Iowa Electric Light and Power Company

November 8, 1982
NG-82-2348

LARRY D. ROOT
ASSISTANT VICE PRESIDENT
NUCLEAR GENERATION

Mr. James G. Keppler
Regional Administrator
Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Re: Duane Arnold Energy Center

Subject: Response to Inspection Report 82-11

File: A-102, NRC-4, Inspection Report 82-11

Dear Mr. Keppler:

This letter is in response to Mr. C. D. Norelius' letter concerning an inspection of activities at the Duane Arnold Energy Center conducted on July 19 through July 22, 1982. The following response indicates the actions which have been taken to correct the three items of noncompliance noted in the subject Inspection Report.

Item of Noncompliance

10 CFR 50.55a(g) requires the licensee to establish an inservice test program. The licensee's inservice test program states that inservice testing of pumps and valves will be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code, 1980 edition and addenda through Winter of 1980.

Contrary to the above:

a. inservice testing of the High Pressure Coolant Injection and Reactor Core Isolation Cooling pumps did not include the establishment of reference speeds as required by Paragraph IWP-3100 of the ASME Code, Section XI.

b. testing of all pumps included in the licensee's inservice test program did not include throttling the pumps to the reference differential pressure or reference flowrate prior to taking inservice test data as required by Paragraph IWP-3100 of the ASME Code, Section XI.

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Response

1. Corrective action taken and the results achieved:

   A. The operability test procedures for HPCI and RCIC were revised on 10/28/82 to set pump speed to a reference value during each quarterly test.

   B. Three groups of pumps have been identified with different corrective action necessary for each as follows:

      a. Residual Heat Removal (RHR) service water, Emergency Service Water (ESW), and Standby Liquid Control System (SLCS) operability tests were revised on 10/28/82 to comply with the existing requirements by setting differential pressure to a reference value.

      b. Core Spray, RHR, HPCI, RCIC, and River Water Operability tests have been revised to incorporate the attached alternate method of setting reference flow rate and differential pressure values. A relief request to allow this method will be included in Rev. 4* of the inservice test program. A copy of this relief request is included herein as Attachment 1.

      c. The Diesel Oil Transfer System has no safe means for controlling pump flow rate or discharge pressure. Therefore, an alternate test program has been designed for these pumps. A relief request to allow this alternate testing will be included in Rev. 4* of the inservice test program. A copy of this relief request is included herein as Attachment 2.

      * Rev. 4 of the inservice test program has been prepared and is currently undergoing internal review. It will be submitted for NRC upon completion of review, which is expected to be in December, 1982. A copy of the revision is available on site for review by the NRC if required. A copy of Rev. 4 will be sent to Region III when the revision is formally submitted to the Office of Nuclear Reactor Regulations (NRR) for approval.

2. Corrective action to be taken to avoid further noncompliance:

   The above corrective actions will avoid further noncompliance. In addition to the above corrective actions an internal QA audit will be performed to ensure that all inservice testing of pumps comply with the ASME standards.

3. Date when full compliance will be achieved:

   A. The revised operability tests listed above will be performed prior to January 1, 1983, for all systems which do not require plant shutdown for testing.

B. The revised operability tests for systems requiring plant shutdown for testing will be performed prior to plant startup for Cycle 7.

C. The internal QA audit will be completed prior to January 1, 1983.

Full compliance will be achieved subsequent to NRC approval of the revised inservice test program.

Item of Noncompliance

10 CFR 50.55a(g) requires the licensee to establish an inservice test program. The licensee's inservice test program states that inservice testing of pumps and valves will be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code, 1980 edition and addenda through Winter of 1980.

Contrary to the above, numerous inservice test instruments did not meet the range requirements specified in Paragraph IWP-4120 of the ASME Code, Section XI.

Response

1. Corrective action taken and results achieved:

The ranges of all instruments used to measure inservice test quantities have been reviewed and appropriate changes have been made where necessary to comply with Code requirements. The only exception is the flow indicator's for RHR service water which currently have a range greater than allowed. The RHR service water flow indicators are presently being re-spanned to the acceptable range.

2. Corrective action to be taken to avoid further noncompliance:

The corrective action taken above will avoid further noncompliance.

3. Date when full compliance will be achieved:

Compliance was achieved on 10-28-82 for all instruments except the RHRSW flow indicator's. Full compliance will be achieved by 11-16-82, when re-span of the flow indicators is completed.

Item of Noncompliance

10CFR 50, Appendix B, Criterion XI, "Test Control" states in part: "A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. Test results shall be documented and evaluated to assure that test requirements have been satisfied."

Duane Arnold Energy Center Procedure QAP 1303.1, Section 5.4.1.1 states that "Specific work procedures for ... testing shall be developed and documented by the organization(s) performing the activities, for the implementation of a design change.

