January 8, 1999 SECY-99-007

FOR: The Commissioners

FROM: William D. Travers /s/
Executive Director for Operations

SUBJECT: RECOMMENDATIONS FOR REACTOR OVERSIGHT PROCESS IMPROVEMENTS

PURPOSE:

This Commission paper provides the staff's recommendations for improving the regulatory oversight processes as requested by the SECY-98-045 Staff Requirements Memorandum (SRM) dated June 30, 1998. This SRM requested that the Commission be informed of the results of the integrated review of the assessment processes (IRAP) public comment period, and requested that the staff forward recommended changes to the assessment process. It was also requested that the staff include any conceptual changes to the inspection program needed to conform with the new assessment process.

This Commission paper also responds to the Commission comments documented in SRM M981102 that resulted from the November 2, 1998, staff briefing on regulatory oversight process improvements. In addition, this paper provides the staff's plans for the continued suspension of the SALP process as requested by the COMSECY-98-024 SRM dated September 15, 1998.

Finally, this paper presents recommendations for improving the NRCs inspection, assessment, and enforcement processes and includes a transition plan for implementing these recommended changes. Although the staff has worked closely with the industry and the public in developing these recommendations, this paper provides the first opportunity to present these recommendations in an integrated manner. The staff requests that the Commission acknowledge that the concepts and scope of the changes presented are consistent with the intent of the referenced SRMs. Recognizing that this proposal is a significant departure from

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current practice in all areas covered, the acknowledgment would include a positive affirmation on establishing a system of risk informed thresholds and applying them as described; approval of the approaches taken to define information needs, integrate performance indicators with inspection areas and scale regulatory response to findings as illustrated in the assessment matrix. Following the completion of the public comment period the staff will forward the results, along with any necessary changes to the proposals contained herein, for final Commission approval.

SUMMARY

This paper presents recommendations for improving the NRC's reactor oversight processes, including inspection, assessment, and enforcement, and includes a transition plan for implementing these recommended changes. The paper also discusses public comments received on the IRAP proposal and the assessment process in general, and responds to 12 areas of specific interest to the Commission identified in the June 30, 1998 and November 19, 1998 SRMs. The paper informs the Commission of the staff's intention to continue the suspension of the systematic assessment of licensee performance process (SALP) until the new processes have been successfully tried.

The NRC conducted an effort to develop changes to the inspection, assessment, and enforcement processes to improve their objectivity, make them more understandable and predictable, and provide increased focus on aspects of performance that have the greatest impact on safe plant operation. The effort was initiated in response to results of internal reviews and external stakeholder input.

The staff organized three task groups to develop recommended improvements, including a technical framework task group, an inspection task group, and an assessment task group. The activities of each group were closely integrated and all groups interfaced frequently with the public and industry through a series of regularly conducted public meetings in order to provide opportunities to exchange information and receive feedback. The results of these three groups are presented in the attachments to this paper and summarized in the discussion section of the paper. The attachments include the following:

Attachment	Subject
1	Key Figures and Tables
2	Technical Framework
3	Risk-Informed Baseline Inspection Program
4	Assessment Process
5	Enforcement Program Changes
6	Transition Plan
7	Summary of Integrated Review of Assessment Public Comments
8	Commitments (Specific Responses to Staff Requirements Memoranda)

The objective of the technical framework task group was to complete development of a hierarchical regulatory oversight framework; develop performance indicators and appropriate thresholds that could be used to monitor performance within the framework; and

identify aspects of risk-informed inspections that should supplement and verify the validity of the performance indicator data.

The objective of the inspection task group was to develop recommendations for a baseline inspection program that identifies the minimum level of inspection required for a plant (regardless of performance) in order for the NRC to have sufficient information to determine whether plant performance is at an acceptable level. The baseline inspection program was developed by using a risk-informed approach to determine a comprehensive list of areas to inspect (inspectable areas) within the oversight framework. These inspectable areas were selected based on their risk significance. The proposed baseline inspection program is based on several concepts that are fundamentally different than those upon which the current core inspection program is based.

The objective of the assessment task group was to develop a process that will allow the NRC to integrate various information sources relevant to licensee safety performance, make objective conclusions regarding their significance, take actions based on these conclusions in a predictable manner, and effectively communicate these results to the licensees and to the public. The review system developed provides continuous, quarterly, mid-cycle, and end-of-cycle (annual) reviews of licensee performance data (performance indicators and inspection results).

The staff intends to develop changes to the enforcement policy to reflect the recommended changes to the inspection and assessment processes. Although it is too early to propose specific changes, they may include changes in the definitions and thresholds for severity levels to align them with the process and guidance developed for evaluating the safety significance of inspection findings, and changing the criteria for not citing violations to be consistent with the licensee performance results determined by the assessment process.

The staff believes the recommendations that resulted from this effort will address many of the concerns with existing reactor oversight processes. The proposal represents considerable progress, however, continued incremental changes will be necessary to respond to lessons learned during process piloting and implementation. While the recommended process improvements will provide for greater use of objective information and defined thresholds for regulatory action, the proposed process still includes some level of judgement, especially in the application of a graded regulatory response to declining licensee performance. The process is intended to provide minimal regulatory interaction beyond the baseline inspection for good performers and a strong regulatory response for facilities that approach unacceptable performance. Finally, although these improvements decrease the reliance on subjective decisions, some level of judgement will still be required because of the complexity of nuclear plant activities and the variability between plants.

