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BRANCH
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of)
METROPOLITAN EDISON COMPANY)
(Three Mile Island Nuclear)
Station, Unit No. 1))

Docket No. 50-289
(Restart)

UNION OF CONCERNED SCIENTISTS RESPONSE TO
GPU LETTER OF DECEMBER 6, 1983, REGARDING
EMERGENCY FEEDWATER FLOW INSTRUMENTATION

Introduction

On December 6, 1983, counsel for GPU transmitted to you a document which it characterized as "potentially relevant and material to matters under adjudication in the plant design and procedures phase" of the TMI-1 restart proceeding. The document is a letter from H. D. Hukill, Director of TMI-1, to the NRC, dated November 23, 1983. The letter discloses that the emergency feedwater flow instruments installed at TMI-1 to comply with the short-term "lessons learned" requirements do not meet NRC's criteria or GPU's commitment in the restart proceeding. In essence, GPU requests an exemption from those requirements, although its submission obscures this, as we will describe below. There is no justification for granting such an exemption and UCS therefore urges that you not permit the plant to operate without accurate feedwater flow instrumentation.

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Background

The NRC's TMI-2 Lessons Learned Task Force noted that "the need for an emergency feedwater system of high reliability is a clear lesson learned from the TMI-2 accident."^{1/} The Task Force recommended, among other things, that safety-grade indication of emergency feedwater flow be provided for each steam generator and that such instrumentation be installed by January 1, 1980.^{2/} This requirement was later clarified to require, for TMI-1 and other Babcock and Wilcox plants, two emergency feedwater flowrate indicators for each steam generator. The implementation schedule was extended such that final design information was to be submitted to NRC by January 1, 1981, and installation completed by July 1, 1981.^{3/}

During the restart hearing, the NRC Staff testified that: 1) each instrument should have "an accuracy on the order of $\pm 10\%$," 2) the licensee had committed to installing two safety grade sonic flow devices on each of the two emergency feedwater pipes, and 3) the licensee indicated that these new flow devices would have "an accuracy of better than $\pm 5\%$."^{4/} The Staff concluded, on that basis, that TMI-1 was in compliance with all the short-term requirements applicable to the emergency feedwater flow indicators, subject only to the submittal of environmental qualification certification.^{5/}

In a letter dated May 24, 1983, GPU advised the NRC Staff that two of the four installed emergency feedwater sonic flow devices would be replaced with

^{1/} NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations," July 1979, p. 10.

^{2/} Id., pp. 11, A-32, and B-2.

^{3/} NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980, pp. II.E.1.2-4, -5.

^{4/} Staff Ex. 1, NUREG-0680, "TMI-1 Restart," June 1980, p. C8-39.

^{5/} Id., p. C3-40. See also NUREG-0680, Supp. No. 3, April 1981, pp. 38-39.

differential pressure transmitters. On August 25, 1983, GPU notified the NRC Staff that further testing had shown the remaining sonic flow devices to be unsatisfactory and that, by restart, all of the sonic flow devices would be replaced with differential pressure transmitters.

In a letter dated September 22, 1983 (copy attached), the NRC Staff informed GPU that the change to differential pressure transmitters was acceptable to meet the short-term lessons learned requirements pertaining to emergency feedwater flow indication.^{6/}

Discussion

In its November 23, 1983 letter, GPU discloses that its August 25, 1983, assurance that the differential pressure instruments for measuring emergency feedwater flow "are reliable and accurate and are designed to monitor the full range of system flow requirements," is incorrect. Tests have disclosed that with emergency feedwater flow less than 100 gpm, oscillations cause the indicated flow to be inaccurate by more than 10%. (GPU does not say how far outside the +10% accuracy requirement the flow indication lies.) Nevertheless, GPU concludes that the emergency feedwater flow system as currently installed and tested at TMI-1 "is acceptable and meets the requirements of NUREG 0737 and our commitment as reflected in the Partial Initial Decision of December 14, 1981."

^{6/} We note the sharp contrast between the Staff's letter approving the differential pressure instruments and its earlier approval of the sonic flow devices in NUREG-0680, p. C8-39, 40. The earlier approval describes the sonic flow devices in great detail, which creates the impression that the Staff reviewed the design. The recent approval of the differential pressure transmitters provides neither a description of the design nor a basis for the Staff's approval. However, this contrast may not be significant because the earlier Staff testimony in NUREG-0680 is little more than a rewording of the material supplied by GPU. See Lic. Ex. 1, Report in Response to NRC Staff Recommended Requirements for Restart of Three Mile Island Nuclear Station Unit 1, p. 2.1-23.

Paragraph 1029 of the Licensing Board's December 14, 1981 Partial

Initial Decision is as follows:

The original EFW system design did not have any provision for indication in the control room of emergency feedwater flow. Safety-grade, redundant indication of EFW flow to each steam generator will be provided in the control room prior to restart. Licensee has committed to perform a functional test of the new EFW flow instrumentation prior to restart. Based upon the Staff's review of the Licensee's design for providing safety-grade EFW flow indication in the control room and on the information that the flow transducers are qualified for operation in the assumed environment from a postulated main steam line break in the Intermediate Building, the Staff has concluded that Licensee is in compliance with the NUREG-0578 recommendation, in item 2.1.7.b, for emergency feedwater flow indication to the steam generators. The Staff will verify that the flow devices are installed and suitably qualified prior to restart. [Citations omitted.]

