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 MURLEY, T. Office of Nuclear Reactor Regulation, Director (Post 870411)

SUBJECT: Discusses licensee ATWS rule (10CFR50.62) compliance rept re design of alternate rod insertion (ARI) sys. Concludes that plant design of ARI sys complies w/NEDE-31096-P. Rev to seal-in feature value in ARI logic changed from 30 to 45-s.

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 TITLE: OR/Licensing Submittal: Salem ATWS Events GL-83-28

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Iowa Electric Light and Power Company

Crutchfield
50-331

June 1, 1987
NG-87-2038

Dr. Thomas Murley, Director
Office of Nuclear Reactor Regulation
Attn: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Re: Duane Arnold Energy Center
Subject: Revision to Iowa Electric's ATWS Rule
(10 CFR 50.62) Compliance Report
Reference: 1) Letter, R. Gilbert to L. Liu, "ATWS Rule
(10 CFR 50.62): Plant Specific Reviews,"
Jan. 8, 1987
2) Letter, R. McGaughy to H. Denton,
"Technical Specification Change (RTS-216)
ATWS Modifications", NG-87-0468,
Feb. 26, 1987
File: A-107a, A-117, A-225

Dear Dr. Murley:

Reference 1 discussed the plant-specific report which Iowa Electric was required to submit to comply with the ATWS rule (10 CFR §50.62(c)(6)). Reference 1 stated that Iowa Electric, a participant in the BWR Owners' Group (BWROG), may reference the licensing topical report (LTR) NEDE-31096-P prepared by General Electric (GE) for the BWROG to support the DAEC-specific submittal to demonstrate the adequacy of the system design for DAEC.

Reference 2 transmitted our plant-specific report which stated (Section 2.3) that the design of the alternate rod insertion (ARI) system for DAEC meets the performance specifications stated in the LTR. Specifically, we stated that control rod motion would begin within 15 seconds and be completed within 25 seconds from ARI initiation. This statement was based upon our analytical model used to design our ARI system. However, in-plant testing of the installed system revealed that these times are not met. The test data indicate that rod motion actually begins at approximately 10 seconds for the first rod and 30 seconds for the last rod. Assuming that insertion of a rod takes 7 seconds (the maximum time allowed by the Technical Specifications), rod motion will be completed within 37 seconds. A post-test evaluation determined that a choked flow condition exists in the scram valves for the individual control rod drives and that modifications to the design of the ARI system would not improve ARI performance.

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Dr. Thomas Murley
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May 29, 1987
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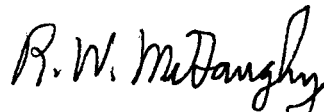
We then contacted GE to discuss the basis for the ARI performance specifications given in the LTR. GE stated that acceptability of ARI performance depends on satisfying certain conditions. Specifically, all control rods must be inserted before the scram discharge volume (SDV) fills with water or becomes pressurized to the point where control rods can not be inserted, and power generation must be terminated (i.e., all control rods inserted) within one minute to preclude degradation of the fuel cladding and exceeding primary containment design limits. If these conditions are met, longer rod insertion times are satisfactory.

On the basis of further analysis, we have concluded that the control rods will be fully inserted prior to either SDV fill or pressurization if rod motion begins within 33 seconds and is completed within 40 seconds. The actual rod motion times measured during the test are within these performance specifications. We have therefore concluded that the design of the DAEC ARI system complies with the intent of the LTR acceptance criteria.

Our earlier submittal also describes a seal-in feature in the ARI logic which allows completion of the ARI function before the system can be reset. In that report, we gave a value of 30 seconds for this (see Figure 2-1 of Reference 2). Due to the longer ARI completion times, we have revised this to 45 seconds. This value is within the GE-recommended criterion, i.e., within 10 seconds after the maximum expected ARI completion time.

Please feel free to contact this office if you require further information.

Very truly yours,



Richard W. McGaughy
Vice-President, Production

RWM/RAB/pjv*

cc: R. Browning
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L. Root
A. Cappucci (NRC-NRR)
A. Bert Davis (NRC-Region III Office)
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