Contrary to the above, preoperational testing of the self-cleaning continuous backwash strainers added to the RHRSW system under Design Change Request 760 did not include determination of whether or not required head and flow could be delivered to the RHRSW system with the strainer backwash in operation. This had been established as a design requirement.

Response

1. Corrective action taken and the results achieved:

   Corrective action taken for this item of noncompliance addresses two separate areas. First is the procedural inadequacy involving failure to specify acceptance criteria for verifying the design requirements of the Design Change Request (DCR). Second is the margin of performance of the RHRSW pumps above technical specification requirements.

   A. A Post-Installation Modification Testing Subcommittee (PIMTS) was established in early 1981, after the DCR was completed. The primary function of this group is to review design modification packages on all safety related equipment and ensure that proper test procedures and acceptance criteria are identified and implemented.

      PIMTS review of design modification packages completed prior to 1981 indicates this is an isolated occurence. Subsequent testing has been performed which shows the RHRSW pumps meet technical specification requirements.

   B. The margin of performance of the RHRSW pumps above technical specification limits is being investigated. A design review of the RHRSW system was committed to the NRC in LER 82-54 and initiated with maintenance action request No. 338867, both dated September 14, 1982. The review is being conducted to evaluate the performance of the existing system. Subsequently, the desirability of possible modifications will be considered.

2. Corrective action to be taken to avoid further noncompliance:

   The corrective actions mentioned above will avoid further noncompliance.

3. Dates when full compliance will be achieved:

Compliance with "design requirement" testing was achieved with the establishment of the Post-Installation Modification Test Subcommittee in 1981.

The design review of performance of the existing RHRSW system will be completed in May, 1983.

Very truly yours,

Larry D. Root

Larry D. Root
Assistant Vice President
Nuclear Generation

LDR/DEW/pf*

cc: D. Wittner
D. Arnold
L. Liu
S. Tuthill
NRC Resident Office
Commitment Control Ref. 820351

RELIEF REQUEST NO. PR-5

PUMP NUMBER: River Water Pumps 1P-117A, B, C, and D
Core Spray Pumps 1P-211A and B
HPCI Pump 1P-216
RCIC Pump 1P-226
RHR Pumps 1P-229A, B, C, and D

SECTION XI REQUIREMENT: Reference values shall be at points of operation readily duplicated during subsequent inservice testing (Article IWP-3110).

BASIS FOR RELIEF: Operating experience has shown that flow rates (the independent variable during inservice performance testing for these pumps) cannot be readily duplicated with the present flow control systems. Also, efforts to exactly duplicate flow rate reference values would require excessive valve manipulation which could result in damage to the valve or operator. Based on these limitations, DAEC proposes to implement an alternate means of determining whether pump degradation has occurred.

ALTERNATE TESTING: Reference values will be established for flow rate (Q_r) and differential pressure (ΔP_r) during the reference value tests. However, instead of exactly duplicating Q_r during subsequent inservice performance tests, a flow rate (Q_l) lower than Q_r will be obtained and recorded along with the corresponding differential pressure (ΔP_l). Next, a flow rate (Q_h) higher than Q_r will be obtained and recorded along with the corresponding differential pressure (ΔP_h). These two points, (Q_l, ΔP_l) and (Q_h, ΔP_h), define a small portion of the pump curve which intersects the vertical line defined by Q_r (See

Figure PR-5.1). Using linear interpolation between the two points, a differential pressure (ΔP) will be computed from the intersection of the pump curve and the vertical line established by Q_r. The computed value for ΔP will be recorded and compared to the ASME allowable ranges for differential pressure (Table IWP-3100-2) which were determined from ΔP_r.

The alternate testing procedure described above asumes that the pump curve is nearly linear between Q_l and Q_h. Procedural limits for Q_l and Q_h have been established and individual pump curves have been analyzed to ensure near linearity between Q_l and Q_h.

