

Iowa Electric Light and Power Company

May 3, 1989
NG-89-0057

Dr. Thomas E. Murley
Director of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Re: Duane Arnold Energy Center
Subject: Update of Conformance to R.G. 1.97, Revision 2
Reference: (1) R. W. McGaughy letter to H. Denton dated 07/03/85
(NG-85-2423).
(2) R. W. McGaughy letter to H. Denton dated 10/16/85
(NG-85-4481).
(3) R. A. Gilbert letter to L. Liu dated 01/13/87.
(4) R. W. McGaughy letter to H. Denton dated 03/31/87
(NG-87-1032).
File: A-370, A-278

Dear Dr. Murley:

Iowa Electric's initial plans and schedules for meeting the recommendations of Regulatory Guide 1.97 (Rev. 2), "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," were described in Reference 1. Reference 2 provided an itemized list of the planned modifications and their completion dates. The purpose of this letter is to inform you of the present status of our efforts to improve accident monitoring instrumentation.

The schedule submitted with Reference 2 called for completion of the listed enhancements of accident monitoring instrumentation by the end of the Cycle 9/10 refueling outage. However, since 1985 when the DAEC program was developed, we have completed other instrumentation modifications and engineering evaluations which led us to revise the program for responding to R.G. 1.97 in certain respects. Attachment 1 to this letter explains these changes. Because of these changes, some actions which were contemplated when References 1 and 2 were prepared have not been implemented. We believe that the explanations given in Attachment 1 and our actions will be acceptable to the NRC staff.

The extended duration and technical complexity of this program have led us to decide that a detailed review should be conducted to verify that the accident-monitoring-instrumentation program for DAEC in fact satisfies Iowa Electric's commitments to R.G. 1.97. A consultant has begun the review and the initial phase (which addresses Category 1 variables) will be completed by July

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1, 1989. When the review is complete, we will update Table 1 of Reference 1 to reflect the status of DAEC instrumentation to monitor all R.G. 1.97 variables.

Please contact this office if you require further information about this matter.

Very truly yours,



Daniel L. Mineck
Manager, Nuclear Division

DLM/PMB/pjv+

Attachment: Clarifications and changes to Iowa Electric's Plans for
Regulatory Guide 1.97 Accident Monitoring Instrumentation

cc: P. Bessette
L. Liu
L. Root
R. McGaughy
J. R. Hall (NRC-NRR)
A. Bert Davis (Region III)
NRC Resident Office
Commitment Control No. 850130, 850296, 850297, 850298

CLARIFICATIONS AND CHANGES TO IOWA ELECTRIC'S PLANS FOR
REGULATORY GUIDE 1.97 ACCIDENT MONITORING INSTRUMENTATION

R.G. 1.97 Variable B-7, Drywell Pressure

R.G. 1.97 specifies Category 1 instrumentation to measure drywell pressure from zero to design pressure (62 psig for DAEC). In References 1 and 2, we committed to upgrade our existing -10 to +90 psig instrumentation (PT-4365A/B) to Category 1 by upgrading the power supply to Class 1E and rerouting the cables for divisional separation. However, as part of our ongoing Detailed Control Room Design Review (DCRDR) project, we installed redundant, Class 1E, 0 to 100 psig drywell pressure instrumentation (PI-4396C/D) during the Cycle 9/10 refueling outage. This new instrumentation meets our commitments to the R.G. 1.97 criteria for drywell pressure indication in the design pressure (62 psig) range. Negative drywell pressure instrumentation requirements are met by the existing -5 psig to +5 psig instrumentation (PT-4398A/B). We upgraded the power supply for that instrumentation to Class 1E during the Cycle 9/10 refueling outage. However, we do not plan to reroute the cables associated with PT-4365A/B to achieve divisional separation because they are no longer considered R.G. 1.97 instruments.

