency as more inspectors are exposed to the process.

  The panel is identified as the SDP/Enforcement Review Panel (SERP). The SERP reviews of each inspection finding potentially greater than Green contributes to the consistent implementation of the ROP. Participants include the Headquarters and region based SRAs, enforcement specialists, and appropriate NRR technical and project management staff. The panel is chaired by the Chief, Inspection Program Branch (IIPB) or by an IIPB section chief who is responsible for obtaining consensus on the determination of significance of the findings. Detailed guidance on the SERP functions is incorporated into a draft document that will become Attachment 0609.01 to Inspection Manual Chapter (IMC) 0609, “Significance Determination Process,” when issued.

Self-assessment Metric Results

The ROP self-assessment program evaluates the overall success of the ROP being objective, risk-informed, understandable, and predictable as well as its success in meeting the Agency's performance goals of maintaining safety, increasing public confidence, making NRC activities and decisions more effective, efficient, and realistic, and reducing unnecessary regulatory burden on stakeholders. On a periodic basis, the self-assessment program collects information from various sources, including the Reactor Program System (RPS), the inspection program, the ROP performance indicator (PI) program, additional industry level PIs, periodic independent audits, stakeholder surveys, and public comment. Based on this information, an assessment of ROP success is performed in the programmatic areas of performance indicators, inspection, significance determination process, and assessment. Listed below are discussions of the self-assessment metrics associated with the SDP. Due to the lack of historical data, an in-depth analysis is not possible in most cases. However, where appropriate, some conclusions were reached.

Objective

The program's design to focus on findings that minimize reliance on subjective inspection input is measured by the number of SDP packages rejected by the SERP because the characterization of the finding and the proposed preliminary significance determination does not meet the guidelines outlined in IMC 0609. During the first year of implementation, no SDP packages have been returned for not meeting established standards for technical accuracy and/or format. However, audit findings indicate that some inspection findings processed through the SDP lacked documentation detailing the actual assumptions used in coming to a significance determination. The required information was obtained by the SERP without returning the subject packages to the region. Revisions to inspection report documentation guidance completed during the initial implementation period should improve the SDP implementation process.

Risk-informed

The SDP is considered to be risk-informed by design. No metrics were specifically established to evaluate this attribute.

Understandable

The ability of the SDP to be understood by the NRC staff responsible for implementing the program, and the ability of the SDP packages to communicate relevant information are measured by internal audits and stakeholder feedback. The available metrics data indicates that improvements are needed to ensure that SDP decisions are auditable and can be easily reconstructed using publicly available documentation. Although all of the necessary information is captured, there is not a single source of information that will allow for simple auditing of the process.

Feedback from survey provides original input in this area. Additional detail is provided in the Stakeholder Feedback section below.

Predictable

The SDP is considered to be predictable if it is consistently implemented as defined. The measures used to determine predictability are: (1) SDP results are reproducible, (2) SDP standards and processes do not require substantial changes, and (3) SDP tools reflect current plant design and licensee operating practices, and the SDP results are perceived to translate to the same level of concern for all cornerstones.

Initial results indicate that the process resulted in reproducible outcomes. However, based on the stakeholder feedback and initial implementation experience, it was recognized that some revisions to the current SDP guidance are necessary in some instances to reduce the complexity of the process and in others to produce appropriate regulatory response. Some enhancements to SDP guidance for Fire Protection, Security and Safeguards, as low as reasonably achievable (ALARA) programs, and Transportation have been completed, others are under consideration. Stakeholder surveys of findings from various inspection areas and cornerstones assessed through the applicable SDP indicate that the classification of the findings by safety significance and corresponding colors led to the expected response band of the regulatory process.

Maintains Safety

The SDP helps to maintain the current level of safety if the SDP is effective in focusing NRC and licensee attention on safety significant issues. This attribute of the SDP is measured by the tracking the total number of over-conservative and non-conservative initial SERP results. During the initial implementation period, no non-conservative findings were identified. This is expected because the SDP incorporates generally conservative assumptions and therefore the results tend to be conservative. The potential implication is that the process is over-conservative, thus repeatedly causing reduction in preliminary characterization of significance of findings following use of more accurate assumptions. Additional program experience must be gained before the optimum balance between conservative and more accurate preliminary SDP assessment can be determined. The metric results also indicate that the SERP process has been effective in identifying over-conservative initial significance determinations prior to final licensee notification.

Efficiency, Effectiveness, and Realistic

The efficiency of the SDP is measured by evaluating whether NRC resource expenditures are commensurate with the significance of the issues identified. This attribute is measured by tracking: (1) NRC interactions with the licensee, (2) whether SDP timeliness goals are met, and (3) the accuracy of SDP results.

The metrics indicates that SDP results have been accurate. The timeliness goals established in MC 0609 have not been met. Specifically for findings greater than Green, the time required to process the finding through the SDP was significantly longer than originally was expected by the staff. Some of the delay can be attributed to a learning phase by both the staff and the licensees. However, additional evaluations to ascertain the effort required to arrive at preliminary significance assessments of the findings is necessary to ensure that the established timeliness goals are realistic, and appropriate adjustments made as necessary. It is expected that through continued use of the SDP, staff proficiency levels will improve. The results indicate that the licensees have also become familiar with the process and have indicated that SDP

outcomes have been predictable and consistent. Refer to substantial stakeholder feedback below.

Enhances Public Confidence

Although public confidence is not readily measurable directly, the SDP is believed to enhance public confidence when information is timely and communicated in a way that demonstrates that the NRC understands the plant's performance. This attribute of the SDP is measured by verifying the accuracy of facts and the timeliness of communicating the facts to the licensee. As previously stated, the inability to meet established timeliness criteria for developing preliminary significance determinations and the SDP's tendency to provide over-conservative preliminary results will be evaluated to determine if changes to the process are necessary.

Reduces Unnecessary Regulatory Burden

The SDP program reduces unnecessary burden by focusing NRC and licensee resources commensurate with the significance of findings. This attribute is measured by licensee feedback on the appropriateness of resource expenditures. Metrics results indicate that the licensee's have accepted the SDP process and believe that the SDP provides for realistic and effective use of NRC and licensee resources.

Stakeholder Feedback (Internal/Public/Industry)

The staff captured internal feedback, regional and resident inspector comments as well as comments by NRC managers, through a standardized feedback process. Issues relating to the SDP were evaluated, incorporated, or scheduled to be incorporated as deemed applicable and appropriate. External feedback was solicited and received through workshops, routine meetings with NEI, at industry forums such as fire protection, that were attended by IIPB. Public comments were received at several workshops. Licensees offered significant criticism during the development, presentation and assessment of all findings, of all levels of safety significance. The staff also received comments by the Initial Implementation and Evaluation Panel (IIEP). The IIEP represented a cross section of stake holders tasked with the assessment of the first year of implementation of the ROP.

Applicable to All Cornerstones.

In general, the time spent by NRC staff on the development of the preliminary significance determination was greater than originally anticipated, and often protracted, resource intensive, interaction with licensees ensued the identification of the finding.

The IIEP recommended that the staff should carefully evaluate any potential changes against Agency goals. For example the need for the development of additional SDPs should be questioned in terms of increased regulatory burden versus benefits in maintaining safety. The IIEP recommended that the staff Improve the process for determining risk characterization of issues so that they are expedient, scrutable, and understandable to all stakeholders. Additionally there were several requests to clarify the definition of performance deficiency.

Reactor Safety SDP

The majority of internal and external stakeholders expressed concern regarding the complexity of the risk-informed assessment of inspection findings. Additionally, a significant number of stakeholders questioned the reliability of the initial Risk-Informed Inspection Notebooks, the Phase 2 process of the SDP, that were based on IPEs and were known to under-estimate the potential significance of inspection findings. This resulted in the time consuming detailed risk analyses of each inspection finding that passed through the Phase 1 screening process as potentially greater than Green, while site visits were conducted to collect the information required to improve the notebooks. Recommendations were made to continue efforts that provide improved and standardized risk analysis tools beyond the Phase 2 Notebooks. Stakeholders also expressed concerns regarding the lack of external events risk data, application of operator response credit, lack of detailed guidance for assessing concurrent performance deficiencies and the method to appropriately address long standing design basis deficiencies. Stakeholders concerns with the guidance provided for assessing shutdown and containment related findings were also noted.

Fire Protection SDP

Concerns with the complexity of the Fire Protection SDP were expressed by some stakeholders. Lack of detailed written guidance for fire scenario development and fire brigade performance evaluation, both key inputs to the SDP, resulted in extensive expenditure of SRA, risk analyst, and fire protection engineer resources. There were also several examples of disagreement between the NRC staff and licensees on the fire protection design bases such as in the evaluation of fire induced circuits failures of associated circuits that would result in hot shorts and spurious equipment actuations.

Maintenance Rule SDP

The feedback received from stakeholders indicated that the significance of (a)(4) Maintenance Rule performance issues cannot be assessed with the existing Reactor Safety SDP.

The existing Reactor Safety SDP does not clearly address issues related to risk assessment and risk management associated with performance of maintenance activities. The existing SDP Phase 1 worksheet may inappropriately screen risk-significant plant maintenance configurations to Green. In addition, the Phase 2 site-specific inspection notebooks lack the necessary level of detail and completeness to assess maintenance configurations with multiple equipment out-of-service. The licensees are already using Phase 3 type analyses (and tools) to assess the at-power risks of maintenance configurations.

The staff has developed a draft SDP for evaluating the significance of Maintenance Rule (a)(4) performance issues (failure to perform an adequate risk assessment and failure to manage risk) for at-power and shutdown conditions. In part, the metrics used for the proposed SDP are based on configuration-specific incremental core damage probability (ICDP), incremental large early release probability (ILERP), and degradation of key safety functions. Findings regarding inadequate risk management are proposed to be assessed qualitatively. The proposed SDP was presented to the internal and external stakeholders during a lessons learned public workshop in order to obtain their feedback and recommendations. During the workshop the stakeholders raised a number of concerns regarding the proposed SDP and provided several

recommendations for improvement. The staff will continue to develop a Maintenance Rule (a)(4) SDP and work closely with stakeholders in resolving the issues.

Transportation SDP

Based on inspection findings, the Transportation SDP was found to result in inappropriately high significance in certain situations.

Physical Protection SDP

The staff determined that force-on-force inspection findings posed a significant challenge in applying the Physical Protection SDP (PPSDP). These challenged were associated with the linkage of the PPSDP to the Reactor Safety SDP. Given the inability to appropriately assess the probability of a successful adversary attack on the facility, the staff found that the PPSDP would generate inappropriately high outcomes for certain force-on-force exercise findings. The linkage to the Reactor Safety SDP also caused the process to focus on operator recovery of a damaged facility rather than on the security program.

Shutdown SDP

Internal stakeholders noted that the Shutdown SDP does not include reactivity guidelines, and the associated check lists do not correlate well with the base line inspection guidance. Shutdown related inspection findings continue to require a Phase 3 assessment by a risk analyst, which involves the extensive use of regional SRAs and Headquarters based risk analysts. A Phase 2 inspection tool that will allow inspectors to make a more detailed assessment of safety significance, is under development.

Occupational Radiation Safety SDP

Stakeholders noted that the Occupation Radiation Safety SDP appears to exclude all hot particle exposures, including whole body (deep dose equivalent) as well as skin dose from hot particles not subject to the enforcement discretion. This is not consistent with the Commission enforcement policy.

The current Occupational Radiation Safety Group two screening criteria in MC 0610*, Power Reactor Inspection Reports," screens out all ALARA issues identified at plants that have a rolling 3-year average collective dose that does not exceed the screening criteria. The unintended consequence of this screening is that, for these licensees, a failure to implement appropriate ALARA procedures or engineering controls, cannot be documented in the inspection report. The process also resulted in a number of unintended outcomes such as: (1) inspectors note that they cannot document a finding for these plants no matter how egregious the performance issue they identify, (2) the Institute of Nuclear Power Operations (INPO) pointed out that the screening criteria can be viewed as a *de facto* definition of ALARA for power reactors, and (3) some licensees, with a 3-year average collective dose above the screening criteria, feel they are at risk for multiple White findings from one poor outage, which would result in NRC action that may be too harsh considering the Agency's previous enforcement history with ALARA.

The question was raised whether a violation associated with multiple White findings (escalated enforcement) is too harsh a response considering the Agencies previous enforcement history

with ALARA. This issue was discussed at the March 2001 External Lessons Learned Workshop. The consensus opinion of the participants indicated that although no scenario could be constructed where a single ALARA failure should result in a degraded cornerstone (i.e., a Yellow finding), it is appropriate for a degraded cornerstone to be assessed for licensees that have multiple White findings in the assessment period.

Significance and Enforcement Review

Attachment 0609.01 to IMC 0609, designed to provide guidance on the conduct on SERPs, Regulatory Conferences, and for the issuance of preliminary and final decisions on SDP and enforcement, was not formally issued at the time of initial implementation. However, the staff implemented a draft of the document that continued to undergo enhancements based on lessons learned from the implementation of the oversight process throughout the period. Final comments are being solicited from all internal stakeholders. The document will be issued during the Summer 2001.

Program Changes Made as a Result of Lessons Learned

Reactor Safety SDP

Phase 2 Notebooks:

The staff determined that the most important change to the reactor safety SDP, currently ongoing, is the development and issuance of the plant/site specific Risk-informed Inspection Notebooks. The notebooks incorporate site specific information collected and verified during site visits by SRAs and NRC Headquarters risk analysts. The notebooks include the Phase 2 worksheets of the SDP giving the inspectors the tool they need to assess inspection findings in the field. All of the 70 notebooks will be completed and issued for use by the inspectors by the end of July 2001. Following issuance, the last important step remaining is a benchmarking process that compares the results of the SDP Phase 2 notebooks with the licensee risk model results to ensure that the SDP is generally conservative. The latter effort requires site visits that started in April 2001. To date, several benchmarking efforts indicate that SDP results using the notebooks are conservative as expected. However, there is also indication that some licensees did not provide adequate comments during the initial site visits resulting in some notebooks that do not accurately reflect certain accident sequences. While the process is ready for full implementation by the inspectors, continued SRA involvement and verification by the SERP remain important aspects of the process. The benchmarking of the notebooks continues at a rate of two site visits per month.

Credit for Operator Actions:

The staff revised the credit given for operator actions by changing from two categories, recovery under normal conditions and recovery under stressful conditions, to four categories of Human Error Probabilities (HEP) ranging from 0.1 to 1E-4. Phase 2 worksheets are in the process of being updated to include plant and site specific information.

Transportation SDP:

For the Transportation / Part 61 area (i.e., classification of radioactive materials for shipment and disposal); the staff accepted a proposed revision to the Part 61 portion of the SDP that was submitted by NEI on June 12, 2000. This portion of the SDP assesses the risk from the failure of a licensee to correctively classify a radioactive waste shipment (i.e., under classify waste shipments by assigning a less restrictive classification, such as classifying Class B waste as Class A waste). Prior to the change, all findings that involved radioactive materials being under classified received a White finding. NEI proposed that the SDP flowchart be expanded to offer additional decision questions to refine the SDP process into separate steps that correspond to graded levels of risk to the public. NEI maintained that there are cases where there is low risk to workers, members of the public, the waste disposal facility, and the environment. For such cases, the SDP should reflect this low risk and the SDP should be include a risk assessment of Green. The NRC agreed with the proposed revision. Adjustments to the SDP and associated flowcharts were made and subsequently tested to assure that the SDP will screen inspection findings to the appropriate licensee and NRC response bands. It was also agreed that a White finding was still appropriate for cases that involved Class C waste and for Class B waste that did not meet the requirements of 10 CFR 61.56.

Physical Protection SDP:

The staff determined that linking the Reactor Safety SDP to the PPSDP would result in reactor safety findings that were at a higher level of NRC response and engagement than is warranted. The problem was most noticeable when processing simulated equipment damage that resulted from mock adversary actions (force-on-force exercises) not prevented by security measures. To remedy the problem, the staff recommended an interim PPSDP to be used to evaluate force-on-force exercise findings. The Commission accepted the staff recommendations and provided additional guidance in COMSECY-00-0036, which directed the staff to continue the effort to develop more permanent guidance. This guidance will be developed and finalized based upon stakeholder feedback and experience with the interim PPSDP.

Fire Protection SDP:

The staff decided to temporarily suspend the review of fire induced circuit failures of associated circuits, as part of the triennial inspection program. This is in response to an industry initiative to improve the understanding of the behavior of electrical circuits while exposed to a fire. Details of the ongoing study, which involves fire tests of various circuit arrangements, are being closely followed by the staff. This effort is expected to last approximately one year. Upon completion, new inspection guidance based on the evaluation of the test results will be incorporated into the inspection procedure.

Near the end of the initial implementation period additional information to enhance the inspectors' ability to assess functionality of fire protection defense in depth components such as fire brigade, automatic detection and protection performance as they relate to the SDP, was incorporated into an attachment to the Fire Protection SDP.

Long-term Program Changes Planned

All Cornerstones

The staff will continue to enhance the SDP through improving existing, and developing new significance determination tools. However, changes to the process will be closely scrutinized to ensure the balance between increased regulatory burden and benefit in maintaining safety and Agency effectiveness. For example, changes to the process to address the "No Color" category of findings are under extensive review to assure that the change improves the process. The development of a maintenance activity related SDP is under similar evaluation by the staff. The staff will continue efforts to reduce time spent on preliminary safety significance determinations. For example, the site specific notebooks for the reactor safety SDPs, and enhancements to the Fire Protection SDP, should result in improvements of timeliness and reduction of resources. Incorporating comments into the SDPs associated with other cornerstones should also result in improvement of efficiencies.

Reactor Safety SDP

The staff's capability to assess the impact of external events on operating reactor safety related issues needs to be improved. To this affect the staff requested the Office Nuclear Regulatory Research to conduct scoping evaluation of the specific plants that may warrant development of improved external events tool.

The staff also needs to improve guidance provided for the assessment of concurrent deficiencies. Existing guidance in IMC 0609 provides for concurrent performance deficiencies to be assessed collectively to determine total contribution to change in the core damage frequency (CDF). However, each concurrent performance deficiency should be assigned a color individually. When multiple issues stem from the same common cause, risk analysis techniques account for the potentially greater risk significance of the combined issues (i.e., delta CDF or delta large early release frequency (LERF)). However, in all cases the Action Matrix was designed to combine multiple issues for determining the appropriate NRC response. Although it is expected that in most cases the regulatory response will not differ if multiple issues are treated either in combination or independently, ROP guidance is being evaluated for enhancement with regard to applying combined risk results of multiple issues in a manner that is appropriate for use in the ROP Action Matrix.

Fire Protection SDP

The staff continues to develop the methodologies that will allow inspectors to determine fire scenario development and improve the accuracy of site specific data used in the assessment of risk associated with findings, such as ignition frequency. The results of these efforts will undergo functional evaluation and be made available to the inspectors by the end of 2001.

