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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 160 TO FACILITY OPERATING LICENSE NO. DPR-49

IOWA ELECTRIC LIGHT AND POWER COMPANY
CENTRAL IOWA POWER COOPERATIVE
CORN BELT POWER COOPERATIVE

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

1.0 INTRODUCTION

By letter dated October 13, 1986, the Iowa Electric Light and Power Company (IELP) submitted proposed changes to the Duane Arnold Energy Center (DAEC) Technical Specifications (TS). These changes would revise the surveillance test frequencies of certain pumps and valves to conform to the Standard Technical Specifications (STS) for Boiling Water Reactors and the current DAEC Inservice Testing (IST) Program. Other minor editorial changes were also proposed.

2.0 EVALUATION

The DAEC TS's specify surveillance frequencies for certain pumps and valves whose function is required for safe operation and/or shutdown of the plant. These frequencies were established based on conservative assumptions and performance data to provide assurance of operability of individual components (consistent with the plant's IST program), as well as to provide assurance of system availability (consistent with the assumptions in the DAEC Final Safety Analysis Report). The proposed changes to the DAEC TS's would extend the surveillance intervals for certain components.

10 CFR 50.55a(g)(4)(ii) requires that the DAEC IST program conform to the appropriate Edition of Section XI of the ASME Code. For the DAEC, this would be the 1980 Edition (Winter 1981 Addendum), which specifies a quarterly surveillance frequency for individual pumps and valves (as opposed to the monthly frequency specified in earlier editions of the Code). In addition, the STS require operability tests for most components and systems at frequencies specified by the applicable edition of the ASME Code.

The changes to the surveillance frequencies specified by the STS and the ASME Code were based, in part, on concerns for accelerated component aging due to excessive testing. Each of the proposed changes to the DAEC TS's is evaluated below with respect to individual component and overall system availability concerns.

A. Standby Liquid Control System (TS's 3.4.A.1, 4.4.A.1, 4.4.A.2, 4.4 Bases)

The proposed change to TS 4.4.A.1 would extend from monthly to quarterly the surveillance interval for functionally testing each Standby Liquid Control (SLC) system pump loop. This surveillance requirement essentially checks the operability of each of two redundant positive displacement pumps; as such, extension of the surveillance interval is consistent with the revised ASME Code (1980 Edition) and the DAEC IST program.

Overall availability of the SLC system is assured through all of the surveillance requirements of Section 4.4, as well as the fact that a single pump is capable of meeting the system design requirements. These additional surveillances include: at least once per operating cycle, the system is manually initiated, including actuation of the explosive valves to inject demineralized water into the reactor vessel. An explosive charge similar to those installed in the valves is detonated to demonstrate proper function. Minimum flow through the sodium pentaborate storage tank discharge line is also demonstrated once per cycle. Based on these additional system surveillance requirements and on the redundant features of the SLC system, the staff finds that extending the interval of pump loop tests from monthly to quarterly will not significantly impact the availability of the SLC system. Therefore, the proposed changes to TS 4.4.A.1 and the associated bases are acceptable.

In addition, the terms "OPERABLE", "COLD SHUTDOWN", and "OPERATING CYCLE" in sections 3.4.A.1 and 4.4.A.2 are capitalized, as these are defined terms. These changes are editorial in nature and reflect standard usage and are therefore acceptable.

B. Core and Containment Cooling Systems (TS's 4.5.A.1, 4.5.A.3, 4.5.D.1, 4.5.E.1, 3.5 Bases, 4.5 Bases)

The proposed changes to the above sections of the DAEC TS's would extend from monthly to quarterly the required surveillances of pumps and motor operated valves of the Core Spray, Low Pressure Coolant

Injection (LPCI), High Pressure Coolant Injection (HPCI), and Reactor Core Isolation Cooling (RCIC) systems. These tests are explicitly intended to confirm individual component operability; therefore, the proposed changes are consistent with the revised requirements of the 1980 Edition of the ASME Code.

Each of these systems is also subjected to a quarterly flow test at representative reactor vessel pressures (113 psig for Core Spray, 20 psig for LPCI, 1040 psig for HPCI and RCIC), and an annual simulated automatic actuation test. In addition, once per operating cycle, flow tests are performed for HPCI and RCIC to demonstrate system operability at low reactor vessel pressure (150 psig).

