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V. A: Moore, Assistant Director for Light Water Reactors, Group 2

HYDROLOGIC ENGINEERING POSITIONS (Q-2)

PLANT NAME: Three Mile Island - Unit 2 LICENSING STAGE: OL DOCKET NUMBER: 50-320 RESPONSIBLE BRANCH: LWR 2-2 REQUESTED COMPLETION DATE: April 25, 1975 REVIEW STATUS: Hydrologic Engineering Section (SAB) - Awaiting Responses

Enclosed are hydrologic engineering positions (Q-2) for the subject plant, prepared by T. L. Johnson and W. S. Bivins for your transmittal to the applicant. Our major concerns are with the effect of local intense precipitation, the present state of the riprap protection for the dikes, and flood protection requirements for safety related buildings. A draft copy of these questions was provided to the LPM on April 29, 1975.

H. R. Denton

Harold R. Denton, Assistant Director for Site Safety Division of Technical Review Office of Nuclear Reactor Regulation

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HYDROLOGIC ENGINEERING POSITIONS (Q-2 THREE MILE ISLAND UNIT 2 DOCKET NO. 50-320





321.01 RSP It is our position that the roof drainage systems of safety-related (2.4.2) buildings are inadequate. Your response to Question 32.2.1 is not complete. You have not documented that the roofs will safely store or discharge the local Probable Maximum Precipitation (PMP). You will be required to redesign your roof drainage system, unless it can be documented that:

- the roofs will withstand the loading of the total PMP, or
- the roof drainage system will safely discharge the PMP without threat to safety-related components, systems, and structures.

Provide the bases for your conclusions.

321.02 RSP It is our position that your site drainage facilities are (2.4.2) inadequate. The potential water surface elevation at the site due to a local PMP may be as high as elevation 301 msl, assuming coincident blocking of the drainage culvert by debris. You have not shown that emergency operating procedures will be unaffected by this level or that a flow path can be maintained through the drainage culvert. You will be required to redesign your site drainage facilities, unless it can be documented that:

- proposed emergency measures assure maintenance of a flow path through the outlet culvert, or
- emergency measures required for plant shutdown (such as necessary transportation to and from buildings, placing of flood barriers, etc.) are not affected by the maximum water level, and adequate time is available to shutdown the plant, if necessary.

321.03 RSP (2.4.3) It is our position that the flood protection provided at safety-related buildings is inadequate. We conclude that the maximum wave runup (coincident with PMF) is approximately 4 feet, which will overtop flood barriers to be placed. Further, you have not documented that safety-related facilities are adequately protected against the static and dynamic effects of wave action, as requested in Question 32.2.5(7). You will be required to redesign applicable poritions of your flood protection, unless it can be documented that, due to their location, the various flood barriers and structures are not susceptible to the maximum runup and wave forces.

In documenting the above, substantiate your design by providing the effective fetch diagrams, and discuss the average depths of water used in your computation of wave heights and periods. Provide your computed valves of wave heights, periods, and wave runup at safety-related structures and at the various locations where flood barriers are placed.

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321.04 RSP Your response to Question 32.2.4 is not adequate. We do not (2.4.9) Your that annual sedimentation monitoring following the "spring floods" is adequate to assure the uninterrupted availability of the ultimate heat sink. Further, we have insufficient information to conclude that the heavy sedimentation you experienced at the Unit 1 intake is solely attributable to the removal of the Unit 2 cofferdam. It is our position that you should:

- commit to perform sedimentation monitoring not less than once each 6 months,
- 2. in lieu of item 1, commit to perform sedimentation monitoring during the recession of floods which were equal to or greater than 300,000 cfs (approximately the mean annual flood as specified by the Harrisburg gage record) and following the spring floods, regardless of magnitude.
- 3. describe your proposed "sounding" methods and areal extent of coverage. With regard to the latter, a sufficient width of the middle channel should be monitored to assure the intake structure is not being segregated from the main channel, which may shift within the confines of the river banks.

321.05 RSP Your response to Question 32.2.7 is not clear. It is our position (2.4.9) you should:

- document that elevation 271 ft MSL at the intake structure corresponds to a flow of 430 cfs through the middle channel and identify and substantiate the bases for the assumed nature and location of the "hydraulic diversions at the upstream end of the middle channel".
- in lieu of 1, provide an alternate source of emergency cooling water supply.

321.06 RSP Your response to Question 32.2.5 is inadequate. It is our position (2.4.10) you should:

- document that access via the bridge will not be required during flood-induced emergency shutdown or to implement emergency measures,
- in lieu of 1, provide a plan for alternate means of access to the island.

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321.07 RSP It is our position that the present state of the erosion (2.4.10) protection provided for the dikes is inadequate. At many locations, we are aware of improper and/or inadequate placement of and damage to the riprap. The following will be required as soon as possible:

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- Commit to adequately r clace and repair any erosion protection which has been damaged since originally placed, or which otherwise does not meet your design bases.
- 2. Place erosion protection at locations where required.
- 3. Document that the erosion protection (size, thickness, gradation) is adequate by showing the design basis channel velocities and wave heights which may exist at specific locations and the ability of the erosion protection to resist that velocity and wave height. Provide the bases for and the results of your computations.
- 4. Provide the date at which items 1-3 will be accomplished.