JANUARY 8 1979

Docket No. 50-220

Mr. Donald P. Dise
Vice President - Engineering
Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

Dear Mr. Dise:

Attached for your information is a copy of NUREG 0460, Volume 3 which details our current view related to ATWS. In this supplement a variety of options are considered regarding ATWS. We intend to select one of the ATWS options in the near future and to pursue it to adoption.

However, it is important to note that all of the options under serious consideration by the NRC staff (options #2, 3, and 4 in Volume 3 of NUREG 0460) regarding resolution of the ATWS issue for BWRs require installation of an RPT. While you have committed to install a RPT on your facility, Nine Mile Point, you have not yet begun to take steps toward such installation, on the grounds that you were awaiting firmer requirements by NRC. The NRC staff now has a firm position that RPT is required for your facility. Therefore, we see no bases for any further delay in implementing an RPT for your facility. The RPT designs discussed in this letter are compatible with ATWS requirements.

To expedite your installation of an approved RPT, the staff is providing a modified description (Appendix A, attached) of design requirements which provide some additional flexibility over those previously provided (May, 1978), but which the staff has found acceptable for RPT systems to be installed in the near future.

For all operating plants, the Monticello RPT design described in NEDO 25016 and summarized in Appendix B has been accepted by the staff as meeting the Appendix A criteria. Sections of NEDO 25016 related to ARI should be ignored as that system is not addressed by this letter. Some operating plants have already installed the "BWR/4" or "Hatch" RPT, and the staff also accepts that design as meeting the Appendix A criteria provided the changes specified in Appendix B, or equivalent changes, are incorporated.

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Both the Monticello design and the modified "BWR/4" or "Hatch" design utilize generator field breakers which have been modified so that they are provided with two trip coils. One coil for each breaker is actuated only by reactor pressure and water level sensors in RPT division A, and the other coil is actuated by pressure and level sensors in RPT division B, thereby providing redundancy of power supplies available to the overall system and increasing trip reliability.

Either the Monticello or modified "BWR/4" or "Hatch" design, would be an acceptable RPT design provided diverse final trip relays of a different type are used, or obtained from a different manufacturer than the primary scram relays used in the RPS.

The staff has not reviewed the specific design of the time delay circuitry recently proposed for the Monticello RPT design for low-level initiated pump trips. We agree that time delays on the order of 10 seconds are desirable to avoid making the consequences of a postulated LOCA more severe, and we agree that such delays of around 10 seconds have insignificant effect on ATWS consequences (for low-level initiated ATWS pump trips only). Therefore; we find incorporation of such circuitry on either RPT design discussed above to be acceptable, provided:

1. The time delay is realized only for low-level initiated pump trips; and,

2. The circuitry is incorporated in such a way that it does not significantly affect the overall reliability of the RPT, that is, that no single failure in the timing circuit(s) can cause failure of the pump trip to occur. This could be accomplished, for example, by use of a separate, independent timing (delay) circuit with each low-level sensor, or equivalent.

Implementation as soon as possible of an RPT in accordance with the attached design criteria will provide an increased level of safety over the lifetime of the plant and should be installed as promptly as is reasonable.

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The staff has given careful consideration to the concern expressed by some licensees that RPT design requirements may change in the future. We have concluded that the design criteria outlined in this letter (Appendix A) are, for operating plants, equivalent to those enclosed with the May, 1978 letters to all BWR licensees, and we intend to effect no changes to those criteria in the future.

We believe that RPT design, procurement, and installation can be accomplished within a two year period without requiring additional outage time beyond refueling outages.

We have given consideration to steps that can be taken at present, in order to reduce the risk from ATWS events during the interim period before recirculation pump trip circuitry and any other necessary plant modifications are completed. We have determined that many of the following steps are practicable and appropriate for your facility for this interim period. We therefore, request that you inform us within 90 days that you have done the following:

1. Developed emergency procedures to enable operators to recognize an ATWS event, including consideration of scram indicators, rod position indicators, flux monitors, vessel level and pressure indicators, relief valve and isolation valve indicators, and containment temperature, pressure, and radiation indicators.