Shutdown SDP

The development of a Shutdown SDP Phase 2 process, a tool that will allow for the conservative assessment of the risk associated with a finding by the inspectors in the field, is under way with the assistance of risk analysts at Brookhaven National Laboratories. The effort is expected to

be complete by the end of 2001. The results of the Phase 2 process should provide colors that correspond to our existing definitions of significance based on incremental increase in core damage frequency and expected Action Matrix Response.

Occupational Radiation Safety SDP

The staff is evaluating options to revise the Radiation Exposure Control section of the Occupational Radiation Safety SDP to clarify how the SDP reflects the Commission's policy on enforcement discretion for skin over exposures from hot particles (or discrete radioactive particles).

The current Occupational Radiation Safety Group 2, Question 1 (concerning ALARA) will be removed. The rolling 3-year average collective dose comparison will be used to adjust the baseline inspection level of effort (hours of inspection) and possibly as a SDP significance criteria. The other criteria (e.g., "greater than 5 person-rem," and "actual dose exceeds estimated [planned] by 50%") will be incorporated into the baseline inspection procedure as guidance on what constitutes a "more than minor" issue. A new Group 2 Question will be developed to clarify that the basis for a finding in this area is an ALARA program failure that results in "unintended collective dose" for a job, similar to the current Occupational Radiation Safety Group 2, Question 2.

Containment SDP

Interim guidance for assessing significance of containment related inspection findings is provided in Appendix H to IMC 0609. Appendix H is based on a draft (August 2000) technical basis document by Brookhaven National Laboratory. The technical basis document is being revised to address residual technical issues and incorporate additional guidance based on feedback and questions from regions. Appendix H will be updated and expanded following revision of the basis document. The target completion date is December 2001. Issues being addressed in the revision include: additional screening guidance for BWR main steam isolation valve leakage and suppression pool bypass findings, refinement of failure criteria for ice condenser hydrogen igniter and ice bed doors, and extension of the guidance to cover containment integrity during shutdown operations.

Spent Fuel SDP.

Spent fuel issues are currently evaluated by a risk analyst using Phase 3 analysis. The feasibility for the development of an assessment tool that can be implemented by the inspector is under evaluation.

Additional Work

Occupational Radiation Safety SDP. The proposed revised basis for ALARA performance assessment will require additional public meetings with NEI, and other stakeholders, to develop a Group 2 Question and clearly define applicable terms such as "unintended collective dose" and "a job".

ASSESSMENT PROCESS

Task Lead: Bob Pascarelli, NRR/IIPB

Attachment 9

Assessment Program

Open Issues Addressed

There were several open issues and commitments that the staff continued to evaluate and work on during ROP initial implementation. Several of the issues involved longer term items that the staff identified in Commission paper SECY-00-0049 as needing additional work following initial implementation. The Commission directed the staff to consider several additional issues in the SECY-00-0049 Staff Requirements Memorandum (SRM) dated May 17, 2000. And several recommendations for staff consideration during initial implementation were made by the Pilot Program Evaluation Panel (PPEP) in their final report. The issues and recommendations for the assessment process are as follows:

SECY-00-0049

Assessment program not fully exercised during the pilot program

There were certain aspects of the assessment process, such as the End-of-Cycle (EOC) Review Meeting and Agency Action Review Meeting (AARM), that were not exercised during the pilot program. However, the EOC Review meetings were exercised at the pilot plants during May 2000. Lessons learned from the pilot plants have been incorporated into the latest revision of IMC 0305 “Operating Reactor Assessment Program” in order to support these meetings at all plants in May 2001. Additionally, the first AARM will be conducted in June 2001 and appropriate lessons learned will be incorporated into draft Management Directive (MD) 8.14 “Agency Action Review Meeting”.

SECY-00-0049 SRM

Deviations from the Action Matrix

The Commission expressed concern in their response to the staff on the results of the ROP pilot program (SRM’s dated 03/28/00 and 05/17/00) regarding the use of deviations from the Action Matrix. Specifically, the Commission directed the staff to:

- Obtain pre-approval by the EDO, during the initial implementation phase, prior to issuing Action Matrix deviations.
- Provide in the report to the Commission on the results of the first year of the ROP, a summary of the deviations from the Action Matrix, recommendations on a method to assure Agency-wide consistency when deviating from the Action Matrix, and recommendations on how to keep the Commission currently informed of such deviations.
- Inform the Commission, during initial implementation, whenever the staff determines a deviation is warranted.
- Develop a process for deviating from the Action Matrix during the initial implementation phase of the ROP.

The staff revised IMC 0305 to clarify expectations for deviating from the Action Matrix. IMC 0305 now requires that the Executive Director for Operations (EDO) pre-approve all deviations and that the Commission be informed of any such deviations. This ensures that deviations that are granted are appropriately considered and are rare. The Agency is considering the development of further guidance that would describe the types of issues that may be considered for deviations from the Action Matrix. Although deviations from the Action Matrix were considered on a few occasions during initial implementation of the ROP, none were issued.

Impact of cross-cutting issues on the ROP

The Commission directed the staff to discuss every case in which enhanced NRC action was taken based on cross-cutting issues in this report. During initial implementation of the ROP, enhanced NRC action was not taken by the Agency based solely upon findings associated with cross-cutting issues.

PPEP Final Report

Significance of inspection findings

A recommendation from the PPEP was that the staff clarify guidance relative to the use of the Action Matrix when the significance of the inspection findings are under review at the time the assessment is published (mid-cycle or annual). Guidance has been added to IMC 0305 to discuss regional office actions when there are inspection findings whose significance have not been determined at the end of the assessment cycle.

For example, IMC 0305 states that the date used for consideration in the assessment program is the end-date of the pertinent inspection period for the inspection finding. After final determination of the significance of the finding, the regional office shall refer back to the appropriate date to determine if any additional action would have been taken had the significance of the inspection finding been known at that time. Additionally, the mid-cycle or annual assessment letter would state the existence of potentially greater than Green findings and that additional inspection may be warranted if the finding is determined to be greater than Green.

Self-Assessment Results

The ROP self-assessment program evaluates the overall success of the ROP being objective, risk-informed, understandable, and predictable as well as its success in meeting the Agency's performance goals of maintaining safety, increasing public confidence, making NRC activities and decisions more effective, efficient, and realistic, and reducing unnecessary regulatory burden on stakeholders. On a periodic basis, the self-assessment program collects information from various sources, including the Reactor Program System (RPS), the inspection program, the ROP performance indicator (PI) program, additional industry level PIs, periodic independent audits, stakeholder surveys, and public comment. Based on this information, an assessment of ROP success is performed in the programmatic areas of performance indicators, inspection, significance determination process (SDP), and assessment. Listed below are discussions of the

self-assessment metric results for the assessment program. Due to the lack of historical data, an in-depth analysis is not possible in most cases. However, where appropriate, some conclusions were reached.

Objective

The program's focus on objective assessment of licensee performance with minimal subjective inputs is measured by: (1) the number of deviations from the Action Matrix, (2) the number of appeals of risk-significant SDP outcomes, and (3) the number of significant departures (not including timeliness goals) from IMC 0305 and IMC 0350, "Staff Guidelines for Oversight of Operating Reactor Facilities in an Extended Shutdown as a Result of Significant Performance Problems". The assessment program was considered to be objective based on:

(1) There have been no deviations from the Action Matrix during the ROP.

(2) There has been a challenge to 3 White findings in the Occupational Radiation Safety Cornerstone at Callaway Nuclear Station. This appeal was processed in accordance with IMC 0609 "Significance Determination Process" and the original determination was subsequently upheld by the Agency.

(3) The review of assessment letters during the ROP have revealed very few discrepancies and those discrepancies were limited to the first quarter of ROP initial implementation.

Risk-Informed

The assessment program is considered to be risk-informed if the actions taken by the regions are commensurate with the overall plant risk as reflected in the Action Matrix. The assessment program was found to be risk-informed based on the fact that the actions that have been taken by the regions have been consistent in all cases with the Action Matrix.

Predictable

The assessment program is considered to be predictable if: (1) the regions arrive at the correct Action Matrix column designation for each plant and subsequently take the appropriate actions for the same set of circumstances, (2) the resources that are expended on the assessment program are appropriate and consistent across regions, (3) there are limited additional actions recommended by senior Agency management at the AARM, (4) the timeliness goals, established in IMC 0305, and ADAMS availability goals were met, and (5) there were few unplanned, substantive revisions to IMC 0305 and IMC 0350.

Based upon the staff's review, the regions arrived at the correct Action Matrix designation for each plant and subsequently took the appropriate actions. Regional resource expenditures on the assessment program were incomplete due to the unavailability of hours expended on the preparation and conduct of the End-of-Cycle Review meetings as well as those hours used to prepare the annual assessment letters. Additionally, analysis

is complicated by the different methods in which individual regions have captured actual expenditures. This analysis is discussed in the "ROP Resource Analysis" attachment of this paper. The first AARM will be conducted in June 2001 and there is no data with which to evaluate the associated metric. The review of assessment letters during the ROP and the posting of these letters in ADAMS have revealed very few discrepancies. Timeliness goals have been met with very few exceptions and there has been only one unplanned, substantive revision to IMC 0350. The staff believes that, based on the results of data collected to date, the assessment program has been predictable.

Maintains Safety

The assessment program maintains safety if: (1) the regulatory attention given to licensees with performance problems is appropriate and (2) NRC actions are timely by measuring the lag time between the issuance of an assessment follow-up letter (discussing a safety significant PI or inspection finding) and the completion of the associated supplemental inspection.

The staff has received a majority of positive responses on the survey with regards to the appropriateness of regulatory attention given to licensees with performance problems. Additionally, the staff has received some limited data on the timeliness of addressing risk-significant issues. Based upon these results the program office is unable to draw any conclusions with the amount of data that has been reported.

Efficient, Effective, and Realistic

The efficiency and effectiveness of the assessment program is measured by evaluating: (1) the appropriateness of regulatory attention given to plants with performance problems, (2) the efficiency with which potentially risk significant issues are processed once a final risk determination is completed, (3) the number of timeliness goals that are not met, and (4) the appropriateness of the level of management involvement with respect to overall plant performance. Based upon our evaluation of these results, the assessment program was found to be efficient, effective, and realistic.

Enhances Public Confidence

The assessment program is considered to enhance public confidence if the process is timely and predictable, the Agency's inspection and assessment reports are understandable, and if few deviations are taken from the Action Matrix. Based upon the feedback from surveys and evaluation of metric data, the assessment program was found to enhance public confidence.

Reduces Unnecessary Regulatory Burden

The assessment program is considered to reduce unnecessary regulatory burden if: (1) the ROP focuses licensee resources on areas of greatest significance and minimizes rework or duplication, (2) the ROP minimizes inconsistencies between the regional offices, and (3) each region takes similar actions for plants in the same column of the Action Matrix. Based upon the results of the external survey, the assessment program was found to reduce unnecessary regulatory burden.

Stakeholder Feedback (Internal/Public/Industry)

A. Treatment of Inadequate Corrective Actions

It was identified during initial implementation that inadequate corrective actions for a PI were not treated consistently with inadequate corrective actions for inspection findings. IMC 0305 states that an inspection finding is normally carried forward in the assessment process for a total of four calender quarters. IMC 0305 requires that an inspection finding is not to be removed from consideration of future Agency actions (via the Action Matrix) until the identified weaknesses in the root cause evaluation have been corrected by the licensee. There is no such provision for safety-significant PIs. However, it was always intended that the original performance deficiency (whether it is an inspection finding or a PI) will not be removed from consideration of future Agency actions (i.e. the Action Matrix) until the licensee has corrected the issue.

This situation occurred at Kewaunee Nuclear Station last year. The licensee's evaluation of a Yellow Alert and Notification System PI was determined to be inadequate after two supplemental inspections were conducted on this issue. In this case, the staff issued a parallel Yellow inspection finding that corresponded to the original performance deficiency from the Yellow PI.

This issue was discussed at the External Lessons Learned Workshop that was held between March 26-28, 2001. The goal of this session was to solicit licensee input and arrive at a consensus approach. The Agency asked the workshop attendees to provide their input on several implementation issues such as:

- How much of an opportunity (if any at all) should be provided to the licensee to correct the deficiencies in the evaluation prior to the issuance of the parallel inspection finding.

- What criteria should the Agency consider in evaluating whether a parallel inspection finding should be issued.

- How to provide licensees the opportunity to provide their perspective on the identified weaknesses prior to issuance of the proposed parallel finding.

- Whether the finding is a placeholder for the original performance deficiency or a separate finding directed against the CAP that would require a separate evaluation and corresponding supplemental inspection. This question would apply whether the original performance deficiency was an inspection finding or a PI.

- The appropriate time and method to remove the inspection finding from consideration in the assessment program.

The participants in the workshop reached alignment on the following implementation issues:

- The performance issue should remain open as a finding of the same color as the original performance issue and be considered as a finding against the corrective action program.

- There should be a strong causal link between the original performance deficiency and the ineffective corrective actions in order to issue the parallel inspection finding.

- That the licensee should be provided an opportunity to provide input at the supplemental inspection exit meeting.

B. Role of "No Color" findings in the inspection and assessment programs

The staff has received feedback from external stakeholders throughout initial implementation of the ROP that the role of "No Color" findings in the oversight process is not clear and has contributed to program inconsistencies. There was also some concern that the existence of "No Color" findings represented a weakness in the ROP. "No Color" findings are associated with specific extenuating circumstances as discussed in IMC 0610*, "Power Reactor Inspection Reports". Early guidance to the regions was non-specific, which resulted in the significance of these findings being confusing to stakeholders and their role in the assessment program unclear. Clarification to existing program office guidance appears to have reduced the number of "No Color" findings. The assessment program was not designed to include "No Color" findings and their existence may undermine public confidence in the ROP.

The staff's intention was that "No Color" findings are greater than minor findings of a regulatory nature (e.g., do not impact a cornerstone) that can not be evaluated by the current SDP. These findings should only include violations of regulatory requirements or notable adverse performance trends or patterns associated with cross-cutting issues. These findings were expected to be small in number.

This issue was discussed at the External Lessons Learned Workshop. The goal of this session was to provide a proposed solution followed by a group discussion of the proposal. The workshop participants could not reach consensus on the staff's proposal to color these findings as Green. Some of the participants were concerned that the proposal would give the appearance that these findings had been evaluated through the SDP and had the same risk significance as other Green findings. As an interim measure, the group recommended that the Agency: (1) address the perception problems with "No Color" findings, (2) continue to monitor "No Color" findings and adjust program office guidance to minimize the number of these findings, and (3) evaluate these findings to determine if they represent a weakness in the ROP. Over the longer term, the staff will continue to evaluate the role of "No Color" findings in the ROP.

C. Role of historical issues in the Action Matrix

Historical issues, such as those that are captured during design inspections, are not necessarily reflective of current licensee performance. In particular, those issues already identified by and appropriately addressed by the licensee may be reflective of good licensee performance. The assessment program determines appropriate Agency actions

based upon the most current licensee performance. The most current licensee performance is determined on a quarterly basis by reviewing the current PI and inspection results.

This issue was discussed at the External Lessons Learned Workshop. The goal of this session was to identify possible approaches with convergence towards a consensus viewpoint. The staff asked the participants to consider the following three fundamental questions when considering historical issues in the reactor oversight process:

- Whether the ROP should be reflective of current plant conditions or current licensee performance.

- What types of issues would not be considered reflective of current plant conditions or licensee performance.

- Can the approach for treating historical issues be structured such that it does not create disincentives for licensees aggressively seeking to identify and resolve issues.

The consensus approach from the breakout session was that an issue with current risk significance (e.g., greater than Green) is a performance issue, regardless of whether it reflects current licensee organizational performance. Licensees and NRC staff had differing views on the desirability of creating disincentives for licensees and how these findings should be treated in the assessment process. Consensus was not reached on whether to: (1) treat these findings like all other findings in the assessment process or whether to define a class of findings that may warrant discretion or (2) keep the finding open for four quarters or remove it once the appropriate corrective actions have been completed.

D. Purpose of a Regulatory Conference and a Regulatory Performance Meeting

The staff has received feedback throughout initial implementation of the ROP that there was some confusion between the purpose of a Regulatory Conference and a Regulatory Performance Meeting. The purpose of a Regulatory Conference is to gain a complete understanding of the significance of an inspection finding as well as information pertinent to understanding any apparent violations. In some cases, this requires a technical discussion of the probabilistic inputs and assumptions used to characterize the risk significance of the issue. The role of NRC and licensee management has changed from their role during enforcement conferences held in the past. The Regulatory Conference was not intended to be a forum for a discussion of the adequacy and effectiveness of licensee corrective actions. However, a significant amount of attention has been devoted to the discussion of licensee corrective actions during Regulatory Conferences. This may be due in part to the efficiency in conducting a detailed discussion of corrective actions at this meeting in conjunction with a discussion of the significance of an inspection finding and any apparent violations.

This issue was discussed at the External Lessons Learned Workshop. The staff proposed that the guidance in IMC 0609, attachment 1 be revised to more accurately

characterize the purpose of the meeting and to clearly differentiate it from the Regulatory Performance Meeting.

Licensees are normally offered an opportunity for a Regulatory Conference to discuss potentially safety significant inspection findings, whether or not violations are involved. A secondary purpose of the meeting is to provide an opportunity to address any apparent violations that may be associated with the finding. This meeting enables the Agency to obtain the licensee's perspective in order to come to a common understanding of the facts and the significance of the findings. The Regulatory Conference is not a meeting to negotiate sanctions or discuss the adequacy of any current or proposed licensee corrective actions. If a licensee is in agreement with the issues then they may opt not to have a Regulatory Conference.

Regulatory Performance Meetings are held between licensees and the Agency to discuss the effectiveness of a licensee's root cause evaluation and corrective actions associated with safety significant inspection findings after the completion of the associated supplemental inspection. Each safety significant assessment input shall be discussed in one of the following forums listed below in order to arrive at a shared understanding of the performance issues, underlying causes, and planned licensee actions. These discussions may take place at supplemental inspection exit meetings between the Agency and the licensee, conference calls, or public meetings. This meeting should be documented in an inspection report or a public meeting summary as appropriate. NRC management, as specified in the Action Matrix, conducts the Regulatory Performance Meeting.

The participants generally agreed to the staff's proposal and provided the following recommendations: (1) due to possible public perception problems, the licensees should be allowed to address corrective actions after the discussion of safety significance and any apparent violations at the Regulatory Conference, (2) someone other than the regional enforcement coordinator should open the meeting, and (3) the Regulatory Conference should be chaired by the appropriate level of NRC management (e.g., in accordance with the Action Matrix). Licensees also recommended that the NRC standardize the process for sharing the basis and assumptions of safety significant findings prior to the Regulatory Conference.

