UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

August 9, 2013

LICENSEE: Entergy Nuclear Operations, Inc.

FACILITY: Palisades Nuclear Plant

SUBJECT: SUMMARY OF THE JULY 16, 2013, PUBLIC INTERNET EVENT BRIEFING REGARDING PALISADES SAFETY INJECTION REFUELING WATER TANK (SIRWT) LEAK

On July 16, 2013, the U S. Nuclear Regulatory Commission (NRC) held a two part Public Internet Event Briefing to discuss NRC's perspectives on the Palisades SIRWT leak that occurred in May, 2013. During the first part of the meeting, the NRC staff presented an overall discussion regarding the leak, repairs performed and respective NRC inspections. 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 (ML13193A330).

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 nuclear plant releases and the recent leak at Palisades. There were 63 meeting participants that had the opportunity to submit questions to the NRC staff related to the SIRWT through the Webinar process.

In addition to answering questions from members of the public on July 16, NRC representatives agreed to provide an answer to technical questions regarding the topic of the SIRWT leak that were submitted during the meeting, but were not answered during the allocated meeting time. The answers to these questions and the follow-up to two questions answered during the webinar are included in this meeting summary (Enclosure 2). A recording of the webinar will be provided by separate correspondence.

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

July 16, 2013

NRC Attendees

J. Giessner, Chief, Division of Reactor Projects, Branch 4
T. Taylor, Senior Resident Inspector, Palisades
M. Holmberg, Senior Reactor Inspector, Division of Reactor Safety, Branch 1, RIII
D. Alley, Senior Materials Engineer, Nuclear Reactor Regulation
R. Conatser, Health Physicist, Office of Nuclear Regulatory Research
S. Shah, Reactor Engineer, Division of Reactor Projects, Branch 4
V. Mitlyng, Senior Public Affairs Officer, RIII
P. Chandrathil, Public Affairs Officer, RIII

Questions for the NRC Meeting on July 16, 2013

1. How did the utilities (Consumers Energy, and now Entergy) and the NRC miss the fact that the SIRWT floor support structures had never been installed in 1968?! How did all the "experts" not realize a construction error had been made 45 years ago?! Doesn't the missing floor support structures (missing sand bed region and missing grout rings on the nozzles) go a long way in explaining why the SIRWT began leaking in the first place, and why none of the attempted repairs of the past two years have worked?! Entergy's and NRC's previous analyses and conclusions, re: root cause and how to fix the problem, were all based on the false assumption that the support structures were in place! In fact, both Entergy and NRC referred to the non-existent sand bed region in previous explanations about the root cause and proposed fixes for the leaks in the SIRWT! Does 300,000 gallons of water, pressing down on the thin-walled aluminum floor plates lacking structural supports for 45 years, explain the leakage and inability to repair it?! What explains the construction error 45 years ago? Was it an oversight to not install the sand bed region and grout rings (incompetence), or was it intentional fraud (taking credit for the installation on the blueprints, in interactions with the Atomic Energy Commission and even recently with the NRC), failing to install it in order to save time, money, and bother? Did those responsible for not installing the floor support structures figure that the thin-walled aluminum SIRWT would be strong enough to last 40 years, even without the support structures?

   NRC Answer:

   NRC Inspectors assessed licensee efforts to determine the cause of the leak and the proposed corrective actions to allow the tank to be safely returned to service. The tank repairs were completed; the tank is currently operable. One finding was recently identified regarding the cause of the leakage and is included in section 1R08 of NRC Inspection Report 05000255/2013003 (ML13219B114). Additional activities to assess the completeness of the licensee's root cause efforts in light of previous leaks and potential configuration-control issues over time regarding tank design will be inspected later this year. It is too early for the NRC to conclude that the deficient condition (lack of sand and grout pad) caused other through wall leaks. Future inspections will evaluate the impact of the missing sand bed and grout pad underneath the tank. Therefore, this issue will remain open pending completion of further inspection activities. Further efforts to review the licensee's characterization and assessment of the leakage, to include any required documentation and reporting, will be performed in future quarters this year.

2. How can NRC have allowed a leak above and into the control room to go on for over two years?!

   NRC Answer:

   There were no continuous leaks into the control room for over two years. There were four separate occasions where leakage did occur into the control room. These leaks were small, lasted a short period of time, and did not impact the equipment's ability to perform its function. The summary of leaks into the control room is provided below.

