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# United States Department of the Interior

GEOLOGICAL SURVEY  
RESTON, VA. 22092

Mail Stop 908  
June 6, 1980

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

Dear Bob:

Enclosed is the U.S. Geological Survey evaluation of the applicants review of the foundation photographs of the GETR site. This review is in response to your request of May 6, 1980.

Sincerely,

Robert H. Morris  
Deputy Chief for Reactor Programs

Enclosure

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General Electric Test Reactor  
Review of Photographs and  
Applicants Interpretation  
as stated in letter of April 29, 1980

The U. S. Geological Survey has reviewed the applicant's interpretation of six photographs of the GETR foundation as stated in the letter dated April 29, 1980, from Mr. Darmitzell to Mr. Eisenhut. The six photographs are identified as follows:

- T1 - View of southeast foundation wall
- Q1 - View of northeast foundation wall
- R1 - View of the north foundation wall
- S1 - Partial view of northwest corner of the GETR foundation wall
- P1 - View of southwestern part of the excavation
- W1 - Distant view looking east of east foundation wall

The USGS does not concur with the applicant's conclusions stated in the April 29, 1980, letter. The photographs do not appear to portray clearly or unequivocally that no faults pass through the foundation area. Our examination of the photographs precludes affirmation of the applicant's conclusions and suggest that there are features evident that are at least permissive of other interpretations as stated below.

- T1 In photograph T1, a sequence of dark- and light-colored beds of sand and gravel are visible in the southeast wall of the GETR foundation. This bedding is interrupted in 2 localities along dipping planes:
- a. In the extreme right center of photograph T1, behind the wood plank leaning against the foundation of the Office Building Control Room. (Photograph S1 was apparently taken just above this locality on the south wall, but looking northwest.) The flat-lying, banded sand and gravel beds in the south wall end abruptly to the west against a light-colored clay(?), along a contact that dips at an approximate  $45^{\circ}$  angle to the right (north). The light-colored clay interfingers with several dark-colored beds at the right edge of the photograph.
  - b. In the left center of photograph T1, below the distant Vallecitos Boiling Water Reactor. Flat-lying or low-dipping bedded gravels and sand appear to be juxtaposed against an unstratified body of gravelly clay(?). Contact dips here at an approximate  $45^{\circ}$  angle to the left (northeast). The unstratified clay might be spoil, but beds to the right of it near the center of photograph T1 appear to wedge out atop it.

The upper one-third of the southeast wall is obscured by spoil, so that the character and age of the materials there cannot be determined.

Claw marks in the wall excavation, spoil, lighting, and construction materials make the interpretation of the dipping planes in photograph T1 difficult, but a reasonable and conservative conclusion is that they represent faults that extend directly into the reactor foundation.

The dipping planes can be interpreted either as faults or channels. We favor a fault interpretation because there do not appear to be any gravels within what would be the channel's thalweg, and the dipping surfaces are more planar and steeper than the other channels observed in the GETR area, such as the one in trench B-1, station 10 + 00, and the one we interpret as a channel in photograph Q1. The bedding on the northeast block of the dipping surface in the left center of photograph T1 does not appear to lense as it approaches that boundary. Rather, the bedding seems to be abruptly truncated against the probable fault. Two light-colored horizons on the northeast block appear to end upward as they approach the fault, suggesting drag. This deformation is characteristically associated with a normal component of fault movement (northeast block down).

We cannot determine the strike of the probable faults in the photographs, they could parallel the others in the GETR area, which strike northwesterly. Alternatively, the two faults, with their opposing dips, may actually be a single west-striking, north-dipping fault that intersects the excavation at 2 points. The fault would appear to be left-dipping in the left of photograph T1, and right-dipping opposite because of the faults' intersection like a chord with a cylinder-shaped excavation. In either case, the probable faults would intersect the GETR foundation.

Inasmuch as the upper one third of the southeast wall is obscured by spoil, the age of the youngest beds displaced by the faults cannot be determined. If our correlation of the materials in the lower part of the excavation is correct, the faults are at least younger than 300,000 years.

Q1 Bedded sands and gravels appear to be exposed in the lower two-thirds of the other 3 walls. Bands of lighter- and darker-colored sediments may represent oxidized units, perhaps buried soils. The sand and gravel beds are low-dipping, if not horizontal. In photograph Q1 (looking northeast), what may be the cross-section of a channel is faintly visible above the bulldozer. There, a darker-colored, graveliferous unit rests unconformably in a broad, shallow, V-shaped depression atop a lighter-colored clay(?). The low dip of the gravels and sand, the buried soils(?), and the channel suggest that the foundation of the GETR is constructed in late Pleistocene alluvium. This would be, in part, the same alluvium (Qoa<sub>2</sub> of Herd, 1977) seen in the center of trench B-1, excavated 280 ft. north of the GETR. That unit is probably older than 70,000-130,000 years and less than 300,000 years (Herd and Brabb, 1980, p. 74).

S1 For all practical purposes, little can be said of what might have been exposed in the west wall of the excavation. Photograph S1 was taken after the west wall had been covered with wood planking for the construction of the foundation of the Office Building Control Room. No other photographs of the west wall apparently exist.