Based on the additional surveillance requirements and the redundant design of these systems (i.e., loss of a single component will not result in exceeding the design basis), extending the test intervals for these pumps and valves from monthly to quarterly will not significantly impact the availability of the respective systems. Therefore, the proposed changes to TS's 4.5.A.1, 4.5.A.3, 4.5.D.1, 4.5.E.1 and the associated bases are acceptable.

C. River Water Supply and Emergency Service Water Systems (TS's 4.5.J.1.c, 4.8.C.1.c, 4.5.J Bases and 4.8 Bases)

The proposed changes to TS's 4.5.J.1.c and 4.8.C.1.c would extend the surveillance intervals from monthly to quarterly for the River Water Supply (RWS) and Emergency Service Water (ESW) system flow tests. The surveillance requirement for the RWS system pump flow rate test specifies that each pump shall deliver rated flow at the required discharge head. Each pump shall be tested after major maintenance and monthly (or quarterly as proposed), and daily when the river level is below a specified value.

Additional surveillances performed on the RWS system include quarterly operability tests of pumps and valves, daily demonstrations of rated flow through operating pumps, and simulated automatic system actuation tests once per operating cycle. The RWS system is composed of two independent trains of two pumps each which provide cooling water under normal and emergency conditions. Each of the four RWS pumps is capable of supplying sufficient flow to meet post-LOCA cooling requirements.

Based on the redundancy of the RWS system, and the additional surveillance requirements, particularly the daily demonstration of flow through the operating pumps, extension of the surveillance interval from monthly to quarterly for pump flow rate tests at rated conditions is acceptable.

The surveillance requirement for the ESW system flow rate test specifies that each pump shall deliver an established flow for a given river water temperature (i.e, greater flow is required for

higher river water temperatures to meet the system design cooling requirements). Each pump is tested after major maintenance, monthly (or quarterly as proposed) and weekly when the river temperature is over 80°F.

Additionally, ESW system pump and valve operability is tested quarterly and simulated automatic system actuation tests are performed once per operating cycle. The ESW system is composed of two redundant trains, each with a single pump. One train is sufficient to meet the minimum system design cooling requirements.

Based on the redundancy of the ESW system and the additional surveillance requirements, extension of the pump flow rate test surveillance interval from monthly to quarterly is acceptable. The proposed changes to the associated TS bases for the RWS and ESW systems, including the correction of a typographical error, are also acceptable.

D. Main Steam Isolation Valve-Leakage Control System (TS's 3.7.E.2, 3.7.E.3, 4.7.E.1.c, 3.7.E Bases and 4.7.E Bases)

The proposed change to TS 4.7.E.1.c would extend from monthly to quarterly the surveillance interval for the motor operated valves of the Main Steam Isolation Valve Leakage Control System (MSIV-LCS). These tests are explicitly intended to confirm the operability of these valves; therefore, the proposed change is consistent with the revised requirement of the 1980 Edition of the ASME Code.

Additional surveillances are performed on the MSIV-LCS, including monthly operability tests on the system heaters and blowers. A system simulated actuation test and a blower capacity test are performed once per operating cycle. The MSIV-LCS also has redundancy; system design requirements can be met with one component or subsystem out of service.

Based on the additional surveillance requirements and the redundancy of the MSIV-LCS, extending the surveillance interval for these valves from monthly to quarterly will not significantly impact system availability. Therefore, the proposed changes to TS 4.7.E.1.c and the associated bases are acceptable.

In addition, the term "OPERABLE" in TS 3.7.E.2 is capitalized, and the term "CONDITION" in TS 3.7.E.3 is reduced to lower-case, consistent with standard usage. These changes are editorial in nature and are therefore acceptable.

In summary, the staff finds that extending the specified surveillance intervals from monthly to quarterly is consistent with the requirements of the Standard Technical Specifications for Boiling Water Reactors, the 1980 Edition of the ASME Code and the applicable sections of 10 CFR 50.55a(g). These changes will result in an appropriate test interval for assuring component operability and will not significantly impact system availability, based on additional surveillances and system redundancy. Therefore, the staff finds that the proposed changes are acceptable.

3.0 ENVIRONMENTAL CONSIDERATIONS

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

4.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Dated: June 1, 1989