

**From:** Pickett, Douglas  
**Sent:** Friday, March 29, 2013 2:17 PM  
**To:** 'DBrancato@riverkeeper.org'  
**Cc:** 'Prussman, Stephen G'; Lubinski, John; Russell, Andrea; Meighan, Sean  
**Subject:** Initial Recommendation of the PRB RE: Riverkeeper 2.206 Petition of November 14, 2012

Ms. Brancato -

The purpose of this e-mail is to inform you of the action taken by the NRC's Petition Review Board (PRB) on the below linked 10 CFR 2.206 petition for enforcement against Indian Point submitted by Riverkeeper on November 14, 2012. The PRB has reviewed your petition along with the supplemental information provided during your presentation before the PRB on December 20, 2012.

The initial recommendation of the PRB, which has been approved by senior management of the Office of Nuclear Reactor Regulation, is to reject the petition from review under 10 CFR 2.206 for the reasons cited below. In addition, the PRB is referring your petition to rulemaking when evaluating the Natural Resources Defense Council's 10 CFR 2.802 petition to revise 10 CFR 50.44 which was submitted on October 14, 2011. The NRC staff is tracking this latter petition under PRM-50-103.

As you are aware, under the staff's 10 CFR 2.206 process, which is described in Management Directive 8.11, "Review Process for 10 CFR 2.206 Petitions," you have the opportunity to comment on the recommendation of the PRB. The opportunity to comment will be in the form of either a meeting in Rockville, MD, or a teleconference. The meeting or teleconference, if held, is an opportunity for you, the petitioner, to provide any relevant additional explanation and support for your petition in light of the PRB's initial recommendation. Following this meeting or teleconference, the PRB will consider the need to modify its initial recommendation which will be followed by an acknowledgement letter which will address your comments and the staff's response.

PETITION:

<http://portal.nrc.gov/edo/nrr/dpr/Lists/2206%20Petition%20Assignments/Attachments/61/G20120875%20Petition.pdf>

SUMMARY OF REQUEST:

On November 14, 2012, Riverkeeper, Inc., filed a petition pursuant to 10 C.F.R. 2.206, which requests that the NRC permanently shutdown Indian Point Units 2 and 3 because their containments could be breached due to a hydrogen deflagration or detonation following a severe reactor accident and, thus, expose the public to a large radiological release. The petition was prepared by Mr. Mark Leyse acting as a consultant to Riverkeeper.

The Petitioner did not request immediate action and the PRB concludes that immediate action is not required. The PRB believes that a detonation would be unlikely and that hydrogen deflagrations would be the most likely mode of combustion in degraded core accidents. The likelihood and nature of deflagrations inside containment are influenced by gas mixture composition and the availability of ignition sources. Due to the small amount of energy needed

to ignite combustible mixtures, there are numerous potential ignition sources, such as sparks from electrical equipment, electrostatic discharges, hot jets/gases, or hot surfaces including core melt particles.

#### BASIS FOR THE REQUEST:

The petitioner asserts that there is no assurance that Entergy, the licensee, could control the total quantity of hydrogen generated following a severe reactor accident at Indian Point. Furthermore, the petitioner believes it is highly likely that there would be hydrogen combustion in the containment either in the form of a deflagration or a detonation.

The petitioner asserts that NRC's resolution of combustible gas control issues for large, dry containments did not assume hydrogen fast deflagrations, detonations, or deflagration to detonation transition (DDT). The petitioner asserts that the above assumptions would result in dynamic loadings which, in turn, would result in more severe results than static loads which are assumed by the NRC.

The petitioner states that Indian Point 2 has passive autocatalytic recombiners (PARs) that can be overwhelmed by the generation of hydrogen during a severe reactor accident and can act as igniters in environments containing elevated concentrations of hydrogen. The petitioner quoted a 2011 IAEA report saying that the electrically powered thermal hydrogen recombiners, similar to those installed at Indian Point 3, can also act as igniters in environments containing greater than 4 percent hydrogen concentrations.

The petitioner references NRC documents that estimate peak calculated pressures following 75 or 100 percent metal-water reaction at Oconee, Three Mile Island, and Turkey Point. While peak estimated static loads approach ultimate containment failure pressures, the petitioner states that these values may be non-conservative because they do not assume dynamic loading if fast deflagrations or DDT were assumed. Furthermore, the petitioner asserts that the estimated ultimate containment failure pressures may be nonconservative.

The petitioner states that internally generated missiles, that may be the result of hydrogen deflagrations or detonations, may challenge containment structural integrity or damage safety-related mitigation systems inside containment. The petitioner quotes General Design Criterion 4, "Environmental and dynamic effects design bases," of 10 CFR 50, Appendix A, as saying "Structures, systems, and components important to safety ...shall be appropriately protected against dynamic effects, including the effects of missiles..."However, the petitioner notes that while Appendix A to Part 50 makes reference to missiles, it fails to include any further requirements for assessing the damage potential of internally-generated missiles caused by hydrogen deflagrations or detonations following a severe reactor accident. The petitioner also states that the Indian Point severe accident management guidelines (SAMGs) do not address internally generated missiles resulting from hydrogen combustion.

Finally, the petitioner states that the Riverkeeper petition is plant-specific for Indian Point and should not be combined with any other petition because of the following:

- The Indian Point site is located within one or two miles of the Ramapo seismic zone. The petition asserts that the site is susceptible to a 7.0 magnitude earthquake on the Richter scale and Indian Point is only designed for a 6.1 magnitude earthquake.

- The petitioner asserts that the population within a 50-mile radius of the site is approximately 17 million and this is significantly greater than any other plant in the country.
- A large radiological release over the New York City area would have a significant financial impact on the country.

On December 20, 2012, the petitioner addressed the PRB via teleconference. The transcript is publicly available at ML13030A486.

PRB INITIAL RECOMMENDATION:

On January 17, 2013 and February 20, 2013, the PRB met internally to discuss the petition and to make its initial recommendation. The PRB concludes that the petitioner asserted deficiencies in the regulations regarding post-accident generation of hydrogen and the subsequent modeling of combustion. The PRB also notes that Mr. Mark Leyse, who prepared the Riverkeeper petition, also prepared the Natural Resources Defense Council 2.802 petition of October 2011 requesting rulemaking to revise the Commission's regulations on combustible gas control. This petition for rulemaking, which is being tracked as PRM-50-103, includes the salient points of the Riverkeeper petition.

The PRB's initial recommendation is to reject the petition because the petitioner asserts deficiencies within existing NRC rules. In addition, the PRB recommends referring the Riverkeeper petition to rulemaking under PRM-50-103.

Please let me know if you would like the opportunity to comment on the PRB's initial recommendation. If so, please provide the time frame that would be convenient for you and I will provide you with specific dates and times that the PRB members will be available.

Please feel free to contact me if you have any questions. A copy of this email will be made publicly available in ADAMS.

Sincerely,

Douglas V. Pickett, Senior Project Manager  
Indian Point Nuclear Generating Unit  
U.S. Nuclear Regulatory Commission  
301-415-1364  
Email: [Douglas.Pickett@nrc.gov](mailto:Douglas.Pickett@nrc.gov)