The staff is asking the Commission to approve the scope and concepts of the recommended changes to the regulatory oversight processes, and their continued development and implementation as described in the attached transition plan.

BACKGROUND:

On March 9, 1998, the staff issued SECY-98-045, “Status of the Integrated Review of the NRC Assessment Process for Operating Commercial Nuclear Reactors,” which forwarded the staff’s

recommendation for a new integrated assessment process. The fundamental concepts that formed the basis of the IRAP proposal were: (1) inspection findings provided the basis for the assessment, (2) inspection findings would be categorized by performance template areas and would be scored according to safety significance, (3) assessment would be accomplished by totaling the scores in each template area and comparing these scores against threshold values, and (4) NRC actions would be taken based on a decision model. On April 2, 1998, the staff briefed the Commission on the staff proposal described in SECY-98-045.

On June 30, 1998, the Commission issued the SRM for SECY-98-045, in which the Commission expressed concerns with (1) the apparent use of enforcement as a "driving force" for the assessment process, (2) the quantitative scoring of plant issues matrix (PIM) entries, and (3) the use of color coding to define performance rating categories. However, the Commission did approve the solicitation of public comment on the IRAP proposal, and requested the staff to (1) provide a recommendation for changes to the assessment process, (2) address regional consistency and equitable treatment of plants receiving varying levels of inspection effort, and (3) include conceptual changes to the inspection program needed to conform with the new assessment process.

In parallel with the staff's development of the IRAP proposal, the industry developed an independent proposal for improving the assessment process. This effort, led and coordinated by the Nuclear Energy Institute (NEI), resulted in a concept that was fundamentally and philosophically different from the IRAP proposal. This approach established tiers of licensee performance based on maintaining the barriers to radionuclide release, minimizing events that could challenge the barriers, and ensuring that systems can perform their intended functions. Performance in these tiers would be measured through reliance on high-level, objective indicators with thresholds set for each indicator to form a utility response band, a regulator response band, and a band of unacceptable performance.

In response to the NEI proposal, Commission comment on the IRAP proposal, and comments made at the July 17, 1998, Commission meeting with public and industry stakeholders and the July 31, 1998, hearing before the Senate, the staff set out to develop a single set of recommendations for making improvements to the regulatory oversight processes.

The IRAP public comment period and a series of public meetings were used to facilitate internal and external input into the development of these recommendations. The 60-day IRAP public comment period, which ended on October 6, 1998, was used to seek comment on improvements to the assessment process. As part of the public comment period, the staff sponsored a 4-day public workshop from September 28 through October 1, 1998, to interact with the industry and public to obtain and evaluate input on improving the regulatory oversight processes. During the workshop a consensus was reached on the overall philosophy for regulatory oversight and general agreement was achieved among workshop participants on the defining principles for the oversight processes.

After the workshop, the staff began several short-term activities to continue developing the improvements to the regulatory oversight process that had been initiated at the workshop. All of these activities were coordinated and integrated and involved broad participation from all four regions, the Office of Nuclear Reactor Regulation (NRR), the Office of Enforcement (OE) , the Office of Nuclear Regulatory Research (RES), and the Office for Analysis and Evaluation of Operational Data (AEOD). The staff selected to participate in these activities were agency

experts in various aspects of regulatory oversight, such as risk analysis, use of performance indicators, inspection, and assessment techniques. Each of these activities also involved frequent interaction with the industry and the public during the development of recommended improvements.

Three task groups were formed to develop these recommendations: a technical framework task group, an inspection task group, and an assessment task group. The technical framework task group was responsible for completing the regulatory oversight structure and for identifying the performance indicators (PIs) and appropriate thresholds that could be used to measure performance. The inspection task group was responsible for developing the scope, depth, and frequency of a risk-informed baseline inspection program that would be used to supplement and verify the PIs. The assessment process task group developed methods for integrating PI and inspection data, determining NRC action based on assessment results, and communicating results to licensees and the public. OE activities to improve the enforcement process were coordinated with these three task groups to ensure that enforcement process changes were properly evaluated in the framework structure, and that changes to the inspection and assessment programs were integrated with changes to the enforcement program.

The staff briefed the Advisory Committee on Reactor Safeguards (ACRS) on the results of the workshop and the progress of these activities on October 2, November 20, and December 3, 1998. The staff briefed the Commission on the progress of these efforts on November 2, 1998. On November 19, 1998, SRM M981102 was issued in response to this Commission briefing and directed that the staff (1) refine key definitions, (2) identify attributes that are important to the assessment program but are not covered by performance indicators, (3) identify the types of information and methodology used in an assessment process, (4) identify the desired outcomes of the cornerstones, (5) further identify the proposed vehicles to inform the Commission and public of the assessment results, and (6) provide the methodology the staff will use to verify and validate the efficacy of the improved oversight process.

The following discussion details the need for change to the regulatory oversight processes, the approach taken by the task groups to develop recommendations for process improvements, and the results of the work accomplished by these task groups.

