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**From:** Bower, Fred  
**Sent:** Friday, November 07, 2014 3:27 PM  
**To:** John Hyde (mgb781529jh@aol.com)  
**Cc:** Screnci, Diane; Tifft, Doug; McNamara, Nancy; Nieh, Ho; Scott, Michael; Barber, Scott; Lin, Brian; Turilin, Andrey; DiPaolo, Eugene; Montgomery, Richard; Ennis, Rick; Pinkham, Laurie; Thompson, Margaret; Bower, Fred; Sheehan, Neil  
**Subject:** RE: Mr. Hyde's comments on Limerick nuclear power plant [EDATS 2014-0336]

Mr. Hyde,

This is in response to your October 9, 2014, email, in which you raised general and specific questions regarding the safety of the Limerick Generating Station (LGS). One of our public affairs officers, Neil Sheehan, forwarded your Limerick concerns to me. One of your specific questions related to a sodium hypochlorite (bleach) spill. You also commented on: underground seismic faults; Fukushima vulnerabilities; spent fuel storage; and, concerns related to the ability of residents to evacuate during an emergency. Because you have raised questions on a number of issues that have a long and complicated regulatory history, I have included links to specific pages on the NRC's public website to better explain the background of these issues. Many of these issues continue to evolve and the NRC implements new policy and regulations as required by law or various rulemaking.

The Nuclear Regulatory Commission (NRC) is responsible for ensuring that the operation of LGS does not result in undue risk to public health and safety. For all power reactors, the NRC implements the reactor oversight process (ROP) to help assure safety at all operating nuclear power plants in the U.S. This process uses a variety of tools to monitor and evaluate plant performance. This process is designed to focus NRC resources on those plant activities most important to safety. NRC develops findings from inspections and licensees collect and report performance indicator data. Inspection findings are evaluated for safety significance using a significance determination process and performance indicator (PI) data is compared against prescribed risk-informed thresholds. The resulting information is then assessed and appropriate NRC actions are implemented using the guidelines of the NRC Action Matrix. Enforcement action is taken on significant inspection findings, when appropriate. The NRC communicates the results of its performance assessment and its inspection plans and other planned actions in publicly available correspondence, on its web site, and through public meetings. Using this methodology helps NRC ensure that it is applying its limited resources to nuclear power plants and issues that need the most attention. A more detailed discussion of this approach can be found at: <http://www.nrc.gov/reactors/operating/oversight/rop-description.html#overall>

For LGS, NRC inspectors from the Region I office conduct specialized technical inspections in a variety of plant areas. More information on the Region I organization can be found here: <http://www.nrc.gov/about-nrc/organization/rifuncdesc.html>. The NRC also employs two highly qualified resident inspectors who report to the plant daily during the work week to directly observe, inspect, and report on activities at the station. This allows NRC management stationed in the nearby King of Prussia office the ability to promptly assess the significance of plant events such as the October 2014 bleach spill. We are aware that our Public Affairs Officer, Neil Sheehan, already explained to you the significance of this event. The results of these specialized and resident inspections are also used as input to the ROP (as discussed above). The NRC's most recent assessment of LGS can be found at: [http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/LETTERS/lim\\_2014q2.pdf](http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/LETTERS/lim_2014q2.pdf)

Regarding seismic faults, the original designers were aware of the underground faults. Limerick's design against earthquakes is based on the existing fault lines near the site and the likelihood that the earthquake risk may be affected by recent studies. During original licensing of the plants, the NRC reviewed earthquake risk in NUREG-0991, dated August 1983, which was the NRC's Safety Evaluation Report (SER) concerning the

application for an operating license for Limerick, Units 1 and 2. As discussed on page 2-44 of the SER, the NRC noted that three faults have been mapped and investigated within two miles of the site. The closest one is the Sanatoga fault. A panel of experts in Appalachian geology and the NRC staff concluded that these faults experienced their last displacements more than 500,000 years ago. This section of the SER concluded that there were no capable faults in the site area.

More recently, the NRC staff re-reviewed the geologic environment as part of the Limerick license renewal review. This review was documented in NUREG-1437, Supplement 49, Volume 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Regarding Limerick Generating Station, Units 1 and 2, Final Report," dated August 2014 (ADAMS Accession No. ML14238A284)<sup>1</sup>. As discussed in Section 2.2.3 of this document, three small faults (the Sanatoga, the Brooke Evans, and the Linfield) occur within 2 miles of the site. The Sanatoga fault passes about 1,300 feet to the west of the reactor enclosure area. The Brooke Evans fault passes within 2,800 feet to the south of the plant area. The Linfield fault lies about 2 miles southeast of the site. All three of these faults are associated with Jurassic-Triassic events that occurred some 140 to 200 million years ago. Studies of these faults indicate that they have been inactive for at least 140 million years. Therefore, this review again concluded that none of these faults are active or considered "capable" of producing earthquakes per 10 CFR Part 100, "Reactor Site Criteria," Appendix A, "Seismic and Geological Siting Criteria for Nuclear Power Plants."

