

REGULATORY DOCKET FILE COPY

JUL 9 1980

Docket No.: 50-410

Niagara Mohawk Power Corporation  
ATTN: Mr. Gerald K. Rhode  
Vice President  
System Project Manager  
300 Erie Boulevard West  
Syracuse, New York 13202

Dear Mr. Rhode:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - GEOLOGY - NINE MILE POINT,  
UNIT 2

In the course of our continuing review of your geologic investigation of the Nine Mile Point site, we have identified a need for additional information. Our request for this additional information is contained in the enclosure to this letter. Two of the present questions supplement questions previously transmitted in our letter dated October 1, 1979. Specifically, Q361.26 supplements Q361.16 and Q361.27 supplements Q361.13.

If you have any questions regarding our request for additional information, contact Kenneth L. Kiper, Project Manager, at 301/492-7318.

Sincerely,

B. J. Youngblood, Chief  
Licensing Branch No. 1  
Division of Licensing

Enclosure:  
Request for Additional  
Information - Geology

cc w/enclosure: See next page

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

*Jera*

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Sincerely,

A handwritten signature in cursive script, appearing to read "B. J. Youngblood".

B. J. Youngblood, Chief  
Licensing Branch No. 1  
Division of Licensing

Enclosure:  
Request for Additional  
Information - Geology

cc w/enclosure: See next page



ENCLOSURE

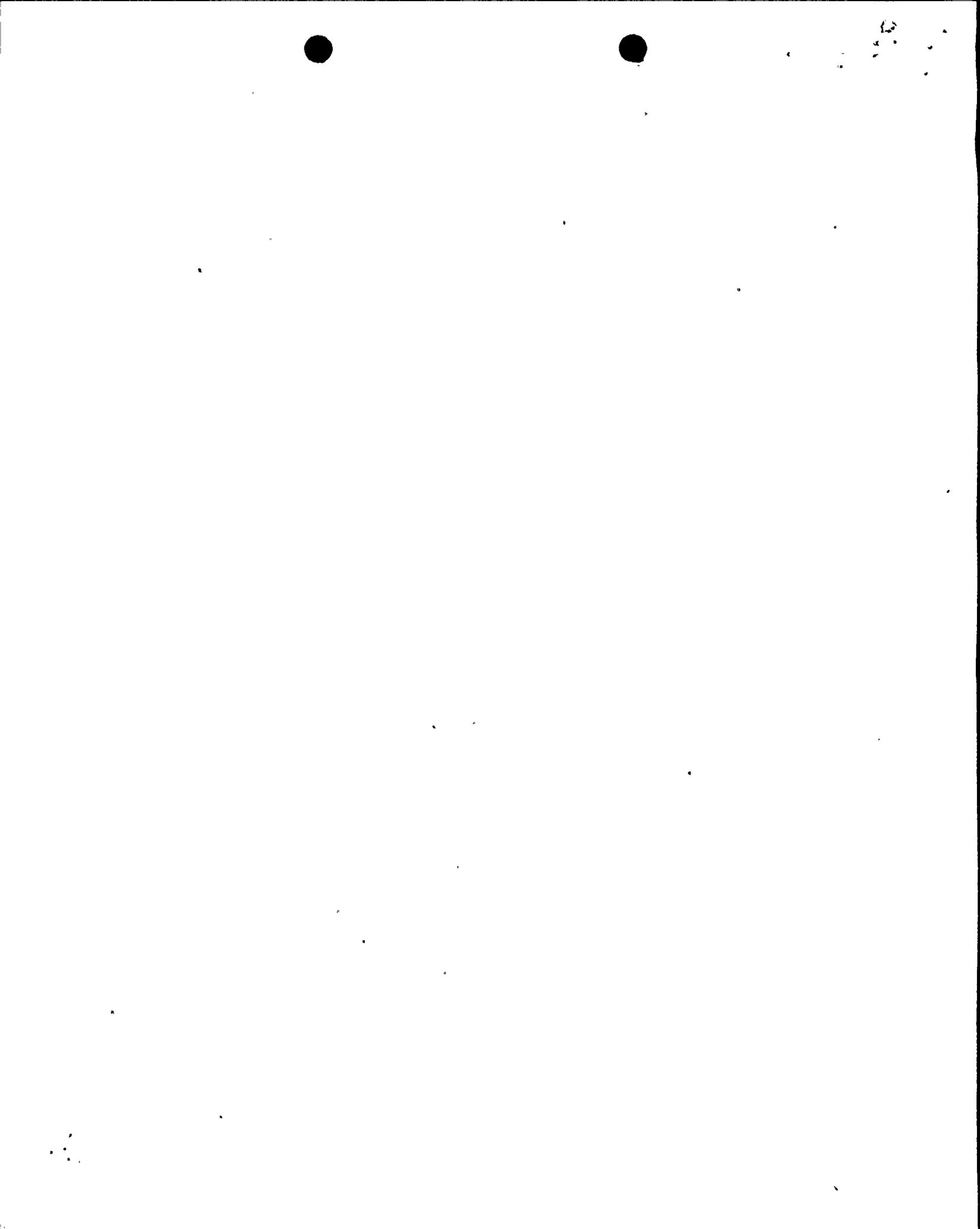
NINE MILE POINT NUCLEAR STATION, UNIT 2  
DOCKET NO. 50-410

GEOLOGIC INVESTIGATION