On May 18, 2011, the licensee observed leakage into the control room (the licensee's estimate was 0.08 gallons per day) during the night shift after heavy rainfall and notified the NRC the following morning. The licensee initially attributed the leakage to roof leaks due to the rain, and investigated other sources for the leak. The leakage was from a seam along the ventilation duct in the far left corner of the control room and did not impinge on main control room equipment. The resident inspectors inspected the control room ceiling, walls and panels, observed that the licensee had installed collection devices to contain the leakage, and concluded that the leaks did not impact control room equipment. A couple weeks later, the licensee repaired the auxiliary building roof and noted that the small amount of control room leakage had stopped. The cessation of leakage was confirmed by inspectors, who routinely tour the control room.
During the refueling outage in spring 2012, once the SIRWT was refilled, the licensee noted leakage into the control room from a similar location that had last been observed in summer 2011 (described above), again of minor magnitude and not impacting any equipment. The NRC confirmed this information. Additionally, the licensee had noted some leakage near the center of the control room since the tank refill following the outage and had set up a metal tray in the ceiling to collect that leakage. The licensee did not report any impact to equipment. Inspectors periodically observed these areas and noted that the leakage had stopped a few days after it was first identified.

Water also entered the control room on a 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. The leak was quickly stopped. On this occasion, water did reach safety-related components; however, follow-up inspections by the NRC 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).

Finally, on June 4, 2013, a few drops of water from the control room ceiling dripped onto one of the control room panels. The leak originated from the ‘M’ nozzle during SIRWT repairs. The licensee established a catch device to capture the leakage. The leakage lasted for approximately 4 hours at 3 drops per minute. The resident inspector walked down the control room and verified there was no impact to any equipment. The leak into the control room was quickly stopped.

The licensee has to repair the concrete ceiling of the control room in accordance with the NRC Confirmatory Action Letter (CAL EA 12-155; ADAMS # ML12199A409).

3. Why did NRC, or the Atomic Energy Commission (with later NRC complicity), allow for a design that placed a 300,000 gallon tank of water directly over the control room?! Isn’t that a very risky place to put so much water, given all the safety-critical equipment, circuitry, etc. directly below that cannot be allowed to get wet, or all control over cooling, safety, communications, monitoring, etc. systems could be lost?!

   NRC Answer:

   The NRC previously evaluated the construction of the tank and has found it acceptable. The NRC, during initial licensing, reviewed scenarios where the tank structure could be impacted and determined in all events in the site’s license, the plant could be safely shutdown and the events mitigated. The very small leaks described in Question 2 above

did not challenge the control room equipment and were of very low safety significance. There is no plausible source of flooding in the control room. If the NRC concluded the control room equipment could be susceptible to flooding from any source, we would take action to ensure the plant is placed in a safe condition.

4. Is the SIRWT seismically qualified? Up to what magnitude of earthquake? Could the SIRWT survive an earthquake without leaking all its water down directly into the control room, risking total loss of control over the operating reactor? Has NRC revisited its Palisades and/or SIRWT seismic analyses, given all the natural gas fracking activity proposed in the vicinity of Palisades, which is documented to cause earthquakes (as in Arkansas, Ohio, etc.)?

   NRC Answer:

   The seismic analyses related to the SIRWT addressed the tank shell, roof and anchorage. The bottom plate was not addressed as it is very flexible and is directly supported on the concrete slab. The piping in the catacombs was seismically analyzed. A hypothetical tank failure will cause spillage on the roof area, but not in the catacombs. Originally, the SIRWT was seismically qualified for accelerations up to 0.42g horizontal and .133g vertical. These acceleration values were part of the original purchase specification. The specifications are based on ground acceleration (as a fraction of earth's gravity, 'g', 32 feet/second/second). These values are not based on the magnitude of an earthquake since the key factor for design is acceleration at the location of the structure or the component. The Palisades Plant subsequently committed to re-evaluating certain plant equipment to new seismic requirements in accordance with the Generic Implementation Plan (GIP)-2 developed by the Seismic Qualification Utility Group (SQUG). The SIRWT, however, could not be qualified to these new SQUG requirements. The issue was resolved through providing an alternate path of borated water in case the SIRWT is unavailable following a seismic event. The spent fuel pool was designated as the alternate source of borated water to be used for primary system coolant make up while the plant is shutdown following a large seismic event.