Section 2.2.3 of NUREG-1437, Supplement 49, also states that, during foundation excavation for the Limerick plant, several features, including shear-fractures with some small offsets (displacement), were encountered. While not unusual for the region, and not posing a hazard to plant structures, these areas were treated as necessary to ensure subsurface stability. Treatment included excavating any soft or otherwise weathered material down to competent bedrock and/or by replacing excavated material with concrete.

Regarding Fukushima vulnerabilities, the NRC has taken a methodical approach in reviewing and taking actions to address the March 2011 Fukushima Accident. In developing possible actions to address lessons learned from Fukushima, the Commission prioritized those actions to ensure timely implementation of the most important safety improvements. The prioritization, as described in a staff paper (ADAMS Accession No. ML13056A480)<sup>[1]</sup> to the Commission dated October 3, 2011, consisted of three tiers ranging from actions that should be started without delay and for which sufficient resource flexibility exists (Tier 1), to those that should wait for other factors. These factors include further technical assessment, resolution of Tier 1 issues, or availability of critical staff skills (Tier 2), or those that require further study, or are dependent upon completion of a shorter-term action, or those that need a critical skill set that is also needed for higher priority work (Tier 3). This prioritization has allowed the Commission to address safety significant issues identified by the Near-Term Task Force, and after subsequent review by numerous stakeholders, the agency has proceeded with implementing the Tier 1 actions. As you can see at the following web address, LGS has completed the actions required to be completed up to this date: <http://www.nrc.gov/reactors/operating/ops-experience/japan-dashboard/japan-plants.html>. See the following link for more information on the NRC's response to the event that occurred at Fukushima: [Japan Event Overview](#)

Regarding spent fuel storage, the NRC regulates spent fuel through a combination of regulatory requirements, licensing; safety oversight, including inspection, assessment of performance; and enforcement; operational experience evaluation; and regulatory support activities. Additionally, the Commission recently approved the Continued Storage final rule and generic environmental impact statement that were published in September 2014. The NRC's ongoing inspection programs continue to assure that LGS meets the agency's requirements for spent fuel. See the following link for more information on spent fuel storage: <http://www.nrc.gov/waste/spent-fuel-storage.html>

Regarding the ability of residents to evacuate during an emergency, the Commonwealth of Pennsylvania has the overall authority for making protective action decisions for the public during a radiological or an all-hazard event. To ensure this ability, an Evacuation Time Estimate (ETE) is calculated to assist planners in determining the best paths to route the public that warrants evacuation of portions of the emergency planning zone (EPZ) during a nuclear plant emergency. Specifically, an ETE uses a calculation of the time to evacuate the plume exposure pathway EPZ, which is an area with a radius of about 10 miles (16 km) around a nuclear

power plant, and is used to inform protective action decision-making for the general public. Per Section 5.3 (State and Local Review) of NUREG/CR-7002, "Criteria for Development of Evacuation Time Estimate Studies" (published November 2011), discussions with State and local agencies are necessary in obtaining local and regional data, understanding the operations and resources of the emergency response capabilities, and understanding the traffic management system. This will help assure that appropriate agencies, such as those providing traffic control or resources to support the evacuation, are aware of the ETE strategies, issues, and assumptions. As a planning tool, there is no regulatory threshold established for a maximum evacuation time developed under the ETE study. Rather, the ETE study serves as one of many tools for assisting the Commonwealth of Pennsylvania in formulating a protective action decision for the various evacuation scenarios analyzed. With respect to the NRC "approving" the ETE study, in the an Emergency Preparedness Rule, implemented in December 2011, Appendix E to 10 CFR 50 was revised to establish criteria for the periodic updating of an ETE and to require a licensee to use ETEs in the formulation of protective action recommendations to the State. Since an ETE update is not as a licensing action, the NRC will not be "approving" ETE updates, but will review them for completeness. Finally, protective action strategies are practiced during biennial exercises and evaluated by the Federal Emergency Management Agency (FEMA). These practices help to ensure that nearby residents can be safely evacuated during an emergency

Additionally, as part of the license renewal process, the population increase in the vicinity of LGS was reviewed in Section 5.3.12, "Population Increase," of NUREG-1437, Supplement 49, Volume 1, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Regarding Limerick Generating Station, Units 1 and 2, Final Report," dated August 2014 (ADAMS Accession No. ML14238A284) which can also be located at the following web address: <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement49/>

In conclusion, we take our mission of ensuring that the operation of LGS does not present an undue risk to public health and safety very seriously and apply NRC resources when and where needed to meet this mission statement. We appreciate the opportunity to address public comments on NRC activities and we trust that this feedback is responsive to your questions.