R.G. 1.97 Variable B-8, Drywell Sump Level

R.G. 1.97 specifies Category 1 instrumentation to measure drywell sump level. In Reference 1, we proposed to measure the integrated leakage flow from pumps in the drywell equipment sump and floor drain sump instead of measuring the drywell sump level. We indicated that our proposed alternate instrumentation met the criteria for Category 1 except for redundancy. We also indicated our intent to reroute the cables to achieve divisional separation. Section C.1.3.1.b of R.G. 1.97, Revision 2, recommends electrical independence and physical separation for redundant or diverse channels of Category 1 instrumentation. However, the drywell equipment drain sump flow and the drywell floor drain sump flow are not redundant or diverse indications of the sump leakage flow rate as defined in R.G. 1.97, so their cables need not be physically separated. The NRC's interim report (Reference 3) characterized our proposed instrumentation as Category 3 and concluded that this instrumentation will provide appropriate monitoring for the parameter of concern. Therefore, separation of the existing cables is unnecessary and the existing instrumentation is adequate. As a result, we no longer intend to reroute these cables to achieve divisional separation.

R.G. 1.97 Variable B-10, Primary Containment Isolation Valve Position

R.G. 1.97 specifies Category 1 instrumentation to indicate the status of primary containment isolation valves. In Reference 1, we proposed to provide Category 1 instrumentation to monitor this variable. We have again reviewed these valves and found that the position indication instrumentation meets Category 1 criteria except for the following valves:

A/B Train Drywell Cooling Water Inlet Valves (CV-5718A/B)
A/B Train Drywell Cooling Water Outlet Valves (CV-5704A/B)

Drywell cooling is a closed-loop system within the primary containment and, in accordance with General Design Criterion 57, is only required to have a single isolation valve on each line that penetrates the containment. Consequently, each inlet and outlet valve in each closed-loop system is a single air-operated outboard isolation valve. Position indication is provided for each of these valves. In Reference 1, we proposed to supply redundant indications of containment isolation valve position by indicating positions for both the inboard and outboard containment isolation valves. In this case, there is no corresponding inboard isolation valve, and it was incorrect to indicate that indication could be given for the non-existent valves. Since the A/B Train Drywell Cooling Water Inlet and Outlet Valves do not provide redundant isolation of a single containment penetration, divisional separation is not applicable.

The indicating light circuits for the drywell cooling inlet and outlet valves are powered from instrument panels which were upgraded to Class 1E power supplies during the Cycle 9/10 refueling outage.

Modifications were performed during the Cycle 9/10 refueling outage to isolate the lights which indicate the position of the drywell cooling valves from the remainder of the control circuits for non-safety-related valves.

The modifications described above for CV-5718A/B and CV-5704A/B brought the instrumentation into compliance with the R.G. 1.97 recommendations for Category 1 instrumentation to monitor primary containment isolation valve position. No further modification is necessary.

R.G. 1.97 Variable C-12, Containment and Drywell Oxygen Concentration

R.G. 1.97 specifies Category 1 instrumentation to measure containment oxygen concentrations from 0 to 10 percent. In Reference 1, we proposed to use existing Category 1 instrumentation to measure this variable from 0 to 25 percent. We performed additional engineering reviews and determined that low range sensitivity is improved when the instrument is spanned to 10 percent oxygen concentration rather than 25 percent. Because there are no requirements in the Technical Specifications, Emergency Operating Procedures or other governing documents to measure oxygen concentrations above 10 percent we will provide instrumentation to measure only 0-10 percent. The revised instrument range will be implemented by our mid-cycle MSIV outage, currently planned for October 1989.