   Rupture of SIRWT was reviewed some time ago and the following conclusion was provided in the licensee's safety analysis report dated September 4, 2012:
   "The rupture of the SIRW tank was evaluated separately. It was concluded that rupture of this tank will have no effect on other safety-related equipment." If the SIRWT ruptured, the vast majority of the leakage would be onto the roof. The piping under the tank has been seismically analyzed and therefore the tank failure will affect the roof area but not the catacombs under the roof. Even if some small amount of leakage did occur and migrated from the roof to the catacombs, the concrete ceiling of the control room (essentially the floor of the catacombs), will keep the leakage from the control room. It has been noted in Question 2 above; there are some very small, tight cracks in the control room ceiling resulting in small leakage on a few occasions. In 2012, due to these deficiencies in the Control Room (CR) ceiling, an additional evaluation was performed. According to this assessment, the leakage from the tank will not impact CR components. The NRC concluded this assessment to be reasonable based on the size of the cracks and the fact the catacombs open into the Component Cooling Water (CCW) room, and therefore, water would not pool in the catacombs area. For the very small leaks possible from the roof or tank, barriers, shields, etc. can be used to protect safe shutdown equipment from effects of these small leaks. The NRC notes this condition is not acceptable long-term and must be repaired as described in Question 2.

The NRC has not revisited the SIRWT seismic analysis based on any reported fracking activities. Based on observations made to-date, the magnitudes of the earthquakes attributed to deep wastewater injection processes in the Central and Eastern United States (CEUS), with a high-degree of certainty, have been approximately magnitude 5.0 or less. Earthquakes of magnitudes 5.0 or less have historically had little effect on modern, well-engineered structures such as nuclear power plants as each nuclear power plant is designed to a ground-shaking level that is appropriate for its location, given the potential earthquake sources that may affect the site and its tectonic environment.

In summary, the SIRWT has been evaluated for a possible rupture and in the worst case seismic event in the plant's design; the plant can be safely shutdown even without SIRWT water. The control room has been adequately evaluated to ensure there is no flooding potential which will impact safety equipment.

5. Why does NRC allow a 38 gallon per day leakage rate from the SIRWT, when it's been clearly shown that such leakage can penetrate directly into the control room, or can spill directly into Lake Michigan? Shouldn't the "allowable" leak rate be ZERO gallons per hour, especially considering the radioactive (tritium, hot particles, etc.) content of the SIRWT water, as well as its boric acid content (corrosive to electrical circuitry and equipment in the control room, for example)?

   NRC Answer:

   The integrity of the tank was 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, provided analytical ways of providing the boundaries for the safe operation of the tank. This code case assessed worse-case crack location, growth rate and geometry, and had additional safety margins applied. The code case ensured adequate margin to provide high assurance the tank is structurally acceptable. The value provided, after evaluating the code case, was that leakage had to be less than the 38 gallon per day (gpd) to ensure structural integrity (The details are discussed in ML12193A631). This was specified in the Confirmatory Action Letter as the point where the plant must shut down. The current leakage since tank repair is 0. The CAL has been revised and there is no limit for leakage, since the tank is not leaking. The NRC will continue to monitor the SIRWT to ensure the safe operation of the plant. The leakage that went to Lake Michigan should not have occurred, but assessment of this leakage indicated no impact to the safety of plant workers or the public. The amount of radiation to a member of the public from the approximate 80-gallon spill was estimated to be less than 0.000002 rem, with the federal limit to a member of the public being 0.1 rem. Thus, the estimated release constitutes less than one-fifty thousandth (1/50,000) of the federal limit.

6. The NRC states (slide #7) that sand samples indicated no impact to the public. NRC is assuming that the spill's radioactivity would have washed back up onto the beach? Or contaminated the beach on the way to the Lake? Isn't the more appropriate question, is the radioactivity being released by Palisades (both this May 5th spill, and 42 years' worth of additional releases) being ingested as drinking water, as by the residents of South Haven? Or, worse still, is the drinking water aquifer contaminated with radioactivity, so that those residing nearby and drinking well water (such as the cottagers at Palisades Park resort community) ingesting concentrated tritium contamination? NRC often downplays the releases to the Lake, claiming that dilution is the solution to radioactive

pollution. But isn't this a delusion, given that bio-accumulation, bio-concentration, bio-magnification reverses this dilution process, and we humans reside at the very top of the food chain?

