

October 8, 1997

FOR: The Commissioners

FROM: L. Joseph Callan /s/
Executive Director for Operations

SUBJECT: PERFORMANCE-BASED INSPECTION GUIDANCE AND THE DISTINCTION BETWEEN INSPECTING FOR PERFORMANCE AND INSPECTING AGAINST A PERFORMANCE-BASED RULE - STAFF RESPONSE TO STAFF REQUIREMENTS MEMORANDUM DATED MARCH 17, 1997 (REF. M970213A, PARAGRAPH 4)

PURPOSE:

This paper addresses performance-based inspection and inspecting against a performance-based rule as requested by the Commission in a SRM dated March 17, 1997, (reference M970213A, paragraph 4). Specifically, the memorandum stated the following: "The staff noted that inspectors are trained and have guidance on how to inspect for performance. It is important that the guidance and the training are consistent and that the distinction between inspecting for performance versus inspecting against a performance-based rule is thoroughly understood by inspectors. This distinction, and its impact on staff inspection activities should be articulated in a paper and submitted to the Commission for consideration."

SUMMARY:

The staff concluded that the inspection guidance and training were consistent on how to inspect for performance. The staff has taken several actions to clarify management's expectations to the inspection staff concerning performance-based inspection and the distinction between performance-based inspection and inspecting against a performance-based rule. Management will continue to emphasize the performance-based inspection approach and communicate inspection issues and expectations to the staff to ensure a consistent understanding and implementation of the inspection program.

BACKGROUND:

On August 31, 1987, the staff issued SECY-87-220, "Assurance of Quality," to inform the Commission about the staff's shift in emphasis from "compliance-based" inspections of licensee quality verification organizations to "performance-oriented" inspections of these organizations. Temporary Instruction 2515/78, "Inspection of Quality Verification Functions," was developed and implemented to provide guidance to the NRC inspection staff to assess the effectiveness of licensee quality verification organizations using a more performance-based approach.

NUREG/CR-5151, "Performance-Based Inspections," was published in June 1988 to describe the concept of "performance-based inspections" that was endorsed and implemented by the NRC. The report also introduced and described the technical training course, "Inspecting for Performance," designed to teach this inspection approach to NRC inspectors. This course is further described in the section of this paper entitled "Formal Training for Inspectors." The performance-based inspection approach was also incorporated into the Inspection Manual as described further in the section entitled "Formal Inspection Guidance."

In late 1995, the Office of the Inspector General (OIG) conducted an audit of the NRC's operating reactor inspection program in response to a Chairman's request to assess the agency's procedures to implement the inspection program consistently. OIG found that although NRC's policy prescribes that inspectors use direct observation and focus on issues with greater safety significance, inspectors and supervisors lacked a clear concept of how to do this. OIG concluded, in part, that NRC management needed to establish and clearly communicate to the inspection staff management's expectations for conducting performance-based inspections.

The staff took several corrective actions to address the OIG's findings as discussed in this paper, including: (1) rewriting Inspection Manual Chapter (IMC) 2515, "Light Water Reactor Inspection Program -- Operations Phase," and IMC 0610, "Inspection Reports," to more clearly describe and emphasize the performance-based inspection approach, (2) developing the "Field Techniques and Regulatory Processes" course to provide hands-on experience in applying the performance-based inspection approach, and (3) reemphasizing the performance-based inspection approach to the inspection staff through the Reactor Inspection Program Newsletter and the resident inspector counterpart meetings.

DISCUSSION:

Performance-Based Inspection and Inspecting Against a Performance-Based Rule

The intent of NRC performance-based inspections is to concentrate on licensee activities that most significantly affect plant safety. The inspections typically start by observing work activities, and then the inspectors let discrepancies or uncertainties lead them to inspect other areas, such as quality verification, training adequacy, and procedural controls. This inspection approach departed from past NRC inspection practices (pre-1987) which emphasized documentation and program review as a means to measure operational safety. Once the licensee's program and documentation structure have been established and accepted through the licensing process, the licensee's ability to perform program activities safely and reliably becomes the principal focus. Performance-based inspection tends to focus more on results (i.e., does the valve work?) than on process (i.e., was the procedure adequate?). Performance problems will lead the inspector into evaluating root causes and potential programmatic problems.

