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PROPOSED RULE PR 50
(59FR 979)

Mr. Samuel J. Chilk
Secretary of the Commission
US. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Docketing and Services Branch

SUBJECT: Codes and Standards for Nuclear Power Plants; Subsection IWE and Subsection IWL (59 *Fed. Reg.* 979 - January 7, 1994)
Request for Comments

Dear Mr. Chilk:

The Nuclear Energy Institute (NEI)[1] on behalf of the commercial nuclear energy industry, has reviewed the proposed rule that would include containment requirements in inservice inspection programs (59 *Federal Register* 979) and offers the following comments for consideration.

Provisions for containment testing and examination are contained in General Design Criteria 16 and 53, and in 10 CFR Part 50, Appendix J. The subject rule is proposed because the existing regulations do not provide specific guidance on how to conduct the necessary containment examinations. Information on how to conduct these examinations currently exists, however, in Subsections IWE and IWL of the ASME Boiler and Pressure Vessel Code and in Regulatory Guide 1.35. NRC proposes to

[1] NEI is the successor organization to the Nuclear Management and Resources Council (NUMARC). NUMARC was the organization of the nuclear industry responsible for coordinating the efforts of all utilities licensed by the NRC to construct or operate nuclear power plants, and of other nuclear industry organizations, in all matters involving generic regulatory policy issues and the regulatory aspects of generic operational and technical issues affecting the nuclear industry. NEI's members include every utility licensed to operate a commercial nuclear power plant in the United States, the major nuclear steam supply system vendors, major architect/engineering firms, fuel fabrication facilities, materials licensees and other holders of NRC licenses, and other individuals and organizations involved in the nuclear energy industry.

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incorporate the detailed requirements in Subsections IWE and IWL of the ASME code, along with some of the guidance from Regulatory Guide 1.35, into 10 CFR 50.55a. NRC further proposes an expedited examination schedule. We have provided detailed comments on the proposed incorporation into 10 CFR 50.55a of two ASME Code subsections and the backfitting implications of that proposed action in the two attachments to this letter. Our position can be summarized as follows.

First, an additional regulation is not needed to establish a requirement that containments continue to maintain minimum design wall thickness and prestressing forces. Nor is it needed to give NRC enforcement authority should this existing requirement not be met. These conditions are already established in General Design Criteria 16 and 53; 10 CFR Part 50, Appendix J; license conditions; technical specifications; the FSAR and other docketed commitments. Attachment 1 contains specific comments in support of why the rule is not needed.

Second, if specific implementation guidance on how to conduct the necessary examinations is needed, it would be more appropriate in a guidance document rather than a regulation. A guidance document, such a Regulatory Guide or consensus standard, can be updated more easily than a regulation to reflect technological improvements or lessons learned from implementation. The Maintenance Rule, for example, has shown the value of performance-based regulations backed by detailed implementation guidance subsequently issued. The guidance on how to conduct containment examinations should be focused on specific design types and environmental conditions, and take into account safety significant aspects and degradation conditions experienced to date.

Third, the proposed requirements contained in Subsections IWE and IWL are overly prescriptive and go beyond the concerns that prompted this proposed rule -- including, for example, requirements for examination of various welds and bolted connections that have not experienced any reported degradation. Further, the proposed requirements make no distinction among various containment designs or mitigating conditions and they do not appropriately consider credible failure mechanisms.

Fourth, there is insufficient justification for invoking the compliance exception under 10 CFR 50.109(a)(4)(i). For example, no evidence has been provided of a single instance of any structural deterioration that might affect containment integrity or leak-tightness such that the containment would not provide an essentially leak-tight barrier against the uncontrolled release of radioactivity into the environment should an accident occur. (General Design Criterion 16) This is not a compliance matter. Therefore, a backfit analysis is required to determine if there is a substantial increase in the overall

protection of public health and safety and whether the direct and indirect costs, including ALARA considerations, of implementation by licensees are justified in view of the increased protection. Attachment 2 contains specific comments in support of our position that a backfit analysis is required.