NRC Answer:

No radioactive materials have been identified in any drinking water either as a result of the SIRWT leak or as a result of any other effluent from Palisades. In the case of the SIRWT leak, tritium was present in the leak water, but tritium water does not concentrate in the lake water, nor does it bio-accumulate (or bio-concentrate or bio-magnify) in fish. The dose from the SIRWT leak was estimated to be 0.000002 rem. This dose estimate includes all exposure pathways including, drinking water, fish consumption, swimming, and boating. The methodology includes many conservative assumptions that overestimate the actual exposure. A dose of 0.000002 rem is very small, and it is about the same as the dose a person receives from the natural radioactivity present in any of the following scenarios:

- Living in a brick or stone house for 2 hours,
- One hour of exposure to the natural radioactivity in the human body, or
- One minute of an airline flight from New York to Los Angeles.

The results of the sand samples collected by the NRC (ADAMS Accession Number ML13218A402) provided additional evidence to substantiate the initial dose estimate. This is why the NRC said the sand samples indicated there was no impact to the health and safety of the public.

Additionally, bio-accumulation is assessed separately through the radioactive environmental monitoring program (REMP). The REMP collects drinking water, fish, sediment, broadleaf vegetation, and agricultural crops important to the local area. At Palisades, below are some sampling locations and frequencies:

- Air Sampling is continuous and collected weekly.
- Lake (surface) water at the plant lake water inlet is a monthly sample.
- Lake (drinking) water at the South Haven drinking water supply is a monthly composite sample.
- Well (drinking) water is a monthly sample at the Palisades Park Community when the well is in operation.
- Fish samples are performed on a semi-annual basis.

The recent Palisades reports related to radionuclide sampling and reporting and their frequency can be viewed at:
http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/pali.html.

These sampling results show that there are no radionuclides detectable in drinking water in the vicinity of the plant.

7. How come, with a dozen NRC inspectors overseeing the SIRWT repairs, they did not detect and publicly announce much earlier than they did the lack of floor support structures, a 45 year old un-intentional construction error, or else intentional shortcut taken in 1968?

NRC Answer:

In 2012, it was the NRC's understanding that the sand bed was in place underneath the tank (ML12193A631). There were some areas where sand needed to be renewed / refilled, but the sand bed was believed intact. It was not until 2013, the licensee and the NRC discovered the sand bed was essentially missing. The NRC issued a meeting summary (ML13154A506) once the licensee informed the NRC during a conference call stating that grout pad and part of the sand support underneath the tank was missing.

8. How did NRC approve the substitution of asphalt and fiberboard, for the sand bed region and grout rings called for in the original design?

   NRC Answer:

   The NRC approved the substitution of asphalt and fiberboard for the sand bed region because the licensee's original SIRWT Construction Code recognizes both materials (asphalt and fiberboard) for this application.

9. Why was the public not even notified of this proposal until it had already been approved by NRC and installed by Entergy?

   NRC Answer:

   The licensee can change component design or make repair decisions in accordance with site procedures that meet our regulations without prior NRC approval or public notification. In general, a licensee may make a change to the design of the plant without prior NRC approval if the change does not require a change to the plant's NRC-approved Technical Specifications or if the change would not change the facility "as described in the final safety analysis report." The final safety analysis report is the official description of the nuclear plant and its design basis that was approved by the NRC in initial licensing, as updated throughout the life of the plant. In addition, even if the facility as described in the final safety analysis report is changed, the changes can be made without a license amendment if the specific criteria in 10 CFR 50.59 (http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-0059.html) are met.

10. Does fiberboard have enough structural integrity to stand up, without disintegrating, to the water leakage, even from rainwater, which has been experienced by the SIRWT and adjacent roof in the past few years?

    NRC Answer:

    The licensee's original SIRWT Construction Code recognizes the asphalt impregnated fiber board material for this specific application (cushion the SIRWT) and is expected to last the life of the SIRWT, and is resistant to water intrusion.

