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Docket Number 50-346

License Number NPF-3

Serial Number 1738

March 19, 1990

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Subject: Toledo Edison Compliance with Regulatory Guide 1.97

Gentlemen:

Toledo Edison has committed to comply with Regulatory Guide (RG) 1.97 by the end of Davis-Besse's sixth refueling outage. The schedule for fulfilling this commitment was based on compliance as defined by Davis-Besse acceptance criteria and guidelines provided in Serial Number 1059 dated June 28, 1984. Toledo Edison's methods for complying with RG 1.97 were provided in that letter and two subsequent letters (Serial Numbers 1232 and 1236) submitted to resolve questions/clarifications submitted by the NRC in Log Number 1838 dated October 16, 1985. The NRC forwarded its final Safety Evaluation Report (SER) regarding Davis-Besse's conformance with RG 1.97 in an NRC letter (Log Number 2447) dated November 25, 1987.

NRC Region III conducted an inspection to verify TE's compliance to RG 1.97 requirements on December 12, 1988, through February 1, 1989 (reference NRC Inspection Report Number 50-346/88038 dated February 14, 1989). NRC Regional inspectors identified several items they believed contrary to RG 1.97 requirements and the NRC staff's Safety Evaluation of TE submittals describing TE methods of compliance to RG 1.97. During the inspection, TE was requested to respond to NRC inspector concerns related to RG 1.97 compliance. Toledo Edison's verbal and written responses to many of these concerns did not satisfy the NRC inspectors. They were uncertain as to whether the NRC staff had evaluated apparent exceptions to RG 1.97 since TE had not specifically requested them to do so in its original submittal (Serial Number 1059). TE explained that although it had not specifically requested exemption from RG 1.97, that TE's method of compliance was clearly denoted in Serial Number 1059.

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The introduction of the Attachment to Serial Number 1059 specifically stated that Davis-Besse's acceptance criteria and guidelines for compliance with the design and qualification criteria for instrumentation in Table 1 of RG 1.97 was provided in Section II of the Attachment. However, the Regional inspector opened several Unresolved Items and referred them to NRR for resolution. The Unresolved Items concerned redundancy, physical separation, equipment qualification and display & recording requirements for Category 1 and 2 instrumentation.

The NRC's SER, issued on November 25, 1987, documents that the staff's review of TE's submittal (Serial Number 1059) identified seventeen exceptions which were initially found to be unacceptable. However, based on additional information provided by TE (Reference Serial Number 1232 and 1236), the staff concluded that TE conforms to or has adequately justified deviations taken from the guidance of RG 1.97.

Therefore, TE hereby requests resolution of the Unresolved Items based on the previously accepted justification for the deviations. Attachment 1 contains an abbreviated description of the Unresolved Items identified and TE's position on each item.

Should you have any questions concerning this matter, please contact Mr. R. W. Schrauder at (419) 249-2366.

Very truly yours,



EBS/ssg

Attachment

cc: P. M. Byron, DB-1 NRC Senior Resident Inspector
✓A. B. Davis, Regional Administrator, NRC Region III
T. V. Wambach, DB-1 NRC Project Manager

Attachment 1

1. Unresolved Item 88-038-02: Failure to Provide Redundant Instrumentation Channels for RG 1.97 SG variables.

The inspectors identified the following instrument channels as not having redundancy:

- A. Steam generator (SG) level transmitters SP9B3 and SP9B8 powered from essential channel Y1 for steam generator 1-1, and SP9A3 and SP9A8 powered from essential channel Y2, for steam generator 1-2.
- B. Steam generator pressure transmitters PT-SP12B1 for steam generator 1-1, and PT SP12A2 for steam generator 1-2.
- C. Reactor coolant system hot leg level transmitter LT5448B for steam generator 1-1 and LT5448A for steam generator 1-2.

Response

- A. From a R.G. 1.97 standpoint, the issue taken by the NRC Audit Team was on redundancy; specifically, the lack of diverse power supplies for the redundant steam generator level transmitters.

It is noted that for any accident in which both SGs are available, the two SG's together provide diversity since only one is needed. Further no failure can make both Y1 and Y2 unavailable. Therefore, one of the available SGs would have level indication available.

The only scenario where diversity will be needed for one SG is when a Steam and Feedwater Rupture Control System (SFRCS) low pressure trip isolates the faulty Steam Generator and a concurrent loss of essential power to the other (good) Steam Generator level instrumentation occurs. In this case, level indication is still available for the good Steam Generator on the Auxiliary Feedwater Level Indicating Controller. This indication is class-1E, diverse from normal level indication power supply, and can be displayed in the Control Room upon operator demand. This instrumentation meets the intent of R.G. 1.97 Category 1 requirements, but was not specifically annotated in Serial Number 1059 or 1232. In addition, a diverse, class-1E, SFRCS level transmitter can be used to display SG level in the Control Room via the plant computer.