- Q361.26 In your report entitled "Nine Mile Point Nuclear Station, Unit 2, Geologic Investigation," (Vol. I, Section 4.7, paragraph 1), you state that the intensity of the shearing on the cooling tower fault does not appear to diminish toward the known extremities. However, it is not clear from your report where the southeastern extremity of this fault is and where either extremity of the drainage ditch fault is. Accordingly, provide data which will indicate the length of the cooling tower and drainage ditch faults and show their relationship, or lack of relationship, to each other. In your response, consider acquiring this information by running a detailed ground magnetic survey using a field magnetometer (e.g., a proton precession magnetometer). This approach could be followed by trenching, if necessary. If you choose to respond without doing a field survey using a magnetometer, indicate your reasons.
- Q361.27 Indicate spatial and age relationships of the faults at Nine Mile Point to the geologic structures at the site proposed for the New Haven facility and to other geologic structures in the region. Furnish a map and the necessary data to support your conclusions.
- Q361.28 Indicate the relationship among the thrust faults, the cooling tower fault, and the drainage ditch fault. Specifically, indicate whether they connect as an integrated system and whether the thrust faults cut the other faults.
- Q361.29 Extend coverage of the lineament map (Vol. II, Plate 1-1) out to a radius of at least 5 miles. Field check the lineaments to determine if they are reflections of unrecognized geologic structures.
- Q361.30 Furnish additional discussion and documentation to support your conclusion that post-glacial reverse movement did not occur below 200 feet on the cooling tower fault. Our concern in this matter is that if this fault had previous normal movement as you suggest, and if the displacement on this fault is presently zero at the 200 foot depth, then it appears that reverse movement must have occurred below the 200 foot level to bring the net displacement to zero.