11. Isn't asphalt and fiberboard a deviation from licensing basis and technical specifications?

NRC Answer:

The licensee's original SIRWT Construction Code recognizes the use of the asphalt impregnated fiber board material as a cushion underneath the SIRWT. Therefore, the use of the fiber board is not considered a deviation from the plant's technical specifications and licensing basis.

12. Why wasn't a license amendment proceeding, with full public access and involvement opportunities, required by NRC?

NRC Answer:

The licensee can change component design or make repair decisions in accordance with site procedures that meet our regulations without prior NRC approval or public notification. Depending on the specific change, a licensee may or may not be required to seek and obtain prior NRC approval via a license amendment. There are regulations that govern what the licensees need to consider in making those decisions. The NRC routinely reviews this area through its inspection program to ensure that the licensees follow the regulations in making those decisions and to determine whether it agrees or disagrees with the licensees' conclusions. These NRC inspections are documented in publicly available inspection reports. As mentioned in answers to previous questions, the licensee's original SIRWT Construction Code recognizes the use of the asphalt impregnated fiber board material as a cushion underneath the SIRWT. The NRC inspectors independently reviewed the licensee's conclusion and supporting evaluation and determined that a license amendment was not required.

13. How can NRC allow Palisades to operate, when in early June it appears that rainwater was able to leak through the age-degraded roof and ceiling into the control room below, dripping down on control room panels containing vulnerable electrical circuitry essential for running the safety, cooling, etc., systems of the plant?

NRC Answer:

The leakage into the control room did not result from rain water. On June 4, 2013, one of the nozzles ('M' nozzle) from the tank (which was empty for repairs) slowly filled with water as a result of an isolation valve not being fully closed. The pipe overflowed slightly causing water to collect in the catacombs. A rubber barrier and other repairs established to prevent leakage into the control room did not provide that function. A few drops of water from the control room ceiling dripped onto one of the control room panels. The licensee established a catch device to capture the leakage. The leakage lasted for approximately 4 hours at 3 drops per minute. The resident inspector walked down the control room and verified there was no impact to any equipment. Prior to startup, the licensee installed a new barrier and is assessing methods to address repairs to the concrete floor pursuant to the NRC's Confirmatory Action Letter. Currently, there are no leaks in the control room.

14. Why didn't NRC require that Entergy replace the entire 46 year old SIRWT (1967-2013)? Even U.S. Rep. Fred Upton (R-MI), one of the most pro-nuclear members of Congress, urged Entergy to consider replacing the entire SIRWT.

NRC Answer:

The licensee completed extensive repairs to the SIRW tank floor and associated nozzles; these repairs have returned the SIRWT to an operable status; and the degraded / nonconforming condition no longer exists. As long as the SIRWT can perform its safety functions, the licensee is not required to replace the tank.

15. Why is Palisades allowed to operate with a roof and ceiling above the control room that is so vulnerable to leakage currently? When will the supposedly required repairs be completed? So in the meantime, buckets will suffice as a safeguard, in NRC's mind?

NRC Answer:

See answers to Questions 2, 3 and 4 for a detailed assessment of the control room susceptibility to possible flooding. Since plant startup after repairs to the SIRWT, no leakage has been noted in the catacomb area despite several heavy rains that have occurred. This is monitored daily by the licensee. NRC inspectors routinely verify this as well. Per the Confirmatory Action Letter, the licensee must repair the control room ceiling before startup from the next refueling outage.

16. On Slide #13, NRC claims inspections show no leakage [from SIRWT]. But hasn't NRC been saying that for the past year? Didn't Entergy say that they were now on top of the problem, and wouldn't happen anymore? That was on April 26, 2013. Then, a week later, the latest leak, this time a spill of 82.1 gallons of radioactive water into Lake Michigan, occurred.

NRC Answer:

Currently, there is no evidence of leakage from the SIRWT. The NRC has not claimed that the tank was not leaking during the past year (See ML12193A631 and ML13042A293). There was leakage from the tank which was described in the CAL and had been very low (less than 1 gallon per minute) before the May 2013 shutdown.

17. So if the May 4th leak [from the SIRWT] had been 50,000 times bigger than it was, NRC would have been fine with that too?!

