Iowa Electric Light and Power Company

March 1, 1993 NG-93-0623

JOHN F. FRANZ, JR. VICE PRESIDENT NUCLEAR

Dr. Thomas E. Murley, Director Office of Nuclear Reactor Regulation U.S. Nuclear Regulatory Commission Attn: Document Control Desk Mail Station P1-137 Washington, D.C. 20555

Subject:	Duane Arnold Energy Center Docket No: 50-331
	Op License No: DPR-49
	Response to Request for Additional Information
	Regarding DAEC IST Relief Requests VR-004 and VR-005
Reference:	NG-93-0222, J. Franz (IE) to Dr. T. Murley (NRC), dated January 29, 1993
File:	A-101b, A-286e

Dear Dr. Murley:

Attached you will find our response to your staff's request for additional information regarding the referenced submittal of Duane Arnold Energy Center (DAEC) Inservice Testing (IST) Relief Requests VR-004 and VR-005.

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

John F. Franz

Vice President, Nuclear JFF/CJR:so Attachment 1: Iowa Electric's Response to NRC Request for Additional Information Regarding DAEC IST Relief Requests VR-004 and VR-005 Attachment 2: Feedwater Check Valve Modification Safety Evaluation cc: C. Rushworth L. Liu L. Root R. Pulsifer (NRC-NRR) A. Bert Davis (Region III) NRC Resident Office DCRC -1047 -018 9303090248 930301 PDR ADOCK 05000331 General Office * r.o. Box 351 * Cedar Rapids, Iowa 52406 * 319/398-4411

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IOWA ELECTRIC'S RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION REGARDING DAEC IST RELIEF REQUESTS VR-004 AND VR-005

1. NRC Request:

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Feedwater check valves V-14-0001 and V-14-0003 were modified and a Code test frequency can no longer be met due to the modification. The NRC requested a copy of the 10 CFR 50.59 safety evaluation for this modification.

Iowa Electric's Response:

The 10 CFR 50.59 safety evaluation is enclosed (Attachment 2).

2. NRC Request:

Relief Request VR-005 states that the Main Steam Safety Valves will now be tested to OM-1. The relief request also states that the setpoint will be restored to within the specified tolerance of the original installation/ construction/manufacture code before reinstallation. The NRC requested the tolerance for each valve that was added to the relief request.

Iowa Electric's Response:

The setpoint tolerance for each Main Steam Safety Valve is +/-1%. This is in accordance with Technical Specification Sections 2.2.1.B and 2.2.1.D.

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10 CFR 50.59

Safety Evaluation (Retyped Safety Evaluation to incorporate handwritten comments.)

DCP 1525 - Feedwater Check Valves

1.0 BASIS FOR DESIGN CHANGE

The feedwater check valves V-14-01 and V-14-03 serve as the in-board isolation valves on the feedwater lines at the DAEC. Recurring problems in testing the original valves to 10CFR50 App. J requirements prompted their replacement with Anchor-Darling Spring-Assisted Air Operated Tilting Disc Check Valves via DCR 765.

Since the valves were replaced by DCR 765, problems have been encountered in passing the Local Leak Rate Tests (LLRTs) which are conducted on the valves every refueling outage (RFO). During RFO 9/10, DCP 1422 was implemented to improve the seating problems encountered with the Anchor/Darling valves. Part of this modification was removed the following RFO because of problems encountered during LLRTs.

The purpose of this modification is to use the latest data available to improve the containment isolation capability of the valves and verify d is improvement through lower leak rates during LLRTs. This data comes from a number of sources including recently passed LLRTs, a survey of feedwater check valve experiences at other utilities, and an engineering study to determine the best available solution. Improvements will be accomplished by modifying the check valves internally and removing the actuator/indicators from them. A high point vent line will also be added downstream of the check valves to facilitate conducting LLRTs and add flexibility to the test procedure.

2.0 DESCRIPTION OF CHANGE

The following description details the scope of design activities to be performed under this DCP.

2.1 Modification of V-14-1 and V-14-3

Both check values are equipped with spring assist actuators originally intended to assist in seating the values. Nitrogen supplied to pneumatic cylinders controls the actuators. Actually, the actuators tend to over-rotate the discs, providing a leak path at the upper portion of the value seat. The values are also equipped with Indicator/Damper mechanisms which provide indication of disc position and dampen the

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impact between the disc and seat. Both the actuators and the indicators act through hinge shafts which are sealed by a series of packing glands. The frictional forces imparted into the shafts also impair the ability of the valves to seal properly. Due to these problems, both the actuators and indicators are being removed from the valves. Blind flanges will be installed in their place to prevent leakage from stuffing box area. The actuator and indicator shafts will be modified to permit the discs to free-float, thereby eliminating the packing induced frictional forces. The nitrogen lines feeding the actuators will be removed. A11 electrical connections inside the drywell will be determinated and the cables will be removed back to junction boxes. A recent survey conducted by DAEC personnel revealed that most plants do not have the above appurtenances on their check valves.

In addition to the above workscope, the valve discs will be re-set to improve the alignment of the valve disc to the valve body and insure that internal clearances are correct and interferences between these components are eliminated. Recent LLRTs, conducted after resetting the disc on V-14-3, revealed better results than previously achieved.

2.2 Addition of High Point Vent Line

The current LLRT procedure drains the downstream side of the check values through the drywell sump drain lines. The current venting is provided for by the 1" drain lines themselves. This creates the possibility of unseating the value disc as the system attempts to equalize the differential pressure created by draining.

