

LIMITING CONDITIONS FOR OPERATIONG. Minimum Low Pressure Cooling and Diesel Generator Availability

1. During any period when one diesel generator is inoperable, continued reactor operation is permissible only during the succeeding seven days unless such diesel generator is sooner made OPERABLE, provided that the remaining diesel generator and all low pressure core and containment cooling subsystems supported by the OPERABLE diesel generator are OPERABLE. If this requirement cannot be met, an orderly SHUTDOWN shall be initiated and the reactor shall be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
2. Any combination of inoperable components in the core and containment cooling systems shall not defeat the capability of the remaining OPERABLE components to fulfill the cooling functions.
3. When irradiated fuel is in the reactor vessel and the reactor is in the COLD SHUTDOWN Condition or REFUEL Mode:
 - a. If no work is being performed which has the potential for draining the reactor vessel, both core spray and RHR systems may be inoperable; or
 - b. If work is being performed which has the potential for draining the reactor vessel, at least two of any combination of core spray and/or RHR (LPCI or shutdown cooling mode) pumps shall be OPERABLE (including the capability to inject water into the reactor vessel with suction from the suppression pool) except as

SURVEILLANCE REQUIREMENTSG. Minimum Low Pressure Cooling and Diesel Generator Availability

1. When it is determined that one diesel generator is inoperable, the remaining diesel generator shall be demonstrated to be OPERABLE in accordance with Specification 4.8.A.2.a.1.a within the first eight (8) hours and daily thereafter. In addition, all low pressure core cooling and containment cooling subsystems supported by the OPERABLE diesel shall be verified to be OPERABLE.

LIMITING CONDITIONS FOR OPERATION

3.8 AUXILIARY ELECTRICAL SYSTEM

Applicability:

Applies to the auxiliary electrical power system.

Objective:

To assure an adequate supply of electrical power for operation of those systems required for safety.

Specification:A. AC Power Systems

At all times when the reactor is in the RUN Mode or STARTUP Mode and not in a COLD CONDITION, the following AC electrical power sources shall be OPERABLE:

1. Both offsite sources and the startup and standby transformers are available and capable of supplying power to the 4kV emergency buses.
2. Operation with Inoperable Components.
 - a. With one of the offsite sources or startup or standby transformers inoperable, maintain the other offsite source OPERABLE and both emergency diesel generators OPERABLE.
 - b. With one of the offsite sources or the startup or standby transformers and one emergency diesel generator inoperable, the requirements of Specification 3.5.G.1 shall be satisfied.
 - c. With both the startup and standby transformers inoperable, maintain both emergency diesel generators, associated buses and all low pressure cooling systems OPERABLE and either:
 - 1) Restore one or both of the transformers to OPERABLE status, or
 - 2) Be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.8 AUXILIARY ELECTRICAL SYSTEM

Applicability:

Applies to the periodic testing requirements of the auxiliary electrical systems.

Objective:

Verify the operability of the auxiliary electrical system.

Specification:A. AC Power System

1. Surveillance Requirements with Inoperable Components.
 - a. With one of the offsite sources or the startup or standby transformers and one emergency diesel generator inoperable, the requirements of Specification 4.5.G.1 shall be satisfied.
 - b. With both the startup and standby transformers inoperable, verify that both emergency diesel generators are either OPERABLE or operating and the requirements of Specification 4.5.G.1 shall be satisfied.

LIMITING CONDITIONS FOR OPERATION

3. Emergency Diesel Generators

The two emergency diesel generators shall be OPERABLE with a minimum of 36,317 gallons of diesel fuel in the diesel fuel oil tank.

SURVEILLANCE REQUIREMENTS

2. Emergency Diesel Generators

a. Diesel Start Test

1) Once each month both emergency diesel generators shall be:

- a) Manually started, the speed increased from idle to synchronous, and verified to deliver rated voltage and frequency.
- b) Manually loaded to rated load. The test shall continue for at least a one-hour period at rated load.
- c) During the monthly start test the emergency diesel generator starting air compressors shall be checked for operation and their ability to recharge air receivers. The operation of the diesel fuel oil transfer pumps shall also be demonstrated during this test.

2) Once each six months both emergency diesel generators shall be manually started and loaded to demonstrate that they will reach rated frequency and voltage within specified time limits. This test may be run in lieu of the regular monthly test.

During the semiannual test the same checks to the air start system and fuel oil pumps performed during monthly testing shall be performed. In addition, the emergency diesel generator starting time to reach rated frequency and voltage shall be recorded.

- b. Once per OPERATING CYCLE the condition under which the emergency diesel generator is required will be simulated and a test conducted to demonstrate that it will start and accept the emergency load within the specified time sequence. The emergency diesel generator shall be operated loaded for a minimum of 5 minutes. The results shall be recorded.

