

Docket Nos. 50-266
and 50-301

February 14, 1985

DUR 016

Mr. C. W. Fay, Vice President
Nuclear Power Department
Wisconsin Electric Power Company
231 West Michigan Street, Room 308
Milwaukee, Wisconsin 53201

Subject: TRANSMITTAL OF TEST DATA ON UPPER PLENUM INJECTION (UPI) AND
A TWO-DAY UPI MEETING ABOUT MARCH 12-14, 1985.

At the January 10, 1985 meeting at NRC to discuss upper plenum injection (UPI), we were asked to provide additional UPI test data as soon as it could be made available. Accordingly, I am providing herewith three copies of "JAERI-M-84-221, Effects of Upper Plenum Injection on Thermo-Hydrodynamic Behavior Under Refill and Reflood Phases," December 1984.

This report describes the effects of UPI as measured on the Slab Core Test Facility (SCTF) operated by the Japan Atomic Energy Research Institute (JAERI). It contains SCTF test data which show that (1) adding UPI to a cold leg injection (CLI) system caused the post-LOCA maximum core temperature to decrease from 1195°K to 1158°K, and (2) subcooling of the UPI water caused a further decrease to 1119°K (per pages 24-27). However, (3) the corresponding time to bottom of core recovery (BOCREC) (equivalent to the beginning of reflood) increased substantially from 19 seconds to 80 and 81 seconds (per pages 47 and 30) and (4) downward flow of subcooled UPI liquid into the core was apparently intermittent (per pages 6, 37 and 47).

The SCTF-UPI data is not directly applicable to the existing Westinghouse two loop UPI plants because the SCTF-UPI test used both accumulators and pumps to provide both UPI and CLI, with the UPI flow about equal to the CLI flow (per page 24). Additionally, the UPI nozzle was at the bottom of the upper plenum (per page 24) rather than the level of the hot legs. Nevertheless, the SCTF tests had important features representative of a full size 1100 MWe Westinghouse PWR, e.g., full height heater rods and full radial width of a core. Also, the tests document phenomena which can be used to develop and/or test a UPI model, e.g., hot leg flow reversal (pages 15 and 53-54), fluid temperature variations in the upper plenum and upper core (pages 38-40) and horizontal pressure variations at three heights inside the core (pages 42-43).

Besides providing JAERI-M-84-221, we will provide proprietary "Quick Look" Reports (QLRs) on UPI tests at JAERI's Cylindrical Core Test Facility (CCTF) as follows: (1) QLRs on CCTF UPI tests 57 and 59 were provided previously; (2) a QLR on the no-single failure UPI test 72 will probably be available in February or March; and (3) draft QLRs on asymmetric UPI tests 76 and 78 will probably be available in March. We suggest you provide copies of the enclosure and of the QLRs to those fuel vendors assisting you in UPI model development.

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An NRC-JAERI discussion of the UPI tests will be held in the Bethesda, MD. area for two days about March 12-14, 1985. The NRC Office of Nuclear Regulatory Research (RES) expects to arrange for UPI licensees and their designated fuel vendor representatives to observe those discussions and to participate with JAERI representatives in round-table technical discussions of UPI phenomena. We anticipate that we will be able to keep the discussions from becoming unwieldy if we limit each UPI licensee to designating one employee observer, one employee participant, one vendor observer and one vendor participant, with a maximum of one observer and one participant present from any given fuel vendor.

Please let me know if you intend to send an employee observer, an employee technical participant, a vendor observer and/or a vendor technical participant so that we can set up the meeting with JAERI and the NRC. Please respond by phone by February 28, 1985 to Dr. David Langford, at 301-492-9403.

Sincerely,

James R. Miller, Chief
Operating Reactors Branch No. 3
Division of Licensing

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As stated

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