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Subject: NIRS comments on risk-informing Part 50

July 30, 2003 (4:05PM)

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

To whom it may concern:

Attached please find the comments of Nuclear Information and Resource Service on the proposed rulemaking regarding risk-informing 10 CFR 50 SSCs.

Thank you,
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July 30, 2003

Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555
ATTENTION: Rulemakings and Adjudications Staff
By Email: SECY@nrc.gov

Nuclear Information and Resource Service Comments on Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Plants

To Whom It May Concern:

On behalf of Nuclear Information and Resource Service (NIRS), I am submitting the following comments on the proposed rule regarding Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Plants as noticed in the Federal Register [May 16, 2003, Volume 68, Number 95]. The U.S. Nuclear Regulatory Commission (NRC) solicited public comment on a proposal to amend its regulations to provide an alternative approach for establishing the requirements for treatments of structures, systems and components for nuclear power plants using a risk-informed method of categorizing structures, systems and components according to their "safety significance." The proposed amendment would revise NRC requirements with respect to "special treatment" or those regulatory requirements that provide increased confidence that safety systems are designed, installed, maintained and operated to perform their functions during a design basis event (earthquake, fire, age-related degradation accident, etc.). The amendment would allow the nuclear industry to remove systems and components newly deemed of "low safety significance" from the scope of certain identified "special treatment" requirements and revise their safety significance. The amendment would place unprecedented reliance on Probabilistic Risk Assessments (PRA) to re-categorize systems, structures and components as "of low safety significance" and replace in very large measure prescriptive requirements as to how licensees monitor, test and maintain safety-related equipment in the nuclear power station. In effect, the replacement of prescriptive measures with PRA would provide the opportunity to significantly reduce the number of systems, structures, and components currently classified as safety-related.

The NRC has established within Chapter 10 of the Code of Federal Regulations Part 50 (10 CFR 50) a set of regulatory requirements for commercial nuclear power reactors largely based on a "deterministic" approach. This deterministic regulatory approach is largely prescriptive in nature to determine that safety requirements and licensing

agreements are complete and maintained in compliance with federal regulation at commercial nuclear power plants. The deterministic approach requires the industry to maintain safety systems capable of preventing or mitigating the consequences of a design basis accident with a high level of confidence (operability, reliability and quality assurance) in order to protect public health and safety. The importance of insuring that these safety requirements and licensing agreements are complete and that licensees are subjected to regulatory enforcement for compliance at nuclear power stations can not be overemphasized. This is of particular concern to public health and safety as nuclear power station systems, structures and components age and deteriorate over time at the same time the nuclear industry, faced with an ever more competitive market, is seeking to reduce outage times and cut costs associated with testing, surveillance, maintenance and repair of these same systems, structures and components.

Industry argues that excess prescriptive requirements are overly burdensome and unnecessarily drive up cost without benefit to public safety and environmental protection. On the other hand, industry disregard of station technical specifications, along with insufficient regulatory oversight and enforcement of licensing agreements leads to unduly risking public health and safety by allowing management decisions to override safety margins in order to drive up production margins as documented most recently by FirstEnergy Nuclear Operating Company (FENOC) management malfeasance and NRC failures to maintain the Davis Besse nuclear power station in regulatory compliance. Such non-compliance resulted in significant degradation of the reactor pressure vessel head and a near accident condition. In the FENOC example, economic pressure resulted not only as a result of ineffectual surveillance and maintenance programs but management's deliberate and repeated abandonment of established programs where increasing degradation of the primary pressure boundary, a significant safety and production-related system, went undetected for several outages over the course of at least 6 years.

NIRS finds it important to note that the Davis-Besse degradation mechanism involving the extensive borated coolant corrosion through 6 ¾ inches of carbon steel of the reactor vessel head component was not considered either a probable or possible event. Vessel head corrosion leading to the failure of the safety significant component was never considered in agency or industry Probabilistic Risk Assessments in risk-informing the surveillance and maintenance activities of licenses reactor pressure vessels. Previous assumptions by the nuclear industry and NRC had concluded that dry boron deposits were not corrosive. In this aspect, NIRS notes that previous PRA assumptions have been documented to be risk misinformed to the point that otherwise robust design and safety margins can be overridden by licensee mismanagement. NIRS asserts that this does not provide a sound basis for the agency to expand the reliance on PRA.

