January 30, 1987

Docket No. 50-331

Mr. Lee Liu
Chairman of the Board and
Chief Executive Officer
Iowa Electric Light and Power Company
Post Office Box 351
Cedar Rapids, Iowa 52406

Dear Mr. Liu:

The Commission has issued the enclosed Amendment No. 140 to Facility Operating License No. DPR-49 for the Duane Arnold Energy Center. This to your application dated November 14, 1986 as clarified by a letter dated January 2, 1987.

The amendment revises the current Technical Specifications to allow an extension, on a one-time only basis, of approximately 10 weeks to the surveillance test intervals for the functional testing of snubbers, the local leak rate testing of primary containment isolation valves and penetrations and the replacement of the T-ring seals in the primary containment purge and vent valves. It will also allow the subsequent surveillance test interval for the functional testing of snubbers and local leak rate testing of certain primary containment valves and penetrations to begin with the actual upcoming Cycle 8/9 Refuel Outage test date.

A copy of the Safety Evaluation is also enclosed. Notice of Issuance will be included in the Commission's Bi-Weekly Federal Register Notice.

Sincerely,

Original signed by
Robert A. Gilbert, Project Manager
BWR Project Directorate #2
Division of BWR Licensing

Enclosures:
1. Amendment No. 140 to
License No. DPR-49
2. Safety Evaluation

cc w/enclosures:
See next page

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Mr. Lee Liu
Iowa Electric Light and Power Company

Duane Arnold Energy Center

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

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

DOCKET NO. 50-331

DUANE ARNOLD ENERGY CENTER

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 140
License No. DPR-49

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Iowa Electric Light and Power Company, et al, dated November 14, 1986 as clarified by a letter dated January 2, 1987, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-49 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A as revised through Amendment No. 140, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Daniel R. Muller, Director
BWR Project Directorate #2
Division of BWR Licensing

Attachment:
Changes to the Technical
Specifications

Date of Issuance: January 30, 1987

ATTACHMENT TO LICENSE AMENDMENT NO. 140

FACILITY OPERATING LICENSE NO. DPR-49

DOCKET NO. 50-331

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised areas are indicated by marginal lines.

Pages

3.6-12
3.7-6
3.7-7

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
	3. Functional Tests At least once per 18 months* a representative sample (10% of the total of safety-related of each type of snubber in use in the plant) shall be functionally tested either in place or in a bench test. For each snubber that does not meet the functional test acceptance criteria of specification 4.6.H.4 or 4.6.H.5, an additional 5% of that type of snubber shall be functionally tested. The representative sample selected for functional testing shall represent the various configurations, operating environments and range of sizes of snubbers. At least 25% of the snubbers in the representative sample shall include snubbers from the following three categories: 1. The first snubber away from each reactor vessel nozzle 2. Snubbers within 5 feet of heavy equipment (valve, pump, turbine, motor, etc.) 3. Snubbers within 10 feet of the discharge from a safety relief valve In addition to the regular sample, snubbers which failed the previous functional test shall be retested during the next test period. If a spare snubber has been installed in place of a failed snubber, then

*This interval may be extended, on a one-time-only basis, for Cycle 8 operation until April 17, 1987. The subsequent test interval will begin with the actual Cycle 8/9 Refuel Outage test date.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
	d. Periodic Retest Schedule
	1) Type A Test
	After the preoperational leakage rate tests, a set of three Type A tests shall be performed, at approximately equal intervals during each 10-year service period. (These intervals may be extended up to eight months if necessary to coincide with refueling outages.) The third test of each set shall be conducted when the plant is shut down for the 10-year plant in-service inspections.
	The performance of Type A tests shall be limited to periods when the plant facility is nonoperational and secured in the shutdown condition under administrative control and in accordance with the plant safety procedures.
	2) Type B Tests
	a) Penetrations and seals of this type (except air locks) shall be leak tested at greater than or equal to 43 psig (P_a) during each reactor shutdown for major fueling or other convenient interval but in no case at intervals greater than two years.*
	b) The personnel airlock shall be pressurized to greater than or equal to 43 psig (P_a) and leak tested at least once every six (6) months. This test interval may be extended to the next refueling outage (up to a maximum interval between P_a tests of 24 months) provided there have been no airlock openings since the last successful test at P_a.
	*This interval may be extended, on a one-time-only basis, for Cycle 8 operation until April 17, 1987. The subsequent test interval will begin with the actual Cycle 8/9 Refuel Outage test date.