E. Timeframe for counting an inspection finding in the assessment process

The Agency has received both internal and external feedback that there should be a graded approach for removing inspection findings from consideration in the assessment process. IMC 0305 states that an inspection finding is normally carried forward in the assessment process for a total of four calender quarters. The program currently states that an inspection finding will not be removed from consideration of future Agency actions (via the Action Matrix) until the identified weaknesses in the root cause evaluation have been corrected by the licensee. During development of the ROP, the period of four quarters was selected as the appropriate time frame for counting inspection findings in the assessment process. The date used for consideration in the assessment process is the date of the end of the pertinent inspection period for the finding. Stakeholders recommended the following approaches for consideration: (1) apply a graded approach such that White inspection findings can be removed from consideration in the

assessment process when the regional offices are satisfied with the results of the licensee's corrective actions. Under this proposal, Yellow and Red findings would normally remain for four quarters or (2) Apply a graded approach to all risk significant (White, Yellow, or Red) findings.

An internal lessons learned workshop was held March 6-8, 2001 to discuss proposed topics for the upcoming External Lessons Learned Workshop. This topic was discussed with regional and Headquarters management in order to determine if a consensus approach existed and to recommend whether this issue should be a topic at the External Lessons Learned Workshop. This was not forwarded to the external workshop due to the limited experience in the disposition of risk significant findings and a concern that the regions may feel unwarranted pressure to close out a finding prior to a proper evaluation of the cumulative circumstances surrounding the finding. However, the Agency committed to re-evaluating the proposal after more experience is gained over the next year of ROP full implementation.

Program Changes Made as a Result of Lessons Learned

As a result of ongoing feedback between the program office and internal and external stakeholders, a revision to IMC 0305 was issued on March 23, 2001 to reflect the following major program changes:

- Added guidance that the EDO is responsible for authorizing all deviations from the Action Matrix (see SRM on SECY 00-0049).

- Added a description of the roles of the Agency Allegations Advisor, Office of Enforcement, Office of Investigations, Office of Research, and DLPM during the EOC Review meetings.

- Added additional guidance for the regional offices regarding preparation for and conduct of the Mid-Cycle and EOC Review meetings.

- Added an EOC summary meeting, between the regional offices and the Director of NRR (or another member of the Executive Team), at the conclusion of the EOC Review meeting.

- Changed the requirement for issuance of the annual assessment letters to three weeks after the EOC Review meeting from 1 week after the AARM meeting. This change was made to recognize the fact that there should be no direct tie between the AARM and issuance of the annual assessment letters.

- Added a note to clarify that; "regulatory actions listed in the Multiple/Repetitive Degraded Cornerstone column of the Action Matrix are not mandatory. However, the regional office should consider each of these regulatory actions when new performance information regarding licensee performance becomes available." This note has also been added to the Action Matrix (exhibit 5 of IMC 0305).

- Updated sample assessment letters to reflect lessons learned from the previous Mid-Cycle and EOC Review meetings.

- Added additional guidance regarding the process for approval of a deviation from the Action Matrix.

Long Term Program Changes Planned

- Implement any lessons learned from the EOC Review meetings, the AARM, and the annual public meetings with the licensees.

- Add additional guidance on how to address supplemental inspection for performance indicators when there are substantive inadequacies in the evaluation of the root causes of the original performance deficiency, the extent of the performance problems, or the associated corrective actions.

- Continue to evaluate how historical licensee performance issues should be treated by the Action Matrix.

- Consider the development of further guidance that would describe the types of issues that may be considered for deviations from the Action Matrix.

- Monitor the ROP to determine whether a graded reset approach for inspection findings is appropriate.

- Continue to monitor “No Color” findings in the Inspection Program Branch inspection report review process.

- Clarify guidance in IMC 0609 attachment 1, IMC 0305, and the Enforcement Policy regarding the purposes of the Regulatory Conferences and the Regulatory Performance Meetings.

ENFORCEMENT PROCESS

Task Lead: Chris Nolan, Office of Enforcement

Enforcement

The Office of Enforcement (OE) is encouraged by the results of the first year of implementation of the reactor oversight process (ROP) and in particular, the manner in which the significance determination process (SDP) assesses the safety significance of inspection findings. OE finds that the assessment and enforcement programs have reached a degree of integration never before achieved under previous oversight programs. While implementation issues still remain, OE has concluded that the ROP provides a sound framework for assessing the performance of power reactor licensees and utilizes the NRC's enforcement authority appropriately through a process that is both objective and transparent.

Open Issues Addressed

A. Enforcement Discretion Regarding the Submittal of Performance Indicator Data

The Enforcement Policy was revised on May 1, 2000, to describe the Commission's decision to provide blanket discretion to power reactor licensees regarding the treatment of performance indicator (PI) data submittals. This policy was developed in recognition that some errors in the data submitted to the NRC were expected given the time constraints to gather and submit historical data and the learning process for the submission and review of quarterly PI data. This policy remained in effect through January 31, 2001. The NRC staff is sensitive to stakeholder concerns regarding this issue and the evolving nature of PIs within the ROP. Expiration of the interim policy has not impeded the staff's ability to exercise enforcement discretion under Section VII.B.6 of the Enforcement Policy on a case-by-case basis for inaccurate or incomplete PI data. Section VII.B.6 provides the NRC with the flexibility to refrain from issuing a civil penalty or a Notice of Violation based on the merits of the case, including, but not limited to, such factors as the significance of the violation and the clarity of the requirement. Exercising enforcement discretion on a case-by-case basis under Section VII.B.6 takes into account the completion of the initial learning curve and the recognition of ongoing PI development activities. For example, the staff may consider exercising discretion if new PIs are developed. The staff does not anticipate a significant number of cases involving inaccurate or incomplete PI data. The staff notes that it exercised enforcement discretion four times for inaccurate or incomplete PI data (three cases under the blanket discretion policy and one on a case-specific basis). Further, OE will continue to have oversight of cases involving inaccurate or incomplete PI data submitted to the NRC that would cause a PI to change color. OE will continue to work with the regional offices and NRR in determining whether enforcement discretion should be exercised for future PI-related 10 CFR 50.9 violations. This position was communicated to external stakeholders at the public External Lessons Learned Workshop held March 26-28, 2001, with no negative feedback received.

Open Issues Unresolved

A. Timeliness of Escalated Enforcement Actions

OE has been monitoring the impact of the ROP on the timeliness with which the NRC staff processes findings that are characterized as greater than Green and associated

violations, if applicable. Timeliness has been traditionally used by the OE as a measure of organizational efficiency. Timeliness was selected for discussion in this Commission paper because it directly impacts two of the NRC performance goals: (1) making NRC decisions more effective, efficient, and realistic; and (2) increasing public confidence. Maximizing process efficiency is a critical component in effective regulation when faced with the constraint of limited resources. Timely and predictable decision making is also important in the Agency's effort to increase public confidence.

Analysis of the timeliness data for the assessment and enforcement process shows that there has been a substantive increase in the amount of time that it takes to process findings under the revised ROP. When taken in total, the ROP identifies fewer issues that are considered for escalated enforcement. Currently, the average process time for all open and closed cases identified since the initial implementation of the ROP is 98 days. This compares to an average timeliness of 75 days that was achieved in FY 1999 under the old enforcement program. This review included significant inspection findings (i.e., White, Yellow, Red) regardless of whether they are associated with an enforcement action. It has been recognized that the ROP places new requirements on the NRC staff regarding the characterization of the significance of inspection findings. These requirements demand the involvement of centralized NRC staff risk expertise in combination with an increased reliance on licensee risk assessment tools and information. These activities provide the basis for the initial significance characterization and occur prior to the SDP and Enforcement Review Panel (SERP). OE has reviewed all of the cases identified since ROP initial implementation and determined that if the NRC staff began tracking issues from the point that they were identified, rather than the point at which they are brought to a SERP, the average cycle time for these significant inspection findings would increase to approximately 150 days.

This timeliness review demonstrated that there are three critical phases of the assessment and enforcement process. First, the time from when an issue is first identified by an inspection or revealed in an event to the time that a SERP is held. This represents the time that it takes the NRC staff to provide an initial risk characterization for an issue. Currently, this phase of the process is not monitored or tracked by any management metric although this is being considered by the staff. Second, the conference preparation time is the time required to develop a case from the SERP to a regulatory conference. This phase has been the most time intensive for the cases handled to date. Licensee responsiveness plays an important role in the time delays associated with this area. Finally, the Agency decision time measures the time period from the regulatory conference to the issuance of the final determination letter. This portion of the process is similar to the traditional enforcement program and only becomes a major impact on timeliness for the few cases that require policy decisions.

The decrease in timeliness for these potentially significant issues is attributable to many factors that include familiarity with new processes, greater reliance on limited NRC staff risk expertise, continuing development of NRC risk tools, greater reliance on licensee risk tools and information, and a greater involvement of the licensee in the process. The effects of some of these factors may diminish as the NRC staff gains more experience under the ROP. However, many of these factors are inherent in the new process and will need to be managed closely to attain optimal organizational performance.

B. Integration of Traditional Enforcement Action with the Agency Action Matrix

During the development of the ROP, the NRC staff recognized that it was not appropriate to assess the significance of violations associated with actual consequences, willfulness, and impeding the regulatory process under the ROP/SDP. As such, these issues have always been reserved for traditional enforcement. OE supports this arrangement as violations associated with actual consequences are captured within the ROP by either the SDP or performance indicators. Violations in the areas of willfulness and impeding the regulatory process are of concern to the Agency as they impact the ability of the NRC to effectively regulate. However, the assignment of risk significance to these types of issues is problematic and application of the ROP/SDP is difficult and impractical. Under the old oversight program, violations and civil penalties in the areas of willfulness and impeding the regulatory process were integrated into the overall assessment of licensees, though admittedly in a fairly subjective manner. Under the revised ROP, the ability to consider traditional enforcement issues is limited. IMC 0305, "Operating Reactor Assessment Program," Section 06.01, "Overall Assessment Process," indicates that traditional enforcement issues may be considered in determining the range of Agency action within the appropriate column of the Action Matrix. However, there is no explicit link to allow integration of traditional enforcement findings to the Action Matrix due to the lack of direct linkage to risk.

C. Maintenance Rule Enforcement Review Panels

Enforcement Guidance Memorandum 96-001 established the Maintenance Rule Enforcement Review Panel (the Panel) to help ensure consistency in enforcement of 10 CFR 50.65. The Panel process has served well to achieve this objective. However, recent experience has shown that many of the issues were able to be dispositioned with consistency without a formal panel meeting. Instead, they have been resolved through consultation and agreement among the key representatives of the organizations comprising the Panel. In addition, under the ROP, findings have either been minor or, if more than minor, of very low safety significance (i.e., no greater than Green).

Accordingly, the revised Maintenance Rule enforcement guidance to be issued shortly will establish a less formal enforcement review process to be used routinely to ensure consistency. Resident inspectors and cognizant regional staff will be expected to continue to consult with the Office of Enforcement and Maintenance Rule-cognizant NRR staff to arrive at a consensus on the proper disposition of the Maintenance Rule findings. Nevertheless, if in the judgement of any of the cognizant parties, the circumstances of a particular Maintenance Rule issue should warrant a formal enforcement panel, such a panel would be convened.

The staff will continue the enforcement review process until such time that the enforcement guidance is verified to be effective and reasonable consistency amongst the regions is achieved. When the staff has determined that these conditions have been satisfied, the special treatment of Maintenance Rule issues will be discontinued without prior notification of the Commission.

D. Enforcement Actions Associated With Findings That Are Particularly Significant

The staff communicated the proposed revisions to the Enforcement Policy required to implement the ROP in SECY-00-0061, “Proposed Revision to the Enforcement Policy to Address the Revised Reactor Oversight Process,” dated March 9, 2000. The Commission approved the staff's recommendation in a Staff Requirements Memorandum (SRM) dated April 11, 2000, with one additional requirement. In the SRM, the Commission requested consultation prior to exercising discretion and issuing a civil penalty for "violations associated with findings that the reactor oversight program's significant determination process (SDP) evaluated as having low to moderate, or greater significance (i.e., White, Yellow, or Red) that are particularly significant" (Enforcement Policy, Section IV.A.5.b). In addition, the Commission requested that the staff provide a recommendation on continuing such consultation on this type of enforcement action as part of its report on the first year of implementation of the revised ROP.

The staff has not identified any violations under the ROP that would be classified as particularly significant and require the assessment of a civil penalty. This is consistent with the expectation that particularly significant inspection findings would be rare. The existing Enforcement Policy ensures that the Commission will receive prior written notification (i.e., Enforcement Notification) of all enforcement actions that involve a civil penalty. However, in order to highlight these rare cases, the Office of Enforcement intends to revise the Enforcement Notification (EN) guidance in the Enforcement Manual to specifically require a discussion in the EN of the basis for assessing a civil penalty for any violation that is characterized through the SDP in accordance with the ROP.

Key Policy Issues

Key Policy Issues

Commission paper SECY-00-0049 identified three "Issues of Note," issues that emerged from the pilot program that had a significant impact on the implementation of the ROP, and that the staff had not been able to resolve in a manner that adequately addressed the majority of stakeholder concerns. The staff committed to present these issues, the differing points of view, and the staff proposal for resolution to the Commission for consideration. Additionally, SECY-00-0049 provided an update to several other key policy issues that need to be considered and addressed as part of the implementation of the ROP.

The three "Issues of Note," and their status are as follows.

1. Significantly different viewpoints existed among stakeholders on how cross-cutting issues and programmatic breakdowns should be addressed in the ROP. One viewpoint supported the original tenet that programmatic breakdowns would reveal themselves by performance indicators (PIs) crossing thresholds and the identification of significant inspection findings. The other view supported the opinion that significant programmatic breakdowns could occur without prior indication through PIs or inspection findings, and that the specific evaluation of licensee performance in the cross-cutting areas would provide a timely opportunity for the NRC to respond to these concerns.

As committed to in SECY-00-0049, a working group was formed consisting of Headquarters and regional management and staff to focus on the concerns expressed regarding cross-cutting issues. The first meeting was held on April 5, 2000 where the group developed five key issues to focus on in the cross-cutting area (see Appendix A for additional detail on the five key issues).

A total of three working group meetings were held, with members of the public, industry, and the Institute of Nuclear Power Operations (INPO) invited to attend the third meeting and present their perspective on the cross-cutting issue concerns. In addition to discussing the five key issues, the group also discussed the feasibility of developing performance indicators in the problem identification and resolution (PI&R) area. The general consensus expressed was that this would be very difficult as the PI&R programs are very site specific. Additionally, the group discussed the current approach the NRC uses to assess safety-conscious work environment. Currently, the only inspection activity where the NRC assesses safety-conscious work environment is the annual PI&R inspection. Some NRC representatives expressed a concern that this was a cursory review that might lead to false positives, that is, falsely assuming that the licensee has established a safety-conscious work environment. Some industry representatives expressed a concern that NRC inspectors may not be trained to accurately assess this area and that this area is more subjective in nature, making it difficult to assess. There was also some discussion about whether this topic is really a separate cross-cutting issue or is it just imbedded in a licensee's overall PI&R.

Cross-cutting issues was a topic that was discussed in both the internal and external NRC workshops held in March of 2001. In the external workshop, four issues were discussed that were closely aligned with the five key issues identified by the above

working group. In addition, a recommendation to change the approach for inspecting the area of PI&R was also discussed at the workshop.

As discussed at the workshop, experience from the initial implementation of the ROP thus far tends to support one of the fundamental premises of the ROP; that degradation in the cross-cutting areas will be detected by either PIs or inspections in a sufficient time frame to allow for Agency action to protect public health and safety. However, these results are not conclusive since one year represents a relatively short experience base, particularly when trying to determine whether the premise holds under all reasonably credible situations. Further, declines in licensee performance typically occur over an extended period of time, so it is too soon to reach definite conclusions in this case.

During initial implementation, there have been no significant precursors to a reactor accident. Also, during initial implementation of the ROP, the staff has not identified any cross-cutting issues that would warrant special treatment. Currently, the ROP addresses cross-cutting issues by highlighting them in inspection reports when they are notable contributors to inspection findings or if there is an appreciable trend or pattern that has emerged; and in assessment letters to the licensee when they constitute a substantive issue.

A revision to IMC 0610*, issued October 6, 2000, better explains when and how cross-cutting issues should be documented in inspection reports. The ROP does not allow for additional NRC engagement on cross-cutting issues unless they are contributing causes to PIs or inspection findings that are characterized as White or greater. The staff has not engaged licensees on cross-cutting issues outside of the guidance contained in the Action Matrix. NRC engagement has occurred per the Action Matrix when significant cross-cutting issues have moved licensee performance beyond the licensee response column.

Following the external workshop, an internal focus group was formed to further study the recommendation discussed at the workshop to improve the effectiveness of the PI&R inspection approach. The focus group recommended changing the baseline frequency of the annual PI&R inspection to once every two years for all facilities. Also, the focus group recommended revising the recommended hours budgeted per inspection to 250 hours from the current 210 hours. In addition, the group recommended adding 60 hours of effort annually to inspection procedure 71152 to allow for follow-up/assessment of PI&R samples throughout the inspection period. The above recommendations will result in an estimated overall reduction of direct inspection effort of 25 hours per year in this area. Lastly, for facilities that reach the degraded cornerstone column of the Action Matrix, the focus group recommended consideration of an additional PI&R team inspection as part of the supplemental inspection response to assess the extent of condition of the identified performance issues. Overall these changes should result in a more effective allocation of NRC resources in this area. Implementation of these recommended changes is currently planned to begin in January 2002.

Based on the lessons learned during initial implementation of the ROP, the staff has not identified a need for significant modifications to address cross-cutting issues; however, the staff will continue to assess events and inspection findings to look for safety significant areas not adequately covered by the current baseline inspections, PIs, or the

significance determination processes (SDP). Further details regarding the staff's assessment of cross-cutting issues during initial implementation of the ROP and on future planned actions to assess this issue are discussed in Appendix A of this paper.

2. The Barrier Integrity cornerstone PIs are fundamentally different from the other indicators used in the ROP. The Barrier Integrity PIs are intended to provide indications of the integrity of the three barriers to the release of radioactive material from the reactor core. They use readily available information that licensees are required to collect by technical specifications (TS). The thresholds are set as percentages of the TS limit. However, in practice plants typically operate very far below the TS limits, so that the Green/White threshold would rarely be exceeded. The indicators therefore serve primarily a public confidence role to indicate how much margin there is to any safety concern in the performance of these barriers, as opposed to an indication, at least at the Green/White threshold, that there is a deviation from nominal industry performance. In addition, because TS requirements vary from plant to plant (e.g., for Reactor Coolant System leakage, in addition to unidentified leakage some plants measure identified leakage while others measure total leakage), and because licensees use a variety of methods to measure compliance with these TS (e.g., some measure as-found containment leakage while other record only as-left leakage), the data reported can vary considerably from plant to plant.

