



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
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LISLE, IL 60532-4352

December 20, 2010

Mr. David Lochbaum
Director, Nuclear Safety Project
Union of Concerned Scientists
P.O. Box 15316
Chattanooga, TN 37415

SUBJECT: PALISADES NUCLEAR PLANT CONTROL ROD DRIVE SEAL LEAKAGE

Dear Mr. Lochbaum:

This letter is in response to the Union of Concerned Scientists issue brief, "Headaches at Palisades: Broken Seals and Failed Heals," that you sent to us in an e-mail dated July 16, 2010. Thank you for bringing your concerns to our attention. In a telephone conversation with you, the staff stated that we would review these concerns and provide the NRC's assessment of the issues you had raised.

We would like to note that the NRC has been aware of the control rod drive (CRD) seal leakage at Palisades -- the subject of your issue brief -- and followed it closely, assessing its impact on plant safety and monitoring the licensee's efforts to address these recurrent leaks. To date, we have not identified any violations of NRC requirements associated with this issue. That being said, we will take appropriate enforcement action if any violations occur in the future.

In your issue brief, which is enclosed with this letter, you express a concern that neither the licensee nor the NRC is treating repeated seal leakage issues as "significant conditions adverse to quality." In accordance with NRC regulations, a significant condition adverse to quality would require the licensee to take actions to prevent recurrence of these issues; and consequently, if the licensee failed to prevent recurrence, the NRC would take enforcement action. The NRC has evaluated the issue and continues to monitor it. The NRC's assessment is that elevated CRD seal leakage constitutes a "condition adverse to quality," which the licensee is required to correct. However, this condition does not represent a significant risk to safe operation of the plant and does not constitute a "significant condition adverse to quality" that requires actions to prevent recurrence.

As you stated, 10 CFR 50 Appendix B, Criterion XVI requires the licensee to establish measures to preclude repetition for "significant conditions adverse to quality." For conditions that are deemed to be "adverse to quality," but not "significant," the licensee is required to promptly identify and correct these conditions.

NRC inspection staff reviewed the issue brief as it related to NRC regulations including 10 CFR 50, Appendix B, and the Palisades Technical Specifications (TS).

The NRC does not consider identified CRD seal leakage at Palisades as a “significant condition” adverse to quality for the following reasons. First, it does not challenge the core cooling safety function. Second, the rod drive safety function is not impacted by this issue. Leakage from the CRDs has historically started small and slowly risen over time, typically over several months. The licensee monitors CRD seal leak-off temperatures each shift and this parameter has proven to be a reliable, real time indicator of seal degradation. Based on these and other indications discussed below, operators have always had advance indications of seal leakage approaching an amount that, by procedure, requires action. The leakage from CRDs is monitored to ensure leakage is well below the TS limit of 10 gpm, which is well within the capacity of coolant makeup systems. We reviewed five years of data and in all cases the plant was shut down before 2 gpm, the administrative limit set by plant procedures requiring the plant to shut down when this value is reached. Therefore, the core cooling safety function is not significantly challenged by this seal leakage. As far as the rod drive safety function is concerned, you stated the CRD leaks could damage rod drive motors as the seals would no longer have the ability to protect them from damage caused by moisture. In our review, we determined the safety function of the rod drive system is to rapidly insert rods ‘in’ on a reactor trip signal. This safety function does not depend on the motor to function, but on the ability of the mechanical gear system to operate under gravity with power removed. Therefore, the rod drive safety function is not impacted by this issue. On this basis, the CRD elevated seal leakage, while an adverse condition to quality, does not cause a loss of, or significant challenge to, system safety functions, and consequently, we do not conclude that the seal leakage is a significant condition adverse to quality.

The plant has established effective procedures for early identification of CRD leakage. TS maximum limit for total “identified leakage” is 10 gallons per minute (gpm). This quantity is for identified leakage which is attributable to any primary system mechanical seals such as the CRD seals, flanges or valves. Some small leakage (on the order of milliliters per hour for each seal) through the seals is anticipated as part of the design. Because the seals can degrade, the licensee administratively set a conservative limit for leakage from the CRD seals at 2.0 gpm (total) at which point plant procedures require the plant to be shut down. In addition, although the TS requires monitoring the leakage rate every 72 hours, the plant procedures require measurement of leakage on a daily basis. Indication of any leakage is also monitored through sump levels, temperature and radiation detectors inside the containment structure on an almost continual basis. In summary, once the seals are identified as degrading and approaching established conservative thresholds, the site procedures require that the licensee shutdown the plant and repair the seals. Our review confirmed the conclusions of previous inspection activities associated with this issue, in that, the licensee has been identifying the leaks in a timely fashion and correcting them.

A degraded seal, causing seal leakage higher than design, is not a desirable condition, in that, it requires NRC and licensee resources to monitor and respond when the plant shuts down for planned repairs. The NRC continues to monitor licensee actions with respect to CRD seals and to enforce the regulations that govern those activities to ensure the safety of the plant and the public.

D. Lochbaum

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Sincerely,

/RA/

John B. Giessner, Branch Chief
Branch 4
Division of Reactor Projects

Enclosure: As stated

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