



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

February 11, 2013

LICENSEE: Entergy Nuclear Operations, Inc.
FACILITY: Palisades Nuclear Plant
SUBJECT: SUMMARY OF THE JANUARY 12, 2013, PUBLIC MEETING WEBINAR
REGARDING PALISADES NUCLEAR PLANT

On January 12, 2013, the U.S. Nuclear Regulatory Commission (NRC) held a two part Public Meeting webinar to discuss NRC's perspectives on leaks, and the regulatory requirements that apply on the repair of such leaks. During the first part of the meeting, the NRC staff presented an overall discussion regarding leaks and provided examples of leaks that occurred in 2012 and how they were addressed. Enclosure 1 is a list of attendees at the meeting. Copies of the slides used by the NRC staff during the meeting can be accessed through the NRC's Agency wide Document Access and Management System: ADAMS (ML13010A282).

The NRC staff stated in the opening remarks that the second part of the meeting was geared towards answering follow up questions from the public about leaks. There were 87 meeting participants that had the opportunity to submit questions to the NRC staff about leak issues through the Webinar process. Several members of the public provided questions regarding the nature of the leaks that occurred during 2012. During the presentation, the NRC stated that they would provide the accession numbers to documents related to NRC responses to questions from Representative Markey and Ms. Pierman. The following are the ADAMS accession number to the documents:

- Chairman Response to Congressman Markey SIRWT/Safety Culture ML12191A401
- Ms. Pierman Letter #1 ML12181A492
- Ms. Pierman Letter #2 ML12275A151
- Letter to Congressman Markey ML12261A321

Entergy Nuclear Operations, Inc.

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In addition to answering questions from members of the public on January 12, NRC representatives agreed to provide an answer to technical questions regarding the topic of leaks that were submitted during the meeting, but were not answered during the allocated meeting time. The answers to these questions are included in the meeting summary (Enclosure 2).

Sincerely,

/RA/

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

Docket Nos. 50-255 and 72-007
License No. DPR-20

Enclosures: As Stated

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PUBLIC MEETING PRINCIPAL ATTENDEES

OCTOBER 1, 2012

NRC Attendees

C. Pederson, Deputy Regional Administrator, RIII
J. Giessner, Chief, Division of Reactor Projects, Branch 4
T. Taylor, Palisades Senior Resident Inspector
E. Sanchez-Santiago, Reactor Inspector, RIII

Questions for the NRC Meeting on January 12, 2013

- 1) I have previewed the slides. Slide 14 shows an image of a through wall leak. Is this an accurate representation of the size of the problem that caused the most recent leak at Palisades?**

Yes, slide 14 shows an accurate representation of the through-wall leak that was identified in Control Rod Drive Mechanism (CRDM) 24.

- 2) Why is there no monitoring directly watching out for primary coolant water leakage through the reactor pressure boundary? Why does the NRC allow false, bogus assumptions to stand – that unidentified primary coolant leakage is not coming through the reactor pressure boundary? It was through the reactor pressure boundary at Palisades for over a month – yet the NRC allowed the bogus/false assumption to prevail.**

The NRC requires all nuclear plants to have means for detecting, and to the extent practical, identifying the source of leaks coming from the primary coolant system. The licensee is required by technical specification to determine how much coolant is possibly leaving the primary coolant system. In order to determine possible sources of leakage, Palisades has a number of means available to detect the presence of a leak like changes in the following parameters: containment sump level, containment atmosphere gaseous activity, containment atmosphere humidity and containment air cooler condensate level. Through a combination of all the instrumentation mentioned the presence of a leak can be detected. After identifying that there is a leak in containment, the licensee has to locate the source of the leak.

In the case of Palisades CRDM leak that occurred in 2012, the leak was located in containment. Certain areas of containment, including the Reactor Vessel head are inaccessible during full power operations. The licensee categorized the leakage as unidentified leakage since they could not determine the exact location while operating at full power. The Technical Specification limit for unidentified leakage is 1 gallon per minute (gpm). The licensee shut down the plant at 0.3 gpm, which was well within the 1 gpm limit. The NRC monitored the increased trend in unidentified leakage since July 2012, when the plant was restarted from a forced outage, to ensure that the plant was taking action as the leakage increased.

- 3) Since Palisades' pressure boundary leak through-wall from CRDM-24 was going on since July 10 or July 16, why didn't the NRC fine Entergy \$130,000 per day for this regulatory violation – that the reactor was not shut down within 6 hours? Why didn't NRC fine Entergy \$3.38 to 4.16 million for this month-long safety regulation violation?**

The NRC still has open items relating to the CRDM leakage that occurred in 2012 (Inspection Report 050255/2012012 [ML12291A806]). The NRC will assess whether or not there was a violation of technical specification requirements and any findings during

a subsequent inspection. The results of this inspection will be documented in an inspection report an available for public review.

Normally, the NRC does not issue fines for safety findings at nuclear power plants. The agency's focus is on making sure the utility fixes the problems. Fines are issued in a number of different situations, including when the violations are deliberate.

