

June 4, 2015

Ms. Donna Gilmore, Founder  
of San Onofre Safety  
205 La Salle  
San Clemente, CA 92672

SUBJECT: STATISTICAL ANALYSIS OF NUCLEAR POWER INCIDENTS

Dear Ms. Gilmore:

This letter is in response to your email dated April 19, 2015 that transmitted Mr. Roger Herried's email dated April 18, 2015, referencing "Of Disasters and Dragon Kings: A Statistical Analysis of Nuclear Power Incidents & Accidents." Mr. Herried discussed major historical nuclear power incidents including Three Mile Island (TMI), Chernobyl, and Fukushima. In the email from Mr. Herried, he indicated the rate of nuclear accidents has dropped significantly as a result of the improvements made in the nuclear industry after the TMI and Chernobyl incidents.

After the TMI incident, the NRC thoroughly studied the accident to understand the facts involved and identify the safety improvements which were needed to protect against such incidents in the U.S. in the future. As a result, significant changes were identified and implemented, including: new requirements related to plant design, human performance standards, and fitness-for-duty, as well as expanded incident response staffing, emergency planning, and resident inspector program. Also, the NRC started performing plant specific probabilistic risk assessments (PRAs) for representative plants. These further characterize the risk contributors of severe accidents and consequently enabled the development of safety improvements and accident management programs at individual power plants. The improvements that were made following TMI have reduced the risk of similar accidents occurring in the U.S. in the future.

Following the Chernobyl incident, the NRC concluded that many factors protect U.S. reactors against the combination of lapses that led to the incident at Chernobyl. The NRC requested each licensee to conduct an individual plant examination for internal and external events. Each licensee complied with this request by conducting PRAs. Licensees have subsequently developed/modified hardware and procedures to prevent or mitigate severe accidents.

Due to the Fukushima Daiichi incident, the NRC has taken significant action to enhance the safety of reactors in the U.S. based on the lessons learned from the incident. The agency issued three orders requiring U.S. reactors to:

- Obtain and protect additional emergency equipment, such as pumps and generators, to support all reactors at a given site simultaneously following a natural disaster
- Install enhanced equipment for monitoring water levels in each plant's spent fuel pool
- Improve/install emergency venting systems that can relieve pressure in the event of a serious accident (for reactors with designs similar to the Fukushima plant)

These and other actions related to lessons learned from Fukushima will reduce the risk of similar accidents occurring in the U.S. in the future. The NRC is improving their understanding of the risks for external hazards, including: seismic, flooding, fire, and/or high winds.

The NRC and licensees develop specific PRAs for operating nuclear power plants using probabilistic methods based on operating experience. The operating experience includes a large quantity of component and operator performance data as opposed to a few significant industry events. As explained above, significant operating events prompt advances to nuclear safety, and those safety enhancements manifest in reduced risk.

Thank you for your concern and for bringing this article to our attention.

Sincerely,

*/RA/*

Dr. Samson Lee, Deputy Director  
Division of Risk Assessment  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission

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Dr. Samson Lee, Deputy Director  
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