OCT 2 3 1968

Roger S. Boyd, Assistant Director, Reactor Projects
Division of Reactor Licensing
THRU: Charles G. Long, Chief, RPB-3, DRL

MEETING WITH METROPOLITAN EDISON ON THREE MILE ISLAND STATION (DOCKET 50-289)

A meeting was held on October 2, 1968 with Metropolitan Edison and its contractors to discuss proposed changes in containment prestress design, principally those associated with increase from 90-to 170-wire tendons. A list of attendees is attached.

Details on the proposed changes were provided by GAI. A summary description of the material presented by GAI follows:

1. Seismic Classification

GAI stated that safety factors for tendon anchors and anchorage zone were at least as high as those for other portions of the structure. GAI said that all components would be Class I.

2. Load Combinations and Thermal Stresses

GAI stated that thermal stress calculations will include diurnal and seasonal variations. We asked what would be the most unfavorable condition in the concrete for thermal stresses. GAI did not have answers readily available.

GAI stated that working stress design is used for normal operation including transients, not for accident conditions. They said that, for accident conditions, ultimate strength of the concrete will be used. The anchorage zone is designed for 70% of the ultimate strength of the tendon.

3. GAI said that both working stress and ultimate strength methods will be used.

4. Concrete Anchor Zone

We expressed our concern that under the anchor zone there might be tension stress normal to the tendon. GAI presented some information but it was applicable only to biaxial compression.

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5. Wires and Tendons

We asked for realistic values for efficiency and friction factors on tendons. GAI said that under factored loads, stresses should not exceed 0.7 ultimate in the tendon. They also indicated that after taking into account losses due to friction, etc., only 95% of the remaining load is assumed to be applied to the structure.

We asked about brittle fracture and low temperature effects. GAI quoted from an AGA publication.

We discussed provisions for redundancy of tendons and wires in tendons. GAI said the structure could withstand three adjacent tendon failures, or 5% random failures.

6. Stress Analysis

We asked for a stress analysis of the tendon zone. GAI said a 2-year test is underway (6 months gone) at 80% ultimate. At the end of 2 years the ultimate strength will be determined. Ryerson recognized that a stress analysis would be quite difficult. We expressed a desire to review available test data on 170-wire systems.

7. Tendons

The tendons, blocks, and sheathing will be Class I. Working stress and ultimate strength methods will be used as appropriate. GAI said that there are no criteria on working stress method as applied to the tendons.

8. Thermal Expansion and Contraction

GAI said that the conduit is not bulk-filled with grease so that thermal expansion is not a problem. A total of 22% of the conduit volume is free for expansion.

9. Properties of Materials

GAI promised to furnish specs and the QA manual of Ryerson for the Met-Ed job. It appears that this information will be at least 6 more months in preparation.

10. Corrosion Protection

Ryerson described corrosion protection provisions to be accomplished during manufacture.

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11. Methods of Fabrication

Ryerson stated that their manual, under preparation, would cover methods of fabrication. A-36 steel, for example, will be burned to shape. Evidently only the bearing plate and shims will be burned to shape. No burning will be accomplished on heat treated parts.

12. Quality Control

We asked for further details on quality control. We also asked for the availability of the Ryerson QA document. (See No. 9 above.)

After caucusing, we reconvened with the applicant. We stated that we had not determined whether a construction amendment would be required. The additional information requested could be furnished by form of a letter supplementing the request for 170-wire tendons.

The first bearing plate is due to be installed in early December 1968. Met-Ed needs an answer prior to then. According to GAI, the information should be available to DRL by Wednesday, October 9, 1968.

/s/

Denwood F. Ross
Reactor Projects Branch No. 3
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Attachment:
As stated above

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