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

MAY 1 1980

Mr. Eugene Orlando, Jr.
Murphy and Parish, P. C.
40 N. Reading Avenue
Boyertown, Pennsylvania 19512

Dear Mr. Orlando:

This is in regard to your letter of April 3, 1980 addressed to the Chairman and myself regarding the site selection process for the Limerick Generating Station and possible geological and seismic problems at the site. I am responding to your letter in view of the fact that, under NRC rules of practice, the Chairman and other members of the Commission may be called upon to review discussions regarding the operating license application for the Limerick Generating Station and, hence, it would be inappropriate for him or other members of the Commission to comment on the matters raised in your letter.

The Limerick site was accepted by the NRC after a staff comparison of Limerick with Philadelphia Electric Company's four proposed alternative sites and with six additional alternative locations selected by the staff. On the basis of the staff's siting criteria, the staff concluded that, on balance, no alternative siting of the proposed nuclear project was superior to Limerick. Thus, the Limerick site was found by the NRC to be acceptable under the guidelines established by the National Environmental Policy Act of 1969.

The geology of the Limerick site was initially investigated as part of the Atomic Energy Commission (AEC) Regulatory Staff's (NRC's predecessor) review of Philadelphia Electric Company's (PECO) construction permit application for the Limerick facility. The geology and seismology portion of this review considered the historic seismic activity of the region and the associative geologic structures in defining a postulated earthquake to serve as the design basis for safety structures, systems, and components in the Limerick facility. The applicant provided data on earthquakes extending back to the early 18th Century, and noted that ten small earthquakes had occurred within about 25 miles of the site. A Safety Evaluation Report was issued in November 1971 which described the review and acceptance of the safe shutdown and operating basis earthquakes to be used for design of the facility, and recommended issuance of the construction permits. The construction permits were issued on June 19, 1974.

Later, during excavation for the reactor buildings, minor geologic faults were discovered in the rock foundations. A geologic investigation was performed and was concluded in late 1974. The geologic investigation included (1) field work performed by PECO's geotechnical consultants, (2) an independent review of these results by a committee of collegiate structural geologists who were familar with the geological formations that contained the faults, and (3) a review of these two efforts by the AEC Regulatory Staff. This investigation

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concluded that differential movement along the fault zones had ceased 150 to 200 million years ago. That conclusion was congruous with the information on which the seismic design criteria was found acceptable during the construction permit review.

Your letter questioned whether recent seismic activity along the eastern coast of the United States has compromised the basis for the originial decision on adequacy of the seismic design criteria for the Limerick Generating Station. Recent events which might impact the safety of the Limerick Generating Station will be considered in our review of the application for operating licenses for these nuclear reactors. We expect the Philadelphia Electric Company to apply for an operating license in late 1980 or early 1981 and our review will start shortly after receipt of the application. In the meantime, we note that the earthquakes on March 5 and 11, 1980 to which you refer provided a ground motion characterized as a Modified Mercalli MM IV earthquake near their epicenters. The ground motion was not noticed at the Limerick site. The Limerick Generating Station is designed to withstand a ground motion characteristic of an earthquake intensity between MM VII and MM VIII. The table given on Enclosure 1 describes the Modified Mercalli scale used to rate the intensity of earthquakes.

In summary, the intensities of recent earthquakes are only a small fraction of the design basis earthquake for the Limerick Generating Station and fall well within the criteria approved for station design. The recent earthquakes appear typical for the region, and earthquakes of equal and larger intensity were considered during the construction permit review. We will examine the recent seismic history (since 1974) in more detail during our review of the application for operating licenses, but the earthquakes to which you refer pose no threat to the station.

Sincerely,

Original Signed by
H. R. Denton

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosure:
Modified Mercalli Intensity
Scale

TABLE 2.5.5

EARTHQUAKE INTENSITY

MODIFIED MERCALLI INTENSITY (DAMAGE) SCALE OF 1931
(Abridged)

I. Not felt except by a very few under especially favorable circumstances. (I Rossi-Forel Scale.)

II. Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing. (I to II Rossi-Forel Scale.)

III. Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibration like passing of truck. Duration estimated. (III Rossi-Forel Scale.)

IV. During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensation like heavy truck striking building. Standing motorcars rock noticeably (IV to V Rossi-Forel Scale.)

V. Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbance of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop. (V to VI Rossi-Forel Scale.)

VI. Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight. (VI to VII Rossi-Forel Scale.)

VII. Everybody runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motorcars. (VIII Rossi-Forel Scale.)

VIII. Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall

TABLE 2.5.5 (Continued)

of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motorcars disturbed. (VIII+ to IX- Rossi-Forel Scale.)

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken. (IX+ Rossi-Forel Scale.)

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks. (X Rossi-Forel Scale.)

XI. Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.

XII. Damage total. Waves seen on ground surface. Lines of sight and level distorted. Objects thrown upward into the air.