DISCUSSION

Regulatory Principles and The Need for Change

Several important principles form the basis for how the NRC oversees and regulates licensed activities. As stated in the Atomic Energy Act of 1954, as amended, one of the missions of the NRC is to ensure that commercial nuclear power plants are operated in a manner that provides adequate protection of public health and safety and the environment and protects against radiological sabotage and the theft or diversion of special nuclear materials.

Through the NRC's Principles of Good Regulation (Independence, Openness, Efficiency, Clarity, and Reliability), the NRC can instill confidence in the public that these facilities are regulated in a manner that meets this mission. An independent regulatory oversight process is one in which the agency's decisions are based on unbiased assessments of licensee performance. An open oversight process provides an opportunity for public awareness of process results. An efficient oversight process is one that applies agency resources in a risk-

informed manner. A clear oversight process will result in agency actions that are logical and coherent, with a nexus to agency regulations and goals. And a reliable oversight process will result in agency actions that are predictable, transparent, and that have a clear tie to regulations.

Commercial nuclear power plants have been operated safely with overall plant performance, as indicated by trends in both NRC and industry performance indicators, improved over the last 10 years. This improvement in plant performance can be attributed, in part, to successful regulatory oversight in accordance with these principles. Despite this success, the agency has noted that the current inspection, assessment, and enforcement processes (1) are at times not clearly focused on the most safety important issues, (2) consist of redundant actions and outputs, and (3) are overly subjective with NRC action taken in a manner that is at times neither scrutable nor predictable.

These concerns and observations have been recently echoed by external stakeholders such as the Congress, the industry, and the public. In light of these noted weaknesses and stakeholder feedback, the Commission has identified the opportunity to improve the regulatory oversight of licensees, and has directed the staff to develop improvements to these processes. The overall objective of developing improvements to these processes was to:

- Improve the objectivity of the oversight processes so that subjective decisions and judgment were not central process features.

- Improve the scrutability of these processes so that NRC actions have a clear tie to licensee performance.

- Risk-inform the processes so that NRC and licensee resources are focused on those aspects of performance having the greatest impact on safe plant operation.

The recommendations made in this paper are intended to improve public confidence in the oversight of licensed activities, and increase the effectiveness and efficiency of the NRC, while ensuring that the agency's mission to protect public health and safety is still met.

Objectives and Approach

The staff used a top-down, hierarchical approach to develop the concept for a new regulatory oversight framework that implements this change vision and addresses the agency's regulatory principles. This approach starts with a desired outcome, identifies performance goals to achieve this outcome, and then identifies specific objectives and information needs to meet each performance goal. The regulatory oversight framework developed by the staff using this approach is represented in Attachment 1, Figure 1. This framework starts at the highest level, with the NRC's overall mission to ensure that commercial nuclear power plants are operated in a manner that provides adequate protection of public health and safety.

The staff then identified those aspects of licensee performance that are important to the mission and therefore merit regulatory oversight. The NRC Strategic Plan identifies the performance goals to be met for ensuring nuclear reactor safety and include the following:

- Maintain a low frequency of events that could lead to a nuclear reactor accident;

- Zero significant radiation exposures resulting from civilian nuclear reactors;

- No increase in the number of offsite releases of radioactive material from civilian nuclear reactors that exceed 10 CFR Part 20 limits; and

- No substantiated breakdown of physical protection that significantly weakens protection against radiological sabotage, or theft or diversion of special nuclear materials.

These performance goals reflect those areas of licensee performance for which the NRC has regulatory responsibility in support of the overall agency mission. These performance goals were represented in the framework structure as the strategic performance areas of Reactor Safety, Radiation Safety, and Safeguards, and formed the second level of the regulatory oversight framework.

With a risk-informed perspective, the staff then identified the most important elements in each of these strategic performance areas that form the foundation for meeting the overall agency mission. These elements were identified as the cornerstones in the third level of the regulatory oversight framework structure. These cornerstones serve as the fundamental building blocks for the regulatory oversight process, and acceptable licensee performance in these cornerstones should provide reasonable assurance that the overall mission of adequate protection of public health and safety is met.

Once the regulatory oversight framework was established, the staff developed defining principles that formed the strategy and rules for the further development of the details of the regulatory oversight processes. These defining principles were developed with internal and external input obtained through written comments and public meetings such as the 4-day workshop. These defining principles established the relationship between elements of the oversight processes, such as enforcement and inspection.

- There will be a risk-informed baseline inspection program that establishes the minimum regulatory interaction for all licensees.

- Thresholds can be set for licensee safety performance, below which increased NRC interaction (including enforcement) would be warranted.

- Adequate assurance of licensee performance at the cornerstone level requires assessment of both PIs and inspection findings.

- Both the PIs and results of inspections used to assess a cornerstone will have risk-informed thresholds.

- Crossing a PI threshold and an inspection threshold will have the same meaning with respect to safety significance and the need for some level of NRC interaction.

- The baseline inspection program will cover those risk-significant attributes of licensee performance not adequately covered by PIs.

- The baseline inspection program will also verify the accuracy of the PIs and provide for event response.

- Enforcement actions taken (e.g., the number of cited violations, the amount of a civil penalty) should not be an input into the assessment process. However, the issue that led to the enforcement action will continue to be considered in the assessment.