- c. Once per OPERATING CYCLE, during shutdown, each emergency diesel generator shall be given an inspection in accordance with

LIMITING CONDITIONS FOR OPERATIONSURVEILLANCE REQUIREMENTS

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| <p>4. Operation With Inoperable Components.</p> <p>a. With one of the emergency diesel generators inoperable, the requirements of Specification 3.5.G.1 shall be met.</p> <p>b. With both of the emergency diesel generators inoperable either:</p> <p>1) Restore one or both emergency diesel generators to OPERABLE status, or</p> <p>2) Be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.</p> <p>B. <u>DC Power Systems</u></p> <p>1. At all times when the reactor is in the RUN Mode or STARTUP Mode and not in a COLD CONDITION, the essential station 24, 125 and 250 volt DC power systems shall be OPERABLE. The associated battery</p> | <p>procedures based on the manufacturer's recommendations.</p> <p>d. A sample shall be drawn from each diesel fuel delivery and tested for API gravity, viscosity, and water and sediment prior to addition to the storage tank. Once it is determined that the fuel meets the criteria for these characteristics specified in ASTM-D975-77, the fuel may be added to the tank.</p> <p>e. The quantity of diesel fuel available shall be recorded monthly and after each use of the diesels.</p> <p>f. Once per month a sample of diesel fuel shall be checked for viscosity, water and sediment. The values for viscosity, water and sediment shall be within the acceptable limits specified in Table 1 of ASTM D975-77 and recorded.</p> <p>g. Once each 3 months a sample of diesel fuel shall be checked for particulate accumulation and the amount recorded. The amount of particulates shall not exceed 10 mg/liter when filtered through a 0.8 micron filter.</p> <p>3. Surveillance Requirements with Inoperable Components.</p> <p>a. When it is determined that one of the emergency diesel generators is inoperable, the requirements of Specification 4.3.G.1 shall be met.</p> <p>B. <u>DC Power Systems</u></p> <p>1. The DC power system surveillance shall be as follows:</p> <p>a. Each week the specific gravity, the voltage and temperature of the pilot cell and overall battery</p> |
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<p>chargers for the 24 volt system, two of the three battery chargers for the 125 volt systems, and one of the two battery chargers for the 250 volt system shall be OPERABLE.</p>	<p>voltage shall be measured and recorded.</p> <p>b. Each three months the essential batteries' voltage of each cell to the nearest 0.01 Volt, specific gravity of each cell, and temperature of every fifth cell shall be measured and recorded.</p> <p>c. Once each OPERATING CYCLE, the essential batteries shall be subjected to a Service Discharge Test (load profile). The specific gravity and voltage of each cell shall be determined after the discharge and recorded.</p> <p>d. Once every five years, the essential batteries shall be subjected to a Performance Discharge Test (capacity). This test will be performed in lieu of the Service Test requirement of 4.8.B.1.c above.</p>
<p>2. Operation With Inoperable Components.</p> <p>a. With normal battery room ventilation unavailable, portable ventilation equipment shall be provided.</p> <p>b. With one of the two 125 volt DC systems inoperable, verify that Specification 3.5.G is met, and within 3 days either:</p> <ol style="list-style-type: none"> 1) Restore the inoperable 125 volt DC system to OPERABLE status, or 2) Be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours. <p>c. With the 250 volt DC system inoperable, the HPCI system shall be considered inoperable and the requirements of Specification 3.5.D shall be met.</p> <p>d. With one of the 24 volt DC systems inoperable, the requirements of Specification 3.2.C shall be met.</p>	<p>2. Surveillance Requirements With Inoperable Components.</p> <p>a. With the battery room ventilation unavailable, samples of the battery room atmosphere shall be taken daily for hydrogen concentration determination.</p>

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
C. <u>Onsite Power Distribution Systems</u>	C. <u>Onsite Power Distribution Systems</u>
1. At all times when the reactor is in the RUN Mode or STARTUP Mode and not in a COLD CONDITION the essential AC 4160 volt buses 1A3 and 1A4, and 480 volt buses 1B3, 1B4, 1B9 and 1B20 shall be energized and OPERABLE	1. Once each 4 cycles each circuit breaker shall be subjected to inspection and preventive maintenance in accordance with procedures based on the manufacturer's recommendations.
2. Operation with Inoperable Components.	
a. With one of the essential AC 480 volt buses, 1B9 or 1B20, inoperable, restore the bus to OPERABLE status within 7 days, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.	
b. With one of the essential AC 4160 volt buses, 1A3 or 1A4, or 480 volt buses 1B3 or 1B4 inoperable, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.	
D. <u>Auxiliary Electrical Equipment - CORE ALTERATIONS</u>	
Refer to Specification 3.9.D.	