NRC Answer:

The NRC reviews every occurrence of a leak or spill using the same protocol: determine the dose impact of the event and assess whether the rate was within the Effluent Concentration Limit (ECL).

18. If "the seepage into the control room is not acceptable," as Jack Giessner just said, then why is Palisades at 100% right now?! The roof and ceiling leakage vulnerability is still not yet solved, right?!

NRC Answer:

On June 4, 2013, a few drops of water from the control room ceiling dripped onto one of the panels. The leak originated from the SIRWT 'M' nozzle during tank repairs. The licensee immediately established a catch device to capture the leakage. The leakage

lasted for approximately 4 hours at 3 drops per minute. The NRC resident inspector walked down the control room and verified there was no impact to any equipment. The NRC does not consider seepage into the control room acceptable, and requires the site to take corrective action. In this case, the corrective action does not require a plant shutdown, as plant safety is not jeopardized based on these very small cracks. However, the licensee has to repair the concrete ceiling in accordance with the NRC Confirmatory Action Letter (CAL) (ML12199A409) before the end of the next refueling outage. Currently, there are no leaks in the control room.

19. Need to address whether or not the licensee is going to fix the service water leak - and when?

    NRC Answer:

    The licensee must address and repair the service water leak in accordance with Codes and regulations. An evaluation in accordance with an approved ASME code case was performed which will allow the licensee to operate with the leakage. Per the code case, repairs must be made during the "next scheduled outage." Until then, the licensee must monitor the leak and examine other areas that may be susceptible to the same type of degradation. This service water leak continues to be monitored, continues to be small (approximately 1/3 gallon per hour and stable). The licensee completed ultrasonic examinations to confirm the extent of the thinned area near the leak and to demonstrate that leak does not impact the structural integrity of the pipe.

20. And, it appears NRC inspections in 2012 regarding weld problems were not very thorough so why again should the public feel safe with your assurances? What other inspections missed problems that will surface and cause future problems and more radioactive leaks?

    NRC Answer:

    The licensee concluded that the SIRWT leak that occurred in 2013 was the result of an improperly performed weld from 2012. The NRC reviewed the cause for the failed weld and identified one finding as documented in section 1R08 of NRC Inspection Report 05000255/2013003 (ML13219B114). The NRC inspection program is focused on those activities with potential risk significance. Although the leakage at the SIRWT nozzle reinforcement weld should not have occurred, it was of very low risk significance as documented in NRC Inspection Report 05000255/2013003 (ML13219B114). Additional activities to assess the completeness of the licensee's root cause efforts in light of previous leaks and potential configuration control issues over time regarding tank design will be inspected later this year. Therefore, this issue will remain open pending completion of further inspection activities. Further efforts to review the licensee's characterization / assessment of the leakage, to include any required documentation and reporting, will be performed in future quarters this year.

21. Why won't NRC name names, in terms of the contractor which screwed up the 2012 welding on the SIRWT? Isn't NRC's mandate to protect public health and safety and the environment? It would seem that naming the name of the contractor which screwed up so badly at Palisades should absolutely be public knowledge. The public absolutely has a right to know, both morally and legally.

NRC Answer:

The NRC usually does not release the names of people involved in issues at the plant. The licensee is responsible for the site's activities, and is held directly accountable.

22. The voided sand region is "Somewhat less important"? So Palisades' licensing basis and technical specifications are optional?!

    NRC Answer:

    The tank rests on a concrete surface as opposed to a fill surface. This reduces the potential for non-uniform (point) loads on the tank bottom. The purpose of the sand bed is to "cushion" the tank bottom; i.e., to ensure uniform loading. The sand bed does not provide the structural support for the tank; the concrete surface provides that function. Given that the probability of non-uniform loads on the tank bottom is substantially reduced due to the fact that the tank bottom rests on concrete, the technical need for the sand bed is substantially reduced. This statement does not, however, imply the absence of the sand bed in the as constructed tank is acceptable from a regulatory perspective. The NRC will be conducting an inspection at Palisades in the near future to consider issues of regulatory compliance associated with the absence of the sand bed under the as constructed tank.

23. Given that Palisades had repeat service water system leaks and breakdowns in 2009 and 2011, and now again in 2013, when is NRC going to slap a significant enforcement action on Entergy? You've said the SWS is safety-significant, but NRC is not treating it this way. It's treating all these repeat breakdowns and leaks as NOT safety-significant. Actions speak louder than words.