- Assessment process results might be used to modulate enforcement actions (although assessment results would not affect the determination of violation severity level).

- Guidelines will establish criteria for identifying and responding to unacceptable licensee performance.

It is important to note that these defining principles will result in an oversight process that provides adequate margin in the assessment of licensee performance so that appropriate licensee and NRC actions are taken before unacceptable performance occurs.

Summary of Task Group Activities and Results

Once the framework structure and defining principles were established, the staff then had the basis for determining what information was needed to provide reasonable assurance that the agency's mission was being achieved. As previously discussed, task groups were formed to finalize the regulatory oversight framework structure, develop a new baseline inspection program, develop a new assessment process, and coordinate with enforcement process improvements. The following sections provide a summary of the activities of these task groups and the results of their work. Those key figures and tables referenced in the following discussion are included as Attachment 1 to this paper.

Regulatory Oversight Framework

The goals and objectives of the technical framework task group's activities were to identify and develop:

- the cornerstones of safety and the key attributes of performance within each cornerstone;

- the performance indicators that can be used to assess performance in certain areas;

- performance indicator thresholds intended to establish clear demarcation points for identifying fully acceptable, declining, and unacceptable levels of performance;

- aspects of risk-informed inspections that should supplement and verify the validity of the performance indicator data.

The task group also evaluated cross-cutting issues, benchmarked the proposed performance indicators against prior plant performance, and identified future development activities. During this effort, information was shared with the inspection and assessment process task groups for use in developing a new baseline inspection program and overall NRC reactor assessment

process. Details of the results of the technical framework task group's efforts are included as Attachment 2 to this paper.

As a starting point, the technical framework task group used the results of the Performance Assessment Public Workshop held from September 28 through October 1, 1998. During this workshop, general agreement was reached with the industry and members of the public on the regulatory oversight framework and the cornerstones of safety. A diagram of this framework showing the relationship between the NRC's overall safety mission, strategic performance areas, and cornerstones of safety is provided in Attachment 1, Figure 1.

These cornerstones of safety were chosen to (1) limit the frequency of initiating events; (2) ensure the availability, reliability, and capability of mitigating systems; (3) ensure the integrity of the fuel cladding, reactor coolant system, and containment boundaries; (4) ensure the adequacy of the emergency preparedness functions; (5) protect the public from exposure to radioactive material releases; (6) protect nuclear plant workers from exposure to radiation; and (7) provide assurance that the physical protection system can protect against the design-basis threat of radiological sabotage.

Within each cornerstone area, the task group then used a top-down, hierarchical, risk-informed approach to:

- identify the objective and scope of the cornerstone;
- identify the desired results and important attributes of the cornerstone;
- identify what should be measured to ensure that the cornerstone objectives are met;
- determine which of the areas to be measured can be monitored adequately by performance indicators
- determine whether inspection or other information sources are needed to supplement the performance indicators, and
- determine the thresholds of performance for each cornerstone, below which additional NRC actions would be taken.

Where possible, the task group sought to identify performance indicators as a means of measuring the performance of key attributes in each of the cornerstone areas. Where such a performance indicator could not be identified, the group proposed a "complementary" inspection activity. Where a performance indicator was identified but was not sufficiently comprehensive, the group proposed "supplementary" inspection activities. The task group also identified the need for "verification" type inspections to verify the accuracy and completeness of the reported performance indicator data. These recommended inspection activities were provided to the risk-informed baseline inspection task group for consideration in developing the baseline inspection program.

Performance indicators, together with risk-informed baseline inspections, are intended to provide a broad sample of data to assess licensee performance in the risk-significant areas of each cornerstone. They are not intended to provide complete coverage of every aspect of plant

design and operation. It is recognized that licensees have the primary responsibility for ensuring the safety of the facility. Objective performance evaluation thresholds are intended to help determine the level of regulatory engagement appropriate to licensee performance in each cornerstone area. Furthermore, based on past experience it is expected that a limited number of risk-significant events will continue to occur with little or no indication of declining performance. Follow up inspections will be conducted to ensure that the cause of these events are well understood and that licensee corrective actions are adequate to prevent recurrence. Likewise, reactive inspections may be performed to follow up on allegations. The results of these follow up inspections will be factored into the assessment process along with performance indicators and risk-informed baseline inspections.

The performance indicators selected for each cornerstone, along with performance thresholds, are listed in Attachment 1, Table 1 to this paper. These thresholds were selected for consistency with the performance threshold conceptual model provided in Attachment 1, Table 2. They correspond to levels of performance requiring no additional regulatory oversight (above the green-to-white threshold), performance that may result in increased oversight (below the green-to-white threshold), performance that will result in specific NRC actions (below the white-to-yellow threshold), and performance that is unacceptable (below the yellow-to-red threshold). For some PIs, white-to-yellow or yellow-to-red thresholds were not identified, because the indicators could not be directly tied to risk data. As experience is obtained, and additional PIs become available, the PIs and thresholds are likely to be refined. It should be noted that although not expected, should a licensee's performance reach what has been determined to be an unacceptable level, margin would still exist before an undue risk to public health and safety would be presented. As later described in the assessment process section of this paper, the extent of NRC actions would be graded based upon the relative deviation from the performance indicator threshold and the number of thresholds exceeded.