- B. Per plant design, SG 1-1 and SG 1-2 outlet pressure indications are redundant to each other. As noted above, only one steam generator loop is required to establish and maintain the plant in a safe

condition under most accident scenarios (SBLOCA and overcooling events). Per RG 1.97, the redundancy requirement is satisfied by PT-SP12A2 and PT-SP12B1 instrument strings. There are scenarios (e.g., Steam Line break) where class-1E redundancy requirements cannot be met, however, additional pressure transmitters (PT-SP12A1 and PT-SP12B2 instrument strings) are available that meet the Category 2 requirements. Category 2 instruments are considered acceptable for back-up indication of a Category 1 variable.

- C. Per plant design, SG 1-1 and SG 1-2 hot leg inventory indications are redundant to each other. Any scenario in which the Hot Leg Level Monitoring System (HLLMS) provides useful information involves significant voiding of the RCS. Were that to occur, both Hot Legs would be expected to behave similarly. Therefore, the redundancy requirement is satisfied by LT-5448A and LT-5448B.

2. Unresolved Item 88-038-03: Lack of Physical Separation of RG 1.97 Circuits

During examination of field installation of RG 1.97 items, the inspectors noted various exceptions taken by the licensee to the physical separation requirements of RG 1.75 as endorsed by RG 1.97, Revision 3.

For example, high pressure injection indicators, FYI HP3A, B, C, and D, and decay heat removal indicators, FYI-DH2A and B, located on control room panel C-5716, were mounted in a divisional barrier that contains non-class-1E indicators TI 1490 and 1498. In addition, non-safety related cables from the non-class-1E indicators were bundled with safety related cables for RG 1.97 class-1E indicators. The licensee stated that the Davis-Besse Safety Analysis Report permits the bundling of class-1E cables with non-class-1E cables. The inspectors informed the licensee that this appeared to be contrary to the requirements of RG 1.75 (which is imposed by RG 1.97, Revision 3).

Response Class-1E indicators FYI-HP3C & D, FI-4909 and FYI-DH2B (Channel 1) are grouped with non-class-1E indicator TI-1489 (Not TI-1498) (Channel A). Class-1E indicators FYI-HP3A & B, FI-4908 and FYI-DH2A (Channel 2) are grouped with non-class-1E indicator TI-1490 (Channel B). Per USAR section 8.3.1.2.18, it is permitted to place non-essential channel A instruments and essential Channel 1 instruments near one another without any physical separation (Same applies for channel 2/B).

It is noted that Toledo Edison has not committed to comply with the requirements of RG 1.75 through acceptance of RG 1.97. Davis-Besse's design, in relation to physical separation, is described in USAR Section 8.1.5 and further clarified by USAR Section 8.3.1.2.25, as specifically noted on page 8.3-39. Serial Number 1059, Section A.2, addresses redundancy and does not endorse RG 1.75. Further, the Davis-Besse USAR does not require specific compliance with RG 1.75 requirements.

3. Unresolved Item 88-038-04: Non-Class-1E Pressure switch used in Category 1, Type A instrument channel

RG 1.97 requires Environmental Qualification from sensor to display for Category 1 variables. Honeywell pressure switches PS5301 and PS5311 were part of the Category 1 Control Room Normal Ventilation System (CRNVS) instrument loop and therefore were required to be qualified. The inspectors informed the licensee that the switches appeared to be contrary to the requirements of RG 1.97 in that the pressure switches were part of the class-1E instrument loop and were non-class-1E.

Response The Honeywell devices associated with the CRNVS are non-class-1E; specifically, the pressure switches and associated relays. The CRNVS control cabinet, C6705, was procured and installed non-class-1E as part of the initial plant design. The safety related portion of the system was installed class-1E. The function of the safety related portion is to initiate a signal to close various inlet and outlet dampers to the control room area, to stop the supply and return fans, and to provide indication in the control room that this signal has been initiated. The functions provided by the non-class-1E pressure switches and relays are to, upon receipt of the signal, trip the supply and return fans, initiate a computer alarm and deenergize additional relays in the relay cabinets. These relays provide the Control Room (CR) indication via Hand Indicating Switches and feedback to the SFAS status lights, also located in the CR. Even if these specific actions did not occur, there would be no safety-related consequences since the fans can be shut down manually based on other CR indications.

