May 28, 2013

Ms. Carol McGeehan
568 West 31st Street
Holland, MI 49423

Dear Ms McGeehan,

I very much appreciated your time and the engaged conversation during the meeting on March 25 at the Beach Haven Event Center in South Haven Michigan. As promised, I am responding to your letter dated March 25, 2013, which expressed concerns regarding the safe operation of Palisades. A record of these and other questions from local citizens, as well as my responses, is documented in the Nuclear Regulatory Commission's (NRC) Agencywide Documents Access and Management System No. ML13142A424. The discussion with you and the other participants was very helpful to me as I continue to consider public concerns about nuclear safety.

You raised issues regarding the safety of the water supply near Palisades. You also had specific questions regarding test results from recent leaks at the plant. In the enclosure, I have provided specific responses to the issues you raised.

The NRC maintains safety as our top priority to ensure the protection of our citizens and the environment. I and all my colleagues at the agency are firmly dedicated to ensuring the safe operation of nuclear power plants and to protecting public health and safety.

Thank you for sharing your views and insights. If you have any additional questions, don't hesitate to contact me at 301-415-8430.

Sincerely,

/RA/

William D. Magwood, IV

Enclosure:
Responses to Questions

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The correspondence addresses policy issues previously resolved by the Commission, transmits factual information, or restates Commission policy.

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Response to Questions Raised in Letter Sent to the NRC by Ms. Carol McGeehan

In your letter you raised questions in a number of areas. I would like to take this opportunity to provide answers to your questions, which were:

1. **Will you/NRC provide us a record of independent test results for any leaks (including Aug. 2012) and routine releases into air and water from Palisades in the past 3 years and with date, amount of radiation (if any) to verify Palisades claims of safe operation?**

   The NRC does not independently test the result of leaks unless there is reason for doubting information provided by licensees. The NRC requires nuclear plants to monitor leaks from various systems, especially those that are significant to plant safety. Per *Title 10 Code of Federal Regulations* (CFR) 50.9, "Completeness and Accuracy of Information," licensees are required to provide complete and accurate information to the NRC. Licensees who willfully present misleading information to the NRC would be in violation of 10 CFR 50.5, "Deliberate Misconduct," and are subject to NRC enforcement per the NRC Enforcement Policy located at http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html. (For reporting requirements and for information about all liquid releases from Palisades please see the answer to question #4 below.)

   The following link to the NRC Website contains an alphabetical listing of all nuclear plants in the United States with an associated link to inspection reports issued from early 2000: http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/listofrpts_body.html. NRC's inspection reports and other documents can be accessed through ADAMS at: http://www.nrc.gov/reading-rm/adams.html. These reports would include leaks that have safety significance.

   In addition to the above requirements, NRC Region III Regional Administrator, Mr. Charles Casto, stated Region III would inform the public living near the Palisades plant about through-wall leaks related to safety-related equipment even if they do not reach the public reporting threshold.

   The NRC has an extensive regulatory framework designed to ensure all nuclear power plants, including Palisades, are operated safely. The regulatory framework is designed to ensure the NRC takes actions before public health and safety is affected. Whenever it is necessary, the NRC will take, action against power plants to ensure the health and safety of members of the public are protected. The regulatory framework associated with radioactive effluents includes: (1) regulations; (2) requirements and licensing conditions; (3) onsite inspections; and (4) reports. The NRC has multiple thresholds for radionuclides in groundwater as part of a defense in depth framework designed to protect public health and safety. This regulatory framework includes reporting levels, design objective, and safety limits. The Environmental Protection Agency (EPA) has established standards for drinking water in the Safe Drinking Water Act to ensure drinking water is safe to drink.

   In addition to the regulatory limits described above, the NRC has a Policy Statement (completed in 1986) on safety goals which broadly defines acceptable levels of radiological risk. The NRC Policy Statement is described in the Federal Register

(51 Federal Register 30028). The goals outlined in the policy statement indicate the NRC will provide a level of protection from the consequences of nuclear power plant operation such that individuals bear no significant additional risk to life or health. Additionally, societal risks should be comparable to or less than the risks of generating electricity by viable competing technologies and should not be a significant addition to other societal risks.