Once the performance indicators and corresponding thresholds were selected, the task group performed a benchmarking analysis to compare the indicators against several plants that had been previously designated by the agency as having either poor, declining, average, or superior performance. The analysis indicated that the performance indicators could generally differentiate between poor and superior plants, but were not as effective at differentiating average levels of performance. In some instances, the cause of the poorly rated plants was due to design or other issues for which valid performance indicators have not been developed. Issues such as these are within the scope of the risk-informed baseline inspection program.

The task group also identified aspects of licensee performance (such as human performance, the establishment of a safety conscious work environment, common cause failure, and the effectiveness of licensee problem identification and corrective action programs) that are not identified as specific cornerstones, but are important to meeting the safety mission. The task group concluded that these items generally manifest themselves as the root causes of performance problems. Adequate licensee performance in these crosscutting areas will be inferred through cornerstone performance results from both PIs and inspection findings.

Risk-Informed Baseline Inspection Program

The objective of the inspection task group was to develop recommendations for a baseline inspection program that is risk-informed and that identifies the minimum level of inspection required for a plant (regardless of performance) in order for the NRC to have sufficient

information to determine whether plant performance is at an acceptable level. A key input to the group's project was the regulatory oversight framework, developed by the technical framework task group. The inspection task group accomplished this objective, and the recommended program is described in Attachment 3 to this paper.

The baseline inspection program was developed by using a risk-informed approach to determine a comprehensive list of areas to inspect (inspectable areas) within each cornerstone of safety. These inspectable areas were selected based on their risk significance (i.e., they are needed to meet a cornerstone objective as derived from a combination of probabilistic risk analyses insights, operational experience, deterministic analyses insights, and requirements in regulations). The final list of inspectable areas incorporated those inspection areas recommended by the technical framework task group and is presented in Attachment 1, Table 3.

The scope of inspection within each inspectable area was determined using the same risk-informed approach. The scope of inspection was also modified by the applicability of a performance indicator. The more fully an indicator measures an area, the less extensive is the scope of inspection.

Several documents were created to integrate risk insights into the baseline inspection program and to aid inspectors and regional managers. Basis documents were created to describe the scope of each inspectable area and the justification for inspection based on risk information. The basis documents also were used to indicate whether the inspection is designed to be complementary or supplementary to a performance indicator (Part 1 of the program) or designed only for verification of a performance indicator (Part 2 of the program). Risk information matrices (RIMs) were developed with input from the Office of Nuclear Regulatory Research to serve as guides in planning and conducting inspections as described in Attachment 3, Section 1.3. Data sources for these RIMs are referenced at the end of RIM No. 1 in Attachment 3.

Inspection practices at two Federal Government agencies were reviewed to determine how they used risk insights to establish the level of inspection effort. The staff held discussions with the Safety, Health, and Environmental Management Division of the Environmental Protection Agency, and reviewed a recent General Accounting Office report, GAO/RCED-98-6, "Weaknesses in Inspection and Enforcement Limit FAA [Federal Aviation Administration] in Identifying and Responding to Risks." The number of inspections and the allotted resources varied widely. Neither of these agencies used probabilistic risk assessment techniques to establish inspection areas or effort. In general, these organizations based their inspections upon regulatory requirements, failure history of the item being inspected, and judgement. The lessons learned by these agencies were: (1) inspections provide both an indirect measure of the industry's compliance and an early warning of potential safety and security problems, (2) more intensive (but less frequent), independent, structured team inspections are more effective than routine inspections performed by individual inspectors, (3) inspection protocols (checklists or other job aids based on safety-critical elements) provide more systematic, comprehensive, and consistent inspections, and (4) inspection findings that have generic applicability should be fed back to the industry. The insights gained from these agencies will be used in developing the more detailed guidance documents for the baseline inspection program.

The recommended baseline program contains certain concepts that are a change in the approach to conducting an inspection program from that currently used in Inspection Manual Chapter (IMC) 2515. The key concepts are summarized below:

- The program is the minimum level of inspection conducted at all power reactor facilities, regardless of their performance. Licensees performing at a level not requiring additional NRC interaction will only be inspected at the baseline inspection level of effort.

- Increases above the baseline program will be termed reactive and initiative inspections as in the current IMC 2515. This increased inspection effort will be based on criteria specified in the assessment process to address declining licensee performance, or in response to an event, and is not included in the baseline program.

- The scope of the baseline program is defined by inspectable areas linked to the cornerstones of safety. The justification for inclusion of the inspectable area in the baseline program is described in a basis document.

- The baseline program has three parts: (1) inspection in inspectable areas in which PIs are not identified and in which PIs do not fully cover the inspectable area; (2) ongoing verification of the information provided in performance indicators; and (3) comprehensive review of licensee effectiveness in identifying and resolving problems.

- The process for planning inspections will be based on a 12-month cycle, aligned with the NRC's fiscal year. The planning process will be guided by the RIMs and with plant-specific data. Information in the RIMs can be modified to reflect site-specific risk insights.

- Budgeted inspection resources are based on insights specified in the RIMs. These resources are fixed within a cornerstone of safety, but may be shifted between inspectable areas within a cornerstone as plant activities dictate.