We agree, however, that there may be value in developing specific guidance on how to conduct the necessary containment examinations as long as the guidance is focused and reflects variations in containment design and environmental conditions, the safety significant aspects of containment, and credible degradation mechanisms. We would be pleased to assist in arranging discussions among NRC staff, codes and standards volunteers, NSSS Owners Groups and other interested personnel in order to identify the essential elements of such guidance.

A copy of this letter is enclosed on a 3.5 inch diskette as requested by the *Federal Register* notice.

We appreciate the opportunity to comment and would be pleased to discuss these comments further with NRC staff.

Sincerely,

R. Simard

Ron Simard
Manager, Industry Coordination

RLS/JAP:sd
Attachments

c: W.E. Norris, USNRC
G.C. Millman, USNRC

Attachment 1: NEI comments on proposed incorporation into 10 CFR 50.55a of ASME Code Subsections IWE and IWL

1. **Existing regulations and licensee commitments are adequate to ensure containment integrity; therefore, an additional regulation is not needed.**

A. Implementation of current requirements

The purpose of the proposed regulation is to ensure that containments continue to maintain or exceed minimum accepted design wall thickness and prestressing forces as provided by industry standards. The regulatory requirements for containment integrity and examination already exist in General Design Criteria 16 and 53 and 10 CFR Part 50, Appendix J. Licensees are committed to these requirements under their license conditions, technical specifications, FSARs and other docketed commitments. In accordance with these requirements and commitments, licensees periodically carry out tests and examinations to verify that adequate containment pressure retaining capability is maintained. The need for additional guidance on how to perform these examinations might be questioned, but sufficient regulatory requirements exist.

B. Types of tests and examinations conducted to meet current requirements

Examples of the types of tests and examinations conducted by licensees include visual examinations prior to containment leak rate testing per Appendix J, integrated leak rate testing, visual surveillance tests of the drywell, use of weld channel and penetration pressurization system continuous monitoring for potential leak paths, and augmented visual and ultrasonic thickness examinations where degradation has been identified by the licensee or based on industry experience at other plants.

C. Detection, correction and reporting of occurrences of degradation

Table 3 of Enclosure 2 to SECY-93-328, "Issuance of Proposed Amendment to 10 CFR 50.55a to Incorporate by Reference the ASME Boiler and Pressure Vessel Code (ASME Code), Section XI, Division 1, Subsection IWE and Subsection IWL," lists the specific instances of containment degradation that have been detected and addressed under the existing requirements. The proposed rule fails to credit prior licensee actions to address containment integrity. Licensees have conducted examinations in response to the identification of corrosion degradation at other plants. In addition, licensees have responded to NRC documents such as Information Notice 86-99, Generic Letter 87-05, Information Notice 88-82 and supplements to these documents. Credit for performing

these examinations, even though not performed under the regular inservice inspection program, should be given to avoid unnecessary duplication of these examinations.

D. NRC Regulatory Guide 1.35

The proposed rule contains provisions for incorporating certain recommendations for tendon examinations that are included in Regulatory Guide 1.35, Rev 3. Enclosure 2 to SECY-93-328 clearly documents the commitment by licensees to follow the guidance in RG 1.35. Based on the proactive and voluntary use of this regulatory guide, it is clear that the regulatory guide has been effective in disseminating guidance. However, making this guidance part of the proposed rule is inappropriate and unnecessary for the reasons mentioned above.

2. Detailed implementation guidance is more appropriate in a guidance document than in a regulation; and the guidance must address design variations and operating experience.

A. Guidance documents can be updated more easily than can regulations

A guidance document, such as a Regulatory Guide or consensus standard, can be updated more easily than a regulation to reflect technological improvements or lessons learned from implementation. NRC staff has more flexibility in issuing or endorsing timely revisions without the necessity of a rule change. Licensees can more quickly and easily upgrade their inspection programs in response to industry experience, and fewer NRC resources are required for review and approval, compared with the Section 50.12 exemption requests that each licensee would have to file if the guidance were codified in a rule. The Maintenance Rule, for example, has shown the value of performance-based regulations backed by detailed implementation guidance subsequently issued.

