



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

R. Jackson

JUN 28 1982

MEMORANDUM FOR: Chairman Palladino  
Commissioner Gilinsky  
Commissioner Ahearne  
Commissioner Roberts  
Commissioner Asselstine

FROM: William J. Dircks  
Executive Director for Operations

SUBJECT: POSSIBLE RELOCATION OF DESIGN CONTROLLING  
EARTHQUAKES IN EASTERN UNITED STATES

SECY 82-53 on this subject dated February 5, 1982 indicated that a USGS working group recommendation on the Charleston earthquake was under development and would be forwarded to the USGS Director. On May 17, 1982 we informed you of a possible delay in this decision. We have recently received a letter from the USGS indicating that it may take several additional months to complete its review. The USGS now intends to issue two reports which will be in the form of open-file reports.

(Signed) William J. Dircks

William J. Dircks  
Executive Director for Operations

cc: SECY  
OPE  
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February 5, 1982



SECY-82-53

## POLICY ISSUE (Information)

FOR: The Commissioners

FROM: Executive Director for Operations

SUBJECT: POSSIBLE RELOCATION OF DESIGN CONTROLLING EARTHQUAKES IN THE EASTERN U.S.

PURPOSE: To provide the Commissioners with information relating to (1) possible modification of the U.S. Geological Survey position on the association of the 1886 Charleston, S.C. earthquake with geologic structure, and (2) the recent earthquakes in New Brunswick, Canada.

DISCUSSION: In the licensing of facilities in the Southeastern U.S., the NRC has maintained the position, based on the advice of the U.S. Geological Survey (USGS), that any reoccurrence of the 1886 Charleston, S.C. earthquake (Modified Mercalli Intensity (MMI) X, estimated Magnitude about 7) would be confined to the Charleston area. That is, the Charleston earthquake is assumed to be associated with a geologic structure in the Charleston area. Nuclear power plants in the region east of the Appalachian Mountains are, therefore, usually controlled in their seismic design, according to Appendix A to 10 CFR Part 100, by the maximum historical earthquake not associated with a geologic structure. This controlling earthquake is typically an MMI VII or VIII. Since 1974, the NRC has funded an extensive research project in the Charleston area to gain further information on the causative mechanism of this event.

On January 28 and 29, the Extreme External Phenomenon Subcommittee of the ACRS convened a meeting of expert professionals in the geosciences to obtain an overview of the state of knowledge and future NRC research needs. During that meeting, we were informed by the

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USGS that they had formed a working group to reassess the validity of their position on the Charleston earthquake. They indicated that their tentative position concluded that the reoccurrence of a Charleston-type earthquake should not be considered unique to the Charleston area. It was further indicated their recommendation would be forwarded to the USGS Director in approximately one month and that a policy decision on the treatment of the Charleston earthquake would be made at the Director's level.

Any major modification of the former USGS position could have significant impact on many Eastern US nuclear plant sites because Appendix A to 10 CFR Part 100 could require an earthquake of this type, with its resulting high ground motion, to be assumed to occur at any location.

A meeting between the EDO and the Director, USGS, on licensing issues is planned for the near future. Further information may be available at that time.

#### New Brunswick, Canada, Earthquakes

On January 9-11, 1982, a series of earthquakes occurred in New Brunswick, Canada. The largest of these events was a Magnitude 5.7 earthquake which occurred on January 9, 1982. Because of its remote location, no damage was associated with this earthquake. In the past, however, events of such size have resulted in MMI VIII. Although all information relating to the size and location of this event is preliminary, it eventually may be concluded that this earthquake could have occurred anywhere within the New England Piedmont Tectonic Province and, in accordance with the Appendix A to 10 CFR Part 100, would represent the largest historical earthquake in that province. The previous historical maximum earthquake is MMI VII. This could result in an increase in the size of the controlling earthquake and, therefore, the assumed earthquake ground motion and Safe Shutdown Earthquake for nuclear power plant sites in this region which includes much of New England and southern New York.

The historical 1755 MMI VIII Cape Ann earthquake, currently used in the design of Seabrook, is related to a different tectonic province within the White Mountain region of New England.

A handwritten signature in dark ink, appearing to read 'W. J. Dircks', written in a cursive style.

William J. Dircks  
Executive Director for Operations