NIRS contends that the proposed rulemaking in its current form in providing for the "risk-informing" of 10 CFR 50 runs the grave risk of further "risk-misinforming" the regulatory process as intended to oversee and enforce compliance with technical specifications and licensing agreements of nuclear power stations through a prescriptive

process. Thus, the proposed rule in its current form, if implemented, would not provide adequate protection of the public's health and safety.

NIRS also points out that NRC is pursuing a risk informed approach to 10 CFR Part 50 based on the "Commission has been successful in developing and implementing a regulatory means for considering risk insights into the current regulatory framework." While the Commission claims such success, it is remiss in acknowledging significant failure in the implementation of its risk-informed efforts. NIRS is particularly sensitive to this issue as a result of its direct involvement with the NRC decision to allow Davis-Besse to operate beyond December 31, 2001 per the advisory in NRC Bulletin 2001-01 as the result of the agency management's abandonment of a staff decision per a risk assessment under Regulatory Guide 1.174 to issue an Order for the shutdown of the reactor for inspection of the Control Rod Drive Mechanism Vessel Head Penetration Nozzles as directed by the bulletin.

There remain significant questions from a broad range of stakeholders—including NRC staff and public interest groups—that the criteria within Regulatory Guide 1.174 "An Approach for Using Probabilistic Risk Assessment on Plant-Specific to the Licensing Basis" were not adequately addressed before extending Davis-Besse's operation beyond the requested inspection and reporting deadline contained within the Bulletin. NRC documents obtained by NIRS through the Freedom of Information Act identified that at least 4 of the 5 key safety criteria had not been met.¹ Failure by Davis-Besse to meet the risk-informed attributes led the staff to draft and finalize the shutdown Order. A re-evaluation of the safety attributes in context of abandoning the Order in favor of allowing the operational extension produced 4 of the 5 key safety attributes were still not being met. While R.G. 1.174 is identified as a process for integrated decision-making using traditional engineering practices and risk informed insights, NIRS is now aware of NRC internal discussions and disagreement as to how many of the five regulatory guide criteria must be met to satisfy safety standards.² The regulatory guide specifies that the acceptability of proposed changes should be evaluated in an integrated fashion that ensures that all five criteria are met.

It is disingenuous for the agency to entertain an internal dialogue in an attempt to segregate any set of the key safety attributes from the others in an admittedly integrated process. Agency actions that include disregarding the key safety attributes in the risk-informing the Davis-Besse decision-making process or current efforts to establish a best out of five criteria for the integrated decision making process seriously damages NRC credibility in the area of risk-informed decision making.

NIRS finds that inconsistencies within NRC policy approach for risk-informing changes to the licensing basis seriously undermine public confidence in the agency's expanded use of risk informing changes as intended by the proposed rule.

¹ NRC FOIA 2002-0229 Appendix B-175.

² Inside NRC, "NRC Risk Analyst Agrees With Most, Not All, of Diaz Davis-Besse Letter," July 28, 2003, p. 7

The proposed rulemaking should not proceed without first addressing the confusion and inconsistency that currently affects the NRC risk-informed approach as outlined under RG 1.174.

NIRS is also aware of a Differing Professional Views dated September 26, 2002 regarding risk informing Part 50 as sought under the current proposed rulemaking.³

NIRS concurs with the following findings of the Differing Professional View.

The categorization and treatment process are not adequately linked to ensure that changes to risk are maintained small.

The categorization process proposed by the rule relies on long-term average unavailabilities and failure probabilities of systems, structures and components that are based on steady state assumptions. Observed surprises and large areas of uncertainty regarding degradation mechanisms raise concerns about the validity of steady state assumptions used in the categorization process. NIRS concurs that licensees implementing the proposed rule could fail to detect significant degradation that could cause multiple component failure during a single design basis accident.

The proposed rule relies on sensitivity studies generated by the licensee to evaluate changes in system, structure and components reliability and assess the change in risk to public health and safety rather than requiring the licensees to characterize and reasonably bound the effects of eliminating treatments on system, structures and components reliability under design basis and severe accidents.

The proposed rule no longer requires timely monitoring and adjustment of the categorization process to ensure that these sensitivity studies remain valid.

