



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO THE INSERVICE TESTING PROGRAM REQUESTS FOR RELIEF

IES UTILITIES, INC.
CENTRAL IOWA POWER COOPERATIVE
CORN BELT POWER COOPERATIVE

DUANE ARNOLD ENERGY CENTER

DOCKET NUMBER 50-331

1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (IST) of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to Sections (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for its facility. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to the Code requirements determined acceptable to the staff. Alternatives that conform with the guidance in GL 89-04 may be implemented without additional NRC approval, but are subject to review during inspections. Section 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME Code requirements upon making the necessary findings. The NRC staff's findings with respect to authorizing alternatives and granting or not granting the relief requested as part of the licensee's IST program are contained in this safety evaluation (SE).

The third ten-year IST interval for the Duane Arnold Center began February 1, 1995, and ends January 31, 2005. The revised IST program was submitted in a letter from IES Utilities, Inc., the licensee, dated January 30, 1995. The program was developed to the requirements of the 1989 Edition of the ASME Code which references ASME/ANSI Operations and Maintenance Standards, Parts 6 and 10, for inservice testing of pumps and valves, respectively. Part 10, in turn, references Part 1 for the inservice testing of safety and relief valves.

ENCLOSURE 1

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2.0 EVALUATION

The Mechanical Engineering Branch, with technical assistance from Brookhaven National Laboratory (BNL), has reviewed the information concerning IST program requests for relief submitted for the revised IST program for the Duane Arnold Energy Center. The staff adopts the evaluations and recommendations for granting relief or authorizing alternatives contained in the attached Technical Evaluation Report (TER) prepared by BNL. Relief is granted from, or alternatives are authorized to, the testing requirements which have been determined to be impractical to perform, where compliance would result in a hardship without a compensating increase in safety, or where the proposed alternative testing provides an acceptable level of quality and safety. A summary of the relief requests and NRC actions is provided in Table 1.

The NRC has identified in GL 89-04, a number of generic deficiencies that affect plant safety and have frequently appeared as IST programmatic weaknesses. In that letter, the staff delineated positions that describe deficiencies and explained alternatives to the ASME Code that the staff considers acceptable. If alternatives are implemented in accordance with the relevant position in the generic letter, the staff has determined that relief should be granted pursuant to 10 CFR 50.55a(g)(6)(i) [now (f)(6)(i)] on the grounds that it is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest. In making this determination, the staff has considered the burden on the licensee that would result if the requirements were imposed.

For any relief granted pursuant to GL 89-04 the staff (with technical assistance from BNL) has reviewed the information submitted by the licensee to determine whether the proposed alternative follows the relevant position in the generic letter. If an alternative conforms to a position of the generic letter, it is listed as having been approved pursuant to GL 89-04 in Table 1 of the SE. Any action items in the relief request are addressed in the TER.

The relief requests for components designated as "non-code class components" do not require NRC approval pursuant to 10 CFR 50.55a for implementation; however, as stated in Position 11 of GL 89-04, licensees may include noncode components in the IST program to meet requirements for testing outside of the requirements for 10 CFR 50.55a. Relief requests which comply with the code are so noted in Table 1. Relief Request PR-07 was evaluated in the NRC's SE of March 21, 1995, as interim relief was granted; therefore, PR-07 is not evaluated in the attached TER and the licensee should follow the actions specified in the March 21, 1995, SE regarding PR-07.

The test deferrals included in the IST program were reviewed. A summary of the review is provided in Table 4.1 and any recommendations are given in Section 5 of the TER. Additionally, a review of the program has not been performed as to the completeness of the scope and the testing requirements which are not related to relief requests; therefore, a sampling review was performed for selected systems and certain recommendations for further review by the licensee are included in Section 5.

The licensee should refer to the TER, Section 5, for a discussion of the various recommendations identified during the review. The licensee should address each recommendation in accordance with the guidance therein. The IST program relief requests are acceptable for implementation provided the action items identified in Section 5 of the TER are addressed within one year of the date of this SE or by the end of the next refueling outage, whichever is later. The licensee should respond to the NRC within one year of the date of this SE describing actions taken, actions in progress, or actions to be taken, to address each of these items.

