

OCT 25 1979

MEMORANDUM FOR: Robert E. Jackson, Chief  
Geosciences Branch, DSS

THRU: Lyman W. Heller, Leader  
Geotechnical Engineering Section  
Geosciences Branch, DSS

Leon Reiter, Leader  
Geology and Seismology Section  
Geosciences Branch, DSS

FROM: Owen O. Thompson, Geotechnical Engineer  
Geotechnical Engineering Section  
Geosciences Branch, DSS

Richard B. McMullen, Geologist  
Geology and Seismology Section  
Geosciences Branch, DSS

SUBJECT: EXAMINATION OF FAULTING AT THE NINE MILE  
POINT 2 NUCLEAR SITE DOCKET NO.: 50-410

A meeting was held on October 10, 1979, at the Nine Mile Point site among representatives from the Niagara Mohawk Power Corporation (NMPC), its consultants Dames and Moore and J. A. Fischer, the New York State Electric and Gas Company (NYSEG), the New York State Geological Survey (NYSGS), the Nuclear Regulatory Commission (NRC) and its consultants the Corps of Engineers (CE) and Los Alamos Science Laboratories (LASL). A list of attendees is attached. The main purpose of this site visit was to examine an exposure in the recent excavation for the radwaste building of a continuation of a fault that had been previously mapped in the heater bay area excavation (see memorandums: Stepp from Jackson, September 27, 1976; and Stepp from McMullen, December 17, 1976). Another reason for the site visit was to provide the opportunity for geologists with the NYSGS, CE, and LASL who had never been there to become familiar with site faulting and rock mechanics characteristics. The fault was encountered in the most recent excavation at about the same level as it had been in the excavation for the heater bay in 1976. An attempt was made during the current investigation to trace it at depth toward the east where it is believed to pass into bedding planes. However, at the base of the trench it was still cutting across the bedding at a low angle.

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The fault is a complex zone of deformation several feet wide containing folding and shearing with thrusting from east to west being the principal movement. The zone strikes north-northeast and dips toward the east at an angle of approximately 30°. Maximum displacements within the fault zone range from 4 feet horizontal and 2 1/2 feet vertical near the bottom of the trench to 7 1/2 feet horizontal and 2 1/2 feet vertical higher up in the western part of the trench. Dialation is apparent along the fault, the bedding planes and joints. Many of the separations have been filled with a very plastic, laminated clay, which, based on its physical appearance and the age dating of pollen imbedded in it, is interpreted to have been deposited from glacial lake Iroquois. Calcite mineralization is present in the fault zone, and fluid inclusions within these crystals are being analyzed at Pennsylvania State University. Preliminary results indicate that the crystals were formed under low temperature and low pressure groundwater conditions. Therefore, they formed after the Cretaceous (36 million years before present) which post dates deep burial and any known hydrothermal event. The thrusting is interpreted as being younger than the normal faulting on the Cooling Tower fault. The Cooling Tower fault is described in NRC memorandums: January 4, 1977, Stepp from Jackson and McMullen; April 27, 1977 Stepp from O'Donnell and McMullen; and July 7, 1977 Stepp from McMullen). Deformed lake bed clays in the fault exposure in the heater bay area indicate that some movement along the fault has taken place since the end of the Pleistocene (10,000 years before present). Mapping of the fault and analyses of materials from the fault zone are continuing. NMPC and its consultants will decide within the next couple of weeks what course future investigations of the fault zone should take.

We had originally requested that NMPC re-open one or more of the pits across the Cooling Tower fault so that those geologists who had not seen it could do so. NMPC was not able to accomplish this for this site visit but agreed to have one of the pits open in mid-November. However, an exposure of the Drainage Ditch fault, which is similar to the Cooling Tower fault was still available for observation during this site visit. The Corps of Engineers indicated that they would not need to examine the Cooling Tower fault. The Los Alamos consultants reserved a decision until after reviewing the NMPC's report on site faulting but indicated that it probably wouldn't be necessary to re-open the pits.

Original Signed by

O. O. Thompson

Owen Thompson, Geotechnical Engineer  
 GES, GB, DSS  
 Original Signed by  
 E. B. McMullen

Richard B. McMullen, Geologist  
 GSS, GB, DSS

Attachment:  
 As stated

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Robert E. Jackson

OCT 25 1979

- cc: w/attachment
- J. Knight
- S. Varga
- R. Jackson
- L. Rubenstein
- L. Reiter
- L. Heller
- D. Lynch
- O. Thompson
- R. McMullen
- T. Wilkinson, C of E, Buffalo
- R. Lutton, C of E, WES
- J. York, LASL
- H. Bailey, NCSGS
- A. Varella, Region I

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 DOCKET FILE (50-410)  
 GSB RDG

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| SURNAME | RMcMullen: sb | OThompson | LHeller  | LReiter  | REJackson |
| DATE    | 10/16/79      | 10/17/79  | 10/17/79 | 10/17/79 | 10/17/79  |

OCT 30 1979

List of Attendees

Niagara Mohawk Power Co.

N. Rademacher  
P. Francisco

Dames & Moore, Inc.

J. Szymanski  
J. Markham

FEES Inc.

J. Fischer

N.Y. State Geological Survey

H. Bailey  
R. Fickies

Corps of Engineers

T. Wilkinson  
B. Greene  
R. Lutton

Los Alamos

F. Goff  
J. York

NYSEG

J. Bardgett

NRC

O. Thompson  
R. McMullen

OCT 30 1979