B. The proposed requirements do not address variations in containment designs and environments

The proposed rulemaking makes no distinction among the different types of containment designs and environmental conditions that exist. Licensees would therefore need to determine which of the requirements do not apply and would have to submit exemption requests to the NRC, unnecessarily consuming both licensee and NRC resources. The guidance should be focused on specific design types and environmental conditions.

For example, Figure 1 of SECY-93-328 very effectively illustrates that there are three basic types of BWR containments. Of the basic types, there are eight variations. Of the

eight variations, only one has been identified as having experienced occurrences of degradation. This involves the free standing steel primary containment, Mark 1 steel drywell and wetwell. A total of twenty two plants have this type of containment. Eleven have reported occurrences of degradation. Two of the eleven have experienced greater corrosion than the others.

In the case of the one BWR plant that experienced corrosion degradation of containment in the sandbed region, the conditions involved water in the sandbed that did not drain due to clogged drain lines. The licensee first identified that they had a leak, investigated it to determine its root cause and took extensive corrective action to correct the problem. The licensee plans to continue monitoring the drywell for leaks in the areas above the sandbed. The sand has been removed and not replaced and the drywell is no longer considered a limiting factor for long term operation of the plant.

In the case of the other BWR plant that experienced corrosion degradation of the torus, that torus shell was designed and constructed without a coating on the inside surface. The original design took into account an allowance for corrosion of the wall over the life of the plant. This licensee now performs semi-annual ultrasonic examinations on the torus to verify that minimum wall thickness requirements continue to be met and has determined that the torus has sufficient wall thickness such that it will retain sufficient margin even at the end of projected plant life. Not coating the inside of the torus is unique to this unit and the conditions experienced with the wall thinning corrosion rate do not apply even to other Mark 1 containment designs.

The two BWR cases described above are considered unique and therefore are not typical of the Mark I design type of containment. To be meaningful, guidance must address design variations and operating experience typical of a specific type of containment.

3. **Subsections IWE and IWL are overly prescriptive and go beyond concerns that prompted the proposed rule.**

A. Requirements for examination of components that have not experienced degradation

The Supplementary Information says that "[t]he NRC is taking the proposed action for the purpose of ensuring that containments continue to maintain or exceed minimum accepted design wall thickness." (59 *Fed. Reg.* 979.) However, Subsection IWE of the ASME Boiler and Pressure Vessel Code addresses components that have not experienced degradation. Therefore, the requirements in the code go beyond the concerns that prompted the proposed rule. Table 3 of Enclosure 2 of SECY-93-328 lists eleven BWR plants and fourteen PWR plants. A total of twenty-nine occurrences were reported related to six examinations of the types specified in Subsection IWE. This represents

twenty-six percent of the total examinations specified in IWE. The remaining seventeen examinations listed within Subsection IWE relate to components that, according to SECY-93-328, have experienced no reported degradation. Similarly, a total of ten occurrences were reported related to three Subsection IWL examinations. The remaining three examinations listed within IWL involve components and sample analysis where no reported degradation has been experienced, according to SECY-93-328. Guidance should be focused on components that have experienced degradation.

B. Proposed requirements do not consider credible failure mechanisms

The approach used in Subsections IWE and IWL require visual and volumetric examinations of generic components or areas of containment structures without proper consideration of credible failure mechanisms. In addition, whether the examinations will actually increase the confidence level in containment integrity has not been given adequate consideration. For example, according to the BWR Owners Group's typical Mark I containment failure probabilistic risk assessment, the most likely cause of containment failure in this type of BWR is the failure of the drywell bellows. Experience has shown that an effective method of detecting a flaw in the drywell bellows is through Appendix J testing. Examinations of such components as bolted connections are not required as part of the ISI program because they are already covered as part of plant maintenance and Appendix J testing. Likewise, visual examination of containment penetration welds, flange welds, nozzle-shell welds, and dissimilar metal welds are not justified. Under the Subsection IWL requirements, for example, examinations and test are required for wires and strands ; however, according to SECY-93-328 there were no reported occurrences of problems, and therefore they should be excluded from any guidance document.