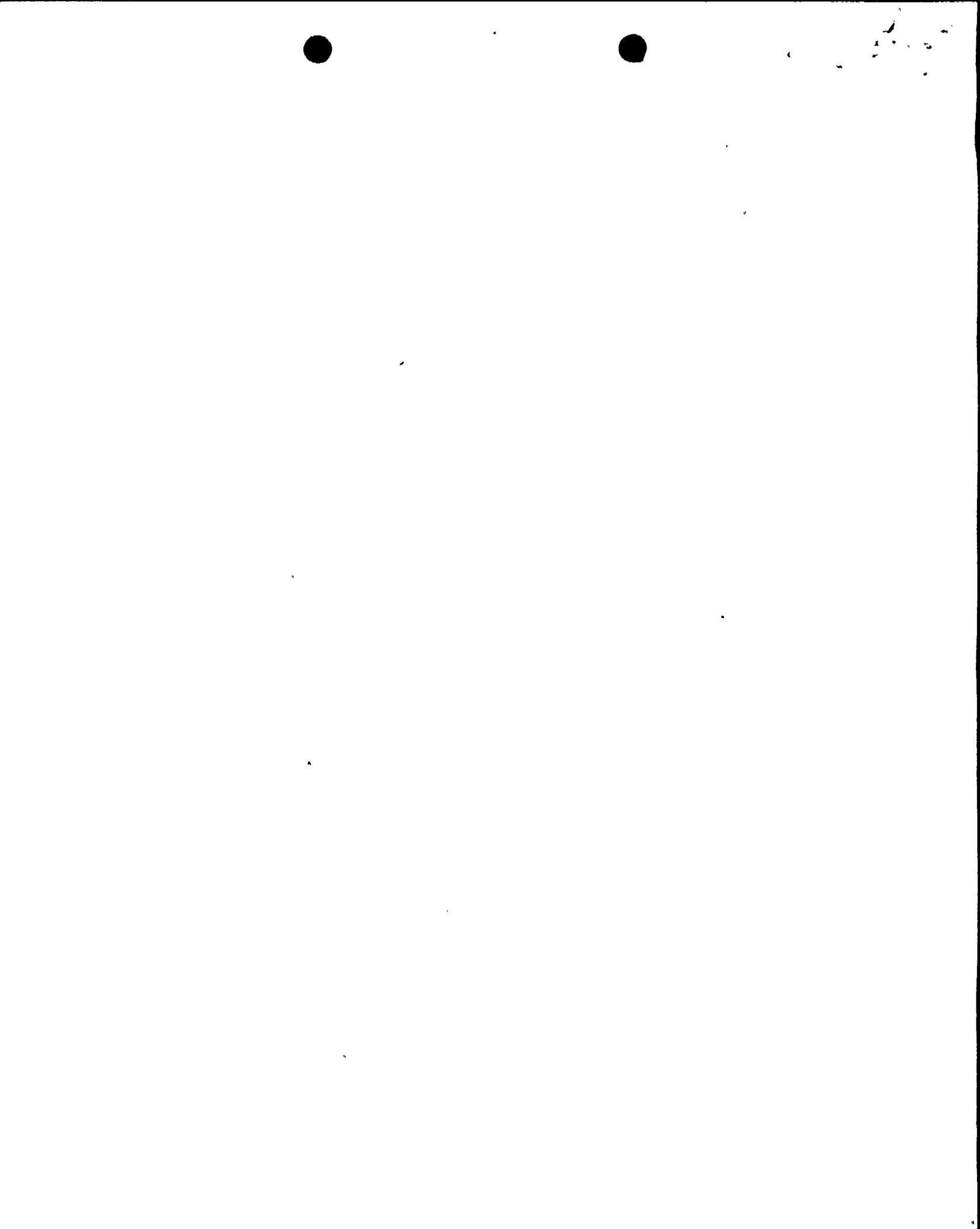


- Q361.31 In Section 3.2 of the Executive Summary, you conclude that any future displacements along the deformation structures at the site will involve very low strain rates. Using the data available for these structures, provide a discussion as to why past Quaternary movements and possible future movements should be classified as slow (i.e., creep) versus rapid (i.e., seismic).
- Q361.32 Our position regarding the dating of the age of the last movement on the faults based on an apparent temperature of mineralization is that this method should be used with caution. Accordingly, provide your basis for discounting the possibility that frictional heat on the fault planes, generated during deformation, could cause the observed fluid inclusion temperatures. Further, indicate your basis for discounting the possibility that fluids which deposited the calcite were heated above the ambient geothermal gradient.
- Q361.33 In Appendix I-G of your report, you present results of uranium/thorium (U/Th) disequilibrium dates from samples of fault-plane calcite. Indicate how this evidence affects your assessment of the most recent movements on the fault. Discuss why the ages of 80,000 and 170,000 years before the present as determined by this technique, are not consistent with ages of faulting determined by other methods. Our concern is that if there is sufficient uranium present in the sample to establish a U - Th disequilibrium date, then there should be sufficient uranium and lead for a U-Pb, Pb-Pb, or U-fission track date. Any one of these methods would be much more sensitive and meaningful if the calcite is older than 200,000 years. If possible, provide a reliable date by one or more of the methods cited above if the 80,000 year date is to be discounted as you claim.
- Q361.34 Substantiate the argument presented in Section 2.6 of your Summary that swelling stresses may have resulted from fluctuations in water level in Lake Iroquois. Show that rocks at the site can develop a swelling stress under confined conditions with water pressure varying from 1 to 10 atmospheres. Estimate how rapidly Lake Iroquois must have drained so that residual pore pressures could approach lithostatic pressures. In this evaluation, use the permeabilities determined by pumping test in the upper 200 feet of rock in this area.



