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LEMPGES,T.E. Niagara Mohawk Power Corp.
RECIP.NAME RECIPIENT AFFILIATION
SCHWENCER,A. Licensing Branch 2

SUBJECT: Forwards App 2M containing addl info re Trench 1 & absence of indication of cooling tower fault in trench,App will be incorporated in FSAR Amend 16.Info resolves SER Open Items 9-12.W/three oversize drawings.Aperture cards in PDR.

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NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

November 8, 1984
(NMP2L 0228)

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Schwencer:

Re: Nine Mile Point Unit 2
Docket No. 50-410

On November 1, 1984, Niagara Mohawk met with the NRC Licensing Project Manager and NRC geology branch staff representative in order to discuss the geology open issues in the Safety Evaluation Report. As a result of discussions at this meeting, we are providing an advanced copy of a new Appendix 2M, which will be incorporated in the FSAR in Amendment 16. This appendix contains additional information related to Trench 1 and the absence of indication of the cooling tower fault in this trench. This material was reviewed during the meeting and was determined by the NRC staff geologist to provide the information necessary to satisfactorily resolve Safety Evaluation Report open items 9-12.

In addition to this appendix, we discussed several photographs which were used for determining lineaments at the Nine Mile Point 2 site. These photographs may be obtained from Lockwood Support Services, Inc., 36 Karlan Drive, Rochester, New York 14617. The photographs are all dated 6/28/38 and consist of the following numbers: ARY-2-20, ARY-2-21, ARY-2-22, ARY-2-27 and ARY-2-28.

Very truly yours,

T. E. Lempges
Vice President
Nuclear Generation

TEL/AFZ:ja
xc: R. Gramm, Resident Inspector
Project File (2)

B001 A/E Type Cond Dist. Drawings To: PA
1/1

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
Niagara Mohawk Power Corporation	)	Docket No. 50-410
	)	
(Nine Mile Point Unit 2)	)	

AFFIDAVIT

T. E. Lempges, being duly sworn, states that he is Vice President of Niagara Mohawk Power Corporation; that he is authorized on the part of said Corporation to sign and file with the Nuclear Regulatory Commission the documents attached hereto; and that all such documents are true and correct to the best of his knowledge, information and belief.

Thomas E. Lempges

Subscribed and sworn to before me, a Notary Public in and for the State of New York and County of Onondaga, this 8 day of November, 1984.

Janis M. Macro
Notary Public in and for
Onondaga County, New York

My Commission expires:
JANIS M. MACRO
Notary Public in the State of New York
Qualified in Onondaga County No. 4784555
My Commission Expires March 30, 1985

APPENDIX 2M

ADDITIONAL INFORMATION

ON

TRENCH 1.

TABLE OF CONTENTS

A. Handwritten Notes of Conference with NRC on December 22, 1976

B. Affadavit of Douglas E. Isler

C. Affadavit of John J. Markham

D. Affadavit of John H. Peck

E. Final Field Sketch of Trench 1 (4 Sheets)

NOTE: A set of color slides showing the bedrock surface in Trench 1 was provided to the NRC by a letter from T. E. Lempges to A. Schwencer dated November 8, 1984.

J.O. 12177.16

NOTED JAN 5 1977 J.H.Peck

NRC Site Visit 12/22/76 Nine Mile 2

Attendance list attached.
For full notes of conference see notes of J. H. Mullin C.H.O.C, attached

R. Jackson of NRC asked T. Peck of S&W what his opinion was in regard to the Cooling Tower Trench fault being a seismic safety hazard to the existing plants. A lengthy response was given which concluded that at the present state of knowledge concerning the feature, it does not constitute a seismic safety hazard to the existing plants. The major points covered in reaching that conclusion were the following:

1. Faulting in rock at Cooling Tower shows left lateral movement, horizontal slickensides, and 1½" of apparent vertical displacement. Rock surface in fracture zone is glacially rounded indicating pre-glacial age for bedrock faulting. Horizontal displacement not determined; based on dip of rock and all strike slip motion, vertical offset can be accounted for by 2½' of horizontal movement.
2. Soil profile over bedrock fault shows

discontinuous graben forming sheaves in lacustrine deposits overlying till. Max. vertical offset is about 1 cm. The till shows no sheering. Peat soil overlies the lacustrine deposits and is not disturbed.