The staff committed to work to improve the meaningfulness of the Barrier Integrity cornerstone PIs during ROP initial implementation. However, no changes were made to these PIs during initial implementation due to the need to address many of the higher priority PI issues previously discussed in this paper. The staff intends to continue work on the barrier integrity indicators following initial implementation to improve their usefulness.

3. There was disagreement on how the ROP should treat inspection findings involving licensee performance issues that are outside the licensing and design basis of the plant. The ROP requires the staff to assess the significance of inspection findings involving deficient licensee performance and to input any results that are of greater than Green (very low risk significance) into the Action Matrix to determine the most appropriate Agency responses to licensee performance declines. The key feature of this policy is that it does not distinguish between findings involving regulatory non-compliance and those findings that do not violate the licensing or design basis but nevertheless represent an unintended increase in plant risk resulting from deficient licensee performance. If such an issue were to achieve sufficient risk significance to meet the regulatory analysis guidelines for backfit, then the staff would consider implementing such a backfit. However, based on the pilot program experience, it is very possible for the risk significance of such issues not to achieve this threshold, but still be characterized as greater than Green.

Lessons learned from initial implementation of the ROP indicate that the oversight process can appropriately treat licensee performance issues that are outside the licensing and design basis of the plant. Of the 22 safety significant inspection findings evaluated by the SDP during initial implementation, four did not involve compliance with regulatory requirements. Although no compliance issues existed, licensees took

appropriate action to address the underlying safety concerns. At this time, changes to the ROP are not necessary to address this issue.

The status of the other key policy issues previously discussed in SECY-00-0049 are as follows:

The ROP may have a long-term impact on the "N+1" policy for resident inspector staffing due to the potential for improved efficiency and changes in the division of responsibility for implementing the new processes. The staff's proposal for addressing the "N+1" resident inspector staffing policy under the ROP was forwarded to the Commission by SECY-99-227, "N+1 Resident Inspector Staffing Policy," dated September 13, 1999. By SRM dated January 11, 2000, the Commission approved the staff's recommendation to modify the policy to require "N" resident inspectors at dual and triple-unit plants, but maintain "N+1" resident inspector staffing at single unit plants.

As part of the first year implementation of the ROP, the staff evaluated the impact of the resident inspector staffing policy change on the ability of the resident inspectors to complete the inspection program. The details of this evaluation are included as Appendix B of this paper. Based on the first year of ROP implementation, the staff concluded that:

- Baseline inspections can be accomplished by "N" resident staffing at dual unit sites with some assistance from region-based inspectors.

- Most regions gained substantive experience completing the baseline inspections at dual unit sites with "N" residents during the first year of ROP implementation.

- Sites that were staffed at "N+1" tend to expend a level of effort commensurate with site staffing, not program requirements.

- There is an increased inspection-related travel requirement for the region-based inspectors because the regions had to rely on region-based inspectors and project engineers to augment the resident inspector staff during extended absences and vacancies at the dual unit sites.

- It is too soon to determine the full impact on the resident inspector program from the change to the "N+1" resident staffing policy. However, early indications are that the "N" staffing policy will challenge the regions in providing extended training, rotations, and other professional development assignment opportunities for the resident inspector staff at multi-unit sites.

- The regions did not gain the immediate increase in inspection flexibility as originally envisioned by the change to the "N+1" resident inspector policy. As regions moved to "N" staffing, it was generally in response to retirements, promotions, and voluntary reassignments. Therefore, many times a hew hire was brought onboard as a resident inspector position was closed, resulting in an overall reduction in inspector expertise available in the regions.

- Regional effort to support the ROP, evaluation and development activities was substantial and impacted the resources available to support site-based activities as regions moved to “N” staffing.

- Regional management must manage the resident inspector program more closely to assure that upcoming RI vacancies are posted and filled in a timely manner and to assure that appropriate site coverage is maintained during RI transitions.

Based on these conclusions, the staff plans to:

- Develop criteria for the Regional Administrators, in consultation with NRR, to allocate additional inspection resources for other than performance related issues (e.g., unique design or organization features).

- Develop appropriate ROP self-assessment metrics to monitor and trend inspector demographics and resident inspector program quality attributes (e.g., inspector training time; site coverage; rotational opportunities).

- Determine and adjust, as appropriate, the budget model to reflect efficiency differences in converting a resident inspector to a region-based inspector.

The regional and Headquarters organizational structures may need to be changed to support the cornerstone framework and the ROP. The development of the ROP has resulted in changes in the necessary inspection skills and expertise for regional and resident inspectors. Two areas of the baseline inspection program where this is particularly true are for the design and fire protection inspections. Fire protection triennial inspections in particular require a breadth of fire protection knowledge that does not currently exist in all regions. Contractor resources are currently being utilized to augment region-based inspectors in the design and fire protection areas. Additionally, risk-informing the ROP and the development of the SDP has identified the need to enhance the risk expertise of regional staff.

Several evaluations were performed during initial implementation to address the resident, regional, and Headquarters resources (including contractor resources) required to implement the ROP. The results indicate that adequate resources are currently budgeted to implement the ROP. The regional resource model that was used to establish resource estimates needs to be refined to reflect the ROP. While the staff has developed a revised resource model based on the initial implementation results, it will be refined as more data is gathered and evaluated. The staff has identified areas for potential efficiencies in the ROP as well as emerging budgetary issues to be considered in refining the resource model. While no significant regional or Headquarters organizational changes were necessary to implement the ROP, adjustments were made to the roles of certain regional staff to participate more in inspection. Additional detail on resident inspector staffing levels can be found in Appendix B and details on the ROP resource analysis can be found earlier in this paper and in Attachment 13.

A working group was formed in August 2000, and charged with reviewing, assessing and modifying the inspector training and qualification requirements contained in inspection

manual chapter (IMC) 1245, “Inspector Qualifications for the Office of Nuclear Reactor Regulation Inspection Program,” to support the ROP. Since its inception, the working group has completed the identification of tasks performed by inspectors under the ROP and has surveyed existing inspectors to determine the level of difficulty they have experienced while trying to implement those tasks. The knowledge, skills and attitudes needed by inspectors to successfully perform the various reactor oversight tasks have been identified and grouped into 11 competencies. The IMC 1245 working group is defining a new set of competency-based training and qualification requirements for inspectors. The content and methods used in the existing training program are being reviewed to identify which program areas already support the newly defined competencies, where improvements are needed, and where new training must be developed. Definition of the requirements is expected to be completed in the summer 2001. However, the new requirements will be implemented over time to allow for the development or revision of the necessary training and qualification materials. Changes to IMC 1245 will not affect the qualification status of currently qualified inspectors.

A separate working group on risk expertise was formed in July 2000, with the purpose of improving the risk expertise among regional staff. The goals of this working group included: (1) ensuring that every reactor inspector in the region is capable of using and understanding the SDP and (2) ensuring that a subset of these inspectors receive advanced risk training. One of the recommendations of the risk expertise working group was to develop near-term training to improve the use and understanding of the SDP through the use of examples. This instructional guide was completed in June 2001 and includes twelve reactor SDP examples, including a fire protection SDP example.

In November 2000, a solicitation of interest notice was issued to select region-based staff for advanced risk training that would enable them to utilize NRC Probabilistic Risk Assessment (PRA) software tools to perform and interpret basic quantitative risk analysis. A total of twelve regional selections for the advanced risk training were made, with these individuals attending a series of seven PRA classes commencing in April 2001. Additionally, the course on ”PRA Technology and Regulator Perspective” (P-111) was redesigned to include more SDP instruction and examples, and to include a scenario in which students are required to defend an SDP analysis during a mock SERP. Finally, the Senior Reactor Risk Analyst training and qualification program was formalized in April, 2001, via a revision to IMC 1245.

Additional detail on the inspector training and regional risk expertise working groups can be found in Appendix C to this paper.

The implementation of the ROP will have an impact on the conduct of the Agency’s allegation program. Four options for modifying the allegation program were forwarded by the staff in Commission paper SECY-99-273, “Impact of Changes to the Inspection Program for Reactors on Implementing the Allegation Program,” dated November 23, 1999. As documented in the SECY-99-273 SRM dated January 27, 2000, the Commission approved the staff’s proposal to solicit stakeholder input prior to a final Commission decision on one of the options. The staff presented the results of stakeholder feedback on the four options in Commission paper SECY-00-0177,

”Implementing the Allegation Program under the Revised Reactor Oversight Process,” dated August 22, 2000.

By the SECY-00-0177 SRM dated October 11, 2000, the Commission disapproved further pursuit of risk-informing the allegation program, and directed the staff to continue to implement the existing allegation program. The staff was directed to ensure that allegations are handled and documented consistently from region to region through a systematic process that interfaces with the ROP. Further, upon completion of the staff's evaluation of the SDP, it should be employed to determine those issues developed from allegations that should be documented in an inspection report in the same way the SDP is utilized to assess findings not related to allegations. The staff is currently implementing this direction from the Commission.

While considering the impact of the ROP on the allegation program, the staff was concerned that the timeliness of allegation closeout might decrease as the regions had less discretion for conducting regional initiative inspection, during which much of the allegation follow-up was conducted. The staff was also concerned that it might be harder to protect the identify of allegers during allegation follow-up inspections and while documenting the allegation results using the revised inspection report writing guidance.

During the first year of initial implementation, the staff noted a slight decrease in the timeliness of allegation closeout as the regions scheduled more allegation follow-up inspections with previously scheduled baseline inspections. However, average allegation closeout timeliness was still well within the Agency goal of 180 days. Additionally, experience during initial implementation did not demonstrate a problem with protecting the identity of allegers, either during the conduct of the allegation follow-up or while documenting the results.

The staff has worked closely with the Office of Nuclear Regulatory Research (RES) to investigate the feasibility of selected risk-based performance indicators (RBPIs) as a potential enhancement to the PIs for the ROP. In response to a User Need Memorandum from NRR, RES is examining the feasibility of developing indicators to enhance the current set of ROP indicators in areas of plant performance where there are currently none, such as equipment reliability, shutdown operations, fire protection systems, and containment performance. RES is examining these selected indicators as part of its broader initiative to examine the feasibility of developing a comprehensive set of RBPIs. Some the RBPIs have the potential to provide insights on component, train, and system performance, as well as allowing for the use of plant-specific thresholds. RES has documented the results of the feasibility study in a draft RBPI Phase 1 report. NRR and RES will assess continued RBPI development based on feedback received from stakeholders on the Phase 1 report. The Phase 1 Report was published for public comment in a *Federal Register* Notice (FRN) in February 2001, and feedback has been received in response to the FRN and as part of two public meetings on the report. NRR will review the stakeholder feedback and provide direction to RES on the continued development of RBPIs in August 2001.

In addition, the staff is developing an industry trends program as a means of assessing whether the safety of operating power plants is being maintained by the nuclear industry

and to enhance public confidence in the efficacy of NRC processes. The NRC will use indicators to identify adverse trends, evaluate them, and take appropriate Agency actions. One important output of this program is to report to Congress each year on the measure "no statistically significant adverse industry trends in safety performance" as part of the NRC's Performance and Accountability Report. No statistically significant adverse trends have been identified to date based on the information currently available from the industry-wide indicators developed by the former Office for Analysis and Evaluation of Operational Data (AEOD) and the Accident Sequence Precursor (ASP) program implemented by RES. The NRC staff will continue to use these indicators to monitor industry trends and use them as the basis for the report to Congress. In addition, the staff will develop additional indicators that are more risk-informed and aligned with the cornerstones of safety for use in the industry trends program. The additional indicators will be derived from the plant-specific PIs of the ROP and from operating experience information in RES. They will be developed and qualified for use in the industry trends program and the report to Congress in phases. In determining its response to adverse trends, the staff will use a graded approach based on the safety significance of the issues. The staff will be examining a more objective and risk-informed approach to assessing the safety significance of changes to indicators, including potentially establishing thresholds for Agency response.

Changes to the reactor oversight process need to be closely coordinated with the Agency initiative to risk-inform 10 CFR Part 50. The ROP increases focus on certain risk-significant requirements and decreases focus on certain other less risk significant requirements. This could result in situations where very low significance findings, even if numerous, would be evaluated and treated with little to no follow-up by the Agency. Similarly, the ROP may identify risk significant conditions, not covered by current regulations, that warrant some level of Agency follow-up beyond the baseline inspection program. Risk-informing 10 CFR Part 50 may provide further insights into aspects of our current regulations that may impact the inspection program. The staff will continue to work to ensure that the ROP is consistent with the results of this effort.

The staff has also worked to apply many of the ROP concepts developed and lessons learned identified to the oversight of nuclear fuel cycle facilities. The Office of Nuclear Material Safety and Safeguards (NMSS) forwarded its proposal for evaluating and proposing revisions to the oversight process in Commission paper SECY-99-188, "Evaluation and Proposed Revision of the Nuclear Fuel Cycle Facility Safety Inspection Program," dated July 21, 1999. NMSS forwarded an update to the status of their development efforts in Commission paper SECY-00-0222, "Status of Nuclear Fuel Cycle Facility Oversight Program Revision," dated November 27, 2000, and briefed the Commission on the status of these efforts on December 20, 2000. NRR staff will continue to work closely with NMSS to share lessons learned from ROP initial implementation and support its work to develop a more risk-informed process for the regulatory oversight of nuclear fuel cycle facilities.

ROP INITIAL IMPLEMENTATION COMMITMENTS

ROP Initial Implementation Commitments

There were several open issues and commitments that the staff continued to evaluate and work on during the first year of ROP implementation. Several of the issues involved longer term items that the staff identified as needing additional work following initial implementation in Commission paper SECY-00-0049, dated February 24, 2000. The Commission directed the staff to consider several additional issues in the SECY-00-0049 SRM dated May 17, 2000. Also several recommendations for staff consideration during initial implementation were made by the Pilot Program Evaluation Panel (PPEP) as noted in the "Final Report of the Pilot Program Evaluation Panel," dated December 21, 1999. All of these issues were considered by the staff during initial implementation as described throughout this Commission paper and its attachments. The status of these issues is summarized below.

SECY-00-0049 SRM

- **The staff should convene another evaluation panel under the Federal Advisory Committee Act during the first year of initial implementation. The staff should include at least one resident inspector and one senior reactor analyst on this "Initial Implementation Evaluation Panel."**

  An Initial Implementation Evaluation Panel (IIEP) was established by the Agency in accordance with Federal Advisory Committees Act (FACA) requirements to serve as an advisory committee to the Agency. This panel was a cross-disciplinary group of NRC, public, and industry stakeholders representing many different nuclear power interests, including the Nuclear Energy Institute, power plant licensees, the New England Coalition on Nuclear Pollution, the Georgia Department of Natural Resources, a PhD candidate from Benedictine University, and the California Energy Commission. NRC staff on the IIEP included a regional Senior Resident Inspector and a Senior Risk Analyst, in addition to Headquarters and regional managers. The purpose of the IIEP was to monitor and evaluate the results of the first year of initial implementation and to provide advice and recommendations to the Agency on reforming and revising ROP. The IIEP first met on November 1, 2000 and conducted a total of six meetings throughout the initial implementation of the ROP. The IIEP final report was issued on May 10, 2001, and the recommendations were addressed throughout this Commission paper.

- **During the initial implementation phase, ending in June 2001, Action Matrix deviations should be pre-approved by the EDO.**

  Inspection Manual Chapter (IMC) 0305, Operating Reactor Assessment Program," was revised on April 24, 2000, to ensure that the EDO approves all proposed deviations from the Action Matrix.

- **In its report to the Commission on the initial implementation phase of the ROP, the staff should provide a summary of the deviations from the Action Matrix, recommendations on a method to assure Agency-wide consistency when deviating from the Action Matrix, and recommendations on how to keep the Commission currently informed of such deviations. Furthermore, during the initial**

implementation phase, the staff should inform the Commission whenever it determines that such a deviation is warranted.

Although deviations from the Action Matrix were considered on a few occasions during initial implementation of the ROP, none were issued. The staff revised IMC 0305 to ensure that the Commission is informed of any such deviations. IMC 0305 provides for Agency-wide consistency by ensuring that deviations from the Action Matrix are rare and are made with the appropriate level of NRC management approval.

- **NRC management should undertake continuing dialogue with the staff, including in particular the inspection staff, to stay abreast of concerns with initial implementation of the ROP and to assure that these concerns are thoroughly aired and addressed.**

  Internal feedback and comments from NRC staff were obtained during the first year of ROP implementation using various methods. Weekly teleconferences were held with regional management to solicit feedback and address implementation issues. Counterpart meetings were held with the regional Division Directors approximately every two months and a briefing of the four Deputy Regional Administrators was conducted to discuss implementation issues and solicit feedback and comments on the ROP. Feedback forms were developed and used for the inspection procedures and oversight process to allow regional staff to document questions and concerns on the various components of the ROP. Regional and site visits were made to each of the four regional offices and six sites per region to solicit program feedback at the mid-point of initial implementation. Based on feedback received, internal staff focus groups were established to address the major issues, which were then discussed at an Internal Lessons Learned Workshop conducted in March 2001. Finally, an internal stakeholder survey of the regional inspection staff was conducted near the end of the first year of ROP implementation to gather additional insights to be considered while evaluating the lessons learned.

- **In its ongoing communication efforts the staff should emphasize the importance of the licensee corrective action programs (CAPs) and the integral role that each licensee must play, i.e., that the new process places greater responsibility on the utilities that operate nuclear power plants. The staff should more clearly articulate the role of licensee CAPs, with self-assessment, as the beginning and the end of this process.**

  In several ongoing efforts, the staff has communicated the importance of licensee CAPs and their role in the ROP. For example, NRC staff and inspectors received training on the problem identification and resolution (PI&R) baseline inspection procedure during the G-200 course, “Reactor Inspection and Oversight Program”, provided by the Technical Training Center. In addition, IMC 0610* was revised to allow documentation of cross-cutting issues, including PI&R issues, associated with greater than Green inspection issues. Similarly, substantive trends in cross-cutting issues have been documented in mid-cycle and end-of-cycle assessment letters. Finally, the staff has continually reinforced the importance of the licensee CAP and PI&R baseline inspections with both internal and external stakeholders at the various presentations, public meetings,

workshops, and other venues conducted as part of the Communication Plan during ROP initial implementation.

- **NRR and regional management should ensure that the threshold for documenting observations is clearly understood and consistently applied. They should also take steps to assure that inspector observations are placed in an appropriate context and do not undermine the overall effort to put inspection and enforcement efforts on a more objective and consistent foundation.**

  IMC 0610* generally does not allow the documentation of observations, except in rare instances where extenuating circumstances exist (e.g., in response to an allegation). When appropriate, these observations can then be documented as "No Color" findings in accordance with the requirements of IMC 0610*.