4. **Additional comments on the proposed rule**

A. NRC Regulatory Review Group comment on 10 CFR 50.55a

In early 1993, the NRC established a Regulatory Review Group (RRG) to conduct a disciplined review of power reactor regulations and related processes, programs, and practices. In August 1993, the RRG issued its report. 10 CFR 50.55a was classified as "prescriptive," and the RRG concluded that it was feasible to make the regulation performance-based. However, this proposed rule would add additional prescriptive requirements to 10 CFR 50.55a, including requirements to examine components that have not experienced degradation. Thus, the proposed changes are inconsistent with the RRG report recommendations, and no justification is provided that would substantiate a different conclusion from that reached by the RRG.

B. Reference to NUMARC Industry Reports

In the Supplementary Information, reference is made to two NUMARC Industry Reports (IRs). (59 *Fed. Reg.* 980.) The specific documents mentioned are the PWR Containment Structures License Renewal Industry Report and the BWR Containment Structures License Renewal Industry Report. The *Federal Register* notice states "[t]he NUMARC plan for containments relies on the examinations contained in Subsection IWE and Subsection IWL to manage age related degradation, and this plan assumes that these examinations are in current and effective use." (59 *Fed. Reg.* 980.) Although the BWR and PWR containment IRs do reference Subsections IWE and IWL, their identification in the IRs should not be misrepresented to imply that Subsections IWE and IWL are being implemented or that they are required for operating plants during their initial licensing term.

The IRs provide guidance that can be used by license renewal applicants to address age-related degradation of key plant components. The documents are formatted to identify the aging degradation mechanisms with respect to their potential safety significance during the license renewal term. Potentially significant degradation mechanisms are evaluated to determine if they are addressed by inspection, testing, maintenance or surveillance programs. If the mechanism is adequately managed by an effective program, then the degradation is not considered to be an issue for license renewal. Key in the previous statement are the words "if" and "then." In the PWR Containment IR for example, corrosion of prestressed tendons and anchors is considered to be potentially significant for license renewal. The IR states "If tendon anchorage has been examined in accordance with the provisions of Regulatory Guide 1.35 or the requirements of ASME Section XI, Subsection IWL...then potentially significant degradation caused by corrosion of prestressing tendons and anchor heads is managed effectively."

The IR states further "[a] license renewal applicant intending to take credit for these effective programs is responsible for reviewing their plant-specific features, including appropriate current licensing basis documents and information, in order to assure that the program elements required to manage the effects of potentially significant prestressing losses, or their justified equivalent, are committed for use at their plant." Referencing the IWE and IWL subsections of ASME Section XI was intended to identify one means of managing age-related degradation for the license renewal period. The IRs should not be interpreted as supporting the imposition of new requirements on operating plants during their operating license term.

C. Estimated cost impact

The industry has conducted an analysis of the additional cost to the licensees to implement the proposed rule. This estimate includes labor hours for development of the initial ISI plan; labor hours to update the plan and provide periodic examinations, including time for reviewing instructions; labor hours to revise the many licensee internal procedures and instructions to meet the new ISI plan; labor hours to train and certify personnel to the 1992 code requirements; and labor hours to develop exemption requests to the NRC, respond to the staff comments and revise the ISI plan and procedures accordingly. An average labor cost of sixty dollars an hour was used to determine the dollar cost.

The estimated cost of the proposed rule is in excess of one hundred million dollars industrywide during the first ten year interval. The estimate does not take into account the cost of the impact associated with resolution of interpretations of the requirements, nor the costs of any supplemental augmented inspections. This does not take into account the impact of having to implement the examinations within a five year period. This could result in carrying out the examinations in perhaps one or two refueling outages where outside resources, required to be certified examiners per the 1992 Edition of the ASME Code, may be limited and the critical path and possible outage duration may be negatively impacted. In addition, the impact in terms of additional personnel exposure in person-rems has not been included in the above cost estimate. This last point is considered a major consideration from an ALARA standpoint and is not justified based on any perceived safety benefit. See Attachment 2 for more specifics on why we maintain that the NRC has not demonstrated that the proposed rule represents a cost justified safety enhancement.