The traditional approach of most NRC requirements has been prescriptive, providing detailed processes, requirements, or instructions for the licensee to

follow. A performance-based rule, on the other hand, describes the general processes to be followed and the results expected by licensees. This approach gives licensees greater flexibility in developing and adjusting implementation activities to most efficiently utilize and/or merge with their existing programs and policies, allowing them to concentrate their resources on the most safety significant issues. Performance-based regulations are more difficult to inspect and enforce because the requirements are less clearly defined and there may be little uniformity of implementation between different licensees.

Performance-based inspection techniques (inspecting for outcomes) have for the most part replaced the more traditional inspection techniques (inspecting for conformance to programs), and performance-based regulations such as the maintenance rule are becoming part of the regulatory framework. These approaches to nuclear regulation and inspection do not change the licensee's requirements or commitments to operate their plants in a safe manner; they simply provide a technique to regulate and inspect nuclear power plant operations, concentrating resources on those issues most important to safety. Regardless of whether a rule is performance based or prescriptive in nature, the preferred method of inspection is performance based. In order to effectively inspect against a performance-based rule, you must first verify that a comprehensive program is in place and is being implemented to ensure that performance can be evaluated. Once the program has been baselined, subsequent inspections should be more performance based in nature. The impact on inspection activities is then transparent between performance-based and prescriptive regulations. Lessons learned from the implementation and initial baseline inspections of 10 CFR 50.65 (the maintenance rule) support this philosophy, as detailed in SECY-97-055, "Maintenance Rule Status, Results, and Lessons Learned."

Formal Inspection Guidance

IMC 2515 establishes the inspection policy for the reactor inspection program. This manual chapter emphasizes the use of performance-based inspection techniques to focus the inspector's attention and resources on those licensee activities most important to reactor safety and reliability, primarily through field observation of licensee activities and results in lieu of in-office reviews of procedures or records. The inspection program implementing procedures (IPs) provide more detailed inspection guidance, which incorporate the performance-based approach into the inspection process. IP 62706

(maintenance rule baseline procedure) and IP 62707 (core maintenance inspection procedure) provide guidance for inspecting against a performance-based rule (specifically, the maintenance rule).

IMC 0610 establishes guidance on inspection report content, format, and style. Section 05.05, "Documentation of Performance-Based Inspection," discusses performance-based inspection techniques and gives guidance on documenting performance-based inspection findings. A concise working definition of "performance-based inspection" is described as "inspection that focuses on issues of safety and reliability, with an emphasis on field observation rather than in-office procedural record reviews." The section describes both "performance-based inspection" and "performance-based regulation." It explains that "for most areas of inspection, the range of relevant regulations, license requirements, industry guidelines, and licensee regulatory commitments is a mixture of performance-based (results-oriented; less prescriptive) and compliance-based (process-oriented; more prescriptive) standards."

The staff concluded that the inspection program guidance documents provided sufficient guidance for the performance-based inspection approach and inspecting against a performance-based rule to inspectors.

Formal Training for Inspectors

In accordance with IMC 1245, "Inspector Qualification Program for the Office of Nuclear Reactor Regulation Inspection Program," the "Inspecting for Performance" course (G-303) is required training for all NRC inspector qualifications. This 2.5-day course produces an understanding of the concepts of performance-oriented inspection, performance-oriented inspection tools and techniques, and insights on, and an understanding of, how to apply these inspection tools and techniques effectively. The course is presented through lectures and discussions as well as workshops that allow the students to examine, exercise, and critique the use of performance-oriented inspection tools and techniques. This course is currently being revised to incorporate lessons learned from the maintenance rule inspections and the revised inspection report writing guidance detailed in IMC 0610, "Inspection Reports."