To aid draining the line, vent lines will be installed in the high point of the line, just upstream of manually-operated valves V-14-2 and V-14-4. These vent lines not only add system venting but also add the flexibility to change the test procedure by introducing an alternative point through which the line may be pressurized.

3.0 UNREVIEWED SAFETY QUESTION ANALYSIS

To determine if the proposed modification constitutes an unreviewed safety question, the following questions must be addressed:

(1) Does the proposed activity increase the probability of occurrence of an accident previously evaluated in the UFSAR?

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Response: No. Work being performed on the check valves will only serve to enhance the ability of the valves to perform their containment isolation functions.

> The modifications are not changing the basis of operation of the valves. The actuators were not intended to control operation of the valves, but only to supplement their ability to seal. Valve operation is, and will be, controlled exclusively by feedwater flow. Indication of valve disc position was helpful, but not required for safe system operation. By design, the check valves are verified open by the passage of feedwater flow and closed by the loss of feedwater flow. The use of a damper was redundant since the design of tilting disc check valves inherently reduces the effects of disc slam.

> Finally, by replacing stuffing boxes with blind flanges the integrity of the system pressure boundary is maintained.

The addition of the vent line to the feedwater system likewise does not increase the probability of a loss of feedwater flow accident, as discussed in UFSAR Section 15.6.3, since failure of a 3/4" line would not significantly decrease flow to the reactor.

As stated in the Description of Change, Section 2.1, this modification is being implemented to improve valve performance and therefore will decrease the probability of an incident involving the feedwater system and as such will not affect the accident analysis in UFSAR chapter 15 or the NSOA.

- (2) May the proposed activity increase the consequences of an accident previously evaluated in the UFSAR?
 - Response: No. Per section 3.1.2.5.6, the check valves are installed to preclude the significant release of radioactivity and therefore, by design, mitigate the consequences of an accident.

In the event of an accident, the modifications to the feedwater system will improve the

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ability of the system to perform its containment isolation function. Therefore, the radiological consequences of an accident evaluated in the UFSAR are not altered by this modification.

Per UFSAR section 15.6.3, the accident analysis for loss of feedwater flow is not altered by the proposed modification. The check valves will function largely as they did previously, and by design cannot affect feedwater flow.

Likewise, the failure of the vent line also would not significantly affect the flow of feedwater due to the small volume of flow which could escape through the 3/4" diameter line. UFSAR section 5.2.4.5.4 states that "make-up systems can maintain inventory in the case of a water- or steam- line break in a line having an inside diameter of 1 and 2 in. "respectively"."

- (3) May the proposed activity increase the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the UFSAR?
 - Response: No. The activities being performed will not jeopardize the ability of the check valves or feedwater line to function as intended.

The deletion of equipment associated with the check valves meets the requirements of providing automatic isolation if necessary, as described in UFSAR section 6.2.4.2.1.4. Design and materials used to modify the check valves will be in accordance with the construction code used initially for the valves. In addition, Table 3.1-1 of the UFSAR, Note a, refers to the inside isolation valve as "a simple check valve", indicating that the valves were approved by the safety analysis prior to the addition of the actuator/indicators.

All work being performed on the ventline, including design, material selection, and construction, will be under the jurisdiction of codes and standards which meet or exceed those originally intended for this system or

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which govern this particular system modification.

(4) May the proposed activity increase the consequences of a malfunction of equipment important to safety previously evaluated in the UFSAR?

Response: No. As stated in question 2, the radiological consequences of an accident, or malfunction, as evaluated in UFSAR chapter 15 are not changed by these modifications.

The check values, when modified by this design change, will function largely as they did before DCR 756, by responding to feedwater flow, and will perform the same containment isolation function. The modifications are designed to decrease the leakage through the value and should therefore improve the ability of the value to isolate primary containment. Additionally, by installing blind flanges over the stuffing box area, the likelihood of a radiological release through the value stuffing box is decreased.

Failure . the vent lines, as it has been mentioned, would not increase the consequences of a loss of feedwater flow accident since the make-up systems more than compensate for the lost volume.

- (5) May the proposed activity create the possibility cf an accident of a different type than any previously evaluated in the UFSAR?
 - Response: No. All accident scenarios associated with this proposed modification have already been evaluated in UFSAR chapters 6 and 15.

No new scenarios are initiated as a result of these modifications.

- (6) May the proposed activity create the possibility of a malfunction of equipment important to safety of a different type than any evaluated in the UFSAR?
 - Response: No. After implementing this modification, the check valves will function as simple check valves. The valve design is not being altered. Only extraneous equipment is being

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removed. These changes will not initiate a malfunction which hasn't been considered. As indicated in the response to question 3, the safety analysis has already evaluated the system with simple check valves.

UFSAR section 6.2.1.3 addresses all the concerns associated with line breaks inside the drywell. Therefore, the installation of new small-bore vent lines in the drywell will not initiate any previously un-addressed malfunctions.

- (7) Does the proposed activity reduce the margin of safety as defined in the basis for any technical specification?
 - Response: No. The intent of the proposed modification is to improve system performance during ILRTs and LLRT's. A margin of safety is factored into containment leak rates to allow for deterioration of the pressure boundary between type A tests. Therefore, the results of this modification are intended to improve the leak rate performance within the existing margin of safety associated with the containment leakage testing program by decreasing the leakage through the check valves during type A testing.