  A revision to IMC 0610* was issued on October 6, 2000, which provided additional guidance and clarification to the thresholds for documenting inspection findings, including the criteria and thresholds for "No Color" findings. Since January 2001, the staff has been auditing inspection reports issued by the regions to determine whether the regions are documenting inspection results in accordance with the requirements of IMC 0610*. The focus of these audits has been on evaluating whether the safety significance of findings is clearly documented and whether "No Color" findings are being properly used and placed in the proper context. These inspection report audits are performed as part of the periodic ROP self-assessment discussed earlier, and will continue beyond initial implementation.

- **The staff should show that cross-cutting issues they identify have a clear and strong link to significant inspection findings or degraded PIs before the staff attempts to take action on programmatic concerns.**

  The ROP addresses cross-cutting issues by highlighting them in inspection reports when they are notable contributors to inspection findings or if there is an appreciable trend or pattern that has emerged; and in assessment letters to the licensee when they constitute a substantive issue. Recent changes made to Inspection Manual Chapter 0610* better explain when and how cross-cutting issues should be documented in inspection reports. The ROP does not allow for additional NRC engagement on cross-cutting issues unless they are contributing causes to PIs or inspection findings that are characterized as White or greater.

- **In its report to the Commission on the initial implementation phase of the RROP, the staff should discuss every case in which enhanced NRC action was taken based on cross-cutting issues.**

  During initial implementation of the ROP, enhanced NRC action was not taken by the Agency based solely upon findings associated with cross-cutting issues.

- **The staff should continue to work with NRC stakeholders to resolve the "Performance Issues Outside Licensing and Design Basis" issue while maintaining its appropriate sensitivity to backfit implications. The staff should**

specifically discuss this issue when they report to the Commission on the results of the first year of RROP implementation.

Lessons learned from initial implementation of the ROP indicate that the oversight process can appropriately treat licensee performance issues that are outside the licensing and design basis of the plant. Of the 21 safety significant inspection findings evaluated by the SDP during initial implementation, four did not involve compliance with regulatory requirements. Although no compliance issues existed, licensees took appropriate action to address the underlying safety concerns.

PPEP Commitments

- **Conduct required verification inspections early for the performance indicator data provided by non-pilot plants.**

  Early during ROP initial implementation, resident inspectors at each non-pilot plant conducted an inspection in accordance with Temporary Instruction 2515/144, Revision 1. The purpose of this inspection was to review the licensee's performance indicator (PI) data collecting and reporting process to determine whether the licensees are appropriately implementing the NRC/Industry guidance.

- **Resolve the outstanding issues regarding the appropriateness and threshold values of the emergency preparedness response training and drill participation, security equipment performance, containment integrity, and siren notification systems PIs. These issues should be resolved during the first year of industry-wide implementation and included as part of the report to the Commission.**

  ERO Drill/Exercise Performance (DEP) and Drill Participation Indicators: NEI 99-02, Revision 0, included language explaining that these two indicators are linked. That is, for key emergency response organization (ERO) members who are responsible for classification, notification or protective action recommendation (PAR) development to get credit in the ERO Drill Participation PI, their performance must be assessed and must contribute to the DEP PI value. The issue of linkage between the DEP PI and ERO PI was largely resolved early during initial implementation. However, the linkage was not apparently universally understood and, in a few instances, was misinterpreted or overlooked. The clarity of the linkage was improved in NEI 99-02, Revision 1, and NEI committed to conduct further industry training to ensure understanding.

  Security Equipment Performance Index: The NRC/Industry working group examined the use of unplanned unavailable hours in lieu of compensatory hours in this PI and concluded that there is no need to change. In addition, changes were made to both the White band and Yellow band thresholds that had been a concern during the pilot program. When the historical data provided by all plants prior to the start of initial implementation was evaluated, the staff determined that the Green band should be widened by adjusting the White band threshold from 0.05 to 0.08, and the Yellow band was eliminated.

Containment Leakage Indicator: As a consequence of several significant problems with this indicator, it was removed from the program prior to initial implementation.

ANS Reliability Indicator: The Green/White threshold for this indicator was set at 94 percent in recognition of the typically high ANS reliability. When this threshold was developed, only one plant-year was below the threshold and one near it. Therefore the threshold was deemed to accurately reflect the performance level at which greater NRC involvement in licensee maintenance of the ANS was appropriate. This premise was borne out during initial implementation. The number of White indicators has been about the expected rate of 5 percent, and they were primarily due to problems with ANS maintenance. The Yellow band threshold was set at 90 percent, the reliability value that requires a formal corrective action plan to be filed with FEMA. Although no member of the NRC/Industry EP working group was aware of an ANS with annual reliability so low, one did occur during Initial Implementation. Inspection of the associated corrective actions revealed a poor root cause analysis and poor corrective action implementation by the licensee, which indicated that the threshold was appropriate in indicating that mandatory regulatory involvement was appropriate.

- **Ensure that the program effectiveness is not measured solely based on the increase or decrease of resource utilization.**

  The staff developed a comprehensive self-assessment program to evaluate the efficacy of the ROP. A total of 20 measures for the inspection program were developed as part the overall self-assessment process. Of those 20, only 3 measures collect and compare inspection resources: 2 measures use NRC inspector time and 1 measure uses contractor support dollars. Therefore, the self-assessment program measures ROP effectiveness by more than resource utilization.

- **Significant events should be evaluated from a program perspective as related to the effectiveness of performance indicators and risk-informed baseline inspection results.**

  An Indian Point 2 Lessons Learned Task Group was formed following the February 2000 Steam Generator (SG) Tube Failure to review the event for lessons learned that could be applied to the ROP, including the new baseline inspection program and PIs. The task group made several recommendations regarding the Inservice Inspection baseline inspection procedure and improvements to the PIs that could better reflect the integrity of the SG tubes. As described earlier in this Commission paper, the staff evaluated these recommendations and is considering appropriate changes to the baseline inspection program. The staff determined that no changes were necessary to the PIs.

- **A monitoring program that seeks to confirm the continued validity of the underlying assumptions regarding cross-cutting issues such as human performance is needed for the first year of implementation.**

  A working group was formed consisting of Headquarters and regional management and staff to focus on the concerns expressed regarding cross-cutting issues. Three working group meetings were held during initial implementation to review lessons learned and

experience with cross-cutting issues. Data obtained from the initial implementation of the ROP thus far tend to support one of the fundamental premises of the ROP; that degradation in the cross-cutting areas will be detected by either PIs or inspections in a sufficiently pro-active time frame to allow for Agency action to protect public health and safety. Also, during initial implementation of the ROP, the staff did not identify any cross-cutting issues that would warrant special treatment.

- **The staff should clearly articulate in writing both the approach and the rationale for using core damage probability (CDP) not core damage frequency (CDF) for event response and enforcement, and CDF and not CDP for SDP and enforcement.**

  The approach and rationale for using CDF and not CDP for the SDP safety evaluations and enforcement was documented in a revision to IMC 0609, "Significance Determination Process," Appendix A, Attachment 2, issued on December 28, 2000.

- **The independent SDP review panel should be maintained during and following industry-wide implementation to continue to reinforce and ensure desired consistency as more inspectors are exposed to the process.**

  The panel is identified as the SDP/Enforcement Review Panel or SERP. The SERP contributes to the consistent implementation of the ROP by reviewing each inspection finding potentially greater than Green. Participants include the Headquarters and region based senior reactor analysts (SRAs), enforcement specialists, and appropriate NRR technical and project management staff. The panel is chaired by the Chief, Inspection Program Branch or by an IIPB section chief who is responsible for obtaining consensus on the determination of significance of the findings. Detailed guidance on the function of the SERP is provided in Attachment 0609.01 to Manual Chapter MC 0609.

- **The staff's guidance should be clarified relative to the use of the Action Matrix when the significance of the inspection findings are under review at the time the assessment is published (mid-cycle or annual).**

  Guidance was added to IMC 0305, "Operating Reactor Assessment Program," to discuss how the regions should document in assessment letters those potentially safety significant inspection findings whose final safety evaluation is pending.

- **Update the program basis document and make it publically available as soon as possible.**

  The staff is in the process of finalizing an update to the ROP Basis Document that will provide the background behind the development of the PIs, the new inspection program, the revised assessment process, the revised enforcement policy, and the SDP. The basis document will not only describe the rationale and decision-making process for the key attributes of each of the oversight processes, but will also describe many of the program aspects that were considered during ROP development, but not included in the oversight process. The staff expects to issue the ROP basis document as a NUREG during the summer of 2001, and will periodically update the document to keep it current with program changes.

- **Set up a process for ongoing confirmation of assumptions underlying the process.**

  The staff has developed an ROP self-assessment program to continue to perform periodic program self-assessments following initial implementation to collect additional lessons learned and gain insights from the new oversight process. This ongoing self-assessment process utilizes objective measures and pre-determined criteria to monitor the performance of the ROP. As described in IMC 0307, "ROP Self-Assessment Program," these periodic self-assessments will monitor the major components of the ROP utilizing eight criteria. The first four criteria would monitor the ROP's ability to be: 1) objective, 2) risk-informed, 3) understandable, and 4) predictable. These criteria derive from the original design objectives of the ROP. The other four criteria would monitor the ROP's ability to: 1) maintain safety, 2) increase public confidence, 3) make NRC activities and decisions more effective, efficient, and realistic, and 4) reduce unnecessary regulatory burden on stakeholders. These criteria derive from the Agency's performance goals as outlined in the Strategic Plan.

ROP RESOURCE ANALYSIS

Task Lead: Armando Masciantonio, NRR/IIPB

Attachment 13

ROP Resource Analysis

Introduction

Prior to initial implementation of the revised Reactor Oversight Process (ROP), the staff stated in SECY-00-0049 that there would be no resource adjustments to the inspection and assessment programs until adequate experience was gained with the revised ROP. A full year of implementation beyond the pilot program was planned to obtain reliable data on which to estimate the resources needed to accomplish individual inspections as well as to execute the overall ROP.

In order to assess the ROP from a resource perspective, the staff focused on two areas; (1) can the ROP be completed within the estimated resources, and (2) is the ROP more efficient in resource utilization compared with the previous inspection and assessment programs.

These issues have been addressed by separately examining the following aspects of the ROP:

- The actual resources used during the first year of ROP implementation compared with the assumptions and estimated resource requirements of the ROP for the specific reactor oversight activities including baseline, plant specific, and generic issues inspection areas and reactor performance assessment.

- Total resources expended in each inspection and assessment program area compared with estimated resources in those program areas.

- Regional variation in resource utilization.

- Comparison of total annual resource expenditures for the revised ROP with the previous program.

Initial Estimates of ROP Resource Requirements

Resource requirements for the ROP were estimated prior to initial implementation based on assumptions relative to the time needed to complete each baseline procedure at the appropriate depth and scope, and the frequency for performing the inspection. The expected needs for supplemental and event response inspections, generic safety issues, and performance assessment were also considered.

An expert panel of inspectors and senior staff reviewed the individual inspection procedures and arrived at a consensus as to the content, scope and the hours required to complete the baseline procedure for single-, dual-, and triple-unit sites. The resource requirements for other elements of the ROP were similarly estimated as described below.

Baseline Inspections

An annual estimate of resource requirements for the baseline inspections was calculated based on the estimated procedure hours and frequency. In addition, the annual effort for plant status activities was estimated at 630 hours, 700 hours, and 840 hours, respectively, for a one-unit,

two-unit, and three-unit site. Plant status activities are not considered direct inspection effort but reflect the time needed for inspectors to stay cognizant of plant conditions and issues. These activities include time spent by resident inspectors gathering and analyzing information related to current plant status and ongoing activities that are directly applicable to inspection planning, including control room and plant walkdown, attendance at licensee status meetings, and participation in inspection entrance and exit meetings.

Based on these assumptions, the resulting annual baseline resource requirements for direct inspection, preparation and documentation, and plant status effort were estimated at 4714 hours for a one-unit site, 5030 hours for a two-unit site, and 5506 hours for a three-unit site.

Plant Specific Inspections

Annual supplemental inspection effort was estimated as 45 hours per site plus 200 hours per region, based on a planning assumption there would be an average of 1.5 White findings per site and one Yellow finding per region. An additional equal number of hours were added to the estimate for inspection preparation and documentation.

Special Inspections (SI) and Augmented Inspection Team (AIT) inspections in response to events were estimated at 1275 hours per region (three event response inspections at 250 hours each for 750 hours of direct inspection effort, and 525 hours for inspection preparation and documentation).

Generic Safety Issues Inspections

Generic Safety Issues inspection effort was estimated at 60 hours per site per year (30 hours direct inspection effort and 30 hours for inspection preparation and documentation).

Licensee Performance Assessment

Performance assessment was estimated at 192 hours per site per year. This estimate was based on best available recent historical data.

A summary of the above assumptions and resulting regional allocation of resources for the revised ROP based on the above assumptions are provided in Tables 1, 2, and 3.

Table 1 summarizes the baseline inspection procedure resource estimates and annual equivalents for single-, dual-, and triple-unit sites.

Table 2 provides a summary of the assumptions and bases for the regional resource model.

Table 3 summarizes the regional allocation of resources based on this model and the specific distribution of units and sites per region.

Actual Resource Expenditures During Initial Implementation of ROP

Tracking resource expenditures during the first year provided the means to benchmark the resource estimates and will permit improvements to the regional resource model and help

identify areas where efficiencies may be possible. Detailed Regulatory Information Tracking System (RITS) codes were developed in order to track time spent on specific activities in the ROP. Guidance was provided to regional staff, and inspectors were instructed to complete the procedures and implement the program as required. This guidance was formalized in the "RITS Users Guide" and is included in draft NRC Inspection Manual Chapter 0306, "Information Technology Support for the Reactor Oversight Process."

A necessary step in evaluating resource implications of the revised ROP was to gather the necessary data, tabulate it, and analyze the results. The hours expended to carry out the ROP at operating power reactors during the first year of implementation were obtained through selective searches of data in the RITS. In addition, contractor effort was included, as appropriate, for all inspections that were supplemented with contractor assistance. The results are tabulated several different ways in Tables 4 through 8 and are discussed in detail in the pages that follow.

(It should be noted that there may be small variations in the actual hours reported within the different tables in this section. These variations are the result of the minor corrections and revisions made to the hours reported in the Regulatory Information Tracking System (RITS) from one week to the next, such that the same search performed on different days may yield slightly different results especially for the more recent RITS entries. The actual hours expended were obtained during the second and third weeks of April 2001)

Baseline Inspections

The expenditures for baseline inspection activities are provided in Tables 4 and 5.

Table 4 shows the actual hours expended for baseline inspection activities compared with initial estimates for single-, dual-, and triple-unit sites. The results show that, with the exception of the two triple-unit sites, the actual resource requirements to accomplish direct inspection, inspection preparation and documentation, and plant status activities were less than initial estimates. However, as discussed below, these specific activities do not represent the total effort needed to conduct routine inspection activities.

Table 5 provides the same information by office. Again the results show that actual expenditures for these activities are less than initial estimates across all regions. The discussion that follows provides some perspective to this comparison.

Except for inspection preparation and documentation, the resource requirements for other indirect inspection activities were not explicitly identified in the regional resource model. It was assumed that the time expended on these activities would be small and would be accommodated within allocated program resources; however, anecdotal regional feedback suggested that indirect activities that were not accounted for; i.e., regional support of inspections (REG), routine communications (COM), and significance determination process (SDP), consumed a measurable amount of inspector effort. In order to determine the actual effort required for these activities, expenditures for the indirect inspection activities; i.e., inspection related travel (AT), routine communications (COM), regional support of inspections (REG), inspection preparation (BIP) and documentation (BID), significance determination process (SDP), enforcement support (ENF) and review of technical documents (RLD), were tracked during the first year of initial implementation.

The actual hours charged to the indirect inspection activities are provided, by region, in Table 6. The results show that, in some cases, expenditures in these activities are significant, such as the Region I expenditures for inspection related travel, routine communications and regional assistance. These indirect activities were charged against the three inspection program areas (baseline inspections, plant specific inspections, and GSI inspections) in proportion to the expected effort in the three areas. Therefore, if the effort for the support activities shown in Table 6 is added to the totals shown in Table 5, the difference between the actual baseline hours and estimated hours in Table 5 becomes less.

Tracking the actual effort in these activities provides a basis to improve the accuracy of the regional resource allocation model by either explicitly accounting for these indirect activities or adjusting the allocation for inspection preparation/documentation. The staff will continue tracking expenditures in these activities and will make appropriate adjustments in the regional model for baseline inspection effort.

Plant Specific Inspections

A comparison of actual total hours expended for plant-specific inspections vs. estimated hours, by region, is provided in Table 7.

As already discussed, the regional allocation for plant specific direct inspection effort was based on an assumption that 1.5 White findings per site would result from performance indicators and inspection findings (67 sites x 1.5 = 100.5 total White findings) at 30 hours per finding = 3,015 hours, four Yellow findings would be identified at 200 hours each (800 hours), and 3 event response inspections per region would be conducted at 250 hours per inspection (3,000 hours) for a total direct inspection effort of 6,815 hours. It was assumed that there would be no Red findings and thus, no resources were allocated for supplemental inspections to resolve Red findings.

In actuality during this first year, Inspection Procedure (IP) 95001, inspection for one or two White inputs in a strategic performance area, was implemented 30 times for a total direct inspection effort of 852 hours; IP 95002, inspection for a degraded cornerstone, was performed four times for a total direct inspection effort of 739 hours; and IP 95003, supplemental inspection for a Multiple/Repetitive Degraded Cornerstone or one Red input, was completed at one plant for a total direct inspection effort of 1,724 hours.

One follow-up inspection to an AIT and seven Special Inspections were performed as determined from the hours charged to Inspection Procedures IP 93800 and IP 93812, respectively. The total direct inspection effort charged to these two procedures was 1,926 hours compared with an initial estimate of 3,000 hours (750 hours per region).

The total NRC staff inspection effort charged to plant-specific inspection at operating power reactors, including direct inspection effort and inspection preparation and documentation at all sites, was 17,980 hours. This includes supplemental inspections, event response inspections and all other plant specific inspections.

Based on an analysis of the resources expended in this area compared to the regional resource model, we can conclude the following as a result of the first year:

- The number of plants where IP 95001 was applied (White inspection findings or White performance indicators) and the effort to resolve these were significantly lower than estimated (852 actual hours vs. 3,015 estimated hours).

- The number of times IP 95002 for a degraded cornerstone was exercised (Yellow or multiple White findings) and the effort to resolve these were both accurately estimated (4 actual vs. 4 estimated; 739 actual hours vs. 800 estimated hours for direct effort).

- The inspection effort and oversight associated with a plant in a multiple/degraded cornerstone was significant. The required regulatory oversight not only consumed considerable effort for direct inspection and inspection preparation and documentation, but also significantly increased the expenditures of other indirect activities such as inspection related travel, routine communication, significance determination process, and regional technical support.