Additional information on radionuclides found in the environment around Palisades can be found in the licensee's Annual Radiological Environmental Operating Reports. The environmental reports also contain information on the quality assurance program that provides independent verification of the licensee's analysis methods and techniques. The recent annual environmental reports for Palisades can be found on the NRC public web page listed above.

The NRC requires licensees to monitor the levels of radionuclides in air, water, plants and animals local to the plant. 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.
- Lake water control location at the Ludington pump storage 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-.

2. **Will you provide us with documentation for how and where any radioactive releases were treated, including "small, low level" releases?**

The licensee is required to continually monitor off-site releases (gas or liquid). In general, these releases are a very small fraction of amounts provided in NRC regulations for normal releases. The radiation values, in general, would be imperceptible at the site boundary from background radiation. However, the NRC requires planning by the licensee for potential offsite radiation conditions. In the extremely unlikely event of an accident where a significant amount of radiation is released, the licensee would be required to implement their emergency action plan. If a threshold is exceeded, the licensee would declare an emergency action level. Protective actions for doses which could impact the public, including possible evacuation or sheltering measures, would be recommended by the licensee to the State of Michigan.

The NRC would also evaluate these conditions and implement our event response actions. These accident releases have not occurred at Palisades.

There have been small amounts of tritium released onsite at Palisades, and the NRC requires the licensee to evaluate the impact or potential impact to the public from all releases. The results from the evaluation are reviewed against several criteria including the emergency action plan, EPA drinking water standards, limits in our regulations and the site's off-site dose calculation manual. Even though these leaks have not exceeded the regulations or standards discussed above, we do expect the site to take action to address the issue. The licensee has made several repairs including replacing about a hundred of feet of piping. Current testing shows a small leak still exists, but it is not impacting the drinking water; in fact, there is no detectable tritium in periodic samples of drinking water taken by the licensee and reviewed by the NRC. For information: in accordance with NRC regulations, the calculated annual total quantity of all radioactive material above background to be released from each light-water-cooled nuclear power reactor to unrestricted areas must not result in an estimated annual dose or dose commitment from liquid effluents for any individual in an unrestricted area from all pathways of exposure in excess of 3 millirems to the total body. This is less than one-hundredth of the natural background radiation received.

The NRC maintains a list of reactor sites where tritium has been detected in ground moisture or groundwater. The list may be found on NRCs public web site (http://www.nrc.gov/reactors/operating/ops-experience/tritium/sites-grndwtr-contam.html). Palisades also provided additional information on historical radioactive leaks and spills in a Groundwater Questionnaire. That document can be found on same NRC public web page where the annual reports are located. The NRC posts this information on NRC's public web site so that the public can be informed of the radioactive effluents from commercial nuclear power plants.

The NRC routinely conducts inspections of the Palisades site to ensure radioactive effluents from the Palisades site meet federal regulations. These NRC inspection reports are publicly available in NRCs agency wide document access management system (ADAMS) on the NRC public web site.

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.

In summary, inspection of the above documents reveals that Palisades has experienced some leaks of radioactive materials onto soil at the Palisades site. As a result, tritium has been identified in groundwater on the Palisades site. The information indicates that tritium released to offsite areas has not resulted in tritium concentrations in excess of standards established by the EPA in the Safe Drinking Water Act. In fact, there were no detectable amounts of radioactivity in drinking water. This includes Lake Michigan which is the source of water for South Haven. Additionally, none of the radioactive releases from the Palisades site have exceeded any of the NRC's regulatory limits for radioactive effluents. Therefore, the NRC is confident these leaks do not represent a hazard to public health and safety.