- 4) Palisades has had CRDM seal leaks chronically, since 1972, with little let up. In 2001 and 2012 Palisades had CRDM through-wall leaks. What is wrong with Palisades CRDMs? Why have these leaks not been prevented? Why does NRC let this chronic leakage in highly safety significant CRDMs go on and on, for over four decades now?**

The NRC has different requirements that apply to leak repairs which depend on a number of factors, one of which is the location. The CRDM seals at Palisades have a design that has resulted in elevated leakage through the seals. Seal leakage increases over time due to seal degradation. This has led to a number of outages over the years to replace the seals. The NRC has tracked CRDM seal leakage issues at Palisades, and monitored the licensee's effort to address these leaks. This type of leakage from a mechanical seal is not categorized as pressure boundary leakage as defined by NRC regulations and does not compromise the safety of the plant. A leak from mechanical seals can be detected and trended since it progresses in a slow manner that allows for replacement before it could have any effect on the safe operation of the system. Additional information on this topic can be accessed through the NRC's ADAMS (ML103540550 and ML12261A321).

The leakage that led to the most recent outage occurred approximately 2 feet above the head near weld #5 on CRDM 24. This leakage was categorized as pressure boundary leakage as defined by NRC regulations, and was categorized properly once the source of the leak was identified. The NRC still has open items relating to the CRDM leakage that occurred in 2012 (Inspection Report 050255/2012012 [ML12291A806]). The NRC will address unresolved item, "Potential Failure to Prevent Recurrence of a Significant Condition Adverse to Quality." This assessment will address should the leak have been prevented.

- 5) Given the NRC identified that Entergy did inadequate ultrasonic testing (UT) on CRDM-24, actually missing several existent cracks, late revealed by dye penetrant testing, how can NRC allow Palisades to operate right now, since Entergy's UT tests are clearly inadequate, and other, adequate tests have not been performed on all the CRDMs? Similarly, why are "difficult" to access CRDMs not required to be tested at all? What if through-wall cracks are about to occur on those "difficult to access" CRDMs?**

As part of an extent of condition review, Palisades tested 8 of the remaining 44 housings to evaluate whether cracks similar to what led to the through-wall leak in CRDM-24 existed. During the review of those tests, the NRC concluded that the testing performed did not include adequate coverage of the potentially affected area. In response to NRC questions, these housings were retested with extended transducer coverage of the affected areas to ensure the plant was safe to start up. The NRC's questions are available in the document titled "Summary of the August 24 and August 28, 2012,

Meetings regarding Palisades Nuclear Plant Control Rod Drive Mechanism (CRDM) 24,” (ML12243A519). Given that these new examinations and subsequent analyses performed did not produce any adverse results, and no information indicated that the additional housings inspected had cracks similar to the CRDM 24 housing, the NRC deemed it safe to restart the plant.

Regarding the selection of the CRDM housings, the NRC considered the population selection to be reasonable. This is based on there being no known difference in the construction or operation of CRDMs between those selected and the remaining CRDMs, which are more difficult to access. For this reason the NRC determined that the sample selection was representative of the affected population. In addition, a periodic inspection plan likely will be needed, to look for potential degradation. Additionally, based on the time required for a potential crack to grow through-wall (a minimum of 2 years), the NRC finds no basis to require immediate resolution of the longer term issues. The NRC will follow-up to ensure the appropriate inspections are performed at an appropriate time interval.

6) If the cause of a leak is indeterminate, how can the NRC claim to be able to predict its propagation?

Based on information evaluated by the NRC we have been able to conservatively estimate crack propagation and determined that a minimum of 2 years would be required for a potential flaw to grow through wall. This was based on regional and headquarters experts conducting a detailed review of the technical evaluations that were performed to ensure the CRDMs' structural integrity met the applicable Codes and standards. Based on the location of the crack, it was concluded that CRDM 24 experienced a through-wall crack due to a type of stress corrosion cracking which occurs under stress and certain water chemistry conditions. The licensee conducted analyses and inspections to determine if other CRDMs may be susceptible to the same failure. The NRC monitored some of those analysis and inspections to ensure they were accomplished in accordance with appropriate standards. This included inspecting eight additional CRDMs to determine if any of the other CRDMs have similar cracks. The inspections identified no additional cracks. Periodic inspections will likely be needed to look for potential degradation, and will be evaluated by the NRC.

7) Isn't this Class 3 system, service water system, the same one involved in one or more breakdowns in 2009-2011, which resulted in an NRC white finding, which contributed to Palisades designation as Degraded Cornerstone, one of just a handful of reactors in the country with such a poor safety status? Why didn't the September 2012 through-wall leak on the service water system also result in at least a white finding then – or better yet, a worse, yellow finding – given all these repeat problems? And land Palisades back on the bad list?