Fred Bower

Chief | Projects Branch 4 | Division of Reactor Projects | Region I | U.S. NRC

2100 Renaissance Boulevard, STE 100, King of Prussia, PA 19406 | ☎: (610) 337-5200 | BB: (610) 731-1920 |

✉: [Fred.Bower@nrc.gov](mailto:Fred.Bower@nrc.gov)

[1] Designation in parentheses refers to an Agency-wide Documents Access and Management System (ADAMS) accession number. Unless otherwise noted, documents referenced in this letter are publicly-available using the accession number in ADAMS.

**From:** Sheehan, Neil

**Sent:** Thursday, October 09, 2014 1:04 PM

**To:**

**Subject:** re: Your comments on Limerick nuclear power plant

Mr. Hyde,

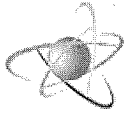
Thank you for your comments regarding the Limerick nuclear power plant

I will forward them to NRC staff responsible for oversight of the plant.

With respect to the sodium hypochlorite leakage that occurred at the plant on Tuesday night, the event had no impact on nuclear safety at the facility. It only impacted plant operations to the extent that river discharges were temporarily halted. No plant personnel were adversely affected. The sodium hypochlorite is used to clean and purify water used in the Unit 1 cooling tower. The company took prompt action to halt the leakage once it was identified. The material was diluted in the holding pond,

and the amount that reached the river was further diluted. The state DEP would be better qualified to discuss any off-site environmental impacts.

Please let me know if you need additional information



Neil Sheehan  
NRC Public Affairs Officer  
Region I  
(610) 337-5331  
cell: (484) 919-2200

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Below is the result of your feedback form. It was submitted by

John Hyde on Thursday, October 09, 2014 at 11:26:50

through the IP 63.141.200.6

using the form at <http://www.nrc.gov/about-nrc/public-affairs/contact-opa.html>

and resulted in this email to [opa1.resource@nrc.gov](mailto:opa1.resource@nrc.gov)

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comments: This is the first time I have contacted your department. What is going on at Limerick? Now they are spilling bleach in the Schuylkill river? I have lived and worked in the 20 mile radius all of my fifty-two years, and while reading the paper this morning I just had to make a comment, I remember watching the towers being built from my Grandparents home on Fricks Locks road. And now I think it's time to shut that plant down when it was originally designed to do so, please hear me out, there is just too much depending on people that can and do make mistakes such as those we read about and I'm sure some we don't hear about because of security issues or public outrage from something that could cause a panic, rightly so I guess. How long is long enough to count ourselves and our descendants lucky from not having an "accident" that could severely injure our local population, the growth of this area in my lifetime has been enormous. Maybe it's time to think about "what if" concerning this power plant with its original design and the possible millions of people an accident would affect, I'm sure the original planners didn't foresee this growth and apparently weren't aware of the underground fault(s) and the design flaws that were exposed at Fukushima. We have piles of spent fuel waiting for a place to take it to, was that in the original plan for the risks for the local population? Plus the issues I commented about previously, does the risk really outweigh the need? really? does your family live in the shadow of the towers? Is it worth it if something happens? And don't think it cannot happen examples, Three Mile Island here in Pennsylvania, Japan and also Russia and how many not publicized, none, I doubt it.

Thank you for reading this comment and please pass it on, I am not one to comment unless I feel it's very important and frankly I'm getting scared for my Children, Grandchildren my Wife and all our family, friends, neighbors, myself included if you didn't pick up on that. Face it an evacuation would be absolute chaos in this area.

Remember we are Americans and each of us has either fought or sacrificed in some way for the right to live in a safe secure country so let's do our best to keep it that way for all of us, each and everyone please!!

John Hyde

organization:

address1

address2:

city:

state:

zip:

country: U.S.A.

phone

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<sup>[1]</sup> The designation in parentheses refers to an Agency-wide Documents Access and Management System (ADAMS) accession number. Unless otherwise noted, documents referenced in this letter are publicly-available from [www.NRC.gov](http://www.NRC.gov) using the accession number in ADAMS.