The staff concludes that the relief requests as evaluated and modified by this SE will provide reasonable assurance of the operational readiness of the pumps and valves to perform their safety-related functions. The staff has determined that granting relief pursuant to 10 CFR 50.55a (f)(6)(i) and authorizing alternatives pursuant to 10 CFR 50.55a (a)(3)(i) or (a)(3)(ii) is authorized by law and will not endanger life or property, or the common defense and security and is otherwise in the public interest. In making this determination, the staff has considered the impracticality of performing the required testing and the burden on the licensee if the requirements were imposed.

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Date: November 21, 1995

Duane Arnold Energy Center SE Table 1
Summary of Pump and Valve Relief Requests

Relief Request No.	TER Sect.	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
PR-01	-	Part 6, §4.6.1.6, Vibration frequency response range.	1P-230A and B, SBL C pumps	Use vibration instrumentation with 4.03 Hz lower frequency response range.	No action required. Pumps are not ASME Code Class.
PR-02	2.1	Part 6, §5.2, Measurement of parameters at reference value, and §5.6, Duration of tests.	1P-117A through D, River Water pumps; 1P211A and B, Core Spray pumps; 1P229A through D, RHR pumps	Calculate ΔP for a given reference flowrate based on data taken at flowrates above and below the reference flowrate.	Alternate approved in accordance with 10CFR50.55a(f)(3)(i), with provisions.
PR-03	2.2.1	Part 6, §4.6.1, Instrument accuracy and range	1P-216, HPCI pump	Use installed pump suction instrumentation.	No action required. Test instrumentation complies with the Code requirements.
PR-04	2.2.2	Part 6, §5.2, Measurement of parameters at reference value, and §5.6, Duration of tests.	1P-216, HPCI pump	Use reference pump curve. Take data for the reference curve after pump conditions are stable.	Relief to use pump curve granted in accordance with 10CFR50.55a(f)(6)(i), with provisions. Test duration remains an open item.
PR-05	2.2.3	Part 6, §4 and 5, Inservice test on each pump	1P-216, HPCI pump	Obtain data on pump combination (i.e., main and booster pumps).	Relief granted in accordance with 10CFR50.55a(f)(6)(i).
PR-06	-	Part 6, §5.2, Measurement of parameters at reference value.	1P-226, RCIC pump	Calculate ΔP for a given reference flowrate based on data taken at flowrates above and below the reference flowrate.	No action required. Pump is not ASME Code Class.
PR-07	-	Part 6, §6.1, Corrective action upon exceeding the alert range.	1P-216, HPCI pump	Upon entering the alert range, pump vibration spectral analysis will be performed and the results will be used to determine if the test frequency will be doubled, i.e., if degradation is detected.	Interim relief granted per March 21, 1995 SE.
VR-01	3.1.1	Part 10, §4.2.1.6, Fail-safe testing and §4.2.1.4, Stroke time measurement.	All solenoid valves	Normal exercising satisfies the fail-safe test requirements, so no additional testing will be performed. No stroke time will be measured for solenoid valves associated with air-operated valves.	No action required. Licensee's proposal complies with the Code.
VR-02	3.1.2	Part 10, §4.1, §4.2.2.3(a), and §4.3.2.1, Test frequency	Excess flow check valves	Exercise valves at each refueling outage in accordance with Technical Specification 4.7D.	Relief granted in accordance with 10CFR50.55a(f)(6)(i), with provisions.

SE Table 1 (Cont.)