2. Train operators to take actions in the event of an ATWS including consideration of manually tripping the recirculation pumps and scramming the reactor by using the manual scram buttons, changing individual rod scram switches to the scram position, stripping the feeder breakers on the reactor protection system power distribution buses, opening the scram discharge volume drain valve, prompt actuation of the standby liquid control system, and prompt placement of the RHR in the pool cooling mode to reduce the severity of the containment conditions.

Early operator action as described above would provide significant protection from those ATWS events which occur at low power levels where the rise in the vessel pressure and the containment temperature is limited to acceptable values by manual recirculation pump trip and actuation of the existing standby liquid control system. If the operator were to promptly (in a few seconds) trip the recirculation pumps to assure that the short term rise in vessel pressure is not excessive, protection will also be provided for those ATWS events where the common mode failure occurs in either the electrical portion of the scram system or in some portions of the drive system.

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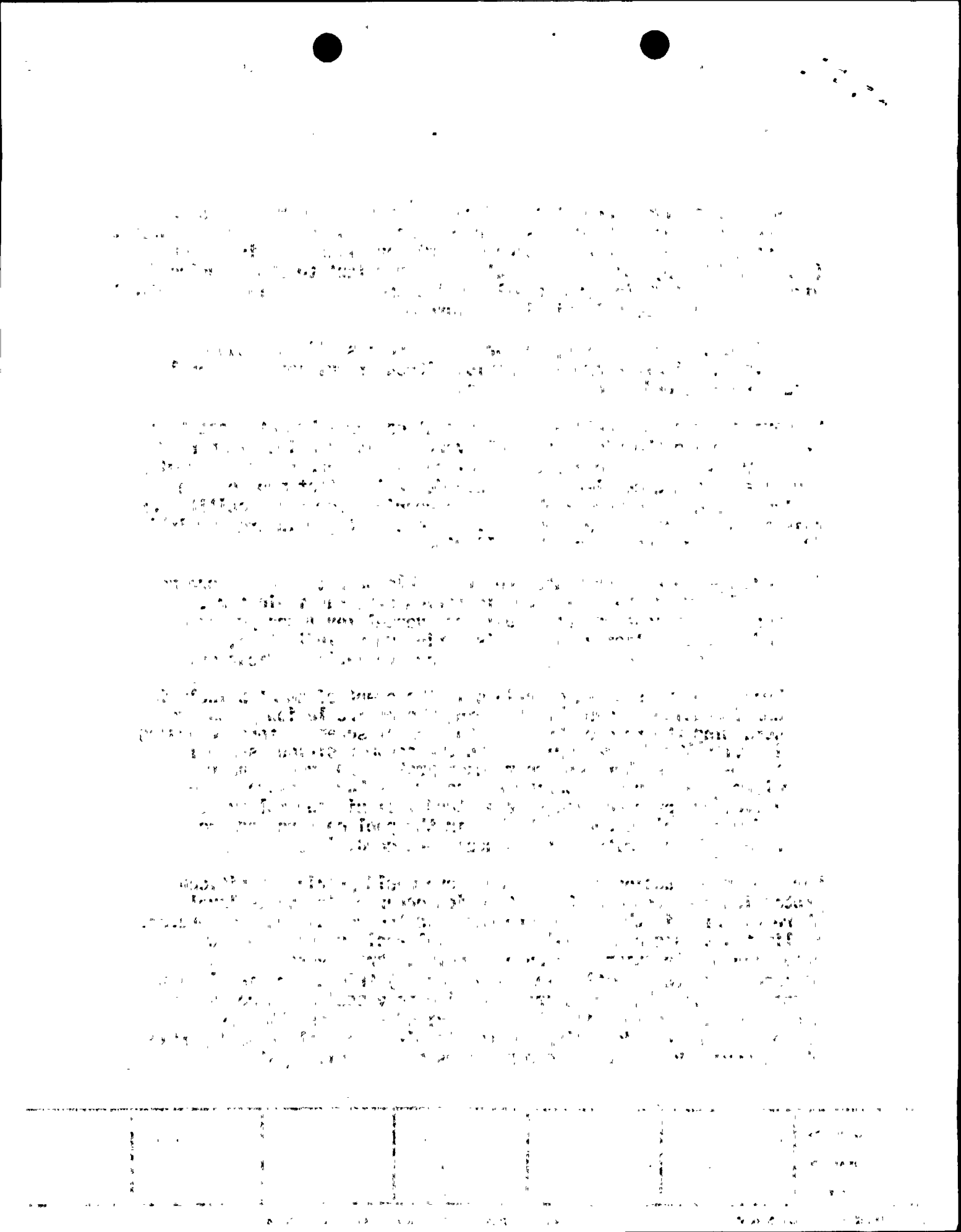