3. In the pit excavated about 40 feet NW of the cooling tower trench, the rock is fractured, shows horizontal slickensides and apparent left lateral movement of unknown amount. Horizontal slickensides are coated with crystalline calcite which is undisturbed. The fracture zone in rock is topographically low (about 6-10' compared to the undisturbed rock on either side and shows glacial polish and striations along edges of the zone

4. The soil profile in the pit consists of till over rock, lake bed silts, rippled and cross laminated sands, and peat soil. Small grabens occur in the lake bed deposits but not in the rippled sand or the till. Displacement is about 1 cm on gravity-type sheers. Compaction folding over boulders in the till is shown in the lake bed silts but not in the rippled sands. The contact between lake bed deposits and rippled sand is an

unconformity.

5. Trenches to the NW of the pit at 800' and 1600' along strike show no faulting in rock or soil disturbance. Some jointing is present.

6. In Trench #3 (600 ft. SW of cooling tower trench) the rock shows apparent vertical offset of at least 2½ ft. possibly more with south side down. The rock also shows a topographic low on the south side of the fracture zone which shows steep dip to the south and evidence of glacial plucking. The topographic relief is about 4½ feet. The fracture zone shows horizontal and vertical slickensides with vertical younger than horizontal and crystalline calcite smeared into vertical slickens. Rock surface dips gently north, north of the pulverize zone and steeply south, south of the zone. No clay gouge is evident but sandstone is brecciated and pulverized in a zone about 6" to 1 foot wide and rock is badly fractured in a zone about 3 feet wide.

7. Soil overlying rock in Trench #3 consists in ascending order of bouldery till, dark gray laminated lake bed silts, and light brown

ripple marked sands and silty sands, with a dark brown peat soil capping the sand. Artificial fill covers the peat. The till, lake bed deposits and rippled sand show a monoclinal fold structure over the fracture zone in bedrock with reverse shears in the sand and the sand-lake bed contact. The displacement on these shears is a max of 2.5 inches. The shears are discontinuous and become lower angle upward. Correlation of beds from south side to north on the monocline show that south side is 2½ ft. lower than north side. No thrusting shears in till, lake beds and sand are evident No displacement of peat is evident. The contact between lake bed deposits and sand is an unconformity and another unconformity within the sand is also evident. The peat soil is also unconformable on the sand, it does not conform to the fold below.

8. In Trench #4 (about 700 ft southeast of Trench #3) the bedrock shows a zone of brecciation and pulverized sandstone about 1 foot wide, trending N 75° W and dipping steeply. The rock surface on the south side is

about 3 feet lower than the rock surface on the north and dips about 25° south. Glacial plucking is evidant south of the fracture zone. Glacial disturbance of large blocks of sandstone north of the zone has resulted in blocks surrounded with till but more or less in a normal open jointed configuration. That is, the joints are filled with till and till occurs under the blocks. The rock north of the zone dips slightly north. Vertical slickensides are present along joints parallel to the broken zone south of the zone. Vertical displacement of the rock, if any, is not yet determined. Change in dip on both sides of crush zone would suggest some sort of near-surface buckling.

9. Soil profile overlying the bedrock in Trench # is mostly till which shows irregular oxidation and includes pockets of structurally disturbed sand, silt and gravel south of the fracture zone in bedrock. Fold & shear structures of the sand bodies in the till indicate overriding by ice or other material. Within the till, no shear zones are evident over the bedrock zone. A large sandstone block is fractured and its north side moved up about 6 inches relative to south side, but thin slab of sandstone

beneath is not broken. The crack in the sand is filled with till in the upper open part. A wedge of post-till soil is present just to the north of the bedrock fracture zone on the west wall. The top of till is a pavement surface, very hard and smooth, dipping north at about 25°. Overlying the till pavement is a thin wedge of lake bed silt which shows a 1/2 inch gravity sheen with south down, coincident with a 2 1/2 inch topographic feature on the till surface. Above the lake bed deposits are rippled sand and gravel deposits which appear to be unconformable on the lake bed silts, do not show sheaving, and thicken northward. Unconformable on the sands is wood-bearing peat soil.

10. The relationships seen in the trenches and pits seem to indicate that a pop-up or glacial rebound feature has occurred along a pre-existing bedrock fault. The timing of the pop-up is uncertain but is either late glacial or early post-glacial. The condition of excavation walls and the history of plant construction including tunnels at the Nine Mile and

Fitzgatrick sites indicates no obvious high rock stress condition. Therefore, it seems likely that conditions which could cause a repeat of the pop-up do not now exist at the plant site and that the feature does not constitute a seismic safety hazard to the existing plants.