The May 1997 session of the Inspecting for Performance course was observed to evaluate its effectiveness in describing and emphasizing a performance-based inspection approach to the inspection staff. In general, the training was informative and valuable, providing inspectors with an understanding of performance-based inspection techniques. The staff will, however, strengthen the course to further clarify management's expectations for inspecting for performance and to clarify inspecting against a performance-based rule.

The "Fundamentals of Inspection" course (G-101) is also an IMC 1245 qualification requirement for inspectors. This 4-day course provides a basic understanding of the NRC inspection program, including inspector conduct, legal aspects, preparation, communication, inspection techniques, documentation, handling allegations, enforcement, and other important inspection issues. Chapter 8, "Performing an Inspection," contains an explanation of and discussion on performance-based inspection techniques and the benefits compared to the more traditional prescriptive inspection approach. The 1-day "Fundamentals of Inspection Refresher" course (G-102) is also required every 3 years to maintain inspector qualification. This course reinforces performance-based inspection skills and techniques, covers lessons learned, and gives management an opportunity to communicate its expectations to inspectors.

In March 1997, the "Field Techniques and Regulatory Processes" course (G-103) was developed for reactor inspectors. This 5-day course is designed to allow the students to apply the knowledge and principles of good regulation in realistic scenarios using actual events to help bridge the gap between formal classroom training and the real world of on-the-job performance. Performance-based inspection techniques are emphasized through the use of case studies to simulate the day-to-day activities of a resident inspector in carrying out the responsibilities of the position. The staff is evaluating whether to incorporate this course into the inspector qualification requirements.

The differences and similarities between the traditional prescriptive requirements and the performance-based, results-oriented requirements are introduced and emphasized to inspectors in training for the inspection of the maintenance rule. This training is presented through lectures, discussions, and workshops, and is required for all inspectors with responsibilities for verifying proper implementation of the maintenance rule. In addition, all NRC-qualified inspectors were given a full day of training on the revised

IMC 0610, which included a discussion of performance-based inspection.

The staff concluded that the training program was comprehensive and consistent with the inspection guidance for performance-based inspection expectations. The Inspecting for Performance course is, however, being revised to further clarify management's expectations for performance-based inspection and inspecting against a performance-based rule.

Further Communication of Management Expectations to the Inspection Staff

Another important opportunity for communicating inspection program issues comes during the resident inspector counterpart meetings. The resident inspectors from each site gather in the regional office for approximately 3 days two to three times a year to share lessons learned from actual experiences at their sites. These periodic meetings continue to emphasize the performance-based inspection approach to nuclear reactor regulation.

An additional NRR initiative to help communicate inspection issues and activities is the Reactor Inspection Program Newsletter. Although the newsletter is targeted at reactor inspectors, it is electronically available to all NRC employees. The first issue of the Reactor Inspection Program Newsletter (Issue 95-01) was dated July 1995 and contained, among other items, an article entitled "Performance-Based Inspection." The article contained background information, inspection experiences, and recent and future program enhancements to clarify the shift in inspection emphasis from a programmatic to a more performance-based approach.

The newsletter is issued periodically, typically two to three times per year, and was most recently issued in September 1997. The April 1997 issue had a 2-page article on lessons learned from the maintenance rule inspections; the article should help clarify any confusion between performance-based inspection and inspecting a performance-based rule. Recent issues have also contained articles entitled "IG Audit of the Inspection Program" and "Revised IMC 0610, 'Inspection Reports'" in April 1996, and "Q & A on the Revised IMC 0610" in December 1996. Future issues will have articles that emphasize performance-based techniques, including an article that specifically addresses the similarities and differences between performance-based inspection and performance-based regulation as discussed in this paper.

The staff concluded that these methods provide consistent direction to the inspection staff on management's expectations for performance-based inspection and inspecting against a performance-based rule. Management will continue to emphasize the performance-based inspection approach and communicate inspection issues and expectations to the staff to ensure a consistent understanding and implementation of the inspection program.

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