Within 90 days inform us of your schedule for implementation of your commitment to install an RPT system for your plant. Such system should conform to the acceptable systems described in this letter and your schedule should be consistent with the staff's overall objective of assuring that an acceptable RPT system is installed at your facility within two years.

Sincerely,

Original signed by

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosures:
1. NUREG 0460, Volume 3
2. Appendices A and B

cc w/enclosure No. 2:
see next page

SEE PREVIOUS YELLOWS FOR CONCURRENCES

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Within 90 days inform us of your schedule for implementation of your committment to install an RPT system for your plant. Such system should conform to the acceptable systems described in this letter and your schedule should be consistent with the staff's overall objective of assuring that an acceptable RPT system is installed at your facility within two years.

Sincerely,

Victor Stello, Jr., Director
Division of Operating Reactors
Office of Nuclear Reactor Regulation

Enclosures:
1. NUREG/0460, Volume 3
2. Appendices A and B

cc: see next page

SEE PREVIOUS YELLOW FOR CONCURRENCES

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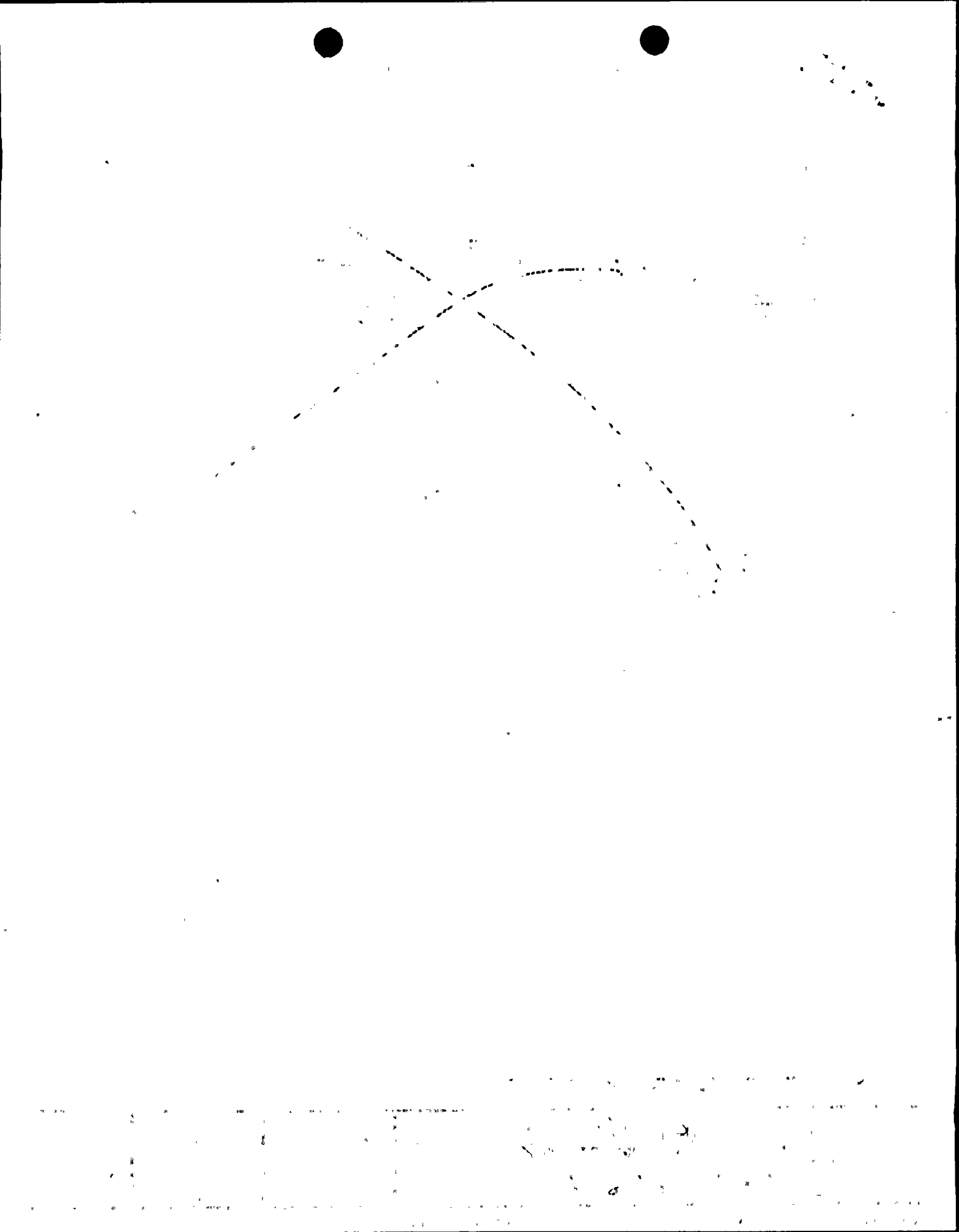

The staff has given careful consideration to the concern expressed by some licensees that RPT design requirements may change in the future. We have concluded that the design criteria outlined in this letter (Appendix A) are, for operating plants, equivalent to those enclosed with the May, 1978 letters to all BWR licensees, and we intend to effect no changes to those criteria in the future.

We believe that RPT design, procurement, and installation can be accomplished within a two year period without requiring additional outage time beyond refueling outages.