NOTED JAN 5 1977 J.H.Peck

NRC Meeting

NOTED JAN 5 1977 J.H.Peck

12/22/76

Meeting Attendance

Name	Company
Norm Ledenovich	Niagara Mohawk
J. Mullin	S&W
J.G. McWhorter	DAMES & MOORE
E E FRICKS	S&W
L.H. Haybrook	NMPC (Const)
Lawrence Dornsife	NRC
JOHN KELLEHER	NRC
A. Serkiz	D&M
V.V. MARKHAM	D&M
R.B. McMullen	NRC
R.E. Jackson	NRC
John H. Peck	S&W
JERZY SZYMANSKI	Dames and Moore
T. Edward Tillman	Dames + Moore
G.W. Page	S&W

JH,

Mtg @ Site

23 Dec 76

NOTED JAN 12 1977 J.H.Peck

NMPPD	NRC	D ???	D ???
Rodemacher	Jackson	McWhorter	Peck
Heybroake	McMullan	Markham	Fricke
	O'Donnell	Syzmanski	Mullen
	Kelleher	Seanor	Page
		Tillman	

(1) Visit to RR Trench, (4) Access Rd Pit, (3) Circ Water Tr...
Access Pit destroyed — Circ Water Pit Snow covered

(2) NRC given 1) plan showing trenches
2) Sketch of Access Rd Soil Face

(3) Markham discussed data to date.
RR Pit shows Tilting.

(4) Jackson: Is this a safety Hazard to 3 Units

Jackson While investigating — What about 1 & Ftg ?
Do we have a strategy ?

(3a) - Markham did not wish to discuss program w/o NMPC permission

J/Syz = Hazard is not as great as looks
postulates that "glacial" cause.

4. NRC – What is mechanism?
JS – Hinge line theory

(5) Rolander – We have a program
Can not state safely beyond yet.

(6) McMullen – Is this related to "Saratoga bay"
Peck – No

(7) Jackson – Seismic potential?
McWhorter – Need to know geometry
Have not looked at it yet.
NRC – Air photos?
McW. Yes – Many lineations show on photos
Mentioned Teepee fold

~~NRC – Relation of~~

J.P. – Discussed Fitz Teepee, stress
McMull – Will stress be studied
Peck – Part of proposed program. Jackson 90' hole indicates no stress hasn't moved. Peck agreed
Jackson – What is immediate feeling on safety beyond
90' holes ~~indicates~~ good indicator of stress
Have we studied it
NRC will have to report on it.
Disagreed w/ Isostatic of adjustment Theory

Jackson - Area review

JI NO - not here, Dr. M - some @ Hudson Bay

2 mm/yr here

J.P - Many problems in soil foundations

1) frost 2) relation of soils deposits sampling

3) general discussion of rock movement

a) 2 motions 1st Hor / 2nd Ver

Upwarp in rock surface along pre existing fractures which disturbed overlying soils and additional soils later deposited.
Indicates movement early in post glacial

Rock excavation, Fitz measurements indicate low stresses at site ; low seismic hazard for initial appraisal

Jackson - This is what he writes

NRC - Schedules:

Rademacher will inform

NRC – Met Previews

(4)

NRC – McMullan

Send letter report summarizing Jahns interpretation. Also proposed ~~report~~ program

(due 2 weeks today)

Basis (to date) of not considering this a

(Now paid) safety hazard. Short summary report of John Peck's argument.

More trenching to SE. Total offset seems to be increasing; several feet of offset may work against glacial rebound ~~case~~

Drill in cooling tower area (probably included in scope.)

Useful to discuss consultants & setup of study.

Why it is reasonable to not take action now re: Fitz – Jahns needs a piece of paper.

Now –

McMullan requested a look @ Unit 1 photos

Have not checked

12/22/76

Meeting Attendance

Name	Company
Norm Hademacher	Niagara Mohawk
J. Mullin	S & W
J.E. McWhorter	Dames & Moore
E E Fricks	S & W
L.H. Hayborn	NMPC (Const)
Edward O Donnell	NRC
JOHN KELLEHER	NRC
A. Singh	D & M
J.J. MARKHAM	D & M
R. B McMullen	NRC
R. E. Jackson	NRC
John H. Peck	S & W
JERZY SZYMAHSKI	Dames and Moore
J. Edward Tillman	Dames + Moore
G W Page	S & W

12/2/76
Meeting Attendance

Name	Company
Norm Rademacher	Niagara Mohawk
J. Mullin	S & W
J.G. McWhorter	Dames & Moore
E E FRICKS	S & W
S.H. Haybrook	NMPC (Const)
Edward O'Donnell	NRC
JOHN KELLEHER	NRC
A. Senior	D & M
J.V. MARKHAM	D & M
R.B. McMullen	NRC
R.E. Jackson	NRC
John H. Peck	S & W
JERZY SZYMANSKI	Dames and Moore
J. Edward Tillman	Dames + Moore
G.W. Page	S & W