Expenditures for plant-specific inspections depend directly on performance indicators, the results of baseline inspections, and events that may occur during the year. The total direct inspection effort expended on plant specific inspection during this first year is reasonably close to the initial estimate; however, the resource allocations in this area need to be refined. In the coming year, the staff will continue tracking events and expenditures in these activities and will make needed adjustments in the resource model and assumptions to more accurately reflect the number and resource requirements for White, Yellow and Red findings.

Generic Safety Issues Inspections

The GSI/SI expenditures vs. estimates are shown in Table 7. Due to the limited effort in this area during this first year of implementation, it is not appropriate to draw definitive conclusions regarding the initial assumptions. The total expenditures in this area depend on the number of issues that surface during the year. During this first year total expenditures for direct inspection were reported as 1,389 hours, while 1,030 hours were charged to inspection preparation and documentation, for a total of 2,419 hours. The actual hours are less than the 4,026 hours estimated. This is consistent with a recent trend of reduced numbers of GSI inspections and may lead to inspection resource savings. The estimated annual 60 hours per site will be maintained for the near term until the assumptions can be validated with greater confidence to see if this estimate can be reduced.

Summary of First Year Expenditures

Table 8 provides a comparison of actual total hours charged to the ROP inspection and assessment program areas during the first year of implementation compared with the initial estimated resource needs. All inspection and assessment related activities are included in the actual total charges, including the indirect activities such as inspection related travel, regional support, enforcement support, etc.

The following can be inferred from the results shown in Table 8:

- Baseline Inspection: The effort required for the baseline program element was underestimated for Regions I and III, and overestimated for Region II. These variances need to be investigated in more detail to understand their basis.

- Plant Specific Inspections: The initial estimate for plant specific inspections only considered direct inspection effort and inspection preparation and documentation. If only these activities are considered, the initial estimate is fairly accurate as can be seen from the data in Table 7. However, if all activities are considered, as shown in Table 8, the resource expenditures for the plant specific inspection program element were underestimated to varying degrees for all four regions. Although the Region I variance can be attributed, in part, to the increased activities related to Indian Point 2, as already discussed, the greater than anticipated effort in this program area indicates that adjustments to the regional resource model are required.

- GSI/SI Inspections: As already discussed, no adjustments to the GSI/SI allocation will be made in the near term until the quality of the data can be validated and potential resource savings are identified.

- Performance Assessment: Table 8 also provides actual expenditures charged to licensee performance assessment activities. It must be noted that the time period on which these assessment numbers are based does not capture the major activities for the first end-of-cycle plant assessments in the revised ROP. Those major assessment activities are scheduled six weeks after completion of the inspection cycle and are not reflected in the hours in Table 8. Also, a significant portion of the hours charged to performance assessment were incorrectly reported to SALP activity without a corresponding docket number. Because of these inadequacies in the database and in recording and reporting the time actually spent performing assessment activities, the quality of these data can not be confirmed with absolute certainty. The staff will continue tracking assessment expenditures with more accurate reporting to determine if adjustments to the regional model are required.

The initial resource estimates for the ROP were based on the best available information and expert opinion. As discussed above, a number of issues were identified that indicate the estimates need to be refined as more experience is gained implementing the process and more accurate, longer term data are available.

Comparison with Previous Reactor Oversight Program

Table 9 provides a side-by-side display of the resource expenditures of the ROP during the first year of implementation with the resource expenditures for the same time period prior to initial implementation. The numbers shown in Table 9 include all direct and indirect inspection effort at operating power reactors expended by NRR and the regional offices during the two time periods. Although there are similarities between the previous inspection/assessment programs and the ROP, a number of significant, elemental differences make a direct comparison difficult and potentially problematic. It should also be noted that, because of the transition in inspection processes, neither the 52 weeks prior to implementation of the ROP, nor the 52 weeks of initial implementation can be considered a typical inspection year.

The previous program consisted of core inspections with considerable latitude for regional initiative based on licensee performance as determined by the results of the systematic assessment of licensee performance (SALP). In contrast, the revised ROP applies the same

baseline inspection effort to all sites and the extent of supplemental inspection is determined by the significance of baseline inspection findings and performance indicators. Also, in the ROP, the effort required for specific indirect activities such as; significance determination process, plant status, regional support, and routine communication, is tracked separately. In the previous program these activities were included as part of other elements of the program. However, even with these differences it is possible to make some general observations.

As in the previous program, the majority of inspection effort is in baseline/core activities. Also, as expected, even with the effort at Indian Point 2, plant specific inspection activities in the ROP are a much smaller fraction of total inspection effort than in the previous program.

The effort for direct inspection activities and plant status for Baseline/Core and Plant Specific inspections is less for the ROP than for the previous program (183,493 hours for the ROP and 192,867 hours for the previous program).

The effort for direct inspection, plant status, and inspection preparation and documentation for Baseline/Core and Plant Specific inspections is comparable for the ROP and the previous program (306,111 hours for the ROP and 307,925 for the previous program). We expect, however, that greater familiarity with process and procedures will decrease preparation and documentation time.

A direct comparison of the GSI/SI hours and Performance Assessment hours is not appropriate for the reasons already discussed.

Additional Considerations

Contractor assistance was used in conducting a number of major team inspections during the past year. These hours have been applied and are reflected in the various tables presented. Contractor assistance is equivalent to approximately 8915 hours of additional inspection resources. A breakdown by inspection area and region during the first year of implementation is shown in Table 10. Future availability of contractor assistance will have significant resource implication for the ROP absent any other changes.

Also, as noted in Attachment 7, Inspection Program, the Physical Protection Cornerstone baseline inspection process is continuing to develop and will likely change based on rule changes and licensee self-assessment efforts. Appropriate resources to address these changes will be evaluated as the changes are finalized.

Conclusions

This first year of ROP implementation provided a benchmark for future decisions on resource expenditures. Based on the results of the first year of ROP implementation, the staff concludes that:

- Current regional resources were adequate to effectively carry out the ROP and achieve its stated objectives during initial implementation. Regional variation in resource usage is not excessive and may be explained by unique circumstances (IP2 activities), or specific process efficiencies.

- Overall resource requirements for the ROP during initial implementation were comparable to the overall requirements in the previous program although the resources are allocated differently.

- Future resource reductions may be possible through efficiency gains as a result of: elimination of start-up costs; inspection preparation time decreasing as staff becomes more familiar with process and procedures; improved documentation methods (such as implementation of quarterly integrated inspection reports in all regions for routine inspections); use of SDP workbooks at all sites; and reduced frequency and level of activities related to licensee performance assessment. Resource savings may result if ongoing staff review and evaluation recommends a reduction in the scope and/or frequency of major team inspections or other baseline inspections.

- A number of other factors may impact resource requirements for the ROP in the future that are difficult to estimate. These include: institutional inefficiencies that may result from full implementation of "N" resident inspector staffing policy (greater inspection preparation and travel time); reduced inspector efficiency due to increases in vacancies filled at an entry level; unplanned issues/events that result in significant plant specific inspections or unplanned demand on inspectors; and additional inspection resources due to the increase in independent spent fuel storage installation (ISFSI) facilities.

- In total, the current regional resource model, modified based on the results of the first year of ROP implementation, provides reasonably accurate estimates of regional resource requirements to implement the ROP. The model will be refined as more data are gathered and evaluated. Areas considered for potential review include anomalies in regional resource usage relative to the resource model (e.g.; more onerous travel requirements for Region IV, additional resources for dual-unit sites that are significantly different in design, vintage or management), refinement of the model to include resource impacts of multiple degraded cornerstones, explicit inclusion of indirect inspection activities in the resource model, and more accurate data for performance assessment expenditures.

These factors will be addressed and evaluated for resource impacts as part of the ongoing improvement process; and efficiency gains will be implemented over the next several years. As part of the effort to develop the FY 2004 budget, the staff will reflect savings resulting from efficiency gains in FY 2003 and beyond.

The following should also be given consideration in any decision related to resource requirements for the ROP:

- There has already been a substantial decrease in inspection hours expenditures over the past five years to reflect improved industry performance and anticipated efficiencies from the ROP.

- Although current resources appear to be appropriate for the near term, additional data will be collected and analyzed as we move out of the start-up phase and complete the transition to "N" resident staffing.

- Efficiency gains can be implemented over the next several years. The self-assessment program will provide for ongoing review of the ROP.

- Factors such as entry level hires, resident inspector quality of life.

- The impact of growth areas such as construction inspection and ISFSI.

Table 1
Baseline Inspection Resource Estimates

			Consensus		Notes	One Unit		Two Units		Three Units		
Procedure	Attachment	Title	*Hours*	Delta		Hours	Delta	Hours	Delta	Hours	Delta	Division
71111	1	Adverse Weather	*18*	3	0	18	3	18	3	18	3	DRP
71111	2	Evaluation of Changes, Tests...	*32*	6	1	30	4	32	6	38	8	DRS
71111	4	Equipment Alignment	*80*	10	1	72	9	80	10	96	12	DRP
71111	5	Fire Protection monthly	*33*	3	0	33	3	33	3	33	3	DRP
71111	5	Fire Protection **Triennial**	*200*	40	4	67	13	67	13	67	13	DRS
71111	6	Flood Protection	*20*	4	0	20	4	20	4	20	4	DRP
71111	7	Heat Sink	*6*	1	0	6	1	6	1	6	1	DRP
71111	7	Heat Sink **Biennial**	*32*	2	3	16	1	16	1	16	1	DRS
71111	8	ISI **Biennial per site**	*32*	4	0	16	2	16	2	16	2	DRS
71111	11	Lic Operator Requal	*12*	2	0	12	2	12	2	12	2	DRP
71111	11	Lic Op Requal **Biennial**	*96*	10	3	48	5	48	5	48	5	DRS
71111	12	Maintenance Rule	*216*	20	0	216	20	216	20	216	20	DRP
71111	12	Maint Rule **Bienniel per site**	*40*	10	3	20	5	20	5	20	5	DRS
71111	13/03	Emergent Work & Maint risk	*120*	20	1	108	18	120	20	144	24	DRP
71111	14	Non-routine evolutions	*102*	10	1	92	9	102	10	122	12	DRP
71111	15	Operability Evaluations **3.5hr per 18/22/26**	*72*	8	1	63	7	77	8	92	10	DRP
71111	16	Operator Workarounds	*35*	3	1	32	3	35	3	42	4	DRP
71111	17	Plant Mods **Biennial**	*80*	8	0	40	4	40	4	40	4	DRS
71111	17	Permanent Plant Mods	*16*	2	0	16	2	16	2	16	2	DRP
71111	19	Post Maint Testing	*84*	8	0	84	8	84	8	84	8	DRP
71111	20	RFO **per refuel per unit**	*80*	8	2	54	5	107	11	160	15	DRP
71111	21	SSDI **Biennial**	*420*	60	3	210	30	210	30	210	30	DRS
71111	22/09/10	Surv Testing & IST	*132*	12	0	132	12	132	12	132	12	DRP
71111	23	Temp Mods	*40*	6	1	36	5	40	6	48	8	DRP
71114	1	EP drills & exercise **Biennial**	*12*	2	3	6	2	6	2	6	2	DRP
71114	1	EP drills & exer **Biennial**	*52*	6	3	26	3	26	3	26	3	DRS
71114	2	Alert & Notif system **Biennial**	*8*	2	3	4	1	4	1	4	1	DRS
71114	3	Response Org Augmen **Biennial**	*8*	2	3	4	1	4	1	4	1	DRS
71114	4	EAL evaluation and EP Changes	*16*	2	0	16	2	16	2	16	2	DRS
71114	5	EP Weaknesses & Def **Biennial**	*12*	2	3	6	1	6	1	6	1	DRS
71114	6	Drill Evaluation	*10*	2	0	10	2	10	2	10	2	DRP
71121	1	Rad Access Controls	*32*	3	0	32	3	32	3	32	3	DRS

71121	2	ALARA **Biennial**	*120*	12	3	60	6	60	6	60	6	DRS

			Consensus		Notes	One Unit		Two Units		Three Units		
Procedure	Attachment	Title	*Hours*	Delta		Hours	Delta	Hours	Delta	Hours	Delta	Division
71121	3	Rad Instruments	*32*	3	0	32	3	32	3	32	3	DRS
71122	1	Effluents **Biennial**	*32*	3	3	16	2	16	2	16	2	DRS
71122	2	Rad Mat. Shipping **Biennial**	*32*	3	3	16	2	16	2	16	2	DRS
71122	3	Environmental **Biennial**	*32*	3	3	16	2	16	2	16	2	DRS
71130	1	Security Access Authorization	*12*	2	0	12	2	12	2	12	2	DRS
71130	2	Security Access Control	*24*	2	0	24	2	24	2	24	2	DRS
71130	3	Contingency Events **Biennial**	*104*	10	3	52	5	52	5	52	5	DRS
71130	4	Security Plan Changes **Biennial**	*16*	2	3	8	1	8	1	8	1	DRS
71151	NA	PI verif **Dependent on # of units**	**	*	5	35	3	50	5	65	8	DRP/S
71152	NA	PI&R	*210*	30	0	210	30	210	30	210	30	DRS
71153	NA	Event Follow-up	*18*	2	1	16	2	18	2	22	2	DRP
TOTAL DIE						2042	250	2165	266	2333	288	
Plant Status						630	68	700	755	840	90	
Total DIE						2042	250	2165	266	2333	288	
Est. Prep/Doc						2042	250	2165	266	2333	288	
Baseline Program						4714	568	5030	607	5506	666	

Notes

0 Nominal procedural estimates are applied to all sites regardless of number of units.

1 Procedural estimates are for a 2-unit site. 1-unit sites are estimated at 90% of nominal and 3-unit sites are estimated at 120% of nominal.

2 Procedural estimates are per occurrence for an estimated 18-month refueling cycle. All units receive the inspection during each refueling.

3 These procedures are performed biennially. Per occurrence estimates are applied at 50% per year at all sites.

4 This procedure is performed triennially. Per occurrence estimate is applied at 33% per year at all sites.

5 PI verification is dependent on the number of units. For a one unit facility, the verification of the PIs is estimated at 35 hours. Due to the overlap of PIs, for each additional unit, this procedure will require an additional 15 hours for a total of 50 hours at a two unit facility, and 65 hours for a three unit facility. This is exclusive of the hours to accomplish the PI TI which is estimated at 25 hours.

Assumptions

- The total of Preparation and Documentation is charged at a rate of 1 hour to every hour of inspection.
- Only baseline inspection program hours were included in the assessment.
- The security and safeguards, radiological safety and emergency preparedness inspection procedures were reviewed and the hours reallocated based on the results of the review. Hour estimates are believed to be reliable.
- The “Consensus Hours” for IP 71111.02 were revised from 40 hours to 32 hours annually. This reflects the transfer of “review of planned changes” from this procedure into EP and security procedures.

Table 2

REACTOR OVERSIGHT PROCESS
REGIONAL RESOURCE MODEL

Baseline Inspections:

	1-unit site	2-unit site	3-unit site
Direct Inspection Effort	2042 hours	2165 hours	2333 hours
Inspection Prep/Doc	2042	2165	2333
Plant Status	630	700	840
Total	4714 hours	5030 hours	5506 hours

Annual Regional Inspection Hours Required = (4714 x number of 1-unit sites in region)
+ (5030 x number of 2-unit sites in region)
+ (5506 x number of 3-unit sites in region)

Plant Specific Inspections:

Direct Inspection Effort = (30 hours/White finding x 1.5 White findings/site x number of sites in region) + (200 hours/Yellow finding x 1 Yellow finding/region)

Inspection Prep/Doc = Direct Inspection Effort

Special Inspections/AIT Effort = 250 hours/inspection x 3 inspections = 750 hours/year/region
Inspection Prep/Doc = 70% of direct effort = 525 hours/year/region

GSI inspections:

Direct Inspection Effort = 30 hours/site x number of sites in region
Inspection Prep/Doc = Direct Inspection Effort

Performance Assessment:

Effort is estimated at 192 hours/site x number of sites per region

Table 3

Estimated Regional Resource Requirements For Reactor Oversight Process
By Program Element
(Hours)

Program Element	Region I (12 single-unit sites)* (7 dual-unit sites)	Region II (5 single-unit sites) (12 dual-unit sites) (1 triple-unit site)	Region III (8 single-unit sites) (8 dual-unit sites)	Region IV (8 single-unit sites) (5 dual-unit sites) (1 triple-unit site)
Baseline Direct Inspection Effort	39659	38523	33656	29494
Baseline Inspection Prep/Doc	39659	38523	33656	29494
Plant Status Activities	12460	12390	10640	9380
Sub-Total	91778	89436	77952	68384
Supplemental Direct Inspection Effort	1055	1010	920	830
Supplemental Inspection Prep/Doc	1055	1010	920	830
Special Inspection/AIT Direct Effort	750	750	750	750
Special Inspection/AIT Prep/Doc	525	525	525	525
Sub-Total	3385	3295	3115	2935
GSI/SI Direct Inspection Effort	570	540	480	420
GSI/SI Inspection Prep/Doc	570	540	480	420
Sub-Total	1140	1080	960	840
Performance Assessment	3648	3456	3072	2688
Total Estimated Regional Requirements	99951 hours	97267 hours	85099 hours	74847 hours

* IP2, IP3, Millstone 2, Millstone 3 are considered single-unit sites.
Hope Creek and Salem 1 & 2 are considered a single-unit and a dual-unit site, respectively.

Table 4

BASELINE INSPECTION ACTIVITIES
Actual Total Hours vs. Estimated Hours
By Number of Units
(Includes Hours Charged by Regional Offices, NRR and Contractor Hours)
4/2/00 - 4/1/01

Activity	Single-Unit Sites		Dual-Unit Sites		Triple-Unit Sites	
	Actual Hours	Est. Hours*	Actual Hours	Est. Hours*	Actual Hours	Est. Hours*
Baseline Direct Inspection Effort	60449	67386	67046	69280	4818	4666
Baseline Inspection Preparation/Documentation	54040	67386	59763	69280	5991	4666
Plant Status Activities	20184	20790	21798	22400	1717	1680
Total Hours	134673	155562	148607	160960	12526	11012
Average Baseline Direct Inspection (hours/site)	1832	2042	2095	2165	2409	2333
Average Plant Status (hours/site)	612	630	681	700	859	840

Prep+Doc/Direct Insp Effort	0.89	1.0	0.89	1.0	1.24	1.0

* Based on 33 single-unit sites, 32 dual-unit sites, and 2 triple-unit sites

Table 5
BASELINE INSPECTION ACTIVITIES
Actual Total Hours vs. Estimated Hours
By Region

4/2/00 - 4/1/01

Activity Code	Region I (12 single-unit sites) (7 dual-unit sites)		Region II (5 single-unit sites) (12 dual-unit sites) (1 triple-unit site)		Region III (8 single-unit sites) (8 dual-unit sites)		Region IV (8 single-unit sites) (5 dual-unit sites) (1 triple-unit site)		NRR
	Actual Hrs	Est Hours	Actual Hrs	Est Hours	Actual Hrs	Est Hours	Actual Hrs	Est Hours	Actual Hrs
Direct Inspection Effort	39798	39659	30803	38523	33506	33656	23581	29494	758
Inspection Preparation/ Documentation	33925	39659	29006	38523	27516	33656	23418	29494	2023
Plant Status	12449	12460	11559	12390	10880	10640	8863	9380	-----
Total Staff Hours	86172	91778	71368	89436	71902	77952	55862	68368	2781
Contractor Hours	1245		2110		2260		2580		------
Total Baseline Hours	87417*	91778	73478*	89436	74162*	77952	58442*	66368	2781

* These totals only include direct inspection effort, inspection preparation/documentation, plant status hours, and contractor hours. The portion of the hours shown in Table 6 expended for indirect activities to support baseline inspections are not included.

