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May 7, 1969

Mr. James E. Hard
Senior Staff Assistant
Advisory Committee on Reactor Safeguards
United States Atomic Energy Commission
Washington, D. C. 20545

CT-0162 A
PDR 4/17/79

James A. Fitzpatrick Nuclear Power Plant
Power Authority of the State of New York

Dear Mr. Hard:

The steeply dipping fault diagonally crossing the turbine area foundation at the Fitzpatrick plant, was examined on the afternoon of May 6 in company with:

Representatives of PASNY, including Chief Engineer Asa George
Representatives of S & W, including Consulting Engineer W. F. Swiger
Mr. Tom Cardone, DRL AEC
Mr. Howard H. Waldron, Engineering Geology Branch, U. S. Geological Survey.

The fault is exposed on the east and west sides of the excavation in the Oswego sandstone in the turbine area. It strikes about N 70 W, thereby being about 20 degrees off of normal to the centerline of the building. It dips northward away from the reactor at about 70 to 75 degrees from the horizontal, thereby being about 20 degrees flatter than vertical. The foundation of the reactor is about 100 feet to the south of the fault. It is underneath the fault in the foot wall in completely undisturbed rock. The north wall of the fault has a very few short vertical fractures. The underside, north side (hanging wall) of the fault is striated in the vertical, showing that the walls of the fault have moved in a vertical direction. It is not a lateral fault like the San Andreas. The gouge, or crushed material between the walls of the fault, is a few inches thick and is a gray silty material, containing about 30 to 40% fragments of sandstone. Some of these are platy and oriented parallel to the striae. On the footwall, or south side of the fault, the laminae of the discontinuous, occasional layers of shale in the Oswego sandstone have been bent down next to the fault plane. But the sandstone beds dip south, away from the fault at angle of about 15 degrees for a distance of about 20 feet. Thus the beds for a short distance on the underside of the fault have been tilted upward as if refusing to move downward. This tilting is the main reason for considering that the fault is a reverse fault (one in which the upper side moves up) even though the dip is a great deal steeper than is usually found in the thrust faults in the flatlying rocks of the platform area of the northeastern part of the

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United States.

Stone and Webster had directed the excavation of two pits over a hundred feet east and west respectively of the main excavation to expose the fault directly beneath the overlying glacial till for the purpose of seeing whether the fault continued from the Ordovician bedrock upward into the Pleistocene till. If the fault continued into the till and the till was offset or disturbed then it may be assumed that action on the fault has occurred in the past 13,000 years since the Wisconsin ice sheet left the site.

The till in the easterly pit was composed of boulders and coarse materials so oriented that it was not clear whether these materials were of natural origin or had been dumped there during this or an earlier construction episode when the area was part of an Army installation during World Wars I and II. However, preliminary clean up of the easterly wall of the westerly pit and exposure of the vertical gouge on the fault plane in its contact with the overlying till for a north-south distance of a foot or so, revealed a continuous dark organic layer which was <u>not</u> broken either directly above the fault or north or south of the fault for several feet.

In my opinion from the data and conditions visible in the excavations on the site on the afternoon of May 6 the fault is old and not active within the age of the organic layer in the westerly pit. It may be considered as a horizontally restrained, nearly vertical, very thin, weak zone in a strong bedrock foundation and not an active fault.

May I suggest that this fault might have been recognizable prior to construction if the cores of the borings had been logged to define the stratigraphy and structure of the site as they would have been in a foundation study for a high concrete dam. There will be many other nuclear plants in stratified bedrock and soils and unless the subsurface explorations in the bedrock and in the soils are conducted in such a way as to reveal the true stratigraphic and structural subsurface conditions, such construction events will continue to disrupt the construction schedule.

Very truly yours,

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