Within 90 days inform us of your schedule for implementation of your committment to install an RPT system for your plant. Such system should conform to the acceptable systems described in this letter and your schedule should be consistent with the staff's overall objective of assuring that an acceptable RPT system is installed at your facility within two years.

Sincerely,

Victor Stello, Jr., Director
Division of Operating Reactors
Office of Nuclear Reactor Regulation

Enclosures:
1. NUREG 0460, Volume 3
2. Appendices A and B

cc: see next page

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Niagara Mohawk Power Corporation

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APPENDIX A

CRITERIA FOR HIGH PRESSURE-LOW LEVEL INITIATED RECIRCULATION PUMP TRIP (RPT) TO BE INSTALLED IN OPERATING BWRs BEFORE NOVEMBER 1, 1979*

A. General Functional Requirement

The RPT system shall automatically initiate the appropriate action whenever the conditions monitored by the system reach a preset level.

B. Independence and Integrity

The RPT system and components shall be independent and separate from components and/or systems that initiate anticipated transient(s) being analyzed and diverse from the normal scram system to minimize the probability of disabling the operation of the mitigating system. Diversity can be achieved by incorporating as many of the following methods as is practicable:

1. Use of RPT final trip relays from different manufacturers (required).

2. Use of energized versus de-energized trip status.

3. Use of AC versus DC power sources.

It shall be demonstrated that the function of the RPT system and components will not be disabled as a consequence of events being analyzed.

