United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VA. 22092

In Reply Refer To:
Mail Stop 905

Dr. Robert Jackson
Chief, Geosciences Branch
Division of Site Safety and
Environmental Analysis
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

JAN 18 1980

Dear Bob:

This is in response to your letter of January 4, 1980, concerning the Skagit Nuclear Power Project, in which you ask for clarification of the intent of our questions contained in our letter of December 10, 1979.

I trust that the intent of each question, in and of itself, is understood but the reason for our requesting such information as a whole is not stated. As we have indicated to you at the various meetings to which you refer in your letter, we have become increasingly concerned, as more new data are analyzed, that the Neogene and Quaternary deformation of the area north of the Devils' Mountain fault including the proposed site area and further north has not been determined adequately. Consequently, the possibility of capable faulting that could generate ground motion and deformation in excess of the amounts proposed for use in the design of the facility has not been precluded.

The justification for our concerns result from several sources; namely, detailed analysis of recently obtained seismic profiles, continued geologic mapping in the Clear Lake 15 minute quadrangle and reanalysis of aeromagnetic data in light of the latest geologic mapping.

Analysis of the seismic profiles (e.g. Mobil lines) has indicated offsets of horizons of very young age. We feel that the most probable interpretation of these offsets is that they represent high angle faults and probably connect from profile to profile to represent faults with general northwest-southeast strike and that the area of data collection contains many such NW-SE high angle faults. Since some of these structures must be considered to be capable, as indicated by offsets at or very near the sea floor, the possibility that all similar structures are capable must be considered unless there are data to demonstrate noncapability.

1829 125

One Hundred Years of Earth Science in the Public Service

The mapping onshore by Professor J. Whetten and others indicate or postulate several NW-SE high angle faults in the general area around Clear Lake and Walker Valley. Due to the difficult terrain and dearth of appropriate stratigraphic markers, it has not been possible to determine the length, throw, direction of movement, or the age of last movement of most of the structures. But there are indications that at least two are several kilometers in length. However, due to the similarity of the onshore and offshore data as interpreted by Survey researchers, we believe that the recent displacements offshore represent faulting that could be very similar to the faulting onshore and consequently represent similar earthquake generating and fault displacement potential.

However, since the demonstration of noncapability of the onshore faults will be very difficult at best and likely impossible in many instances, it is our judgment that the impact of these features on the proposed Skagit Nuclear Generating Station is unknown, could be severe, and will be extremely difficult to determine with the degree of certainty necessary. Consequently, we believe that an extensive and time-consuming field program would be needed to address these issues and even then, may not be successful because 1: there are few stratigraphic horizons of appropriate age and distribution in the region, and 2: the possibility that the onshore structures have, indeed, experienced recent movement.

Finally, prior to the Skagit application the geologic data base in this extremely complicated region of the country was extremely poor, relative to what is needed to arrive at a position with the level of confidence required by the Nuclear Regulatory Commission. In addition, this data base has been developed very slowly and with great difficulty and expense (one point with which I'm certain the applicant could agree). Consequently, the potential for significant new findings that could affect a nuclear facility license is relatively high.

It was with the consideration that no geologic structure, closer to the proposed site than the Devils' Mountain fault, need be considered to be capable by NRC criteria that we agreed to the proposed use of a bedrock acceleration value of 0.35g as the Safe Shutdown Earthquake. However, since we now believe that the site region may contain young faulting whose lengths, throws, distributions and ages are not known, there is not, in our judgment, assurance that the proposed acceleration values are sufficiently conservative to meet the requirements of the Nuclear Regulatory Commission.

Sincerely yours,

H. William Menard
Director