3. **Will you provide us with your rationale and any tests to prove that Palisades deserves to be rated at level 1, despite recent leaks in 2012 and 2013, after it was upgraded from level 3?**

NRC oversight and inspections of a nuclear power plant occur on a continuous basis, and we evaluate specific violations and the safety risk that these violations present. The NRC conducts this evaluation using the Reactor Oversight Process (ROP). The NRC uses this information to place the plant in one of five columns (I-V) in the ROP's action matrix. The higher number columns represent more significant safety issues, which require increased NRC oversight and inspections. Columns I through IV characterize plants that continue to operate safely. The agency reserves Column V for plants that are unsafe to operate and would, therefore, need to shut down. NRC resident inspectors, who are assigned to each site, conduct frequent inspections to ensure that the plant is operating in accordance with its license and with Federal regulations. The resident inspections are conducted at random times including nights, weekends and during holidays. Staff from the NRC's Region III office and headquarters supports the Palisades resident inspectors. You can find additional information about the NRC's operating reactor oversight program and the ROP action matrix at http://www.nrc.gov/reactors/operating/oversight.html.

In 2012, the licensee identified leaks in the safety injection refueling water tank, control rod drive mechanism housing #24, service water valve SW-136 and a drain valve on the secondary side of 'B' steam generator. In 2013, the plant experienced a leak in the component cooling water system E-54A heat exchanger.

In each of the above cases, the licensee followed NRC requirements and repaired or replaced the component. The NRC agrees that Palisades has experienced more leaks than most of the nuclear plants. The NRC will conduct additional reviews of these issues as part of the deviation which is discussed below, and evaluate possible maintenance issues. However, based on our current evaluation, these leaks were of low safety significance. The public was not in danger at any time. The risk related to these leaks did not reach the threshold of a White finding (Column II). The NRC inspectors independently verified repair activities to ensure that the licensee implemented appropriate corrective actions.

Inspections of Past Issues:

On September 28, 2012, the NRC completed a supplemental inspection pursuant to Inspection Procedure 95002, "Inspection for One Degraded Cornerstone or Any Three White Performance Inputs in a Strategic Performance Area," at the Palisades Nuclear Plant. This supplemental inspection was performed to follow up on a Yellow finding with substantial safety significance, which occurred on September 25, 2011. This issue, a failure to have adequate work instructions for work performed on panel ED-11-2, was previously documented and assessed in NRC Inspection Report 05000255/2011014. This supplemental inspection was also performed to follow up on a White finding associated with a service water pump failure which occurred on August 9, 2011.

The NRC determined that the staff at Palisades Nuclear Plant performed an acceptable evaluation of the Yellow finding. To correct this issue and prevent recurrence, the Palisades Nuclear Plant implemented corrective actions including reinforcing Entergy standards for procedure compliance, accountability, and unacceptable behavior via face

to face communications from senior managers to individual contributor levels as well as implementing, and ensuring compliance with, Entergy risk management procedures.

The NRC also determined that the staff at Palisades Nuclear Plant performed an acceptable evaluation of the White finding. To correct this issue and prevent recurrence, the licensee created a limited distribution Engineering Standard for Palisades that clearly identified station requirements and expectations for material changes affecting installed plant equipment. In addition, the 416 stainless steel (SS) service water pump shaft couplings were replaced with 17-4PH SS couplings.

After reviewing Palisades Nuclear Plant's performance in addressing the Yellow and White findings using Inspection Procedure 95002, the NRC concluded that the licensee's actions met the inspection objectives with no significant weaknesses. Therefore, in accordance with the guidance in Inspection Manual Chapter 0305, "Operating Reactor Assessment Program," the Yellow and White findings were closed as of October 1, 2012, and the NRC returned Palisades to the Licensee Response Column (Column I) of the Reactor Oversight Process Action Matrix. The findings and results of this inspection can be found in the NRC Inspection Report, 05000255/2012011.