Relief Request No.	TER Sect.	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
VR-03	5.6	Part 10, ¶4.3.2.1 and ¶4.3.2.6, Test frequency and post-maintenance testing.	V-14-001 and 3, Feedwater check valves	Verify full-stroke using quantitative criteria at least once per cycle and quarterly when possible. Manually exercise following maintenance.	Approved in accordance with Generic Letter 89-04, Position 1, with provisions.
VR-04	3.2	Part 1, ¶1.3.4.2, Replacement of rupture disks.	PSE-1848-HCU#, CRD accumulator rupture disks	None.	Open item.
VR-05	-	Part 10, ¶4.3.2, Test frequency.	V-19-014, V-19-016, V-20-006, RHR pump minimum flow path check valves	Part-stroke exercise quarterly and disassemble and inspect one valve each refueling outage.	Approved in accordance with Generic Letter 89-04, Position 2.
VR-06	-	Part 10, ¶4.3.2, Test frequency.	V-21-009 and 12, CS pump minimum flow path check valves	Part-stroke exercise quarterly and disassemble and inspect one valve each refueling outage.	Approved in accordance with Generic Letter 89-04, Position 2.
VR-07	-	Part 1, ¶1.3.4.2, Replacement of rupture disks.	PSE-2214, HPCI turbine steam exhaust rupture disk	Replace periodically under preventative maintenance program.	No action required. Component is not ASME Code Class.
VR-08	-	Part 1, ¶1.3.4.2, Replacement of rupture disks.	PSE-2419, RCIC turbine steam exhaust rupture disk	Replace periodically under preventative maintenance program.	No action required. Component is not ASME Code Class.
VR-09	-	Part 10, ¶4.2.1.4(b), Measurement of stroke time and corrective action.	SV-3261A through C, 3262A through C, Diesel generator air start valves	Test diesel generators monthly in accordance with Technical Specification 4.8.A.1.a.1.	No action required. Component is not ASME Code Class.
VR-10	-	Part 1, ¶1.3.4.3, Test primary containment vacuum breakers every 6 months.	CV-4327A through D and F through H, Pressure suppression chamber to drywell vacuum breaker valves	Exercise valves quarterly with their pneumatic operators. Measure setpoint and mechanically exercise valves each refueling outage.	No action required. Component is not ASME Code Class.
VR-11	-	Part 10, ¶4.3.2.4, Verify valve obturator movement.	V-73-006, 7, 16, and 17, normal instrument air supply isolation valves	Verify closure of pair of valves in series.	No action required. Component is not ASME Code Class.
VR-12	-	Part 10, ¶4.2.1.4(b), Measurement of stroke times.	SV-8101A and B through 8110A and B, Containment atmosphere monitoring system CIVs	Exercise valves and verify position quarterly. No stroke times will be measured.	No action required. Component is not ASME Code Class.

SE Table 1 (Cont.)

Relief Request No.	TER Sect.	Section XI Requirement	Equipment Identification	Proposed Alternate Method of Testing	NRC Action
VR-13	-	Part 10, §4.2.1.4(b), Measurement of stroke times.	CV-1849 and 1850, CRD scram valves	Exercise valves during CRD scram testing.	Approved in accordance with Generic Letter 89-04, Position 7.
VR-14	3.3	Part 1, §1.3.4.1, Set pressure acceptance criteria.	PSV-2223, HPCI barometric condenser relief valve	Establish acceptance criteria at 17 psig in lieu of Code required 15.45 psig.	No action required. Licensee complies with the Code.
VR-15	-	Part 1, §1.3.4.1, Set pressure acceptance criteria.	PSV-2474, RCIC barometric condenser relief valve	Establish acceptance criteria at 17 psig in lieu of Code required 15.45 psig.	No action required. Component is not ASME Code Class.
VR-16	3.4	Part 1, §1.3.4.1, Set pressure acceptance criteria.	PSV-4439A through F, vacuum breakers	Licensee will establish acceptance criteria based on system and component functional requirements.	No action required. Licensee complies with the Code.
VR-17	-	-	-	-	None-Request deleted
VR-18	-	Part 10, §4.3.2, Test frequency.	V-26-004 and 6, SBLC pump discharge check valves	Full-stroke exercise open quarterly. Verify closure by sample disassembly and inspection.	Approved in accordance with Generic Letter 89-04, Position 2.
VR-19	-	Part 10, §4.3.2, Test frequency.	V-13-121, 126, 140, Emergency service water to HVAC instrument air compressors check valves	Partial-stroke exercise quarterly and sample disassemble and inspect one valve each refueling outage.	Approved in accordance with Generic Letter 89-04, Position 2.
VR-20	-	-	-	-	None-Request deleted.
VR-21	-	Part 10, §4.3.2, Test frequency.	V-22-0026, 28, 29, 63 and 64; V-24-0010, 12, 46 and 47, Misc. HPCI and RCIC check valves	Sample disassemble and inspect one valve in each group each refueling outage.	Approved in accordance with Generic Letter 89-04, Position 2.
VR-22	3.5	Part 10, §4.2.1.8(d), Corrective action.	CV-4412, 4413, 4415, 4416, 4418, 4419, 4420, and 4421; MSIVs	Use the Technical Specification acceptance criteria.	Alternate authorized in accordance with 10CFR50.55a(a)(3)(i).
VR-23	3.6	Part 10, §4.2.1.8(d), Corrective action.	CV-1956A and B, 2080, and 2081; Emergency service water control valves	Exercise valves quarterly and estimate stroke times based on valve stem movement. Take corrective action based on limiting stroke time. No corrective action will be taken based on multiples of reference values.	Open item.