- Procedures will guide inspectors through their review of licensee activities. The procedures will be a brief checklist of key methods to use during review of each inspectable area in a cornerstone.

Many details of the recommended program were developed by the inspection task group, but more work needs to be completed before implementing such a program. This work has been incorporated into the transition plan, which is discussed later in this paper.

Assessment Process

The charter of the assessment task group was to develop a process that will allow the NRC to integrate various information sources relevant to licensee safety performance, make objective conclusions regarding their significance, take actions based on these conclusions in a predictable manner, and effectively communicate these results to the licensees and to the public. This effort focused on the design of an assessment process within the regulatory oversight structure and was closely coordinated with the framework, inspection, and

enforcement efforts. The details of the recommended changes to the assessment process are given as Attachment 4 to this paper.

The following key principles were identified as having a direct effect on the assessment process design:

- Both performance indicators (PIs) and inspection results will be inputs to the assessment process.

- Performance indicators and cornerstone inspection areas (inspection results grouped by cornerstone area) will have established thresholds.

- Crossing PI or cornerstone inspection area thresholds will have similar meaning and will result in the NRC considering a similar range of actions.

A review system, shown in Attachment 1, Table 4, was developed that provides continuous, quarterly, mid-cycle, and end-of-cycle (annual) reviews of licensee performance data (PIs and inspection results). The system is designed so that the lower level reviews are informal reviews of performance data and are not resource intensive. The mid-cycle review is more formal and is focused on assessing performance to determine appropriate NRC inspection actions. The mid-cycle review generates an inspection planning letter. The end-of-cycle review generates both an assessment report and an inspection planning letter. The agency action review is reserved for plants requiring consideration of agency-wide actions. This review is analogous to the review performed at the current senior management meeting (SMM), however the focus has been changed from an assessment activity to an oversight and agency-level action approval function.

An action matrix, shown in Attachment 1, Table 5, was developed to provide guidance for consistent consideration of actions. The actions are graded across five ranges of licensee performance in all response categories (management meeting, licensee action, NRC inspection, and regulatory actions) and in terms of annual communication of assessment results. Action decisions are triggered directly from the threshold assessments of PIs and cornerstone inspection areas. For example, a single PI or cornerstone inspection area crossing its threshold would require the NRC to consider the actions listed in the second performance range of the action matrix, such as regional initiative inspection to determine the cause of the assessment input degradation. More significant changes in performance, such as one degraded cornerstone, would lead to the consideration of more significant actions.

The action matrix is not intended to provide guidance that is excessively rigid. It establishes expectations for interactions, licensee actions, and NRC actions. It does not preclude taking less action or additional action, when justified. The key point is that assessment results are not altered; action decisions are modified, when appropriate.

The communication of assessment results involves quarterly updates of assessment data, semiannual inspection planning letters, and annual assessment reports. All assessment results and NRC actions will be forwarded to Commission via a negative consent Commission paper before an annual Commission meeting. All assessment results are released at the Commission meeting to provide proper balance and context. This differs from the current SMM, which focuses primarily on poor performers.

Enforcement Process

The staff intends to develop changes to the enforcement policy for power reactors to reflect the recommended changes to the inspection and assessment processes. The fundamental purposes of the NRC enforcement policy need not be changed. However, changes in the definitions and thresholds for severity levels will need to be aligned with the process and guidance developed for evaluating the safety significance of inspection findings. Additionally, the criteria for not citing violations should be tied to the licensee performance results determined by the assessment process. For example, the NRC may request a licensee to document corrective actions for current and previous related deficiencies when licensee performance degrades into the increased regulatory response performance band. Additionally, for those plants in the utility response band, the NRC would not combine violations of low safety significance into an escalated enforcement action. Attachment 5 discusses some preliminary views on how the enforcement policy and program might be changed. However, it is premature to develop specific changes until the oversight processes are more fully developed.

Conclusion

The staff achieved its objective of developing improvements to the regulatory oversight process that address each of the needs for change discussed earlier in this Commission paper: increase objectivity, improve scrutability, reduce redundancy, and risk-inform the process.

The proposed process will provide for increased objectivity by relying on objective performance indicators, where possible, to provide the basis for determining performance, and using risk-informed thresholds to determine expected regulatory and licensee response.

The proposed process is more scrutable by more clearly relating individual information from inspections and performance indicators to their impact on overall safety performance. This will serve to produce a clearer trail of evidence and uses the action matrix to trigger NRC actions in a logical and consistent manner, with a clear tie to licensee performance.

The proposed process has eliminated many of the redundancies of the current processes by developing an single, integrated assessment process that sends a clear message regarding licensee performance. The assessment and enforcement processes are also more closely aligned and integrated to prevent redundant and conflicting messages on licensee performance.

The new process is designed to be risk-informed. The risk significance of performance data is the primary determinant of data significance in the process, particularly in the new risk-informed baseline inspection program. PI and cornerstone inspection area thresholds include risk insights, where applicable.

The staff recognizes the need to accommodate future changes to these processes in response to issues such as the identification of new, risk-significant generic safety issues and lessons learned from implementation. While the recommended process improvements described in this paper will provide a better framework for oversight, assessments of licensee performance will continue to be only as good as the performance data and inspection findings that feed it. Further, while these improvements decrease the reliance on subjective decisions,

some level of judgement will still be required due to the complexity and the variability between plants.