    NRC Answer:

    The service water system is safety-related. An issue identified as affecting the system (or any system for that matter) can range from a non-significant issue to very significant issue depending on the nature of the issue. In the case of the service water leaks, they have not been safety significant. Functionality of the system has not been challenged. Inspectors have looked at issues with the service water system and will follow NRC Enforcement principles (http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html) based on the results of the inspections.

    A violation and finding was issued related to the service water system leaks (ML13219B114). This finding was green and of very low safety significance.

24. So there IS a statute of limitations on accountability for nuclear safety under NRC regulations?!

    NRC Answer:

    There is no statute of limitations on accountability for nuclear safety under NRC regulations. All licensees are required to follow specific NRC rules and regulations as it applies to their licensing requirements.

25. Jack Giessner just reported that Entergy inserted sand into the bed region in certain places, that that accounts for the sand that was found in place. So it seems clear that Entergy -- and NRC -- have known for some time that the sand bed region has had problems (in fact, was non-existent) for some time. How long has this been known? Why were the media and public only just now informed in recent weeks?!

    NRC Answer:

    In 2012, it was the NRC's understanding that the sand bed was in place underneath the tank (ML12193A631). It was believed there were some areas where sand needed to be renewed / refilled, but the sand bed was essentially intact. It was not until 2013, the licensee and the NRC discovered the sand bed was essentially missing. The NRC was informed of the missing sand bed and grout pad on May 29, 2013 during a conference call with the licensee. The NRC issued a meeting summary (ML13154A506) to inform the public on June 3, 2013.

26. How many attendees are on today's Webinar? How many questions have been submitted? When/Where/How can attendees find NRC's answers to questions not gotten to on today's one hour short Webinar?

    NRC Answer:

    There were 63 attendees during the Webinar. 94 questions were submitted. The NRC answered questions related to topic of the Webinar. Any relevant questions that were not answered due to time restrictions are answered here in the meeting summary to the Webinar.

27. Does the age of the plant contribute to the increasing problems of Palisades?

    NRC Answer:

    The NRC's assessment is that leaks at Palisades are most likely the result of a poor equipment maintenance program rather than plant aging.

    The NRC provides ongoing oversight of the safety of all commercial nuclear power plants, regardless of whether they are old or new. One of the programs the NRC employs to provide that oversight is the Reactor Oversight Process (ROP). The Reactor Oversight Process uses a variety of tools and inspection techniques to monitor and evaluate licensee performance. The process focuses on those plant activities that are most important to safety. Specifically, the Reactor Oversight Process consists of three key strategic performance areas: reactor safety, radiation safety, and safeguards. Satisfactory licensee performance in the cornerstones provides reasonable assurance that the facility is operating safely and that the NRC's safety mission is being accomplished.

    The NRC continuously assesses plant performance in each cornerstone by analyzing two inputs: NRC inspection findings and performance indicators reported by the licensee. Both inspection findings and performance indicators are evaluated and given a color designation based on their safety significance. Green inspection findings indicate a deficiency in licensee performance that has very low risk significance with little or no impact on safety. Green performance indicators represent acceptable

performance in which cornerstone objectives are fully met and likewise have little or no impact on safety. White, Yellow, or Red inspection findings or performance indicators each, respectively, represent a greater degree of safety significance and therefore result in increased NRC attention in accordance with the Reactor Oversight Process Action Matrix.

Regarding the safety of nuclear power plants in the period of extended operation, the NRC's primary focus during the license renewal process is aging management. Each license renewal application must contain technical information regarding the plant's systems, structures, and components; their material composition; the environment that they are exposed to; and the applicable aging effects for each material and environment combination. In addition, license renewal applicants must demonstrate that they can adequately manage such effects through their aging management programs. The NRC staff performs a safety review of the information in the application and determines whether the applicant can adequately manage the effects of aging such that the plant can be operated safely during the period of extended operation. To support its evaluation, the NRC uses its Generic Aging Lessons Learned Report, along with other relevant generic and plant-specific operating experience. The Generic Aging Lessons Learned Report is a systematic compilation of plant aging information and describes over 50 programs acceptable to the NRC staff for managing the effects of aging. The NRC staff performs inspections and audits during the license renewal process and performs follow-up inspections to verify implementation of aging management programs. A renewed license, however, is not a guarantee that a facility will operate for the entire renewed license term. If at any time the NRC does not have reasonable assurance that a nuclear power plant can be operated safety, it has the authority to modify, suspend, or revoke an initial or renewed license.

