



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

APR 23 1984

MEMORANDUM FOR: Richard H. Vollmer, Director
Division of Engineering

THRU: *[Signature]* James P. Knight, Assistant Director for
Components & Structures Engineering
Division of Engineering

FROM: Robert E. Jackson, Chief
Geosciences Branch
Division of Engineering

SUBJECT: 4.1 MAGNITUDE EARTHQUAKE NEAR LANCASTER, PENNSYLVANIA

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1.22
76.3500
1.5*

An earthquake of magnitude $m_b = 4.1$ and focal depth of 6 km occurred at 08:36:00.2 P.M. EST on April 22, 1984. The epicenter of the earthquake was located at 39.85N - 76.27W.

Personnel at Peach Bottom (10 km from the epicenter) and Three Mile Island (63 km from the epicenter) felt the earthquake but none of the strong motion instruments in the plants triggered.

Personnel at Calvert Cliffs, Surry, Susquehanna, Beaver Valley, Indian Point, Oyster Creek and Salem did not feel the earthquake.

Very minor damage occurred near the epicenter of the earthquake. This earthquake occurred in the same area as the magnitude 3.0 earthquake which occurred on April 18, 1984.

Attached is a map from the Limerick FSAR showing historical seismicity (1755-1980) within 50 miles of the Limerick site. Indicated on this map are the April 18, 1984 earthquake epicenter and the Peach Bottom and TMI Nuclear Power Plants.

As shown in the figure, the earthquake occurred in a region which has experienced moderate seismic activity in the past.

Robert E. Jackson, Chief
Geosciences Branch
Division of Engineering

Attachment:
As stated

cc: w/attachment
H. Denton
L. Beratan
J. Fouchard

D. Eisenhut
K. Perkins
GSB Staff

84/518/313 XA

May 11, 1984

Docket No. 50-277
50-278

Dr. Thomas E. Murley
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

SUBJECT: Seismic Event in the Area of Peach Bottom
Atomic Power Station

Dear Dr. Murley:

The purpose of this letter is to provide you with information relative to the April 22, 1984, seismic activity which occurred in the area of Peach Bottom. This activity did not cause ground motion sufficient to be reportable under facility Technical Specification; however, due to the circumstances of the occurrence, it is prudent to provide you with this information.

On April 22, 1984, at approximately 8:35 p.m., seismic activity was noted by Peach Bottom personnel. Although no alarms were received and the plant continued to operate normally, the Special Event Procedure for earthquakes (SE-5) was performed. This procedure involves testing of all emergency diesels, surveying rotating equipment and storage tanks, inspection of the plant for water leaks and testing of the fire pumps. No defects or malfunctions were observed.

This seismic event was reported by ecologists from the states of Pennsylvania and Delaware to be 4.0 on the Richter scale. Table 19-2 of "Nuclear Energy Technology" provides a correlation of Richter scale vs. ground acceleration. This correlation indicates that for a Richter magnitude 4.0 event the corresponding g force is approximately 0.01g at the epicenter. Since the epicenter was determined by the authorities to be several miles from Peach Bottom, the expected level of ground acceleration should be less at the plant. The trigger threshold for the installed seismic monitoring system activation is 0.01g.

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Due to the fact that the absolute magnitude and exact epicenter of the event were unknown, the appropriate surveillance testing was undertaken to verify the operability of the seismic monitoring system. These tests revealed that the system would not have responded to any event due to a malfunction of the Strong motion detector which serves as a trigger for the system. The system had last been demonstrated to be operable during surveillance testing on April 19, 1984. The cause of the failure of the active system trigger was traced to a defective circuit board. This board was replaced and the system was successfully retested and returned to service on April 27, 1984.

Information from the passive recording system which consists of triaxial peak acceleration recorders (etch plate accelerographs) was also analyzed. The minimum sensitivity of these devices is 0.01g (or 0.02 mm displacement on the recording). The analysis of the etch plates provided unreasonably high event levels (0.5 to 1.8g) which have been attributed to work activities which had taken place in the areas in which these recorders are located.

The passive system was tested and calibrated in accordance with the appropriate surveillance test and the devices were returned to service. The purpose of the system is such that the sensitivity of these devices is appropriate for the application as described on pages 7.21-1 and 2 of the Updated FSAR. No further action is anticipated in this area.

The significance of this event is minimal. In the worst case, assuming the epicenter had been on-site, the ground acceleration would have been 0.01g or 20 percent of the Operating Basis Earthquake level. This level also corresponds to the setpoint of the strong motion sensor trigger.

If you require further information in this matter, do not hesitate to contact us.

Very truly yours,

W. T. Ullrich
Superintendent
Nuclear Generation Division

JCN:vdw

cc: A. R. Blough, Site Inspector