Table 6
Regional and NRR Hours Charged To Indirect Inspection Activities
At Operating Power Reactors
4/2/00 - 4/1/01

Activity	Region I 19 sites		Region II 18 sites		Region III 16 sites		Region IV 14 sites		Regional National Average (Total hrs/67sites)	NRR Total Hours
	Total Hours*	Hours/ site	Total Hours*	Hours/ site	Total Hours*	Hours/ site	Total Hours*	Hours/ site	Hours/site	
Inspection Related Travel	5782	304	4693	261	4347	272	5125	366	298	247
Routine Communication	6628	349	3412	190	2244	140	2901	207	227	-----
Technical Documents Review	106	6	226	13	2	-	182	13	8	-----
Regional Assistance	1334	70	465	26	843	53	418	30	46	212
Significance Determination	1268	67	954	53	1208	76	909	65	65	289
Enforcement Support	794	42	1139	63	330	21	927	66	48	210
Total	15912		10889		8974		10462			958

*Actual total hours (regular + non-regular) charged 4/2/00 to 4/1/01. These hours were not explicitly accounted for in the regional resource model.

Table 7
PLANT SPECIFIC/GSI INSPECTIONS
Actual Total Hours vs. Estimated Hours

4/2/00 - 4/1/01

Activity	Region I (12 single-unit sites) (7 dual-unit sites)		Region II (5 single-unit sites) (12 dual-unit sites) (1 triple-unit site)		Region III (8 single-unit sites) (8 dual-unit sites)		Region IV (8 single-unit sites) (5 dual-unit sites) (1 triple-unit site)		NRR
	Actual Hrs	Est Hours	Actual Hrs	Est Hours	Actual Hrs	Est Hours	Actual Hrs	Est Hours	Actual
Plant Specific Inspections Direct Effort	4676	1805	1979	1760	2350	1670	1088	1580	1203
Plant Specific Inspection Prep/Doc	3316	1580	1096	1535	559	1445	1332	1355	381
Total hours	7992 Staff 720 Contr 8712	3385	3075	3295	2909	3115	2420	2935	1584
Generic/Safety Inspections Direct Effort	308	570	292	540	483	480	306	420	-----
GSI/SI Inspection Prep/Doc	431	570	315	540	221	480	63	420	-----
Total hours	739	1140	607	1080	704	960	369	840	-----

Table 8

Actual Total Hours vs. Estimated
By Program Element
(All Inspection and Oversight Activities and Contractor Effort at Operating Power Reactors)

4/2/00 - 4/1/01

Program Element	Region I		Region II		Region III		Region IV		NRR
	Actual Hrs	Est Hours	Actual Hrs	Est Hours	Actual Hrs	Est Hours	Actual Hrs	Est Hours	Actual Hours
Baseline Inspections	100346	91778	80510	89436	79632	77952	65057	68384	3062
Plant Specific Inspections	9663	3385	4715	3295	4078	3115	3655	2935	2272
GSI/SI Inspections	908	1140	711	1080	778	960	445	840	----
Performance Assessment	3632	3648	3101	3456	6332	3072	2979	2688	4974
Contractor Assistance	1965		2110		2260		2580		
Total	116514	99951	91147	97267	93080	86099	74716	74847	10308

Table 9

Resources Expended
ROP vs. Previous Program
(Total Staff Effort Expended at Operating Power Reactors)
(NRR, RI, RII, RIII, RIV)

	52 weeks prior to implementation 4/4/99-4/1/00		52 weeks post implementation 4/2/00-4/1/01	
Baseline/Core				
Direct Inspection Effort	142,259		128,447	
Inspection Prep/Doc	108,730		115,935	
Plant Status	74		43,751	
Subtotal		251,063		288,133
Plant Specific Inspections				
Direct Inspection Effort	50,534		11,295	
Inspection Prep/Doc	6,328		6,683	
Subtotal		56,862		17,978
GSI/SI	2,709		2,416	
Performance Assessment	23,746		21,017	
Inspection Related Travel	16,524		20,193	
Routine Communication			15,185	
Regional Support			3,272	
Enforcement Support	4,408		3,397	
Significance Determination Process			4,628	
Review of Technical Documents	1,270		515	
Total Staff Effort (reg + nonreg hrs)	356,582 hours		376,734 hours	

Table 10

Contractor Inspection Hours Expended
4/2/00 - 4/1/01

	Engineering Inspections	Fire Protection Inspections	Region Total (hours)
Region I	1650*	315	1965
Region II	1160	950	2110
Region III	1630	630	2260
Region IV	1630	950	2580
Total Effort (hours)	6070	2845	8915

* Includes approximately 720 hours, one-time, contractor support for IP2 restart

CROSS-CUTTING ISSUES

Task Lead: Jeff Jacobson, NRR/IIPB

Cross-cutting Issues

Background

In the framework for the revised reactor oversight process (ROP) described in SECY-99-007, the staff explained how cross-cutting issues potentially impacting more than one cornerstone were addressed during the cornerstone development process. Specifically, the staff explained how the cross-cutting issues of human performance, safety-conscious work environment, and problem identification and resolution (PI&R) were linked to either performance indicators (PIs) or baseline inspection areas. In the past, these cross-cutting issues have been shown to be the root causes of performance issues.

With regard to human performance, a premise of the ROP is that if risk-informed inspections and PIs together indicate that plant performance is meeting the cornerstone objectives, then those findings also provide an indication of the acceptability of the associated human objectives. As such, the baseline inspection program does not include a specific human performance inspection. In a similar fashion, the ROP does not include a specific baseline inspection to assess safety-conscious work environment, since it was thought that a lack of a safety-conscious work environment would result in an increase in problems and events; however, insights into this cross-cutting issue are obtained during periodic reviews of licensee's PI&R programs and via the Agency's review of allegations. This periodic PI&R baseline inspection also provides the NRC with the opportunity for early indication of potentially declining plant performance.

In SECY-00-0049, the staff described feedback obtained from stakeholders with regard to how cross-cutting issues were being treated in the ROP. The feedback was essentially divided into two views. One view supported the above assumptions that significant weaknesses in the cross-cutting areas would reveal themselves by PIs crossing thresholds or via the identification of inspection findings. The other view supported the opinion that significant programmatic breakdowns could occur without prior indication through PIs or inspection findings, and that the specific evaluation of licensee performance in the cross-cutting areas would provide a timely opportunity for the NRC to respond to these concerns. Due to the inability to reach consensus on this issue, the staff recommended the formulation of a working group specifically to address cross-cutting issues.

In its recommendations to the Commission, the Pilot Plant Evaluation Panel (PPEP) also recommended that the staff seek to confirm the validity of the underlying assumptions made regarding cross-cutting issues during the first year of implementation.

In the staff requirements memorandum to SECY-00-049, the Commission stated that cross-cutting issues should have a clear and strong link to significant inspection findings or degraded PIs before action is taken on programmatic concerns.

Work Group Activities

As a result of the above commitments and recommendations, a working group was formed consisting of Headquarters and regional management and staff to focus on the concerns

expressed regarding cross-cutting issues. The first meeting was held on April 5, 2000, and the group developed five key issues to focus on in the cross-cutting area. The five key issues were:

1. Do the PIs and baseline inspection program provide sufficient information regarding performance in the cross-cutting areas of human performance, safety-conscious work environment, and PI&R? For the purpose of this issue, "sufficient information" can be thought of as information of sufficient depth and scope and within a sufficient time frame to allow for appropriate levels of Agency interaction.

2. Are there other cross-cutting issues that warrant additional consideration in the ROP?

3. Does the ROP (e.g. inspection program, significance determination process, Action Matrix) provide for proper treatment of cross-cutting issues when they are identified? Should the approach be the same for all cross-cutting issues or should the approach vary?

4. What would be the definition of a "substantial" cross-cutting issue that would require additional Agency actions beyond what the current process would provide?

5. Currently, what is the guidance for capturing cross-cutting issues in inspection reports?

It was recognized by the group that resolution of these issues would likely be a long term effort and would be aided by the additional experience that would be acquired during the initial implementation of the ROP.

In its second meeting conducted on September 14, 2000 the group focused on initial experiences gained during implementation of the annual PI&R inspection. The group also discussed newly issued guidance that described the approach for documenting cross-cutting issues in inspection reports. This guidance addressed issue #5 above regarding documentation of cross-cutting issues.

In its third meeting conducted on December 11, 2000 the group invited members of industry and the Institute of Nuclear Power Operations (INPO) to attend and present their perspective on the cross-cutting issue concerns. INPO gave a presentation on recent activities it has taken to assess licensee corrective action and self-assessment programs. The group also discussed the feasibility of developing indicators in the PI&R area. The general consensus expressed was that this would be very difficult as the PI&R programs are very site specific. There was some agreement that some generic indicators could be developed, but that the thresholds for the indicators would have to be site specific. In general, there was little support for such an effort and some concern was expressed that generic PIs in this area might lead to unintended consequences. Some members from the industry detailed some of the site specific PIs that they use in the PI&R area such as one for repeat events.

The group discussed the current approach the NRC uses to assess safety-conscious work environment. Currently, the only inspection activity where the NRC assesses safety-conscious work environment is the annual PI&R inspection. Some NRC representatives expressed a concern that this was a cursory review that might lead to false positives, that is, falsely assuming that the licensee has established a safety-conscious work environment. There was a general consensus that the resident inspectors might be in a better position to perform this assessment

as part of the baseline inspections that they are assigned. Some industry representatives expressed a concern that NRC inspectors may not be trained to accurately assess this area and that this area is more subjective in nature, making it difficult to assess. There was also some discussion about whether this topic is really a separate cross-cutting issue or is it just imbedded in a licensee's overall PI&R.

Preliminary Conclusions Regarding Cross-cutting Issues and Other Stakeholder Feedback

Cross-cutting issues was a topic that was discussed in both the internal and external NRC workshops held in March of 2001. In the external workshop, three issues were discussed that were closely aligned with the first three key issues identified by the above working group. An additional recommendation to change the approach for inspecting PI&R was also discussed at the workshop. For each of these issues, the NRC staff presented its preliminary findings based upon the first year of initial implementation, allowed for questions or comments, and then discussed its planned future actions.

With regard to key issue number one, the staff explained that experience obtained from the initial implementation of the ROP thus far tends to support one of the fundamental premises of the ROP; that degradation in the cross-cutting areas will be detected by either PIs or inspections in a sufficiently pro-active time frame to allow for Agency action to protect public health and safety. Examples of where this has proven true include Indian Point 2 (IP2), Kewaunee, Millstone, and Cooper. At these facilities, problems have been identified during the initial implementation of the ROP that have been attributed to one of the three cross-cutting areas (mainly PI&R) and the NRC has performed supplemental inspections due to PIs and/or baseline inspection findings crossing thresholds. Also, during initial implementation, there have been no significant precursors to a reactor accident.[1] A significant precursor that was caused by a cross-cutting issue might be indicative of a weakness in the ROP approach in this area. Since the first year of initial implementation of the ROP represents a relatively short experience base, particularly when trying to determine whether the premise holds under all reasonably credible situations, these results are preliminary. Further, declines in licensee performance typically occur over an extended period of time, so it is too soon to reach definite conclusions in this case.

Feedback received from the Nuclear Energy Institute (NEI) in response to the NRC's *Federal Register* notice is supportive of the staff's above preliminary conclusions.

During initial implementation of the ROP, the staff has not identified any cross-cutting issues that would warrant special treatment. There has been a tacit recognition that there are programs, such as the maintenance effectiveness and erosion/corrosion programs, that are essentially elements of a licensee's PI&R process and thus have cross-cutting aspects to them, but not necessarily to the degree they should be called out as an individual cross-cutting area. Numerous changes have been made to the PIs, baseline inspection program, and significance determination processes (SDPs) to better direct our resources to those areas of most safety significance, including areas were not adequately addressed in the past. This assessment addresses key issue number two identified above.

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[1]There have no events classified as significant precursors to a reactor accident during 2000 and 2001. A significant precursor is defined as an event that has a 1/1000 or greater probability of leading to a reactor accident.

With regard to key issue number three, the ROP addresses cross-cutting issues by highlighting them in inspection reports when they are notable contributors to inspection findings or if there is an appreciable trend or pattern that has emerged; and in assessment letters to the licensee when they constitute a substantive issue. Recent changes made to Inspection Manual Chapter 0610*, "Power Reactor Inspection Reports," better explain when and how cross-cutting issues should be documented in inspection reports. The ROP does not allow for additional NRC engagement on cross-cutting issues unless they are contributing causes to PIs or inspection findings that are characterized as White or greater. The Commission previously directed the staff to specifically inform them if the NRC decides to engage licensees outside of the Action Matrix because of cross-cutting issues. To date, the staff has not engaged licensees on cross-cutting issues outside of the guidance contained in the Action Matrix. Engagement has occurred per the Action Matrix when significant cross-cutting issues have contributed to issues that have moved licensee performance outside of the Licensee Response column.

Based on the staff's preliminary assessment, initial ROP data, and feedback received from internal and external stakeholders, the staff has not identified a need for significant modifications to the ROP to address cross-cutting issues; however, as detailed below, the staff will continue to assess events and inspection findings to look for safety significant areas not adequately covered by the current baseline inspections, PIs, or SDPs. As such, the staff's preliminary assessment of key issue number four is that there is not a need to take additional actions for "substantial" cross-cutting issues, beyond what the current process already provides.

In addition to the key issues identified above, the staff also discussed at the external workshop some proposed changes that would increase the effectiveness and efficiency of the NRC's approach to inspecting a licensee's PI&R program. These proposed changes were the result of experience gained during the initial year of implementation of the ROP. Following the external workshop, an internal focus group was formed to study the proposed changes and to develop additional specific recommendations to improve the effectiveness of the PI&R inspection approach. The focus group recommended changing the baseline frequency of the annual PI&R inspection to once every two years for all facilities. Also, the focus group recommended revising the estimated hours per inspection to 250 hours from the current 210 hours. In addition, in order to maintain the ability for timely detection of degradation of licensee performance in the PI&R area, the group recommended adding 60 hours of effort annually to inspection procedure 71152 to allow for focused follow-up/assessment of PI&R samples throughout the inspection period. The above recommendations will result in an estimated overall reduction of direct inspection effort of 25 hours per year in this area. Lastly, for facilities that reach the Degraded Cornerstone column of the Action Matrix, the focus group recommended the consideration of an additional PI&R team inspection as part of the supplemental inspection response to assess the extent of condition of the identified performance issues. Overall these changes should result in a more effective allocation of NRC resources in this area. Implementation of these recommended changes is currently planned to begin in January of 2002. Plans are for the focus group to continue to assess what changes can be made to the inspection approach in this area in order to make the inspections more effective, efficient, and objective.

Additional Planned Actions

During the next year of implementation of the ROP the following activities are being pursued or considered to further evaluate the adequacy of the ROP with regard to cross-cutting issues:

- ASP events[2] and inspection findings classified as Yellow or Red will be reviewed to determine if weaknesses in one of the three cross-cutting areas contributed to the event or finding. If cross-cutting issues were a major contributor to the event, The staff will assess whether the PIs or inspection program provided for sufficiently pro-active NRC engagement on the issues to protect public health and safety.

- During periodic reviews of issued inspection reports, the staff will evaluate whether cross-cutting issues are being sufficiently captured when identified during inspection activities.

- As part of the self-assessment metrics developed for assessing the ROP, the staff will review the circumstances surrounding plants that jump two or more columns in the Action Matrix to see if these performance weaknesses were due to cross-cutting issues, and if so, whether inspections or PIs have identified similar concerns.

- During our annual assessment of the ROP we will evaluate whether the ROP allowed for sufficient NRC engagement at facilities that reached the Degraded Cornerstone column of the Action Matrix.

- A workgroup will be formed to assess whether changes should be made to how the NRC assesses safety-conscious work environment.

- Office of Nuclear Regulatory Research staff will complete research to: (1) characterize the extent to which the effects of human performance on safety are accounted for through the current oversight process, (2) characterize the types of human performance problems that are not accounted for and assess the significance of their effects, and (3) identify how these effects could be addressed though enhancements to the ROP.

- The Inspection Program Branch of NRR will evaluate the need for additional refinements to inspection and assessment guidance regarding the definitions of what constitutes an “appreciable trend or pattern” or a “substantial” cross-cutting issue.

[2] ASP events are events with a conditional core damage probability of equal to or greater than 1.0 X 10E-6.

RESIDENT INSPECTOR “N+1" POLICY

Task Lead: Jim Isom, NRR/IIPB

Appendix B

Resident Inspector "N+1" Policy

Background

On January 11, 2000, the Commission approved a revision to the resident inspector staffing policy to require two resident inspectors at single and dual unit sites and three resident inspectors at triple unit sites. The Commission's revision to the resident inspector staffing policy required that the staff evaluate and recommend inspection staffing issues as part of the first year implementation of the revised reactor oversight process (ROP). Specifically, the Commission requested that the staff make recommendation on how the inspection resources should best be allocated among Headquarters, the regions, and the sites. This attachment provides the staff's analysis of the resident inspector resources (sites) required to complete the baseline inspections.

Assumptions

Inspection hours associated with activities that were either attributable to the resident or the senior resident inspectors were totaled for each plant during the period from April 2, 2000 through April 1, 2001. The activity codes were selected in an attempt to fully capture the time spent by the RIs during the first year (April 2, 2000 to April 1, 2001) of ROP implementation to complete the baseline inspection activities. Some activity codes from the previous core program (e.g., CO: core inspections) were used because it appeared that time spent on performing baseline activities were charged to the old core activity codes. These hours were then converted to full time equivalent staff (FTE) values to determine the resources expended to complete the portion of the ROP assigned to the RIs (Table 2). These activities included:

APP:	Inspection-Related Prep/Doc	ASM:	Reactor Performance Assessment
AT:	Inspection Related Travel	BA2:	Normal Enforcement Activities
BH2:	Escalated Enforcement	BI:	Baseline Inspections
BID:	Baseline Inspection Documentation	BIP:	Baseline Inspection Preparation
CO:	Core Inspections	COM:	Routine Communications
PS:	Plant Status	SDP:	Significant Determination Process
SI:	Safety Issues Program	ENF:	Enforcement

Additionally, hours that were charged by region-based inspectors for completing the following baseline inspections were also totaled over the initial year of ROP implementation and converted to a FTE value (Table 3). These expended regional resources were also adjusted for inspection-related prep/doc and for inspection related travel. Finally, RI and regional resources were summed to obtain the total resources expended to perform the part of the ROP assigned to be completed by the RIs (Table 1).