Q361.35

If the draining of Lake Iroquois provides a plausible explanation for the Quaternary movement along the deformation structures at the site, then similar features should exist at other locations similarly affected by the draining of Lake Iroquois. The existence of similar structures only at such locations would provide evidence for your hypothesis. Accordingly, determine the known distribution of such structures from a literature search and present a discussion as to whether this distribution favors your hypothesis.



Niagara Mohawk Power Corporation

JUL 9 1980

ccs: Eugene B. Thomas, Esq.  
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Albany, New York 12223



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

July 2, 1980

App/3

ALL APPLICANTS FOR CONSTRUCTION PERMITS AND OPERATING LICENSES

Gentlemen:

SUBJECT: REQUEST FOR INFORMATION REGARDING EVACUATION TIMES

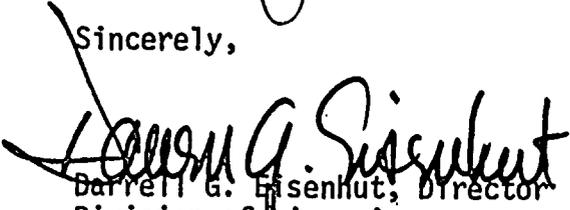
This letter is being sent to all applicants for construction permits and licenses of plants under construction. The purpose of the letter is a request for information regarding estimates for evacuation of various areas around proposed nuclear power plants. The information sought is described in our letter of December 26, 1979 (copy enclosed). The requested submittal date for this information was suspended by our letter of March 11, 1980.

We are requesting that you submit evacuation time estimates on an accelerated basis to enable the NRC staff to identify, in a timely manner, those sites where evacuation constraints exist and special planning measures should be considered. In some cases of extreme difficulty where a large population is at risk, special facility modifications may also be appropriate. The information requested in the enclosure should be submitted by August 1, 1980. This time is shorter than provided in the December 26, 1979 letter because of the need for timely information and because the content of the information desired has been available to you for some months. Units sharing the same site need not, of course, submit separate time estimates.

This special request for information has been submitted to the General Accounting Office and cleared by GAO as noted in the clearance block below:

Approved by GAO  
B-180225 (S80010)  
Expires 80-09-30

Sincerely,

  
Darrell G. Eisenhut, Director  
Division of Licensing  
Office of Nuclear Reactor Regulation

Enclosure:  
December 26, 1979 Letter  
w/Request for Evacuation  
Time Estimates

cc: Service Lists





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

December 26, 1979

APPLICANTS FOR CONSTRUCTION PERMITS AND  
LICENSEES OF PLANTS UNDER CONSTRUCTION

Gentlemen:

SUBJECT: REQUEST FOR INFORMATION REGARDING EVACUATION TIMES

This letter is being sent to all applicants for construction permits, and licensees of plants under construction. The purpose of the letter is a request for information regarding estimates for evacuation of various areas around future nuclear power plants. The requested information is in addition to that requested by the November 21, 1979, letter to all applicants for an operating license and licensees of plants under construction from Domenic B. Vassallo, Acting Director, Division of Project Management, Office of Nuclear Reactor Regulation.

Although evacuation time estimates are expected to be prepared in the course of the upgrading of the state of emergency preparedness as previously specified submission of these estimates to the NRC is being requested on an accelerated time scale so that the NRC can identify those instances in which unusual evacuation constraints exist and special planning measures should be considered. In some cases of extreme difficulty where a large population is at risk, special facility modifications may also be appropriate. The information requested in the enclosure should be submitted no later than March 31, 1980.

Previous correspondence indicated that efforts to develop a model plan were continuing. It now appears that the model plan will not be completed on a schedule which will be of use in developing upgraded plans in the near term. The upgraded plan development should therefore proceed on a site-specific basis.

Sincerely,

Brian K. Grimes, Director  
Emergency Preparedness Task Group  
Office of Nuclear Reactor Regulation

Enclosure:  
Request for Evacuation Time  
Estimates

cc w/enclosure:  
Service Lists



[The text in this section is extremely faint and illegible due to low contrast and noise. It appears to be a multi-paragraph document.]