LIMITING CONDITION FOR OPERATION	SURVEILLANCE REQUIREMENT
	3) Type C Tests Type C tests shall be performed during each reactor shutdown for major refueling or other convenient interval but in no case at intervals greater than two years.*
	4) Additional Periodic Tests Additional purge system isolation valve leakage integrity testing shall be performed at least once every three months in order to detect excessive leakage of the purge isolation valve resilient seats. The purge system isolation valves will be tested in three groups, by penetration: drywell purge exhaust group (CV-4302 and CV-4303), torus purge exhaust group (CV-4300 and CV-4301), and drywell/torus purge supply group (CV-4307, CV-4308 and CV-4306).
	e. Seal Replacement The T-ring inflatable seals for purge isolation valves CV-4300, CV-4301, CV-4302, CV-4303, CV-4306, CV-4307 and CV-4308 shall be replaced at intervals not to exceed four years.* The baseline for this requirement shall be established during the Cycle 6/7 refuel outage.
	f) Containment Modification Any major modification, replacement of a component which is part of the primary reactor containment boundary, or resealing a seal-welded door, performed after the preoperational leakage rate test shall be followed by either a Type A, Type B, or Type C test, as applicable, for the area
	*This interval may be extended, on a one-time-only basis, for Cycle 8 operation until April 17, 1987. The subsequent test interval will begin with the actual Cycle 8/9 Refuel Outage test date (Appendix J testing only).

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 140 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 November 14, 1986 as clarified by a letter dated January 2, 1987, the Iowa Electric Light and Power Company (IELP/licensee) requested a revision to the Technical Specifications (TS) for the Duane Arnold Energy Center (DAEC). The proposed change will permit DAEC to extend by approximately 10 weeks the surveillance test intervals for the functional testing of snubbers, the local leak rate testing of primary containment isolation valves and penetrations, and for the replacement of the T-ring seals in the primary containment purge and vent valves. The extensions are requested on a one-time only basis to prevent a premature reactor shutdown until the cycle 8/9 Refuel Outage, and the potential need for a similar extension to reach the scheduled September 1988 Cycle 9/10 Refueling Outage.

2.0 EVALUATION

A. SNUBBER SURVEILLANCE TEST INTERVAL

The DAEC was scheduled to shutdown for the Cycle 8/9 Refuel Outage on February 1, 1987. IELP chose this date to comply with the Technical Specifications surveillance requirements for (1) the functional testing of snubbers, (2) the 10 CFR 50, Appendix J Type B and C local leak rate testing of primary containment penetrations and isolation valves, and (3) the replacement of the T-ring seals in the primary containment purge and vent valves. However, the shutdown had to be rescheduled because of the unanticipated extension of the Cycle 7/8 Refueling Outage and other unscheduled shutdowns during the Cycle 8 operation making the target end-of-cycle core exposure unachievable by February 1, 1987. The requested extension is approximately 75 days.

The purpose of functional testing of snubbers is to assure that safety related snubbers will perform their function as designed during dynamic loadings such as those caused by seismic events. The surveillance testing requirement is to test 10% of the safety related snubbers every 18 months, and for every inoperable snubber discovered, an additional sample of 5% of the snubbers will be tested. The period of 18 months was selected to match approximately the fuel cycle length and the refueling outage.

