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Member, and M. A. Dinkins, Engineering Technologist,
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INTERIM REPORT

NRC Research and Technical
Assistance Report

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FOREIGN TRIP REPORT

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DATE: August 8, 1980

SUBJECT: Report of Foreign Travel of D. B. Lloyd, Staff Member, and
M. A. Dinkins, Engineering Technologist, Advanced Instrumentation
for Reflood Studies (AIRS)

TO: Herman Postma

FROM: D. B. Lloyd and M. A. Dinkins

PURPOSE: To install film probes in the SCTF-1 Upper Plenum Structure

SITES VISITED: 7/21-7/26 Ishikawajima-Harima Heavy Industries (IHI)
Plant, Yokohama, Japan

ABSTRACT:

The travelers assembled and installed six ORNL furnished film probe assemblies in the upper plenum structure of the Slab Core Test Facility (SCTFI-1) at the plant in Yokohama, Japan.

NRC Research and Technical
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REPORT

The travelers assembled and installed six upper plenum structural film probes in the Slab Core Test Facility presently being fabricated by Ishikawajima-Harima Heavy Industry (IHI) in Yokohama, Japan.

Prior to installation and assembly the triaxial cables associated with the individual sensors were inspected and measured to determine their electrical characteristics. It was found that many of the cables had experienced a degradation in the measured values since the time of the last measurement prior to shipping from ORNL.

A tube furnace was improvised from materials and equipment made available by IHI and sensors whose cables gave evidence of unacceptably high moisture content were passed through this furnace to dry out the cables. Glass seals were installed on the open end of the cables when acceptable readings were obtained. All cables were rechecked a day or so after sealing to assure the integrity of the new seals. It was possible to upgrade the cables on all but two of the sensors. These were rejected and two spare units which had been hand-carried to the site as spares were substituted. These rejected units were returned to ORNL and will be inspected to determine, if possible, the fault.

The area where the cable repairs and the assembly work were conducted was located in one of the large high-bay manufacturing buildings at IHI. There were no provisions for a "clean" area and the air was usually heavy with fumes from weld flux. These fumes collected on the surface of the cables and the sensors and it was necessary to wipe the sensor faces and the cables with alcohol saturated cloths before accurate electrical measurements could be made. (A typical reading would change by a factor of 2 after the contact areas were cleaned with alcohol.)

During the final set of electrical measurements it was determined that the electrodes in one of the film thickness sensors were shorted together, presumably inside the sensor head. There were no replacement sensors available so this unit was left in the module.

The support column into which the film probe assemblies were mounted are square pipes about 100 mm on a side with a wall thickness of about 7 to 10 mm. On each column that received a film probe assembly the

pipe face in which the assembly was to be mounted had been improperly machined by IHI. The machined surface is at a slight angle to the original pipe surface. The machined surface extends beyond the film probe assembly about 30 cm in each direction. The film probe assemblies as installed are parallel to the original surface of this pipe but cannot be made flush with the improperly machined surface. To minimize the flow perturbation caused by this mismatch the film probe assemblies were mounted so that their centerline is flush with the machined surface. (This means that one edge is slightly above the machined pipe surface and the other edge is slightly below.) The offset is from 0.5 to 1.0 mm at each side of the assembly. The user may choose to rework the surface of the structural member to allow the film probes to operate satisfactorily.

Although the work involved in the sensor installation was substantially different from that involved in the normal activities at IHI the workers assigned to help us were quick to catch on and proved to be both helpful and pleasant. The JAERI representative and the IHI representatives were also most cooperative and helpful.

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