Procedure: 71111

Attachment	Title:	Attachment	Title:
1	Adverse Weather	4	Equipment Alignment
5	Fire Protection Monthly	6	Flood Protection
7	Heat Sink	11	License Operator Requalification

12	Maintenance Rule	13/03	Emergent Work & Maint Risk
14	Non-routine evolutions	15	Operability Evaluations
16	Operator Workarounds	17	Permanent Plant Mods
19	Post Maint Testing	20	RFO
22/09/10	Surveillance Testing & IST	23	Temp Mods

Procedure: 71114

Attachment	Title:	Attachment	Title:
1	EP drills & exercise	6	Drill Evaluation

Procedure 71152: PI Verification
Procedure 71153: Event Follow-up

Table 1 is a tabulation of resources (expressed in Full-time equivalent staff (FTE)) required to complete the baseline inspections assigned to the resident inspectors. The table also includes the FTE expended by region-based inspectors (from either Division of Reactor Projects or Division of Reactor Safety) who assisted the RIs to complete the baseline inspections. The resources in Table 1 do not include the FTE required to complete other baseline inspections assigned to be completed by the Division of Reactor Safety (DRS).

Inspection resources associated with Indian Point 2 (IP2) in Region I and D.C. Cook in Region III were not included in any of the tables. IP2 was a performance outlier (Multiple/Repetitive Degraded Cornerstone column of the Action Matrix) and D.C. Cook is under the IMC 0350 process and is transitioning to oversight under the ROP. Therefore they received many more inspection resources than the typical facility.

Two methods were used to convert the hours of inspection performed to the number of inspectors required to perform the baseline inspections. For the region-based inspectors, 1167 hours of inspections per FTE was used to convert the total inspection hours to an FTE value. This value is used by NRR in its budget model. The conversion factor of 1167 hours to an FTE was empirically developed by taking data averaged over several years, including all regions and all regional inspectors.

For the resident inspectors, a conversion factor was derived by dividing the average hours of inspection performed at the site by the number of inspectors assigned to the site. A different conversion factor was derived for the RIs because the staff recognized that the RIs were more efficient at performing baseline inspections than the region-based inspectors. The inspector number was adjusted for overtime performed by the resident inspectors (RIs) since use of overtime was equivalent to availability of additional resources at the site to perform inspections. A unique conversion factor, which was averaged, was used for the following categories: single unit site; dual unit sites staffed at “N” RIs; and dual unit sites staffed at “N+1" RIs for each of the four regions. This conversion factor was based on data obtained during the initial implementation of the ROP and generally resulted in a conversion factor which was greater than the NRR official budget model of 1167 hours of inspections for an FTE.

Resident Inspector Inspection Hours Data

Table 1 displays the FTE required to complete baseline inspections by both resident and region-based (either DRP or DRS) inspectors for different types of sites in each of the Regions.

Table 1

FTE Expended By RIs and Region-Based Inspectors to Complete Baseline Inspections				
	Single unit sites	**Dual unit sites at "N"**	**Dual unit sites at "N+1"**	**3 unit sites**
Region I	2.23	2.31	3.16	0 (note 1)
Region II	2.07	2.14	3.07	4.03 (note 2)
Region III	2.24	2.36	2.71	0 (note 1)
Region IV	2.22	2.25	0 (note 3)	3.14 (note 4)
National Avg	2.19	2.26	2.98	3.58
National Median	2.22	2.28	3.07	3.58
Resources Estimated	2.36	2.63	2.63	3.02

Table 2 displays the FTE expended to complete baseline inspections by only the resident inspectors for different types of sites in each of the Regions.

Table 2

FTE Expended By Only RIs to Complete Baseline Inspections				
	Single unit sites	**Dual unit sites at "N"**	**Dual unit sites at "N+1"**	**3 unit sites**
Region I	2.09	2.05	3.09	0 (note 1)
Region II	2.04	2.05	3.05	4.03 (note 2)
Region III	2.11	2.15	2.55	0 (note 1)
Region IV	2.07	2.1	0 (note 3)	3.1 (note 4)
National Avg	2.07	2.08	2.89	3.56
National Median	2.08	2.07	3.05	3.56

Table 3 displays the additional FTE required to augment the resident inspector resources in order to complete the baseline inspections.

Table 3

FTE Expended By Region Based Inspectors to Complete Baseline Inspections				
	Single unit sites	**Dual unit sites at "N"**	**Dual unit sites at "N+1"**	**3 unit sites**
Region I	0.14	0.26	0.07	0 (note 1)
Region II	0.03	0.09	0.02	0 (note 2)
Region III	0.13	0.21	0.16	0 (note 1)
Region IV	0.15	0.15	0 (note 3)	.04 (note 4)
National Avg	0.11	0.17	0.08	0.02
National Median	0.13	0.18	0.07	0.02

note 1: no 3-unit sites in the Region
note 2: staffed to “N+1" resident inspectors
note 3: no dual-unit sites staffed to “N+1" resident inspectors in R-IV
note 4: staffed at “N” resident inspectors

Transition to “N” Resident Staffing Status

Table 4 shows that the Agency is rapidly completing its transition to the “N” resident inspector staffing. Greater than 50 percent of the multi unit sites were at “N” resident staffing status during the first year of implementation under the ROP.

Table 4

Multi-unit	August 2000	June 2001
Sites @ N	20	27
Sites @ N+1	13	6
Sites with exemptions:	2	2
Multi-unit Sites Total:	35	35

Status of Implementing the Transition From “N+1" to “N” (06/2001)

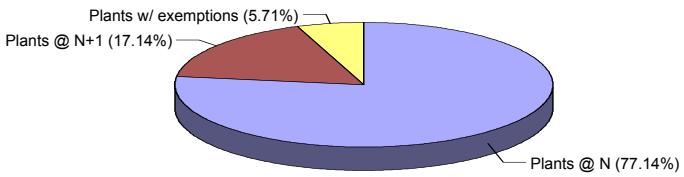

Table 5 displays how the “N+1" resident inspector vacancies are being filled. Nearly all of the vacancies which resulted from the Agency’s transition to “N” resident inspector staffing at dual unit sites were filled by new hires. The positions filled by the departing “N+1" RIs included:

- promotion to SRI
- assigned as RI to another site in one of the four regions
- assigned or promoted to other organizations in the Agency other than the Division of Reactor Projects (DRP)

Table 5

Regions	No. of sites Transition to “N” (01/2000 - 05/2001)	No. of RIs Rotated to Region	*No. of Vacancies Filled By New Hires
I	4	0	4
II	4	0	4
III	3	3	0
IV	3	0	3
Total	14	3	11

* Generally, all positions filled by new hires were transferred to Division of Reactor Safety

Feedback from the Regions

The staff requested the regions to assess the degree to which the regions have been able to allocate resources on the basis of licensee performance through the “N” resident staffing policy during the first year of its implementation and its impact on implementing the ROP.

Additionally, the staff requested that the regions provide an assessment of the impact of transitioning to the “N" resident staffing policy as it relates to:

- increased flexibility to facilitate site coverage (e.g., to support scheduled training and vacations)

- improved ability to provide support to reactive inspections and to support other baseline inspections

- overall ability to support implementation of the ROP

- any challenges that have resulted that need to be accommodate either through ROP program guidance or considered in the budgeting process

The following responses from the regions were received by the staff:

Increased Flexibility to Facilitate Site Coverage

- The current EDO policy of site coverage is still achievable, however, there must be closer management oversight and coordination. This policy has not yet posed a significant problem for the sites staffed at “N” and we recommend retaining the policy as a public confidence consideration. It should be recognized, however, that the frequency of one and two day periods with no resident inspector coverage will increase with the revised policy. There is the potential that over the long term this policy could negatively affect resident inspector morale when an inspector gets "stuck" as the sole coverage person because the other resident inspector is off on a long term assignment. Even when regional resources are used to supplement site coverage needs, they rarely are used for weekend event response coverage. Although the Agency policy is to be able to respond to an event at the site within eight hours, the current regional management expectation is for the residents to be available to respond to significant site events and emergencies. Increased planning and coordination will be necessary to implement this expectation, although this challenge has always been the case at single unit sites.

Improved Ability to Provide Support to Reactive/Baseline Inspections

- The revised resident inspector staffing policy will impact the region’s ability to support developmental assignments, developmental training, vacations, and inspections at other sites of greater than one week duration by the resident inspectors. Since the margin between available resources and program requirements is small, the staff will have to pay greater attention to planning ahead and trying to anticipate future needs for any extended time away from the site. Additionally, because of the small margin between available resources and program requirements, going to “N” resident inspectors will require more frequent support of the resident inspector office by region-based inspectors.

- Project engineer support is a necessity at multi-unit sites to complete the resident baseline portion of the ROP, and this results in scheduling challenges. At single unit sites, project engineer support is needed if there is any loss of inspector availability (e.g., turnover, rotation, extended training class, protracted medical leave [like maternity/paternity]).

- The current resident inspector staffing levels are now such that small perturbations in workload have a much larger consequence than they did under the core inspection program. As a result, the flexibility in responding to changes in plant performance and to providing site coverage has been greatly reduced.

- DRS inspectors are usually rigidly scheduled and, therefore, are less available than resident inspectors to support reactive efforts. Alternatively, since the resources have been given to DRS, there are specialty skills that have been retained that would have, otherwise, been lost. Bottom line - we have more specialized personnel on staff to support reactive efforts; however, our overall staffing levels are so tight that we are challenged in utilizing them.

Overall Ability to Support Implementation of the ROP

- Significantly more management oversight and planning are necessary to ensure resident inspector program requirements such as refresher training, back-up site visits, objectivity visits, and counterpart meetings do not impact completion of the reactor oversight process. In addition, extended annual or sick leave (more than one week) and military leave will create new challenges for management to ensure the baseline program requirements are met.

- The flexibility in both resident and region-based inspection resources that existed in the past is no longer present and we must make prioritization decisions on every activity that we now assign to inspectors. Also, we now find it more difficult to support program development initiatives since having gone to “N” resident inspectors.

ROP Program Guidance Issues

- The policy should allow staffing of some sites at “N+1" when warranted by the site’s unique design and/or organizational features that may challenge the ability of the program to provide an adequate indication of licensee performance.

- The policy should be revised to allow the creation of resident positions at sites to provide opportunities for career development and succession planning. In addition, we recommend allowing regions the option to assign the replacement resident before the incumbent resident’s rotation date. This would help us maintain an ROP inspection tempo and also provide some “pipeline flexibility.” To support this revision, we would shift some region-based inspection activities for that site to the resident staff along with making those additional resident inspectors available for inspections at other sites.

Other Comments

- It may be too soon to tell the full impacts of the policy change on the resident inspector program.

- The most recognizable impacts of the policy change have been the unintended effects on career development for the staff and on succession planning. Career development and succession planning efforts have been made more difficult as a result of the reduced

number of resident inspector positions and the longer assignments at a particular site. Similarly, our ability to retain highly qualified staff in the region has been adversely affected.

- Several inspectors have commented that another outcome of the resident inspector staffing changes will be fewer inspection findings overall from the resident inspectors simply because fewer resources are applied to the inspection program.

Conclusions:

The staff made the following conclusions with respect to the impact of transitioning to “N” resident inspectors at multi-unit sites.

- Baseline inspections can be accomplished by “N” resident staffing at dual unit sites with some assistance from region-based inspectors.

- Most regions gained substantive experience completing the baseline inspections at dual unit sites with “N” residents during the first year of ROP implementation.

- Sites that were staffed at “N+1" tend to expend a level of effort commensurate with site staffing, not program requirements.

- There is an increased inspection-related travel requirement for the region-based inspectors because the regions had to rely on region-based inspectors and project engineers to augment the resident inspector staff during extended absences and vacancies at the dual unit sites.

- It is too soon to determine the full impact on the resident inspector program from the change to the “N+1" resident staffing policy. However, early indications are that the “N” staffing policy will challenge the regions in providing extended training, rotations, and other professional development assignment opportunities for the resident inspector staff at multi-unit sites.

- The regions did not gain the immediate increase in inspection flexibility as originally envisioned by the change to the “N+1” resident inspector policy. As regions moved to “N” staffing, it was generally in response to retirements, promotions, and voluntary reassignments. Therefore, many times a hew hire was brought onboard as a resident inspector position was closed, resulting in an overall reduction in inspector expertise available in the regions.

- Regional effort to support the ROP, evaluation and development activities was substantial and impacted the resources available to support site-based activities as regions moved to “N” staffing.

- Regional management must manage the resident inspector program more closely to assure that upcoming RI vacancies are posted and filled in a timely manner and to assure that appropriate site coverage is maintained during RI transitions.

Planned Actions:

Based on these conclusions, the staff plans to:

- Develop criteria for the Regional Administrators, in consultation with NRR, to allocate additional inspector resources to certain sites for other than performance related issues (e.g., unique design or organization features).

- Develop appropriate ROP self-assessment metrics to monitor and trend inspector demographics and resident inspector program quality attributes (e.g., inspector training time; site coverage; rotational opportunities, etc.).

- Determine and adjust as appropriate the budget model to reflect efficiency differences in converting a resident inspector to a region-based inspector.

STAFF TRAINING INITIATIVES

Task Leads: Mary Ann Ashley, NRR/IIPB
Fiona Tobler, NRR/IIPB

Staff Training Initiatives

The staff undertook several significant initiatives during initial implementation to evaluate staff training needs as a result of implementing the ROP. A working group was established to review and modify, where appropriate, the inspector training and qualification requirements. And a second working group was established to determine how best to enhance the risk analysis expertise of regional staff.

Inspector Training and Qualification

Purpose, Objectives, and Scope

A working group was formed in August 2000 and charged with reviewing, assessing and modifying the inspector training and qualification requirements contained in Inspection Manual Chapter (IMC)1245, "Inspector Qualifications for the Office of Nuclear Reactor Regulation Inspection Program," to support the reactor oversight process. The working group comprises representatives from the regional offices, the technical training staff and the Office of Nuclear Reactor Regulation (NRR). The working group is guided in its efforts by a steering committee comprised of Headquarters and regional managers.

Results Achieved to Date

Since its inception, the working group has completed the identification of tasks performed by inspectors under the oversight program and has surveyed existing inspectors to determine the level of difficulty they have experienced while trying to implement those tasks. Current inspectors were also asked to rate the effectiveness of training they received during the inspector qualification process. The difficulty information is serving as the basis for determining the appropriate level of training needed to prepare future inspectors to implement the oversight program, while the effectiveness ratings are being used to identify the best methods for presenting that training.

The knowledge, skills and attitudes needed by inspectors to perform the various reactor oversight tasks successfully have been identified and grouped into 11 competencies. The competency areas are as follows: Regulatory Framework, Fundamental Plant Design and Operation, Inspection-area Technical Expertise, Inspection, Emergency Response, Problem Analysis, Assessment and Enforcement, Communication, Teamwork, Self-Management, and Information Technology. The organization of knowledge, skills and attitudes into competencies will focus the training and qualification process on inspector capabilities in the field and ensure that each inspector (1) will understand the legal basis for and the regulatory processes used to achieve the NRC's regulatory objectives; (2) will understand the technology and have a demonstrated ability to apply concepts in various technical areas to allow the NRC to carry out its overall responsibilities; (3) will have mastered the techniques and skills needed to collect, analyze, and integrate information using a safety focus to develop supportable regulatory conclusions; and (4) will have personal and interpersonal skills to carry out the regulatory activities either individually or as part of a team.

The IMC 1245 working group is defining a new set of competency-based training and qualification requirements for inspectors. The content and methods used in the existing training

program have been reviewed to identify which program areas already support the newly defined competencies, where improvements are needed, and where new training must be developed. Definition of the requirements is expected to be completed this summer. However, the new requirements may be implemented over time to allow for the development or revision of the necessary training and qualification materials. The requirements of the newly designed training and qualification program will be applied to staff hired after its implementation and will not affect the qualification status of currently qualified inspectors.

Longer Term Program Changes Planned

IMC 1245 will be revised to incorporate the changes to the content of the inspector training and qualification requirements and also to incorporate improvements to the administrative aspects of program implementation. The administrative changes are based on feedback from inspectors and regional managers and will include improvements to the structure of on-the-job training and self-study to better define the desired outcomes and thereby improve consistency. The revised manual chapter will also include a requirement for the Inspection Program Branch to conduct regular assessments of the effectiveness of the training and qualification process in preparing inspectors to implement the reactor inspection program. The results of those assessments will serve two purposes: defining the continuing and refresher training needs of inspectors and providing an ongoing means for maintaining the initial inspector training and qualification program content.

Enhanced Regional Risk Analysis Training

Purpose, Objectives, and Scope

A Working Group on Risk Expertise was formed in July 2000, with the purpose of improving risk expertise among staff. The goals of this working group included: 1) ensuring that every reactor inspector in the Divisions of Reactor Projects and Reactor Safety is capable of using and understanding the risk-informed Significance Determination Processes (SDP) and, 2) ensuring that a subset of these inspectors receive advanced risk training.

Results Achieved to Date

One of the recommendations of the Working Group on Risk Expertise was to improve the understanding and use of the reactor safety SDP through the use of examples. A Web-based instructional guide was completed in June 2001. The SDP instructional guide contains case studies of actual ROP issues processed through the various SDPs.
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On November 11, 2000, guidance on a solicitation of interest notice for advanced risk training for competitively selecting region-based staff for training was sent to the Regional Administrators. The purpose of the solicitation of interest notice was to offer GG-14
region-based inspectors a series of advanced risk training that would enable them to utilize NRC Probabilistic Risk Assessment (PRA) software tools to perform and interpret basic quantitative risk analysis. This solicitation notice culminated in a total of twelve regional selections for the advanced risk training. The advanced risk training consists of a series of 7 classes and is a subset of the training offered to Senior Risk Analysts (SRA).

The course on ”PRA Technology and Regulator Perspective” (P-111) has been redesigned to include more SDP instruction and examples, and to include a scenario in which students must defend an SDP analysis during a mock SERP.

Program Changes Made:

The staff formalized the SRA training program via a revision to IMC 1245, issued in April 2001.

Long Term Program Changes Planned

Staff is exploring the use of a comprehensive computer-based training course for all of the SDP’s. This effort will be coordinated with the IMC 1245 Task Group.

Additional Work:

The Inspection Program Branch will continue to review risk analysis training requirements.