R.G. 1.97 Variable D-6, Suppression Pool Water Temperature

R.G. 1.97 specifies Category 2 instrumentation to measure suppression pool water temperature from 30°F to 230°F. In Reference 1, we proposed to use existing Category 1 instrumentation to measure this variable from 20°F to 220°F. The NRC's interim report (Reference 3) concluded that this instrument range is acceptable. We performed additional engineering reviews and determined that, although the temperature elements and cables are Class 1E, the circuits do not meet the Category 1 specification for divisional separation. We also determined that both A and B Train instruments are presently powered from the same source. Modifications were made during the Cycle 9/10 refueling outage to supply independent, Class 1E power for these A and B Train instruments. However, we determined that it was not practical to provide divisional separation of the cables during the Cycle 9/10 refueling outage. The equipment, with the modified power supplies, meets or exceeds the R.G. 1.97 recommendations for Category 2 instrumentation for this variable. Therefore, we propose to provide Category 2 instrumentation to monitor suppression pool water temperature.

R.G. 1.97 Variable D-7, Drywell Atmosphere Temperature

R.G. 1.97 specifies Category 2 instrumentation to measure the drywell atmosphere temperature. In Reference 1, we proposed to provide a Category 3 system with divisional separation between redundant trains of temperature monitoring equipment. However, we have found that although the temperature elements and their associated cables are Class 1E, both trains share a common drywell electrical penetration. No other drywell penetrations are available which will accommodate the twisted, shielded cables that connect the temperature elements inside the drywell to the temperature transmitters outside the drywell. Therefore, we propose to provide Category 2 instrumentation for the variable (as recommended by R.G. 1.97) rather than the previously indicated Category 3 with divisional separation. In fact, we provided Class 1E power for this instrumentation during the Cycle 9/10 refueling outage and our system meets or exceeds the R.G. 1.97 specifications for Category 2 instrumentation.

R.G. 1.97 Variable D-16, LPCI System Flow

R.G. 1.97 specifies Category 2 instrumentation to measure flow of the low pressure coolant injection system. In Reference 1, we proposed to provide Category 1 instrumentation to measure this variable. Subsequent reviews have shown that our present instrumentation meets Category 1 specifications except that both trains feed a common flow recorder on Panel 1C04 and both trains feed non-Class 1E indicators on Panel 1C208. Although our present instrumentation does not meet all the Category 1 specifications, it does meet or exceed the R.G. 1.97 criteria for Category 2 instrumentation to monitor this variable. Therefore, we propose to revise our commitment and provide Category 2 instrumentation for Variable D-16 as recommended by R.G. 1.97.

R.G. 1.97 Variable D-17, Standby Liquid Control System Flow

R.G. 1.97 specifies Category 2 instrumentation to measure flow of the standby liquid control system (SLCS). In Reference 1 (Issue 11), we indicated that existing instrumentation and controls were adequate to monitor SLCS operation and that SLCS flow instrumentation was unnecessary. This was deemed to be an acceptable position in the NRC's interim report (Reference 3). Subsequent to submittal of Reference 1, we installed SLCS flow instrumentation as a part of our response to the ATWS rule (10 CFR 50.62). This instrument (FI-2620), located on Control Room Panel 1C05, indicates flow from 0 to 60 gpm (0-115% of the minimum pump flowrate allowed by the Technical Specifications). The SLCS flow instrument is located in a mild environment as defined by 10CFR50.49. Section 50.49(c) states that requirements for "environmental qualification of electrical equipment important to safety located in a mild environment are not included within the scope of this section." Class 1E power to this instrumentation was provided during the Cycle 9/10 refueling outage. This instrument meets R.G. 1.97 criteria for Category 2 instrumentation to measure SLCS flow. We therefore propose to substitute measurement of SLCS flow as our R.G. 1.97 instrumentation for Variable D-17 in lieu of the various indications referred to in Reference 1.

R.G. 1.97 Variable D-24, Emergency Ventilation Damper Position

R.G. 1.97 specifies Category 2 instrumentation to indicate the position of emergency ventilation dampers. In Reference 1, we proposed to provide Category 1 instrumentation to measure this variable. We indicated in References 1 and 2 that it would be necessary to reroute cable in order to provide divisional separation. A subsequent review revealed that all emergency ventilation damper position indication systems already meet Category 1 specifications. Therefore, cable for this instrumentation need not be rerouted.