The proposed rule no longer requires that significant conditions adverse to quality be evaluated for their applicability to other components.

The proposed rule is technically inadequate to provide reasonable assurance that systems, structures and components will be capable of performing their safety functions under design-basis conditions.

As the DPV points out, in 2001 Idaho National Engineering and Environmental Laboratory compared special treatment requirements applied to safety-related components in nuclear power stations and commercial practices applied to non-nuclear components. INEEL concluded commercial practices varied so widely and commercial standards by themselves did not provide reasonable confidence of functionality. The study further concluded that station processes will have significant effect on providing reasonable confidence of component functionality. The DPV contended that the

³ Memorandum to NRC, David Fischer, NRR, To Sam Collins, Director, NRR, September 26, 2002, "Differing Professional View-Risk Informing Part 50 Option 2.

construct and content of the proposed amendment are not consistent with the conclusions of the INEEL study.

The DPV found that senior management made significant technical and policy changes to the proposed rule without receiving formal content from stakeholders.

The DPV further identifies that experience indicates that changes to treatment can have a significant and widespread impact on component reliability and possibly invalidate safety analysis performed to justify the changes.

The proposed rule does not contain a requirement for potential common-cause problems to be evaluated and corrected, particularly with common-cause failures that extend from one system to another that can invalidate the categorization process.

The monitoring, corrective action, and feedback required by the proposed rule is not adequate to ensure that timely adjustments are made to the categorization and treatment process as necessary to maintain safety.

The current rule is excessively reliant upon risk-based assessments and fails to acknowledge and adhere to the key safety principles identified in Regulatory Guide 1.174. The regulatory guide clearly identifies that changes be monitored to include tracking the performance of the equipment that when degraded can significantly affect the conclusions of engineering judgments and integrated decision-making that supports the licensing basis. Contrary to R.G 1.174, the proposed rule does not justify the agency's departure as to why such monitoring is no longer considered necessary.

The data does not currently exist to predict the effect of reduced treatment on currently identified safety-related systems, structures and components. NIRS contends this to be the equivalent of the unsafe practice of over-driving the headlights on one's automobile at night or operating the vehicle at a rate of speed that would exceed the visible braking distance available to the driver by the headlights.

The DPV further points out that under the current Reactor Oversight Process, the NRC will not periodically check to see if the licensee treatment processes for "low-risk" equipment are effective.

The established process for developing the proposed rule was not followed.

The DPV states, "Significant technical and policy changes were made to the proposed rule package during the concurrence process without consulting the technical staff, without providing a technical basis, without discussing the changes with the teams that were involved with developing the rule. (e.g., RIP-50 Core Team, Risk Management Team, Risk-Informed Licensing Panel). As a result of hastily making these changes to the proposed rule, there are significant inconsistencies between the proposed rule and

associated Statement of Considerations.”⁴ For example, the development and maintenance of linkage between the categorization and treatment processes is not required by the proposed rule.

NIRS contends that the elimination of prescriptive regulatory special treatment requirements as provided by the proposed rule would likely result in significant degradation to safety-related equipment and unduly increase the risk to public health and safety. The degradation would likely go undetected as a result of exemptions from monitoring, maintenance, in-service testing, and regulatory oversight. Therefore, the proposed rule does not provide reasonable assurance or adequate confidence that the proposed change in risk as a result of implementation of the rule will be insignificant and acceptably small.

It is apparent to NIRS that the aim of NRC by the proposed rule is to significantly reduce the costs to the industry associated with the reduction of surveillance, testing and maintenance to currently identified safety-related systems, structures and components. At the same time, the proposed rule will not provide adequate protection of public health and safety and could result in a catastrophic accident at one or more nuclear power stations.

NIRS views this as a blatant promotional activity on the part of NRC to economically shield the industry from current deterministic regulation intended to regulate the safety of the nuclear industry. Such promotional activity comes at the expense of unduly increasing the risk to public health and safety.

NIRS is, therefore, opposed to the proposed rule change as presently written.

Sincerely,

Paul Gunter, Director
Reactor Watchdog Project
NIRS

⁴ Memorandum of David Fischer, NRR/NRC, To Sam Collins, Director, Director, NRR/NRC, September 26, 2002, “Differing Professional View-Risk Informing Part 50 Option 2, p. 11.