

MEMORANDUM TO: Chairman Meserve
Commissioner Dicus
Commissioner Diaz
Commissioner McGaffigan
Commissioner Merrifield

June 4, 2002

FROM: William D. Travers */RA by Carl J. Paperiello Acting For/*
Executive Director for Operations

SUBJECT: EFFICACY OF 10 CFR 50.65, THE MAINTENANCE RULE
(WITS 199800135)

This memorandum addresses the Commission's requirement that the staff determine the efficacy of 10 CFR 50.65, the maintenance rule. In an April 11, 1997, staff requirements memorandum on SECY-97-055, "Implementation of Maintenance Rule, Revised Regulatory Guide, and Consequences," the Commission directed the staff to "consider how to assess the effect of the rule on the overall quality of maintenance, and ultimately the effect on equipment performance, in order to determine the efficacy of the rule." The staff responded in SECY-97-172, dated August 1, 1997, its belief that overall trends in maintenance practices and equipment performance would not be discernable for at least 5 years.

Subsequently, at the request of the Office of Nuclear Reactor Regulation, the Office of Research (RES) prepared a study entitled "Feasibility of an Effectiveness Assessment of the Maintenance Rule," dated April 11, 2001 (Attachment). RES concluded that such a study would be feasible, with the following qualifications:

- A comparison of the outcomes to the Commission's expectations of the rule would likely involve many qualitative judgements.
- It may not be possible to uniquely associate outcomes with specific requirements of the rule because both the industry and NRC have experienced many changes since the issuance of the rule.
- The comparison between expectations and outcomes would not necessarily be conducted at the level where specific structure, system, and component data are monitored and collected by licensees. However, aggregated information could provide an equally valid basis for the assessment.

Additionally, RES believed the principal sources of data for a quantitative assessment would be from both internal and external stakeholders, as well as the Reactor Oversight Process (ROP), and that acquisition of such data would be resource intensive to both the external stakeholders and the staff.

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As the RES feasibility study would indicate, determining the independent impact of the rule would be a formidable task because so many other factors have contributed to improved licensee performance. These factors include an increased focus on safety, improved training, greater licensee involvement in the mainstream of industry activities, industry consolidation, and increased managerial accountability for maintenance performance. More recently, the deregulation of the electric power industry has motivated licensees to further improve operational effectiveness and efficiency so that their plants will remain economically competitive.

Although ferreting out the specific impact of the maintenance rule may be difficult to accomplish, the Performance Indicator Program data that was maintained by the former Office for Analysis and Evaluation of Operational Data, the performance indicators (PIs) in the current ROP, and World Association of Nuclear Operators (WANO) PIs for the U.S. nuclear utility industry show that plant equipment performance has improved since the maintenance rule was implemented in 1996. However, essentially all pertinent indicators show improving equipment and safety performance trends well before the rule was implemented. That improving trend was, in part, initiated and sustained because of licensee and industry efforts to operate more reliably and safely as well as substantial regulatory initiatives focused on improving safety performance. The development of the maintenance rule emanated from the agency's recognition of the direct relationship of sound maintenance practices to safety performance.

The Commission's interest in licensee maintenance programs and practices can be traced back to the mid-1980s, even before the loss-of-all-feedwater event at Davis-Besse in 1985 justified that concern. To determine the actual quality of industry maintenance activities, the staff conducted team inspections from July 1988 to March 1991 at 70 of the 71 operating sites. (Maintenance capability at the 71st site, Oyster Creek, was evaluated as part of other inspections.) These Maintenance Team Inspections (MTIs), which generally found industry's maintenance practices to be acceptable, successfully focused the industry's attention on the importance of quality maintenance practices. The Commission evaluated the collective results of the MTIs and determined a rule was necessary to prevent industry performance from regressing and to reduce the likelihood of failures and events being caused by the lack of effective maintenance.

Additionally, to improve licensee maintenance activities, the Commission wanted the rule to eliminate the common weaknesses that the MTIs found. Most notable of those weaknesses were a lack of equipment performance trending, inadequate root cause analyses that led to repetitive failures, and inadequate consideration of risk in scheduling, planning, and performing maintenance activities. As a result, the rule includes requirements for establishing equipment performance goals and monitoring actual performance against those goals, conducting root cause evaluations when goals are not met, and integrating risk insights into maintenance activities. From July 1996 to July 1998, Maintenance Rule Baseline Inspections reviewed licensee implementation of the rule at every operating site and found all licensees were trending equipment performance, reducing repetitive failures, and taking risk into consideration when planning, scheduling, and performing maintenance activities. Today, ROP baseline Inspection Procedures (IPs) 71111.12, "Maintenance Effectiveness," and 71111.13, "Maintenance Risk Assessment and Emergent Work Control," provide agency inspectors with an integrated approach intended to ensure that licensees continually monitor and assess the effectiveness of their maintenance activities.

Certainly, sound maintenance is at the heart of good equipment performance, and the rule has supported the use of sound maintenance practices. For example, the rule established a “scope” that focuses resources on equipment that is important to reliable (safe) operation of the plant and has heightened licensee awareness of the safety impact of maintenance activities. Also the rule causes licensees to periodically review their preventive maintenance programs for insufficient or excessive out-of-service activities and make appropriate adjustments.

Assessing the ongoing effectiveness of the maintenance rule continues to be an area of emphasis in the ROP. IPs 71111.12 and 71111.13 will continue to be tools for staff inspectors to exercise their oversight and monitoring of industry safety equipment performance. Inappropriate activities, work practices, or common-cause issues will be identified and reported through the inspectors’ normal channels. In addition to the PIs discussed above that monitor key safety system and equipment performance, the recently developed Industry Trends Program may provide more global insights regarding selected safety system performance industry wide.

In conclusion, a quantitative determination of the specific impact of the maintenance rule would be very difficult and costly to perform. However, available quantitative and qualitative information indicates that the rule has contributed to improvements in the quality of licensee maintenance and equipment performance since its inception. Any benefit to be gained from more detailed study would be limited. Therefore, the staff believes that sufficient evidence exists that indicates that the maintenance rule has had a notable and positive impact on the overall quality of maintenance, and ultimately the effect on equipment performance, thus supporting the efficacy of the rule.

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