Notes copied from field notebook 76-2 of
John H. Peck, Stone & Webster
With reference to observations in "TRENCH #2"

Site Visit 12/17/76

Trench in front of Hire
Mile 1. Switchyard was
practically all cleaned
but no indication of
any faulting or joints
parallel to the trend of
the rock features to the
SE. A few sets of
closely spaced relatively tight
joints trend N 70° E ±
No indication of any motion
along these joints. May
be part of regional set
Indications are that this
trench is beyond any

Copy made 10/15/84 John H. Peck

NOTED OCT 15 1984 J H Peck

NHP2

Northwest extension of the
cooling tower bedrock fau
This trench gives us a
conservative Northwest term
of faulting. At this te
it is probably not
necessary to trench close
to the cooling tower effo
to document the actual
location of the terminu

The new trench, (Trench 4,
which shows brecciation in
the bedrock along a trend of
N 73-75° W. Bedrock dips 6
to south and also some
less to north. Gives

AFFIDAVIT OF JOHN H. PECK of Amarillo, Texas, being duly sworn comes forward and states that the following is true and correct to the best of his knowledge, information and belief:

1. My name is JOHN H. PECK. My address is 514 NORTH FILLMORE STREET AMARILLO, TEXAS.

2. During the period from September 30, 1976 to December 22, 1976 as an employee of Stone & Webster Engineering Corporation I was engaged in geological consultation regarding mapping of the excavations and/or trenches at the Nine Mile Point 2 site and adjacent property to the west. Based upon the mapping of Trench No. 1 and No. 2 which I reviewed in the field; and based upon my observations in Trench No. 2, it is my professional opinion that such mapping did not reveal the so-called "cooling tower fault".

3. I have made all notes and written memoranda and evaluations of the trench No. 1 and No. 2 observations available to my employer, Stone & Webster Engineering Corporation, and I have no other information in my possession that was not previously provided that bears on the western termination of the fault in question.

John H. Peck
JOHN H. PECK

Acknowledged and sworn before me this 1st Day of November 1984

GARY D. WILSON
Notary Public in the State of New York
Qualified in Onon. Co. No. 4756957
My Commission Expires March 30, 1986

Sworn to before me this 23rd day of October, 1984.

Michelle A. Goldsberry Notary Public

AFFIDAVIT OF JOHN J. MARKHAM

John J. Markham, being duly sworn comes forward and states that the following is true and correct to the best of his knowledge, information and belief.

1. My name is John J. Markham. My address is 1901 Deer Hill Drive, Wayzata, Minnesota.

2. During the period September 1976 to February 1977 as an employee of Dames & Moore, I was engaged in the observation of Trenches 1 and 2 at the Nine Mile Point Unit 2 site as shown on Figure 2.5-28A of the FSAR. Based upon the observation which I performed, it is my professional opinion that the so-called "Cooling Tower Fault" was not revealed in these trenches.

3. I have made all of my logs, notes, photographs, memoranda and evaluations of the trench features available to Dames & Moore, and I have no other information in my possession, not previously provided, that bears on the length or termination of the fault in question.

John J. Markham

Sworn to before me this 1st day of November 1984

GARY D. WILSON
Notary Public in the State of New York
Qualified in Onon. Co. No. 4756957
My Commission Expires March 30, 19

AFFIDAVIT of Douglas E. Isler

_____, being duly sworn comes forward and states that the following is true and correct to the best of his knowledge, information and belief:

1. My name is Douglas E. Isler. My address is 5276 Church St., Mexico, New York.

2. During the period from 10/1/76 to 12/31/76 as an employee of Stone and Webster Eng. Corp., I was engaged in the geologic mapping of excavations in so-called Trench 1 and Trench 2 at the Nine Mile Point Unit 2 site. Based upon the mapping which I performed, it is my professional opinion that such mapping did not reveal the so-called "cooling tower fault."

3. I have made all my logs, notes, photographs, written memoranda and evaluations of the trench features available to my employer, Stone and Webster, and I have no other information in my posession that was not previously provided that bears on the length or termination of the fault in question.

Douglas E. Isler

Sworn to before me this 24th day of October, 1984. Amy L. Durant

AMY L. DURANT
Notary Public in the State of New York,
Qualified in Onon. Co. No. 4748938
My commission expires March 30, 1985