REQUEST FOR  
EVACUATION TIME ESTIMATES (AFTER NOTIFICATION)  
FOR AREAS NEAR NUCLEAR POWER PLANTS

Background

Prior to recent NRC requests that means for prompt notification to the public be installed around each nuclear power plant site, a significant component of evacuation time estimates was the time required to notify the public of a need for evacuation. Studies of actual evacuations that have taken place generally do not distinguish between the time required for notification, the time required to implement the evacuation, and the time required to confirm that an evacuation has taken place.<sup>1/</sup> The estimates for time required for evacuations now requested relate primarily to the time to implement an evacuation as opposed to the time required for notification. These estimates may be based on previous local experiences (e.g., chemical spills or floods) or may be based on studies related to population density, local geography and road capacities. No standard method for making such estimates is identified for use at this time. The basis for the method chosen should be described in the response. As a check on the evacuation time estimates, comments on the time estimates made should be obtained from the principal local officials responsible for carrying out such evacuations. Such comments should be included in the submittal.

The format given below is appropriate for reporting to the NRC estimates of the time required to implement evacuation of areas near nuclear power plants. These estimates, are to be made for the primary purpose of making available, to those officials who would make evacuation decisions in an emergency situation, knowledge of the time required to complete one of the protective action options (evacuation) available for a particular potentially affected segment of the population. A second purpose of these estimates is to identify to all concerned those instances in which unusual evacuation constraints exist and that special planning measures should be considered. In some cases of extreme difficulty where a large population is at risk, special facility modifications may also be considered.

Given a decision to evacuate rather than shelter in an actual event, fewer or more sectors or different distances than given in the reporting format might be evacuated should this be the chosen protective action. For example, three 22-1/2° sectors might be initially evacuated in a downwind direction (the sector containing the plume and an adjacent sector on each side), followed by the evacuation of other sectors as a precautionary measure.

<sup>1/</sup>

Hans, J. M., Jr., and T. C. Sell, 1974 Evacuation Risks - An Evaluation, U. S. Environmental Protection Agency, National Environmental Research Center, Las Vegas, EPA-520/6-74-002.

### Format for Reporting Information

The areas for which evacuation estimates are required must encompass the entire area within a circle of about 10 miles radius, and have outer boundaries corresponding to the plume exposure EPZ. These areas are as follows:

<u>Distance</u>	<u>Area</u>
2 miles	two 180° sectors
5 miles	four 90° sectors
about 10 miles	four 90° sectors

Estimates for the outer sectors should assume that the inner adjacent sectors are being evacuated simultaneously. To the extent practical, the sector boundaries should not divide densely populated areas. Where a direction corresponding to the edges of areas for which estimates have been made is thought not to be adequately represented by the time estimates for adjacent areas, an additional area should be defined and a separate estimate made for this case. The format for submittal should include both a table and a figure (overlaid on a map) which each give the information requested in items 1 and 2 below. Additional material may be provided in associated text.

### Required Information

1. Two estimates are requested in each of the areas defined in item 1 for a general evacuation of the population (not including special facilities). A best estimate is required and an adverse weather estimate is required for movement of the population.
2. The total time required to evacuate special facilities (e.g., hospitals) within each area must be specified (best estimate and adverse weather).
3. The time required for confirmation of evacuation should be indicated. Confirmation times may consider special instructions to the public (e.g., tying a handkerchief to a door or gate to indicate the occupant has left the premises).
4. Where plans and prompt notification systems have not been put in place for areas out to about 10 miles, estimates of the times required to evacuate until such measures are in place for the plume exposure emergency planning zone (EPZ) should also be given. Notification times greater than 15 minutes should be included in the evacuation times and footnoted to indicate the notification time.

5. Where special evacuation problems are identified (e.g., in high population density areas), specify alternative protective actions, such as sheltering, which would reduce exposures and the effectiveness of these measures.
6. A short background document should be submitted giving the methods used to make the estimates and the assumptions made including the routes and methods of transportation used. This document should also note the comments of principal local officials regarding these estimates.

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, DC 20555

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