Several key policy issues remain that must be considered in arriving at a final process for implementation. In addition, although significant progress was made in developing concepts for the future regulatory oversight process, much work remains in benchmarking, piloting, developing implementation procedures, and training on the new process. The key policy issues are:

- Evaluating the interface with 10 CFR Part 50. The new oversight process increases focus on certain risk-significant requirements and decreases focus on certain other requirements. This could result in situations where low significance findings, even if numerous, would be evaluated and treated as such.

- Revisiting event response and evaluation processes. The new process recognizes that a certain number of random, significant events are possible (industry wide) without necessarily having an impact on assessment conclusions. That is because the process would evaluate the event within the context of overall performance.

- Revisiting the n+1 policy for resident inspector staffing. The proposed oversight process recommends that only a baseline inspection level of effort be performed at certain plants. This may conflict with the n+1 policy.

- Organizational impact. Regional and headquarters organizational structures may need to be changed to support the framework and oversight processes.

A transition plan and success criteria have been drafted to guide future development efforts.

Transition Plan

The staff has developed a recommended plan to be used by the NRC to transition through the implementation of the revised oversight process. This transition plan includes change management strategies for creation of management systems necessary to support those desired changes. These aspects are key ingredients in enabling an organization to successfully implement change. The details of this transition plan appear in Attachment 6 to this paper.

The transition plan contains milestones for both the NRC and industry. Successful implementation will require a continuing interface with the industry and other stakeholders at various stages. Significant investment in staff and management resources also will be required to complete the necessary supporting documents and infrastructure, develop and train staff, and manage all aspects of the resulting change effort.

The transition plan contains challenging but achievable goals. The milestones reflect best estimates based on recognized challenges. Adjustments will be made as necessary to allow for resolution of unanticipated problems (e.g., difficulty in assigning significance to inspection findings, difficulty in collecting PI data in a consistent manner, unexpected change in resources) or additional direction from the Commission.

A key factor during the implementation of the new process focuses on creating and maintaining a shared vision within the NRC. “Opinion Leaders” are individuals within the organization who have significant credibility among their peers so that their peers’ views are influenced by the opinion leader’s views. The identification and cultivation of opinion leaders at both the regional and Headquarters offices will be important for creating alignment within the agency and extending that vision to other stakeholders. These opinion leaders will be the “agents of change” within the NRC and will form the “Change Coalition.” The Change Coalition will be the communication ambassadors at all levels within the agency. This group will discuss the need for change, what the changes will be, and how the change will be accomplished. It is anticipated that the industry will be conducting a similar process during program implementation.

A Transition Task Force, which is separate from the Change Coalition, will be formed in order to manage the phase-out of the existing processes and the phase-in of the new oversight processes. The role of the Transition Task Force will be to complete the development of the detailed implementing instruments and infrastructure.

A major feature of the transition plan will include piloting the process at two sites in each region for six months. The results of the pilot program will be measured against previously established success criteria prior to proceeding with full implementation. Training will be provided to the staff throughout the process culminating in a joint NRC/stakeholder workshop prior to full implementation. Existing processes such as plant performance reviews (PPRs) and SMMs will be phased out as they are replaced by the new risk-informed oversight process.

The pilot program is just one aspect of a multi-pronged approach that will be used for measuring the success of regulatory oversight process improvements. In addition to the pilot program, PI and inspection finding significance benchmarking will be performed for a limited number of plants to determine the technical feasibility of the new process. Further, the overall oversight process will be evaluated after about one year of full implementation. This evaluation will verify that the oversight process objectives are being met. Potential success criteria are shown in Table 4.1 of Attachment 4 to this Commission paper.

Public Comment

As directed by the June 30, 1998, SRM for SECY-98-045, public comment was solicited on the IRAP proposal and the assessment process in general. The *Federal Register* notice that announced the 60-day public comment included a questionnaire to focus public comment on specific topics. This questionnaire grouped these topics into four broad categories; Regulatory Oversight Approach, Integrated Assessment Process, Risk-Informed Assessment Guidance, and Indicators.

There were 26 respondents to the *Federal Register* notice. Industry groups, represented by NEI, licensees, support contractors, and law firms, submitted 19 of the responses. Public advocacy groups submitted 3 of the responses, concerned citizens or consultants submitted 3 responses, and one of the responses came from a State government. A summary and evaluation of these comments can be found in Attachment 7 to this paper. These public comments were evaluated and considered during the development of the regulatory oversight improvements described herein. Public input was appropriately reflected in the recommended changes to the inspection, assessment, and enforcement processes.

Regarding the regulatory oversight approach, industry groups stated that thresholds for NRC action should be based on objective and measurable performance indicators that relate to protecting public health and safety. These thresholds should be a blend of regulatory requirements and risk insights. One member of the public responded that the NRC must establish a threshold at which underperforming plants must be shutdown. The majority of respondents supported the use of performance indicators and stated that the use of PIs would be timely and comprehensive enough to ensure the adequate protection of public health and safety. The majority of respondents supported the enhanced use of licensee self-assessments and felt that this would result in a regulatory process that was sufficiently independent.