Attachment 2: NEI comments on Backfitting Implications of Proposed Incorporation in 10 CFR 50.55a of ASME Code Subsection IWE and IWL

1. Summary

The NRC recognizes that the proposed regulation would impose on licensees new requirements for containment and tendon examinations. (59 *Fed. Reg.* 983.) Nevertheless, the NRC concludes that a backfitting analysis does not need to be performed because the proposed rule is justified under the "compliance exception" of 10 CFR 50.109(a)(4)(i). (59 *Fed. Reg.* 982.)

NEI considers the use of the compliance exception to be inappropriate and believes that the cost/benefit analysis required by the backfitting rule must be performed to determine whether the proposed new requirements are justified. The proposed rule is based on the premise that prescriptive requirements are needed to guide licensees on how to perform the necessary containment examinations. In the industry's view and under Section 50.109, the imposition of new methods for achieving or demonstrating compliance is a backfit.

The NRC appears to acknowledge that licensees are not currently violating any of the applicable regulatory requirements (e.g., that containments provide an essentially leak-tight barrier against the uncontrolled release of radioactivity into the environment should an accident occur). Instead the NRC bases its reliance on the compliance exception by suggesting that there may be degradation in existing containment structures that could compromise the containment's pressure-retaining and leak-tight capability. However, as explained in Attachment 1, the NRC has not demonstrated that a generic problem of excessive degradation exists. Thus, the NRC's reliance on the compliance exception is inappropriate. In accordance with 10 CFR 50.109, a backfit analysis must be performed before the NRC imposes such new requirements on licensees.

2. The NRC's reliance on the compliance exception is inappropriate

A. Imposition of new examination methods constitutes a backfit

The proposed rule, through the incorporation by reference of subsections IWE and IWL into 10 CFR 50.55a, would impose detailed new requirements for containment and tendon examinations for the purposes of ensuring compliance with 10 CFR Part 50, Appendix A, General Design Criteria 16 and 53, and Part 50, Appendix J. The adoption of explicit new examination methods, in addition to the provisions that exist currently, would constitute a backfit, not a matter of compliance.

The Statement of Considerations to the 1985 final backfit rule plainly states that "[t]he compliance exception is intended to address situations in which the licensee has failed to meet known and established standards of the Commission because of omission or mistake of fact. It should be noted that new or modified interpretations of what constitutes compliance would not fall within the exception and would require a backfit analysis and application of the [cost-benefit] standard." (50 *Fed. Reg.* 38103.) In other words, the NRC cannot redefine what methods are necessary to demonstrate compliance with regulatory requirements governing containment inspection and testing without performing a backfit analysis.

While the Supplementary Information accompanying this proposed rule refers to three general regulatory provisions governing containment design, testing, and inspections, the NRC does not suggest that licensees are in violation of these provisions. In fact, the Staff emphasized in SECY-93-328 that the proposed rule does not mean that "licensees who have not yet adopted the provisions of Subsection IWE and Subsection IWL are in non-compliance now or until they do implement these provisions." In addition, the Supplementary Information does not discuss any instances, much less any industrywide problem, where NRC enforcement action was taken against a licensee for the failure to comply with any of the provisions related to containment design, testing, or inspections. In these circumstances, it is difficult to understand how detailed new requirements are needed to ensure compliance with the existing regulations and plant Technical Specifications.

The NRC's existing regulations require that the structural integrity and leak tightness of containments be maintained. Following the dictates of General Design Criterion 16, containments were designed and constructed with an allowance for corrosion or degradation of the containment wall over the life of the plant. It is therefore hardly surprising that, as noted in the Statement of Considerations, "[o]ver one-third of the operating containments have experienced corrosion or other degradation." (59 *Fed. Reg.* 979.)