During the Cycle 6/7 Outage in spring 1983, 100% of the safety-related snubbers in DAEC were replaced or refurbished. Since then, only one inoperable snubber was detected by all functional tests and visual inspections. The inoperability was found in a mechanical snubber located on the reactor head spray line and was caused by dried lubricant due to high ambient temperature. This deficiency was corrected by removing the lubricant, which is not required for proper operation of the snubber. Also, lubricant was removed from another snubber in the same area, precluding a similar failure. However, since analysis indicates that these two snubbers can be replaced by rigid struts, the replacements will be done in the coming refueling outage.

Based on the good performance record in the past 3 years, it is judged that an extension of approximately 75 days will not increase the probability of snubber failures. In addition, the lubricant in mechanical snubbers in high temperature areas, which was the cause for the only known failure, was removed. The request to extend the functional testing period should be granted.

B. LOCAL LEAK RATE TESTING INTERVALS

The extension of the leak rate testing interval by the licensee involves tests which must be performed at least every 24 months as indicated in 10 CFR Part 50, Appendix J. The TS change would extend the 24 month surveillance interval for leakage testing of selected containment penetrations and isolation valves by approximately 10 weeks beyond the time allowed by the TS. This would permit the licensee to delay performing this testing until a refueling outage which will begin on or about mid-March 1987.

The unit was originally scheduled to shutdown for its end-of-cycle-8 refuel outage on February 1, 1987. This would have allowed the Appendix J Type B and C testing to be completed during the required two-year interval. A mid-March outage would result in extending the two-year test interval requirement of 10 CFR 50, Appendix J about 45 days. However, to provide a margin for contingencies, the licensee has asked that the TS extension be granted until April 17, 1987 (about 75 days).

Appendix J requires that leakage rate tests for all containment isolation valves and penetrations be performed at a frequency not exceeding 24 months. This is to ensure that primary containment integrity will be maintained during any accident within the design bases.

In their November letter, the licensee requested that the amendment cover 144 penetrations and isolation valves, approximately 70% of the total components. After discussions with the staff, the licensee agreed to test all isolation valves that have a leakage history and are capable of being tested at power (letter dated January 2, 1987). As a result, 18 valves were removed from the licensee's request and will be tested (see Table 1).

Our review of the leak rate data on the remaining 126 components during 1983 and 1985 outages indicated that their performance has been excellent. Based on this performance it is believed that the leakage will remain under the TS allowable limit even when their service life is extended 10 weeks beyond the 2 year test interval. The staff, therefore, concludes that the TS change requested by the licensee on those components is acceptable. The following discussion provides a detailed basis for our conclusion.

Out of 126 components for which the TS amendment applies, 64 involve penetrations. Data supplied by the licensee in a January 2, 1987 letter demonstrated that leakage rates from the penetrations are extremely small. The as-left leakage rate from the tests performed during the 1985 outage totalled approximately 4900 Standard Cubic Centimeters per Minute (sccm). This value is less than 3% of the TS allowable of 185,221 sccm. Leakage rates from the 1983 outage tests were equally insignificant.

The number of isolation valves requiring the time extension totals 62. Review of the licensee data indicated that 17 of these valves had a tested zero leakage rate for the 1985 outage. Tests during the 1983 outage also showed no significant leakage. The combined leakage rate of the 17 valves was 294 sccm and represents less than 0.2% of the TS allowable. They are mostly 3/4" valves on the oxygen analyzer.

Out of the remaining 45 valves, 4 valves are inaccessible for testing during power operation (inside drywell or steam tunnel), 8 valves cannot be isolated because they are essential for power generation, 15 valves require entering a TS Limiting Condition for Operation, and 18 valves cannot be tested due to lack of accessibility of the vent valve and test connection. As indicated in the licensee's letter dated January 2, 1987, the last measured combined leakage rate from these 45 valves was quite low. Therefore, significant increases would not be expected to result in exceeding the TS limit. The as-left leakage rate of these valves for the 1985 outage totalled 23,000 sccm, about 13% of the TS allowable. Thus, leakage through these valves would have to increase many times before a significant portion of the total allowable leakage rate is reached. Combined as-left leakage rate of the entire list of components, some 200 penetrations and valves, at the 1985 outage was only 75,835 sccm (providing close to a 60% margin before reaching the 185,221 sccm TS limit).