For an integrated assessment process, all respondents agreed that the NRC should not formally recognize superior performing plants, and the majority of respondents did not support the continuation of the watch list. The vast majority of respondents stated that positive inspection findings should not be factored into the assessment process. Industry groups supported an approach similar to the NEI proposal as a means to provide a quantitative input into the assessment process. There were a wide variety of responses to the periodicity of assessment with some respondents supporting an annual assessment and other respondents making alternate proposals.

Several respondents stated that risk insights can be used to identify risk-important plant indicators and to set thresholds for performance. Further, the comments indicated that the guidance in Regulatory Guide 1.174 can be used to establish safety thresholds for the performance of risk-significant structures, systems, and components. Several respondents stated that issues involving human performance and risk management that affect safety performance will be reflected in the performance indicators. If poor human performance or other causes result in performance falling below PI thresholds, then the NRC should initiate action to address these issues.

Regarding the use of indicators, industry groups stated that the NRC should base its assessment on objective indicators with risk-informed thresholds to directly measure safety performance. Respondents stated that the indicators and thresholds proposed by NEI provide a more direct indicator of safety and trends in performance than the current NRC indicators and trending methodology. However, one member of the public noted that longstanding design problems are not accurately reflected in safety system reliability variables, and inconsistent reporting by licensees results in the licensee event report (LER) database not being an accurate source of data on nuclear plant problems. The majority of respondents also stated that financial indicators should not be used in the assessment process. Licensee financial information is an issue for utility management and the financial community, and financial indicators are not a predictor of safety outcomes or plant safety.

SALP Suspension

The SRM for COMSECY-98-024, dated September 15, 1998, approved the staff's recommendation for suspending the SALP process and directed the staff to inform the Commission of its plans relative to whether the SALP process should be resumed in the future or terminated.

The staff intends to continue with the suspension of the SALP process and continue with the current assessment processes, including an annual senior management meeting. As described in Attachment 4, the recommended changes to the assessment process will not require the performance of SALP assessments. Therefore, in accordance with the transition plan as

described in Attachment 6, the staff will continue the suspension of SALP until the pilot program for the recommended process improvements is completed. Assuming the pilot program is successful, the staff will propose to delete the SALP program and cancel the associated program documents.

RESOURCES

Considerable resources will be required in the short term to implement these changes. As described in the attached transition plan, the staff initially estimates that approximately 17-19 FTE will be required to develop and implement the recommended changes, including training. This is in addition to the 6.5 FTE expended to date in FY 1999 for the development of these recommendations. These FTEs are within the currently budgeted resources in FY 1999 and FY 2000 for developing and implementing changes to the inspection and assessment programs. These activities have been included in the Reactor Performance Assessment Program and Inspection Program operating plans .

In the long term, the recommended changes to the regulatory oversight processes described herein will likely result in overall reductions in the resources required for program implementation. For example, inspection program changes recommended by the risk-informed baseline inspection program will likely result in fewer hours of direct inspection effort per power reactor unit than is currently allotted in the core inspection program. Further, changes in the scope, depth, and frequency of the baseline inspection program as compared to the current core program will likely result in changes in the division of responsibility between region-based and resident inspectors. Changes to the assessment process are likely to result in fewer resources required to assess licensee performance, decide on appropriate NRC action, and communicate these assessment results to the licensees and the public. Changes to the enforcement policy will likely result in fewer resources required to document and follow up on regulatory discrepancies with no safety significance.

Although overall resource savings are expected in the long term, it would be premature to make any resource reduction decisions at this time beyond those already documented in the FY 2000 budget submittal. The staff will be able to further quantify these resource changes once procedure development is complete and the process is implemented at the pilot plants.

COMMITMENTS

The SECY-98-045 SRM dated June 30, 1998, and SRM M981102, issued in response to the November 2, 1998, Commission briefing on reactor oversight process improvements identified 12 specific areas of Commission interest. The areas and how they are addressed in this Commission paper are summarized in Attachment 8.

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 Information Officer has reviewed this Commission paper for information technology and information management implications and has no objections.

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

RECOMMENDATIONS: That the Commission:

1. Acknowledge that the concepts and scope of the changes presented are consistent with the intent of the referenced SRMs. This would include a positive affirmation on establishing a system of risk informed thresholds and applying them as described; approval of the approaches taken to define information needs, integrate performance indicators with inspection areas and scale regulatory response to findings as illustrated in the assessment matrix. Final approval would be sought following the comment period in March.

2. Note:

   a. Unless directed otherwise, the staff will continue with development efforts (e.g., stakeholder meetings and procedure development) as outlined in the attached transition plan,

   b. The proposed schedule for transition to the new processes (Attachment 6), is contingent upon the staff receiving a response from the Commission by March 31, 1999.

   c. The request for comment on the process recommendations described herein will be published in the *Federal Register* for a 30-day public comment period.

William D. Travers
Executive Director
for Operations

Attachments: 1. Key Figures and Tables
2. Technical Framework
3. Risk-Informed Baseline Inspection Program
4. Assessment Process
5. Enforcement Program Changes
6. Transition Plan
7. Summary of IRAP Public Comment
8. Commitments