This is considered to meet the intent of RG 1.97 for the following reasons:

- The Honeywell control system (C6705) is configured as fail-safe (i.e., deenergize to trip).
- Adequate information is provided to the operators to allow manual tripping of the fans should any malfunction occur in the Honeywell control system concurrent with a valid automatic trip signal.
- Manual shutdown of the supply and return fans can be accomplished via HIS 5316 and HIS 5317 located in the control room.

4. Unresolved Item 88-038-06: Lack of Class-1E Indication for Category 1, Type A Variables

1. Borated water storage tank (BWST) level and containment narrow range (CNR) pressure class-1E indication.

The Licensee has identified BWST level and CNR pressure as Category 1, Type A variables. RG 1.97 requires qualification of the complete instrument channel from sensor to display, where the display is a direct-indicating meter or recording device.

The licensee's submittal, Serial Number 1059, dated June 28, 1984, stated that indications for both variables were non-class-1E because power to the indicators was provided through isolators located within the essential

safety feature actuation cabinet. The indicators, therefore, did not meet the single failure criteria required to qualify them.

2. Core Coolant Inventory (RCS Hot Leg Level)

The Licensee identified this variable as Category 1, Type B. The walkdown inspection revealed no indication for this variable in the control room. The licensee submittal, Serial Number 1059, dated June 28, 1984, committed to upgrade the variable to RG 1.97 standards during the fifth refueling outage.

Response

1. BWST Level and CNR Pressure

Per Serial Number 1059, taking into consideration Table 2 and Notes E and F, the requirements of R.G. 1.97 are met. The indicators are powered, via current loop, from essential power, through a qualified isolator located within the SFAS cabinets. This was accepted by the NRC in their Safety Evaluation Report (Log Number 2447) for Davis-Besse on RG 1.97.

2. Core Coolant Inventory (RCS Hot Leg Level)

Toledo Edison did not commit to upgrade this variable to RG 1.97 standards. As stated in Note B to the RG 1.97 Inventory & Compliance Table, which was submitted as an Attachment to Serial Number 1059, this instrument already had been or was being added or upgraded as part of regulatory requirements for post TMI-2 modifications (i.e., NUREG-0737). Indication is provided in the Control Room via computer display.

The Hot Leg Level Monitoring System (HLLMS) was installed during the 1983-1985 timeframe (FCR 80-0269) as part of the Inadequate Core Cooling (ICC) instrumentation system. This was done to conform with NUREG-0737, Item II.F.2 as required by an NRC Order for Modification of License for Davis-Besse dated December 10, 1982 (Log Number 1157). An inspector's review of TMI NUREG 0737 items, performed during Inspection 86-05 (Log Number 1-1373, dated 4/23/86) documents the acceptability of the computer display availability and computer power source reliability for the HLLMS instrumentation in meeting the intent of NUREG-0737 for computer display systems. Inspection Report 87004, dated March 8, 1987, documented that the only part of this item that remained to be reviewed by the NRC was the void coefficient monitoring system. Toledo Edison considers the NRC's acceptance of NUREG-0737 Item II.F.2 as acceptance of TE's alternative method of complying with this RG 1.97 item.

5. Unresolved Item 88-038-07: Lack of Class-1E Recording of Instrument Readout Information

RG 1.97, Revision 3, Table 1, paragraph 6, states that "Recording of Instrumentation Readout Information should be provided for at least one redundant channel". Further, RG 1.97, Revision 3, stated "Qualification applies to the complete instrumentation channel from sensor to display....."

The inspectors noted that the licensee failed to provide class-1E recording for RG 1.97 variables essential for operator information. Recording of RG 1.97 variables is provided through the licensee's non-class-1E plant computer and safety parameter display system (SPDS).

Response

Per R.G. 1.97, equipment qualification (class-1E) "applies to the complete instrumentation channel from sensor to display where the display is a direct-indicating meter or recording device". For the subject instrument strings, class-1E, direct-indicating meters are provided in the Control Room. These parameters are also monitored by either the plant computer and/or the Safety Parameter Display System (SPDS). Qualified channel isolation is provided for the 1E to Non-1E transition to the computer systems.

The signals to the computer systems are not essential for immediate operator information since the class-1E indication is utilized for operational procedures.

Recorded information is only used for subsequent transient assessment. For the purposes of transient assessment, the SPDS computer is highly reliable, even though it is not class-1E equipment. A loss of power to the SPDS could occur upon a failure of an inverter. SPDS would then be automatically provided power by a diesel powered unit to allow continued SPDS recording.