

**From:** "Paul G. Richards" <richards@ldeo.columbia.edu>  
**To:** <IndianPointEIS@nrc.gov>  
**Date:** 10/12/2007 1:02:02 PM  
**Subject:** comment on the scope of the Environmental Review

Chief, Rules and Directives Branch  
Division of Administrative Services  
Mailstop T-6D59  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

October 12, 2007

Dear Sir or Madam

Thank you for the opportunity to submit comments on the scope of the Environmental Review to be conducted as part of the consideration of a license renewal for two nuclear power reactors at Indian Point, Buchanan, New York.

At the Environmental Scoping Meeting held September 19 in Peekskill, New York --- which I attended --- the final graphic in the presentation by NRC invited views on three questions, one of which was "What local environmental issues should the NRC examine?"

I am writing in answer to this question, to urge that consideration be given to the seismic hazard. Specifically, we need to know what is the likelihood that these two reactors --- and associated facilities including pools and casks for storage of spent fuel --- will be exposed to ground shaking, during their extended lifetime (if the licenses are renewed), greater than they have been designed to withstand.

It may be convenient to break the local environmental issue here into three separate questions:

- (1) What is the current best understanding of earthquake hazard (expressed in terms of the probability of exceeding certain levels of acceleration over a fixed period of time, say 50 years), in the region of these two reactors?
- (2) What level of ground shaking (expressed in terms of acceleration and duration) should re-licensed facilities be required to withstand?
- (3) Can these two reactors meet that requirement throughout the projected time for which the re-licensing applies?

This region does of course have earthquakes. Since 1971 I have lived south of the Indian Point reactors, at various houses in Rockland County at distances in the range 10 to 15 miles from the plant. Along with several million others I was woken one Saturday morning in October 1985 by a local earthquake in Ardesley, NY. The seismicity

of Eastern North America is a subject of ongoing research, and much more information is available today than was the case when the Indian Point reactors were originally licensed. Also, in the last 20 years much more has become known about the distinctly different ways in which seismic waves propagate in the geological structures of Eastern North America, as compared to their propagation in the western U.S. In the East (as compared to the West), seismic waves are much less attenuated as they propagate; also the typical earthquake source spectrum is richer in high frequency. The net effect is that an earthquake of a particular magnitude is felt, and can inflict damage, over a much wider region in eastern North America, as compared what happens if an earthquake of that same magnitude were to occur in the western U.S. The methods the NRC may be using to assess seismic hazard for reactors in California must be adapted to assess the different seismic conditions relevant to reactors in the eastern U.S.

It is relevant to note that there is current consideration of a replacement for the Tappan Zee Bridge, a three-mile long structure across the Hudson River, about 15 miles south of the Indian Point reactors. I am a participant in a Working Group of this Tappan Zee Environmental Review, and seismic considerations are a major factor. In particular, it is understood that although they were not a factor --- were not even taken into account --- when this bridge was originally built; but now there is improved understanding, and seismic issues will definitely be evaluated in discussions of a replacement bridge.

In my view it would be appalling if the Environmental Review of re-licensing at Indian Point ignored seismic considerations, merely on the ground that they had not led to serious concerns as an outcome of the hearings on the original licensing (the issue of whether the Ramapo Fault was a capable fault was raised but not to a high level). For Indian Point reactor #1, no longer licensed, earthquakes were not a serious consideration, just as was the case for the original Tappan Zee Bridge. It is directly important for NRC to stay on top of relevant subjects such as seismic hazard, and its different nature in different parts of the U.S., as research evolves. It also of indirect importance, in that an appearance of determined ignorance by the NRC on seismic issues most definitely means that public confidence in nuclear power technology will suffer.

I am sending these comments as a local resident, but given their technical content it relevant to note that I am a seismologist who has taught at Columbia University since 1971, co-author of a standard grad school textbook (Methods of Quantitative Seismology), and am the Principal Investigator of a project funded by the U.S. Geological

Survey (as part of the National Earthquake Hazard Reduction Program), to improve the accuracy with which earthquakes are located in this region. Of course the views conveyed in this letter are personal, and the various agencies and institutions noted above and below are given merely to indicate my professional qualifications, and not to indicate any agency endorsement of these my personal views.

Yours sincerely

Paul G. Richards

Mellon Professor of the Natural Sciences, Columbia University;  
Member of the Board of Directors of the Seismological Society of America;  
former President of the Seismology section of the American Geophysical Union

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**Federal Register Notice:** 72FR45075  
**Comment Number:** 20

**Mail Envelope Properties** (47304C7B.HQGWDO01.OWGWPO04.200.2000002.1.144ED3.1)

**Subject:** comment on the scope of the Environmental Review  
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**Created By:** richards@Ideo.columbia.edu

**Recipients**  
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**Post Office**  
OWGWPO04.HQGWDO01

**Route**  
nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	5812	10/12/2007 1:02:02 PM
TEXT.htm	7606	11/6/2007 11:14:03 AM
Mime.822	14950	11/6/2007 11:14:03 AM

**Options**  
**Priority:** Standard  
**Reply Requested:** No  
**Return Notification:** None  
None

**Concealed Subject:** No  
**Security:** Standard

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