Diversity of the RPT pressure and level sensing devices (including relays used in such sensing devices) from similar or identical devices used on the RPS is not required, since failure of those devices on both the RPT and the RPS is not likely to cause an ATWS due to the presence of other diverse trips on the RPS (high flux, valve position, etc.).

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*The NRC staff has reviewed the Monticello RPT design and the "Hatch" RPT design, and finds that they meet these criteria (provided the changes specified in the cover letter are made to the "Hatch" design). Plant specific reviews will be conducted only as necessary to ascertain that the plant design is the same as, or equivalent to, one of the approved designs.

C. Equipment Qualification

The RPT system equipment and components shall be tested to verify that the system will provide, on a continuing basis, its functional capability under conditions relevant to postulated ATWS events, including extremes of conditions (as applicable) relating to environment, which are expected to occur in the lifetime of a plant.

D. Periodic Surveillance and Preventative Maintenance Testing and Calibration

Periodic surveillance and preventative maintenance tests and calibration requirements shall be identified to provide continuing assurance that the RPT system, including sensors and actuated equipment, is capable of functioning as designed and that system accuracy and performance have not deteriorated with time and usage. These requirements shall be particularly directed toward the detection of those failures or degradation of accuracy and performance which would not otherwise be likely to be detected during the course of normal operations. Integrated system testing shall also be performed to verify overall system performance.

E. Quality Assurance

A quality assurance program in conformance with the requirements of 10 CFR 50 Appendix B shall be applied to the RPT system design and equipment.

F. Administrative Controls

Administrative controls shall be established to control the access to all set point adjustments, calibration and test points.

G. Information Readout

The RPT system shall be designed to provide the operator with accurate, complete and timely information regarding its status. For those functions, including operations, test or maintenance, and calibration, which require direct operator interaction, human engineering factors such as information displays (e.g., display formats, layout and controls) and functional controls (e.g., methods, location and identification) shall be included in the design.

H. Maintainability

The design shall include measures which enhance maintainability to reduce mean-time-to-repair and to assure the continued availability and reliability of the system for the life of the plant. The system design shall include features which facilitate the recognition, location, replacement, repair and/or adjustment of malfunctioning equipment and components or modules.

Appendix B

Acceptable RPT Designs

Monticello RPT Design

The Monticello design simultaneously trips both MG sets "A" and "B" generator field breakers upon receipt of either reactor high pressure or low-low water level control logic input signals. The logic to each breaker is two-out-of-two (pressure) or two-out-of-two (level) (2/2 or 2/2), i.e., contacts "A" and "C" or contacts "B" and "D" must close to trip the breaker. The Monticello design employs diversity, testability, separation and redundancy.

Modified BWR/4 or Hatch RPT Design

The modified "BWR/4" or "Hatch" design results in the independent (separate) trip of each of the two recirculation pumps upon receipt of either one reactor high pressure signal or one low-low water level signal. The logic to each MG set "A" and "B" generator field breaker is one-out-of-two (level) or one-out-of-two (pressure) (1/2 or 1/2). The modified "BWR/4" or "Hatch" design employs diversity, testability, separation, and redundancy.

The modification to the existing "Hatch" design which makes it acceptable is accomplished as follows:

1) Add a second trip coil to each recirculation loop's M-G set generator field breaker, as per the identical modification made to Monticello.

2) Connect one of the pressure sensors and one of the low level sensors in RPT train A to the old (existing) trip coil in the recirculation loop A M-G set generator field breaker. Connect one of the pressure sensors and one of the low level sensors in RPT train B to the new trip coil in the recirculation loop A M-G set generator field breaker.

3) Connect the other pressure sensor and the other low level sensor in RPT train A to the new trip coil in the recirculation loop B M-G set generator field breaker. Connect the other pressure sensor and the other low level sensor in RPT train B to the old (existing) trip coil in the recirculation loop B M-G set generator field breaker.