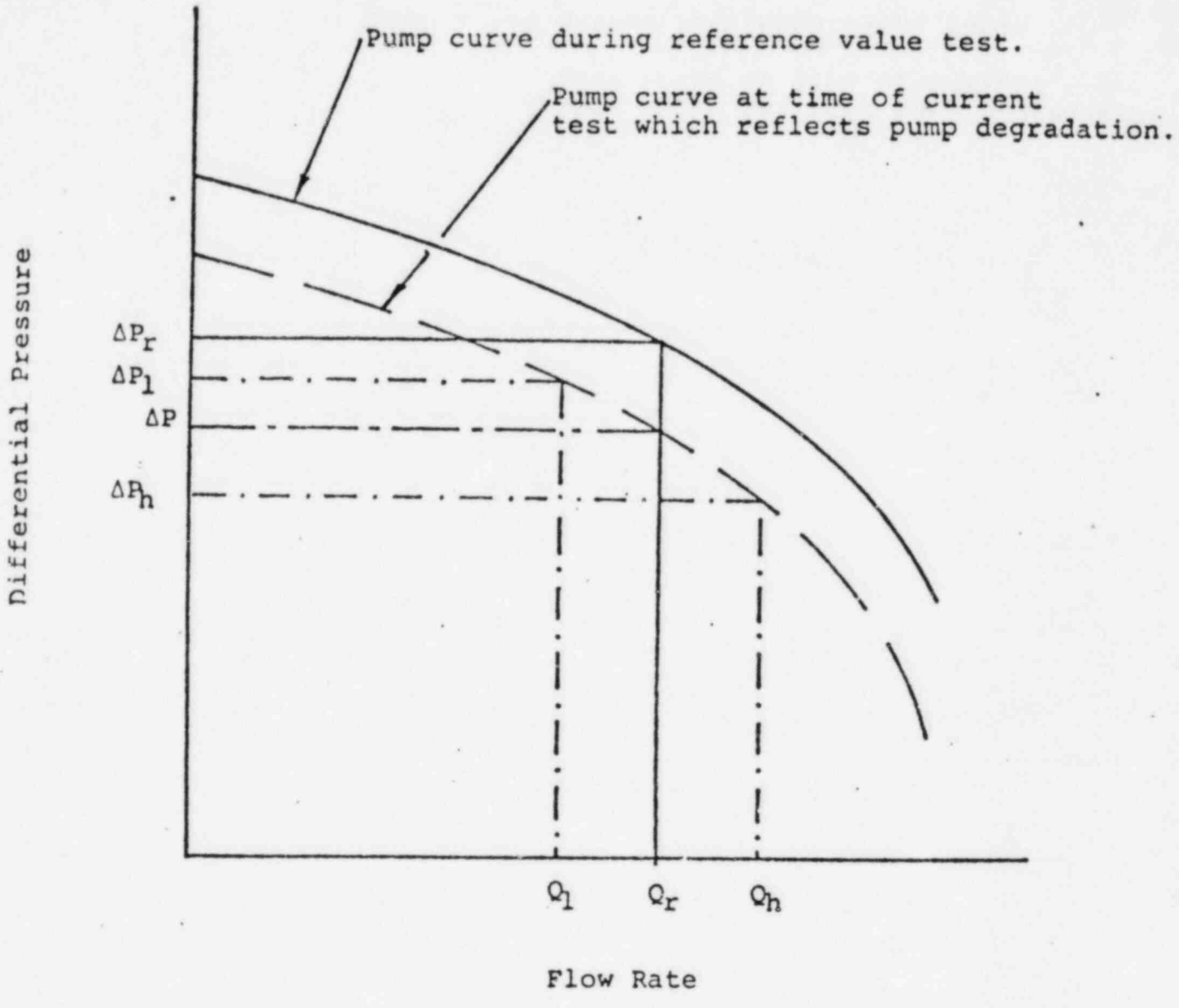

Figure PR-5.1 Alternate Testing Approach for Determination of Hydraulic Change

RELIEF REQUEST NO. PR-6

PUMP NUMBER: Diesel Oil Transfer Pumps 1P-44A and B

SECTION XI REQUIREMENTS:

1) During testing, the resistance of the system shall be varied until either the measured differential pressure or the measured flow rate equals the corresponding reference value.

2) Any deviations determined from the measured test quantities shall be compared with limits given in Table IWP-3100-2 and the specified corrective action taken.

3) Each pump shall be run at least five minutes under conditions as stable as the system permits.

BASIS FOR RELIEF:

1) There are no safe means for controlling diesel oil transfer pump flow rate or discharge pressure. The diesel oil transfer pump is a screw type, positive displacement, pump and the system has no over-pressure protection.

2) The ASME limits in Table IWP-3100-2 are based on the assumption that an independent variable, either flow rate or differential pressure, is set to a specific reference value, and the dependent variable is measured and compared to the ASME limits. As stated above, neither flow rate nor differential pressure can be safely controlled. Therefore, the ASME limits in Table IWP-3100-2 cannot be applied to the diesel oil transfer pumps.

3) The diesel oil transfer pumps cannot be operated for five minutes because the available volume in the diesel oil day tanks is too small.

ALTERNATE TESTING:

1) Flow rate will be computed quarterly.

2) The flow rate will be compared to a minimum value based on past operating experience. Corrective action will be initiated if the flow rate falls below this minimum value.

3) As soon as the diesel oil transfer pump reaches a stable operating point, flow rate and discharge pressure will be measured.