The NRC, as part of our ROP deviation (ML12306A367), will be looking at the site's aging management program to assess its effectiveness. The inspection results will be publicly available.

28. Leaks tend to increase in size. What would happen if the leak became huge and leaked into the control room and shorted out the electrical equipment? What is the worst case scenario? How can you allow leaking above the control room? Wouldn't it be better to shut the old plant down and save the risks involved with running a plant past its prime???

    NRC Answer:

    Water leakage into the control room is not acceptable and the NRC has taken actions to ensure that the licensee will correct the water ingress path. The cracks in the concrete in the control room ceiling are very small and tight. The NRC has not seen any indications of crack growth in the ceiling.

    See answers to Questions 3 and 4 above.

29. You just admitted that the "catch basin" radioactive water is ultimately discharged into Lake Michigan. NRC does not require tritium to be filtered out, right? So all of the leakage of tritium from the SIRWT, for over two years now, has been ultimately dumped into Lake Michigan, right? What quantity of radioactive water has that been? 82.1 gallons on May 4th, 2013. But altogether, during the entirety of this leakage, how many

hundreds, or thousands, or more, gallons of radioactive water has been released, intentionally, into Lake Michigan?

NRC Answer:

The volumes of all releases from nuclear power plants are reported in the annual effluent reports that are available on the NRC webpage. The cumulative effect of all releases is assessed using the radioactive environmental monitoring program (REMP). The REMP collects drinking water, fish, sediment, broadleaf vegetation, and agricultural crops important to the local area. These sampling results show that there are no radionuclides detectable in drinking water in the vicinity of the plant. The results of all samples collected are included in the Annual Radiological Environmental Operating Report that is available on the NRC webpage (http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-info.html). The recent Palisades reports related to radionuclide sampling and reporting and their frequency can be viewed at: http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/pali.html

The total leakage from the SIRWT into Lake Michigan over the last two years has not exceeded 90 gallons. The leakage from the SIRWT during 2011 and 2012 was contained and there were no releases to the environment. The released radioactivity to Lake Michigan due to the recent leak in May 2013, had very low impact to an individual (.000002 rem), and did not impact the safety of plant workers or the public. This radioactivity level is well below the annual dose limit of 0.1 rem to the public.

30. Has the use of fiber board in place of sand ever been tried before?

NRC Answer:

The SIRWT Construction Code recognizes both materials for this application and there is no information on the extent of use of one material over the other.

31. Are you are proactively looking for other initial construction errors equivalent to the voided sand region, which may be occurring in other areas of the plant?

NRC Answer:

NRC Inspectors assessed licensee efforts to determine the cause of the leak and the proposed corrective actions to allow the tank to be safely returned to service. One finding was identified regarding the cause of the leakage and is included under section 1R08 of NRC Inspection Report 05000255/2013003 (ML13219B114). Additional activities to assess the completeness of the licensee's root cause efforts in light of previous leaks and potential configuration-control issues over time regarding tank design will be inspected later. This will include review of existing construction errors. Therefore, this issue will remain open pending completion of further inspection activities. Further efforts to review the licensee's characterization/assessment of the leakage, to include any required documentation and reporting, will be performed in future quarters this year.

The NRC received several questions related to the sand bed and the grout pad underneath the SIRWT. The impact of not having the sand bed support and grout pad on other welds in the tank is under review and will be discussed further in future inspection reports. Currently, the tank is capable of performing its safety function. The failure of the 'F' East nozzle weld has been adjudicated as a Green finding in NRC Inspection Report 05000255/2013003 (ML13219B114).

Sincerely,

/RA/

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

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Letter to Entergy Nuclear Operations, Inc. from J. Giessner dated August 9, 2013

SUBJECT: SUMMARY OF THE JULY 16, 2013, PUBLIC INTERNET EVENT BRIEFING REGARDING PALISADES SAFETY INJECTION REFUELING WATER TANK (SIRWT) LEAK

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