

UNION OF CONCERNED SCIENTISTS

March 21, 1997

Mr. Samuel J. Collins, Director
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: REACTOR SAFETY MARGIN

Dear Mr. Collins:

Thank you for your letter dated February 27, 1997, in response to my letter of January 6, 1997, to Mr. Hubert J. Miller, Regional Administrator, Region I.

In your response, you indicated that I had implied that any licensee's failure to comply with the NRC's regulations corresponds to that licensee's facility having been operated unsafely during the period of nonconformance. That has never been my position, so I will attempt to clarify what I am advocating.

The safety implications of any nonconformance, in my opinion, are best measured by the corrective actions implemented by the licensee to resolve it. The originally reviewed and approved safety margins at the facility are clearly unaffected when the licensee is able to address a nonconformance via "soft" actions, such as successfully completing a surveillance test that had not been performed on time or accepting an apparent degraded condition as-is based on a rigorous engineering evaluation. However, when the licensee makes a physical change to the facility to correct a nonconformance, it is reasonable to conclude that these actions *restored* safety margin that had otherwise been missing.

By way of illustration, consider a facility with a technical specification limit that containment ambient air temperature must be $\leq 120^{\circ}\text{F}$. The accident analyses of design bases events assume an initial ambient air temperature of 120°F in the containment. The licensee verifies compliance with the technical specification by averaging a number of temperature instruments located within the containment. The licensee reports a nonconforming condition when it discovers that the methodology used to calculate average ambient air temperature is nonconservative by up to 8°F . A review of past operating data reveals that temperatures of $116\text{--}119^{\circ}\text{F}$ had routinely been experienced during full power operation in past summer months.

If the licensee reanalyzed all applicable design bases events for an initial ambient air temperature of 130°F in the containment and determined margin to safety limits, then it would be appropriate to conclude that the facility had not been operating unsafely. The physical plant configuration of the facility was adequate despite the nonconformance.

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However, if the licensee upgraded the containment cooling system to maintain the *corrected* ambient air temperature of the containment $\leq 120^{\circ}\text{F}$, then it would not be appropriate to conclude that the facility had been operating unsafely. The physical plant configuration of the facility was inadequate. This situation also applies in the case where the licensee revises procedures to direct its operating staff to start another containment cooling unit when necessary to maintain the *uncorrected* ambient air temperature below 110°F (i.e., to maintain the *corrected* ambient air temperature below 120°F).

My position on the safety implications of nonconformances appears consistent with the guidance provided by the NRC to its licensees in Generic Letter 91-18, "Information to Licensee Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability." This guidance permits *reasonable engineering judgement* to be used to determine that a safety function can be performed by a system, structure or component despite the nonconforming condition. When a licensee makes a physical change to the plant to resolve a nonconformance, *reasonable engineering judgement* should conservatively conclude that the safety function could not be performed unless there is an analysis showing that margin existed in the nonconforming condition.

This position is further reinforced by NRC actions relative to nonconservative decision-making by licensees. Following the marsh grass event at Salem in April 1994, the NRC was very critical of the decision-making by the licensee's operating staff. The NRC was also critical of the command and control capabilities of the operating staff at Zion during this month's inadvertent shutdown and restart event. The NRC has repeatedly informed its licensees that it expects them to make conservative decisions when faced with uncertain and unanalyzed situations. Thus, it seems that the NRC's own expectations would dictate that nonconformances resolved by physical plant changes must be considered to reflect prior unsafe operations unless specific evaluations indicate adequate margins existed. Absent such evaluations, the conservative decision must be to assume that adequate margin did not exist for the nonconforming conditions.

It is from this perspective that I evaluate the safety implications of nonconformances. It is why I cannot reconcile the findings of Maine Yankee's Independent Safety Assessment Team (ISAT) with the reassuring statements made to the public by NRC officials. The ISAT documented numerous nonconformances involving safety systems that were resolved by physical plant changes. The ISAT conducted vertical slice evaluations of four of the top five risk significant systems as ranked by the Maine Yankee licensee in its Individual Plant Examination. The ISAT documented missing wiring for the High Pressure Safety Injection (HPSI) pump, inadequate ventilation for the containment spray pump rooms, lack of overpressure protection for piping penetrating the containment, and numerous other problems. While some of these problems were resolved by "soft" actions, many of them involved physical plant changes. I am not aware of any evaluation performed by the licensee or by the NRC that would indicate that this facility had adequate safety margin with all of these nonconforming conditions existing prior to their resolution. In fact, the licensee reported that the missing HPSI pump wiring *alone* increased the core damage frequency at Maine Yankee by 6%. Therefore, any NRC official who concludes that Maine Yankee was not being operated unsafely with all of these nonconforming conditions is making, in my opinion, a nonconservative decision that is contrary to the expectations established by the NRC for its licensees.

My concern over the safety implications of nonconformances goes beyond the issue of the NRC's credibility in its dealings with the public. In your response to my letter, you stated:

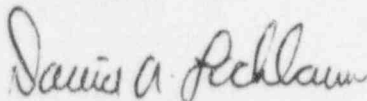
NRC Generic Letter 91-18, "Information to Licensee Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability," provides guidance for licensees when they identify degraded or nonconforming conditions.

However, once a plant has been shut down, for whatever reason, it is often more prudent to permit restart only after significant nonconformances have been corrected. Thus, it is possible that a particular deficiency that would have been insufficient by itself to warrant shutdown of a plant might be sufficient to warrant repair prior to restart.

I confess that I do not understand how it can possibly be more prudent, *from a nuclear safety perspective*, to require a license to correct nonconformances when a plant is shut down than when the plant is operating. I also do not understand how a problem, or even a parcel of problems, could be so significant as to prevent a plant from starting up yet be so insignificant as to not warrant shutting that plant down were it operating. The criteria for determining if a plant is safe to operate must be independent of the plant's operating condition. The reasonable assurance threshold that a system, structure, or component can perform its safety function cannot be lower when a plant is running than when it is shut down -- that is inversely proportional to the risk and quite frankly potentially dangerous. In short, the NRC cannot wait until some other event causes the plant to shut down before running in with a long list of safety issues that must be resolved. Such behavior has at least two adverse consequences: it erodes public confidence in the NRC's regulatory oversight function and it provides incentive for licensees to keep problem plants running under degraded conditions.

I realize that the NRC is reviewing its inspection and enforcement programs based on lessons learned from Millstone, Salem and Maine Yankee. I am prepared to assist the enhancement of these vital programs in any way that I can. Please do not hesitate to contact me if further clarification of my position is required or if I can answer any questions related to my concerns.

Sincerely,



David A. Lochbaum
Nuclear Safety Engineer

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