

To: Ken Cook

12/13/82

From: Annette Vietti

Subject: Questions generated by NRC Geosciences branch in a preliminary review of the FSAR.

As discussed in the meeting on December 7, 1982, an effort was initiated by the NRC staff to submit main topics of interest and any site specific questions NRC reviewers would like to see covered in the February 1st WNP-3 technical presentation to Geosciences branch and Hydrologic and Geotechnical branch. In a preliminary review of the FSAR geoscience reviewers request the following items be discussed at the February 1st meeting.

1. A summary of regional tectonic synthesis, conclusions, and the basis for the conclusions.
2. Identify the maximum magnitude earthquake capable of being produced by the Juan de Fuca subduction zone, and the resulting ground motion. Present specific evidence.
3. Present a summary of the site region (subregion) structure lineaments, and analysis of these features. Present evidence for their stated non-capability.
4. Discuss significant new information since the PSAR, such as:
 - a. geology, stratigraphy, and structure as found in the foundation excavation
 - b. engineering tests of rock from site foundation
 - c. evidence for stated non-capability of faults in the site region
 - d. data on Mt. St. Helens and the effects on the WNP-3 site, ie., possible effects of wind blowing toward the site during an eruption
 - e. the postulated NNW fault from Mt. St. Helens toward the site; whether the fault exists; and if so what kind of fault it is and evidence concerning its capability.
 - f. Land-slide hazards near the site

As stated earlier these are questions generated from a preliminary review to give you an idea of what the NRC staff would like to see discussed at the February 1st technical presentation. This information and more detail will be provided in a final memo to follow in late December.

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First Quarter Report - FY 84

Northwest U.S. Subduction Zone Seismic Risk Assessment

Thomas Heaton

Work is proceeding on schedule for the seismic risk evaluation of the Pacific Northwest and the estimation of the likely strong ground motion from a large, shallow, subduction zone event. If the total area of the Juan de Fuca - North America convergence zone were to rupture in one event (approximately 600 km by 200 km), a magnitude 9 earthquake would result. Some data, currently under evaluation, suggests that the plate boundary is segmented with different degrees of coupling on each segment. If two segments exist, and only on ruptures at a time, the maximum magnitude earthquake would then be 8.5.

As part of the determination of possible source geometries for the Pacific Northwest (Task I) and a comparison with other subduction zones (Task II), trench bathymetry and the temporal and spatial patterns of seismicity have been studied. Based on trench bathymetry, seismic quiescence, and also plate age, Washington and Oregon compare most closely with the Nanka Trough in southern Japan, southern Chile, and perhaps northern New Zealand and parts of Mexico. Another aspect of trench seismicity which has been considered, is the rate of moderate sized earthquakes (magnitude 5.5 to 6.5). Moment release as a function of time has been plotted for different subduction zones for the given magnitude window. The objective is to test for an inverse correlation between the maximum size earthquake in an area and the moment release rate of smaller events. The results do not show any systematic variations between subduction zones. However, nonuniform sampling may exist at the lower magnitude cut off. The results will be checked by using a magnitude window of 6.0 to 7.0.

The characterization of the rupture heterogeneity (Task IV) is an important component of both the comparison of different subduction zones and the computation of response spectra for the Washington-Oregon area. After considering different data sets, the Caltech, 1-90 Benioff seismometer records were selected to characterize the rupture heterogeneity of large, shallow thrust earthquakes from different subduction zones. The 1-90 instrument was chosen because of its broad bandwidth and long history of operation. Records from the 60 largest, shallow, thrust earthquakes that have occurred in the circum-Pacific since 1938 have been collected and their P-waves digitized. Time functions for 1/3 of these events have been computed to date using a constrained, least-squares inversion. When completed, this set of time functions will form a unique and valuable basis for the comparison of different subduction zones and the ground motion that may be expected from subduction zone earthquakes.

The Japanese data set of strong motion records is perhaps the most appropriate (Task V) to use to construct ground motions for a Juan de Fuca subduction zone event. However, the final decision on which records should be used will be made at the completion of the time function analysis.



Nuclear Information and Resource Service

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June 1, 1984

James M. Felton, Director
Division of Rules and Records
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

FREEDOM OF INFORMATION
ACT REQUEST

FOIA-84-462
Rec'd 6-5-84

FREEDOM OF INFORMATION ACT REQUEST

Previous Related Request: FOIA 84-276 (BELL)

To whom it may concern:

Pursuant to the Freedom of Information Act, 5 U.S.C. 522, as amended, the Nuclear Information and Resource Service requests the following documents regarding subduction zones and low angle thrust faults in the Pacific Northwest which could affect the Trojan and WPPSS No. 3 nuclear plants. Please consider "documents" to include reports, studies, test results, correspondence, memoranda, meeting notes, meeting minutes, working papers, graphs, charts, diagrams, notes and summaries of conversations and interviews, computer records, and any other forms of written communication, including internal NRC Staff memoranda. The documents are specifically requested from, but not in any way limited to, the Office of the Executive Legal Director (OELD); Office of Nuclear Regulatory Research (Research); Office of Nuclear Reactor Regulation (NRR); Geosciences Branch of the Division of Engineering; and the Operating Reactors Branches of the Division of Licensing. In your response, please identify which documents correspond to which requests below.

Pursuant to this request, please provide all documents prepared or utilized by, in the possession of, or routed through the NRC related to:

1. Contracts with the United States Geological Survey and NRC to examine the implications for subduction zones, low angle thrust faults and any other geologic/seismologic information or theories which may affect the Trojan and WPPSS No. 3 sites;
2. Studies, papers or other reports produced by public and private sources regarding subduction zones, low angle thrust faults and other geologic/seismologic characteristics which bear on nuclear sites in the Pacific Northwest; and

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3. NRC's considerations of the possible implications of these developments in information and theories to the Trojan nuclear power plant;

4. The status of the geologic and seismologic review of the WPPSS No. 3 operating license application, including open items, resolved items and schedules (not previously identified in response to FOIA-83-515 BELL).

In our opinion, it is appropriate in this case for you to waive copying and search charges, pursuant to 5 U.S.C. 552(a)(4)(A) "because furnishing the information can be considered as primarily benefiting the general public." The Nuclear Information and Resource Service is a non-profit organization serving local organizations concerned about nuclear power and providing information to the general public.

Sincerely,



Nina Bell
Nuclear Safety Analyst

cc: File