NRC Deviation:

Although the NRC has transitioned the Palisades plant to the Licensee Response Column (Column I), the NRC has determined that additional inspection is warranted and deviation from the Reactor Oversight Process is appropriate (ADAMS ML12306A367). Approximately 1,000 additional hours of inspections will focus on two areas. The first focus area for inspection is related to follow-up on the licensee's actions to address the findings based on the 95002 supplemental inspection team. Although the NRC did not find any significant weaknesses in the areas inspected, some of the corrective actions to improve the organization and strengthen the safety culture at the site had not been fully implemented when the supplemental inspection was completed. While the NRC found the safety culture adequate to support safe operations, we will inspect future site activities to ensure that the licensee is implementing appropriate corrective actions to improve the organization and strengthen the safety culture on site, as well as assessing the sustainability of these actions. The second focus area for additional inspection is to review several ongoing technical issues such as the leaks discussed earlier. Although these issues, thus far, do not appear to have other than low safety significance, it is imperative that the causes of these issues, and the licensee's planned corrective actions, are understood to provide reasonable assurance that these issues will not lead to more significant safety concerns.

4. What are NRC reporting requirements to the public and NRC when there are leaks at nuclear plant? Where can the public access the data on leaks from Palisades?

Per 10 CFR 50.72, "Immediate Notification Requirements for Operating Nuclear Power Reactors," (http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-0072.html) the licensee is required to notify the NRC for issues where a news release is planned or notification to other government agencies has been or will be made. Such an event may include inadvertent release of radioactively, even if there is no safety impact. Also, the licensee is required to notify the NRC for shutdowns required by technical specifications for leaks that impact safety equipment. Finally, the licensee is required to report any event or condition that could have prevented the fulfillment of the safety function of

systems that are needed to control the release of radioactive material, or represent a safety barrier being seriously degraded. 10CFR50.72 and 50.73 are the required reporting regulations. NUREG-1022, "Event Reporting Guidelines," provides guidance for reporting leaks. This information is located at http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/.

In addition, details related to leaks that are considered risk and safety significant are documented in NRC inspection reports as White, Yellow or Red Findings. The leaks that are not considered risk and safety significant may or may not be documented, depending on if a violation has occurred. Areas where there is no violation would not require documentation. The NRC requires leaks released outside of the plant to be reported in publicly available annual effluent and the environmental monitoring reports.

In Palisades' case, no leaks of risk significance occurred since the ROP colored findings have been implemented in 2000. Two leaks required reporting in accordance with 10 CFR 50.72 in 2013 for a shutdown related to Safety Injection Refueling Water Tank leak (EN 49002, public link http://www.nrc.gov/reading-rm/doc-collections/event-status/event/2013/20130506en.html), and shutdown related to Component Cooling Water heat exchanger leak (EN 48758, public link http://www.nrc.gov/reading-rm/doc-collections/event-status/event/2013/20130219en.html). Two leaks required reporting in 2012 due to shutdowns in accordance with 10 CFR 50.72 for a secondary side steam leak (EN 48478, public link http://www.nrc.gov/reading-rm/doc-collections/event-status/event/2012/20121105en.html), and a shutdown related to Safety Injection Refueling Water Tank (EN 48018, public link http://www.nrc.gov/reading-rm/doc-collections/event-status/event/2012/20120613en.html). One leak required reporting for a degraded barrier: control rod drive mechanism housing #24 (EN 48182, public link http://www.nrc.gov/reading-rm/doc-collections/event-status/event/2012/20120813en.html). One leak required reporting in accordance with 10CFR 50.72 due to offsite notification of local government officials: the tritium leak onsite in 2007 (EN 43832, public http://www.nrc.gov/reading-rm/doc-collections/event-status/event/2007/20071211en.html). This leak did not result in any impact on drinking water, but was provided for information.

Information about all liquid releases from Palisades, including leaks and spills, are reported to the NRC in the licensee's Annual Radioactive Effluent Release Reports. These annual effluent reports are available on the NRC's web site (http://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/pali.html).