JUN 1 1 1970

P. A. Morris, Director
Division of Reactor Licensing

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 2 - DOCKET NO. 50-320

The DRS Structural Engineering Branch has reviewed the S/H system of prestressing tendons proposed for the Three Mile Island Nuclear Station, Unit No. 2 as presented in a Burns and Roe report dated February 1970. Adequate responses to the enclosed list of questions will be required before we can complete our review of this matter.

Original signed by
E. G. Case
Edson G. Case, Director
Divison of Reactor Standards

Enclosure:
List of Questions

cc w/encl:
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DATE ▶	6/ /70	6/ /70	6/ /70	6/11/70

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THREE MILE ISLAND NUCLEA STATION, UNIT NO. 2

(Docket No. 50-320)

S/H ANCHORAGE SYSTEM

(Burns & Roe, Inc. Report Dated February 1970)

ADDITIONAL INFORMATION REQUIREMENTS

1. List ACI, PCI, ASCE and ASTM standards, specifications, codes, and other supplemental requirements which will be applied in the proposed S/H anchorage system. For elements of the S/H systems not covered by these specifications and codes, identify the specifications which apply to the design, fabrication and erection.

   If test results support the suitability of the S/H anchorage system, correlate test results and methods with the applicable requirements of specifications, codes, and criteria.

2. List references of other applications of S/H systems with slotted wedges similar to the one proposed for this facility, and include a description and typical drawings of the S/H system including location of grouting pipes and vents.

3. Specify, for the principal elements of the S/H System, the manufacturing processes, heat treatments, flame cutting, and welding precautions (to preclude notch effects), nondestructive testing and acceptance standards, sampling procedures, and applicable standards which will be used to qualify materials, and control the quality of the fabricated components.

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4. Discuss the capability of S/H system to maintain long-term loads (over the service lifetime), without potential failure of component parts and wedges, or without excessive relaxation. If test data are available to support system performance, provide such data including description of tested assembly, test procedures, and conditions of the Three-Mile Island S/H system application.

5. Evaluate the potential effects that erection and service conditions may have on the structural degradation of the system when considering:
   a. Condition at erection of faying surfaces of wedges and bearing blocks (dry, lubricated, dusty, gritty);
   b. Variability of hardness properties of wedges;
   c. Corrosion of wedges (especially in slots), wedge-strand, and wedge bearing-block interface;
   d. Hydrogen embrittlement;
   e. Cracking of concrete under the bearing plates
   f. Stability of wedge anchors, and nonslippage of strands under sudden tendon load reduction, or tendon vibration.

6. Discuss and evaluate the strand arrangement and twist in curved tendons with respect to the potential weakening effects that this arrangement and curvature may have on the performance of the system, especially under dynamic loading.

7. With regard to the proposed corrosion protection grouting specify:

   a. The experience available with grouting of long vertical tendons;

   b. The grout capability to penetrate between the wires and provide protection for the wedges and the wedge-grip-strand and wedge-bearing-block interfaces;

   c. The provisions that will be made to accommodate grout volume variations and prevent the formation of voids, or blockages in ducts.

8. List anchorage efficiency performance data on the basis of actual ultimate strength of wire and strand. Clarify the term, "Percent of Guaranteed Ultimate Strength".

9. Describe the quality assurance organization and program which will be used in the manufacture and erection of the S/H system, including specifically the quality control measures that will be applied to wedge threads, taper angle, splay plates, wedge plates, bearing plates, and ducts; duct placement, tendon tensioning, bearing plate centering, and all interface surface conditions.