Based on the information provided in GPU's November 23 letter, UCS concludes that the short-term lessons learned requirements for emergency feedwater flow indication have not been met at TMI-1. The basis for this conclusion follows.

GPU claims that its admittedly inaccurate emergency feedwater flow instrumentation does "not affect the functional capability of the EFW system or the ability of the operator to take proper action." We agree that lack of reliable flow indication does not directly affect the functional capability of the emergency feedwater system, but it can (and during the TMI-2 accident did) affect proper operator action. During the TMI-2 accident, the lack of EFW flow indication did not, in fact, affect the functional capability of the EFW system. However, there was no EFW flow initially because two valves were closed, and the lack of EFW flow instrumentation delayed proper operator action for about 12 minutes.

GPU also claims that, if the EFW system is automatically initiated, "accuracy of flow rate is not necessary at low flows." GPU apparently overlooks the fact that the EFW pumps are cooled by that flow. If the EFW flow control

valves are closed, a failure of the pump recirculation flow paths could require prompt operator action to prevent failure of the EFW pumps.

During manual control of EFW flow, GPU claims that the operator's attention would be focused on the indication of steam generator level and pressure, not on EFW flow indication. Again GPU's memory is short. During the TMI-2 accident, the operators focussed their attention on a few instruments and ignored others, to the detriment of core integrity. Does GPU now propose to stand on its head the lesson learned that operators should not focus their attention on only a few instruments?

GPU's claim that the operators do not need to use EFW flow indication to control steam generator level also directly contradicts the lessons learned requirements. The requirement to install two EFW flow indicators for each steam generator in B&W plants like TMI-1 stemmed from the need "to provide the capability in the control room to ascertain the actual performance" of the emergency feedwater system.^{7/} This requirement was relaxed, for Westinghouse and Combustion Engineering plants, to the extent that only one EFW flow indicator for each steam generator was required "for PWRs with U-tube steam generators because flow indication is of secondary importance in assuring steam generator cooling capability for steam generators of this design."^{8/} Because TMI-1 uses a once-through steam generator design, EFW flow is of primary importance.

GPU's proposal also ignores the experience of the TMI-2 accident in another respect. During the TMI-2 accident, the operators ignored indications of extremely high temperatures in the core because they knew the instruments were not safety grade and thus potentially unreliable. Now GPU proposes to operate

^{7/} NUREG-0737, p. II.E.1.2-4.

^{8/} Id.

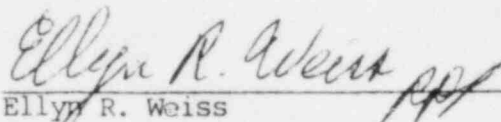
TMI-1 with unreliable EFW flow indication and "assist the operators in understanding how the EFW flow devices are expected to perform under various EFW flow conditions," i.e., inaccurately.

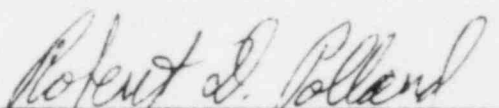
Conclusion

The short-term lessons learned of NUREG-0737 specifically require for B&W reactors precisely what TMI-1 does not have: emergency feedwater flow instrumentation meeting strict, detailed performance criteria to ensure that operators can rely on them. These requirements can not be met by installing faulty instruments and telling the operators to ignore them. To even suggest such a response is disingenuous in the extreme. Because GPU has failed in two attempts over a period of several years to design an accurate, reliable EFW flow indication system, it is reasonable to conclude that this further demonstrates the licensee's technical incompetence.

Since the industry-wide deadline for installing this instrumentation was July 1, 1983, we assume that all other operating plants have met the pertinent requirements. There is no reason to exempt TMI-1. Therefore, TMI-1 should not be permitted to restart until it also complies with this "short-term" requirement.

Respectfully submitted,


Ellyn R. Weiss
General Counsel


Robert D. Pollard
Nuclear Safety Engineer

Dated: December 9, 1983



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

September 22, 1983

Docket No. 50-289

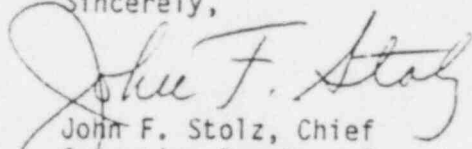
Mr. Henry D. Hukill
Vice President
GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17057

Dear Mr. Hukill:

By order dated August 9, 1979, the Commission required, in part, that GPUN provide indication in the TMI-1 Control Room of emergency feedwater system (EFW) flow to each steam generator prior to any subsequent restart. To satisfy this requirement, GPUN committed to install two safety-grade sonic flow devices on the flow path to each steam generator to provide Control Room indication of EFW flow. This commitment was reviewed and found acceptable by the NRC staff as documented in the TMI-1 Restart Safety Evaluation (NUREG-0680) pages C1-5 and C8-39, 40 and NUREG-0680, Supplement 3 pages 38-39.

Recently by letters dated May 24, 1983 and August 25, 1983, you advised us that, due to signal interference problems between the sonic flow devices and other unsuccessful test results, you have decided to remove the sonic flow devices and replace them with differential pressure transmitters. We have received the information provided in your submittals and, based upon that review, we conclude the changes you propose satisfy the requirements of Part 2 to NUREG-0737 Action Item II.E.1.2 "Auxiliary Feedwater System Automatic Initiation and Flow Indication" and are therefore acceptable.

Sincerely,


John F. Stolz, Chief
Operating Reactors Branch #4
Division of Licensing

cc:
See next page

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