Although the two issues occurred in the same system, they are not comparable in their safety significance. The Class 3 leak from the service water system mentioned during the January 12 Webinar was in the critical service water system and was located in the discharge side of a Component Cooling Water Heat Exchanger. Due to the location of the leak (at the outlet of the component cooling heat exchanger), it was of very low safety significance and had no effect on the system performing its safety function. In comparison, the White finding was associated with the failure of service water pump

P-7C due to intergranular stress corrosion cracking that occurred on a pump shaft coupling on August 9, 2011 (ML 112780190 and ML 120450037). The failure of a pump could affect the proper function of the system; for that reason, the finding was of greater safety significance (White). The NRC will follow-up and review these issues to ensure corrective actions are in place.

- 8) Why did/does the NRC allow a 300,000 gallon tank of water to be located above the control room? That doesn't seem to make good safety sense at all. Isn't the control room, by its very nature, a concentration of highly safety significance electrical circuitry and equipment that must be kept dry? How could NRC allow leakage of water into the control room for months on end? Why was NRC Chairman Jaczko kept in the dark about these leaks into the control room, even as he toured the control room? What is the status on the investigation into why Chairman Jaczko was kept in the dark? Why was the public kept in the dark, until courageous whistleblowers revealed it?**

The NRC previously evaluated the construction of the tank and has found it acceptable.

The leakage into the control room occurred in three separate distinct locations. The leakage is described in detail in ML12191A401. The leakage into the control room first occurred during May 2011, and on a separate occasion in early May 2012. These leaks were very small, about 1 cup per day. Water also entered the control room on a third separate occasion in June 2012, with a higher leakage rate, several drops per minute. However, this water was not related to leakage from the tank, but rather the source was water-cooled equipment used for repair activities conducted while the plant was shut down. On this occasion, water did reach safety-related components; however, follow-up inspections did not reveal any effect on plant equipment. The NRC issued a Green Finding on this issue in the 2012 third quarter Inspection Report (ML12319A093). There is no leakage into the control room at this time. The NRC has issued a Confirmatory Action Letter to the licensee to ensure the continued safe operation of the SIRWT (ML12199A409).

In a letter dated September 4, 2012 (ML12181A492), Chairman McFarlane addressed the concern of former NRC Chairman, Gregory Jaczko, not discussing the issue of leakage from the Palisades Nuclear Power Plant SIRW tank during a meeting with the public on May 25, 2012. The letter states: "At the time of the meeting, the NRC staff had evaluated the issue and determined that the SIRW tank leakage was not impacting public health and safety, or safe plant operation. An issue of this nature would not normally call for notification of the Commission."

In addition, on June 25, 2012, the NRC Office of Investigations self-initiated an investigation to determine whether officials of Entergy Corporation, owner of the Palisades Nuclear Generating Station, provided complete and accurate information to the NRC regarding leakage from the safety injection refueling water tank, including leakage into the control room. The investigation is ongoing.

- 9) How can NRC claim that the SIRWT structure is sound? Isn't Entergy continuing to use the SIRWT under "degraded conditions" exemptions?**

The integrity of the tank is evaluated by using the American Society of Mechanical Engineers (ASME) Code, parts of which have been endorsed by the NRC for use in

nuclear plant applications. A specific Code Case, endorsed by the NRC, provides analytical ways of providing the boundaries for the safe operation of the tank. This Code Case assesses worst-case crack location, growth rate and geometry, and has additional safety margins applied. The value provided, after evaluating the Code Case, is that leakage must be less than the 38 gallon per day (gpd) to ensure structural integrity (The details are discussed in ML12193A631). This is specified in the Confirmatory Action Letter as the point in which the plant should shut down. The current leakage in the area surrounding the tank is approximately 0.8 gpd. The NRC will continue to monitor the leakage to ensure the safe operation of the plant.

10) Slide 18 – steam leak next to electrical plugs and outlets? Isn't this a danger of short circuits? Fires? Electrocuting? Were those electric wires turned off, given that source of moisture, steam leak?

The slide shows electrical cables in the background that are part of instrument indications that went to a processing unit in the room. The cables are rated for this environment and did not represent a risk to plant personnel, and were performing properly.

11) Relative to pipe leaks; do you do sonar or x-ray inspections?

Depending on the type of pipe and location of the potential leak there are a number of methods available for the inspections such as: dye penetrant testing, ultrasonic testing (which uses sound waves) and radiography (which may use x-rays).

12) Can these leaks be due to a number of cycles (fatigue cycles) or are we sure that they are not?

Our inspection efforts are still ongoing. Our current assessment does not show the CRDM crack propagated by fatigue failure, but by transgranular stress corrosion cracking. Future inspections will take a close look at the possibility of fatigue cycles influencing the crack in CRDM housing 24. The results of these inspections will be available in an inspection report.

In addition to answering questions from members of the public on January 12, NRC representatives agreed to provide an answer to technical questions regarding the topic of leaks that were submitted during the meeting, but were not answered during the allocated meeting time. The answers to these questions are included in the meeting summary (Enclosure 2).

Sincerely,

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John B. Giessner, Chief
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Letter to Entergy Nuclear Operations, Inc. from J. Giessner dated February 11, 2013.

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