The relevant question for this rulemaking is not whether containments are experiencing corrosion or other degradation, but whether the corrosion or degradation is so unanticipated and excessive as to constitute a genuine compliance concern industrywide. As noted above, no single instance has been identified where structural deterioration has so affected the containment's integrity or leak-tightness such that the containment would not provide an essentially leak-tight barrier against the uncontrolled release of radioactivity into the environment should an accident occur. Moreover, there is nothing in the proposed rule to support the conclusion that current regulatory requirements are inadequate to identify and remedy such a situation. Indeed, if such a

situation were to arise, the NRC would have full authority to take appropriate action (e.g., through issuance of an order).

B. The NRC has not demonstrated that current requirements are inadequate to identify and resolve problems with containment degradation

The NRC's alternative justification for classifying this issue as a compliance concern is that there has been an industrywide failure to identify the problem of corrosion and degradation. The NRC asserts in the Supplementary Information that "[a]lmost one-half of these occurrences were found by the NRC through its inspections or audits of plant structures, or by licensees because they were alerted to a degraded condition at another site." (59 *Fed. Reg.* 979-80.)

The evidence, however, does not appear to support such a characterization. First, Table 3 of SECY-93-328 reveals that the NRC identified the problem before plant personnel in four instances out of the twenty-seven cases cited. Additionally, the NRC has already taken steps independent of the proposed rule to address these isolated occurrences. In particular, the two instances involving greater corrosion than the others were determined to involve unique scenarios and appropriate corrective actions have already been implemented (as described in Attachment 1 to this letter). The NRC does not demonstrate a compliance concern by simply noting that current NRC's practices have helped licensees identify and rectify containment problems.

3. The NRC has not demonstrated that the proposed rule represents a cost-justified safety enhancement

The NRC staff suggested in Enclosure 6 of SECY-93-328 that the proposed rule is consistent with the backfit criteria as a safety enhancement backfit under 10 CFR 50.109(a)(3). While the safety enhancement rationale was not relied upon by the NRC in the proposed rule, it is important to highlight some of the more significant weaknesses in the analysis.

As required by the backfitting rule, the staff's analysis includes a discussion of the costs of the proposed backfit. However SECY-93-328 does not provide any analysis -- let alone quantification -- of the anticipated safety benefits of the proposed rule, e.g., in terms of improved containment failure probabilities or person-rem reductions. Without such an evaluation of the safety benefits, the NRC cannot fulfill its regulatory obligation to determine whether the proposed rule will result in a "substantial increase" in overall health and safety or whether the increased protection justifies the proposed rule's direct and indirect costs. (10 CFR 50.109(a)(3).)

With respect to cost, even utilizing the staff's own assumptions, each licensee will be required to spend over one million dollars per plant during the first ten year interval. This estimate is extremely conservative. For example, it does not consider the costs of the impact associated with resolution of interpretations of the requirements or the impact of having to implement the examinations within a five year period.

Furthermore, the NRC's conclusion that no significant worker exposure will result is open to question. Information that we have received from licensees indicates that implementation of the proposed rule could result in additional unjustifiable occupational exposure industrywide, for a ten year interval on the order of 3,000 to 5,000 person-rem. The NRC presents no rationale for extrapolating person-rem exposure industrywide from a single containment liner examination at the Monticello Plant. In light of the unique circumstances at each plant and the variety of inspections required by the proposed rule, a careful review of the expected worker exposure should be undertaken in accordance with 10 CFR 50.109(c).

In this connection, the NRC should also assess the impact of differences in facility type and design on the need for the proposed new requirements. Section 50.109(c) requires consideration of facility type and design in a backfitting analysis. Such an assessment, in our view, would lead to the conclusion that the most significant cases of degradation have been the result of unique factors (e.g., clogged drain lines in the sandbed region, lack of coating on the inside surface of a torus shell) and do not indicate an industrywide problem justifying the proposed rule.

We note that if the NRC decided to rely on the SECY-93-328 safety enhancement analysis, it would need to satisfy the criteria set forth in 10 CFR 50.109(a)(3) and address the factors of 10 CFR 50.109(c). In this event, the NRC would also need to re-notice the proposed rule in order to provide for meaningful public participation on the backfitting analysis.