Data supplied by the licensee on the 45 valves demonstrated that no such large degradation of valve performance has been seen from previous tests. Comparison of as-found and as-left 1983 outage leakage rates with that of the 1985 outage indicated that the rate of degradation of valve performance (i.e., leakage increase) is stable and predictable. These data provide reasonable assurance that there is adequate margin to accommodate an additional 10 week operation without fear of exceeding the allowable leakage limit. Therefore, containment integrity would not be compromised.

Additionally, after the Local Leak Rate Test (LLRT) was conducted on the last of the affected components during the 1985 outage, the plant remained in a cold shutdown condition for another 12 weeks. Therefore, the actual period of operation will be less than the 2-year maximum allowable interval. This is expected to provide additional assurance that the leakage limit will not be exceeded.

On the bases discussed above, the staff has concluded that the licensee has provided sufficient justification for the one-time extension of the 24 month surveillance interval requirement of Appendix J and the TS change is acceptable.

The one-time extension of the Technical Specification-required surveillance interval for the performance of Type B and C LLRTs applies to 126 components as discussed above and in the licensee's November 14, 1986 and January 2, 1987 letters. There are 64 penetrations, 17 small diameter valves and 45 inaccessible or untestable isolation valves. The remaining 18 components listed in Table 1 of this evaluation are to be tested in accordance with 10 CFR 50, Appendix J, requirements.

C. PURGE AND VENT T-RING SEAL REPLACEMENT

The primary containment purge and vent valves have an inflatable T-ring seal which ensures leak tightness of the valve by inflating and thereby pressing the valve disk against the valve seat when the valve is closed. The T-ring seals are made of an ethylene-propylene elastomer, which has an in-service life of 4 years. This 4 year in-service life is based on a consideration of the aging of the material with continued exposure to high temperatures and a radiation environment. The environmental conditions for the aging model consists of 4 continuous years at expected drywell conditions, plus 30 days at post-accident conditions. As these T-ring seals are actually located outside the drywell, their operating environment is less stringent than that used to determine the 4 year in-service life. The 4 year in-service life is based upon continuous exposure to the operating environment. Therefore, when the plant is in the cold shutdown condition, or the purge/vent valves are closed, the seals are exposed to a reduced radiation and temperature environment and the T-ring seal material is not expected to be affected. The plant has been in the cold shutdown condition, or had the purge/vent valves closed, over a significant fraction of the lifetime of the present T-ring seals. The extension now requested (10 weeks) is substantially less than the seal lifetime, and the seals were not exposed to operating conditions over much of the time they have been in place. Furthermore, the quarterly results for T-ring seal integrity demonstrate that there has been no degradation in leak tightness.

Based on the actual in-service time of the T-ring seals being less than the maximum allowable interval, even with the 10 week extension, and the fact that the purge/vent valves have continued to demonstrate leak tightness, the staff concludes that there should not be degradation in leakage over the 10-week period beyond the allowable TS value and that the requested one-time-only TS change is 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 and changes to the surveillance requirements. 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

We have 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.

Principal Contributor: P. Hearn, S. Kim, and H. Shaw

Dated: January 30, 1987

Table 1

List of Isolation Valves
to be Tested on Power

Penetration No.	Description of Values
231	CV-4304
231	V-43-169
26&220	CV-4312
220	CV-4313
211B	SV-4334A
211B	SV-4334B
39A	SV-4332A
39A	SV-4332B
229C	SV-8109A
229C	SV-8110A
56D	SV-8103B
56D	SV-8104B
26&220	CV-4306
26&220	CV-4307
26&220	CV-4308
211A	SV-4333B
39B	SV-4331B
211A	SV-4333A