

August 15, 1979
GQL 1059

Director of Nuclear Reactor Regulations
Attn: R. W. Reid, Chief
Operating Reactors Branch #4
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Sir:

Three Mile Island Nuclear Station, Unit 1 (TMI-1)
Operating License No. DPR-50
Docket No. 50-289
IGSCC Investigation

- References
- a) GQL 0865 dated June 30, 1979
 - b) GQL 0902 dated July 17, 1979
 - c) IE Bulletin No. 79-17 dated July 26, 1979

BACKGROUND: References a) and b) reported the status of preliminary IGSCC investigations at TMI - Unit 1, using a highly sensitive, state of the art, ultrasonic inspection technique which has subsequently been explained and demonstrated to NRC, EPRI, B&W Users Group and their respective NDE consultants. The metallurgical analysis of five weld joint samples from the Spent Fuel Cooling System having UT indications of IGSCC confirmed the technique's ability to detect such cracking to the extent that a .006" deep crack originating at the pipe ID was found by metallography. Confident that the procedure could detect the initiation of such cracking, Met-Ed QC continued to examine all welds in 2½" diameter or larger piping in all engineered safeguards systems, recording all UT indications to define the maximum extent of the problem, realizing that such indications would require further evaluation before declaring such indications as IGSCC.

STATUS: On July 27, 1979, inspection of additional weld joints utilizing this technique was halted. The following was the status of indications obtained using this sensitive procedure:

<u>System</u>	<u>No. of Welds Inspected</u>	<u>UT Indications</u>
Spent Fuel Cooling	566	117
Decay Heat Removal	408	101
Containment Spray	241	56
Make Up & Purif.	656	76
Core Flood	31	0
	<u>1902</u>	<u>350</u>

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Radiographic examination of 16 weld joints with UT indications of IGSCC was then performed including the six joints in the unisolable portion of the High Pressure Injection System, three joints in the Containment Spray System and seven joints in the Spent Fuel System. In no case did radiography provide any indication of IGSCC. The seven radiographed joints from the Spent Fuel Cooling System were then removed from the system and extensive UT examination of each joint was performed in the lab by two independent contractors who concluded the original UT indications were due to geometric reflectors and not IGSCC. These results were confirmed by subsequent liquid penetrant inspection of the ID of each weld joint sample in which no indication of IGSCC was found.


Met Ed Quality Control is presently developing a screening procedure, with the cooperation of independent consultants, research organizations and educational institutions in order to determine which of the original UT indications are due to geometry and which are indeed due to IGSCC. It is important to emphasize that this Met Ed initiated investigation involves research and development of state of the art technologies in detection of IGSCC and attempted definition of the causes and corrective action for such a phenomenon occurring in low pressure, thin walled, 304 stainless steel piping systems. Insofar as;

- 1) Reference (c) was initiated as a result of the Met Ed TMI-1 IGSCC investigation and the NRC has been and will continue to be kept informed of all developments in that investigation, and
- 2) The current Met Ed investigation goes beyond the requirements of IE Bulletin 79-17 in that it includes engineered safeguards system piping where dynamic flow conditions exist,

Met Ed considers this and subsequent status reports as adequate response to IE Bulletin 79-17 in its entirety.

The next status report will be submitted by September 30, 1979.

Very truly yours,


J. G. Herbein
Vice President
Nuclear Operations

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