LIMITING CONDITIONS FOR OPERATION

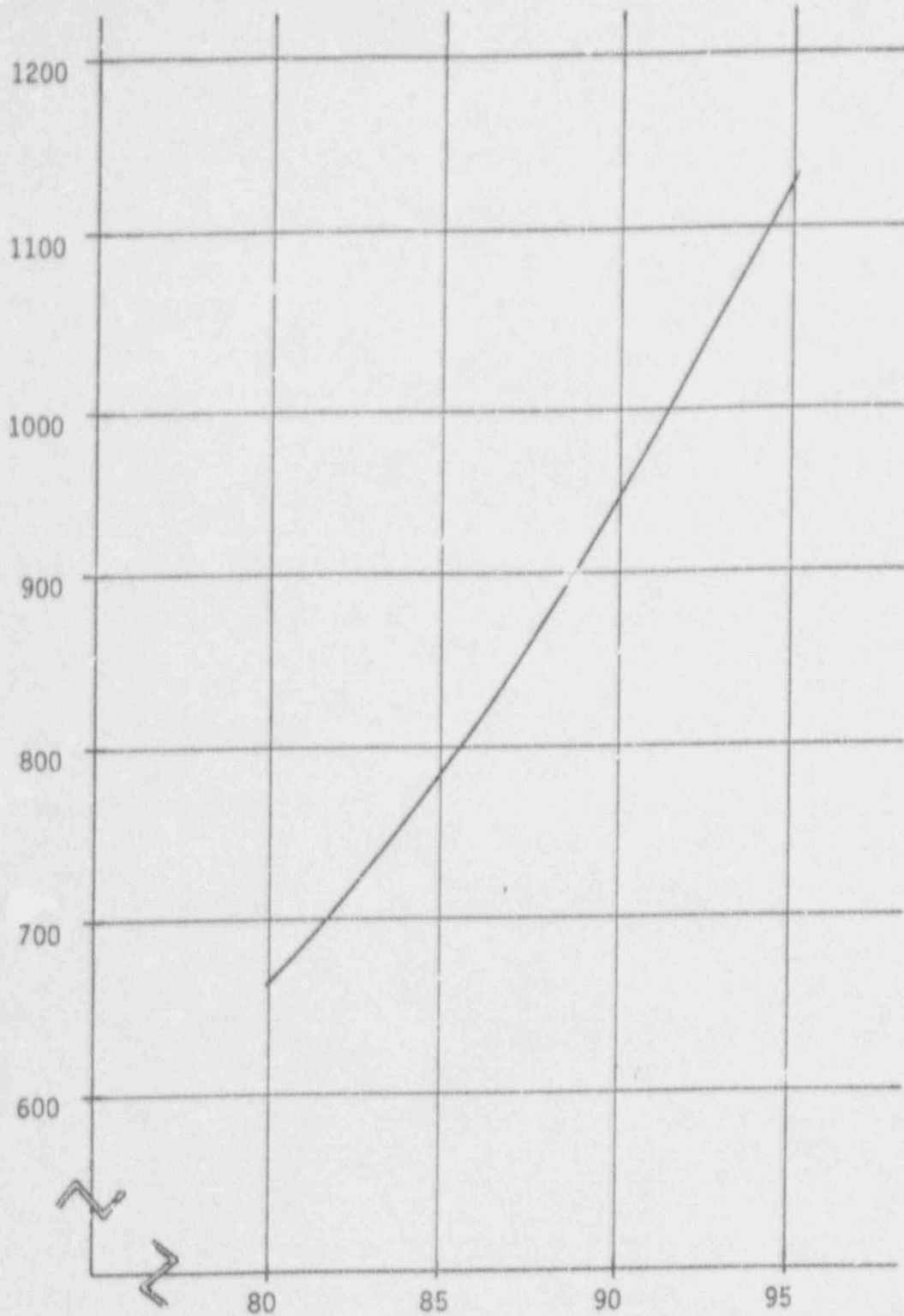
- E. Emergency Service Water System
1. Except as required in Specification 3.8.E.2 below, both emergency service water system loops shall be OPERABLE whenever irradiated fuel is in the reactor vessel and reactor coolant temperature is greater than 212°F.
 2. With one of the emergency service water system pumps or loops inoperable, REACTOR POWER OPERATION must be limited to seven days unless OPERABILITY of that system is restored within this period. During such seven days all active components of the other emergency service water system shall be OPERABLE, provided the requirements of Specification 3.5.G are met.
 3. If the requirements of Specification 3.8.E cannot be met, be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

- E. Emergency Service Water System
1. Emergency service water system surveillance shall be as follows:
 - a. Simulated automatic actuation test. Once/operating cycle
 - b. Pump and motor operated valve OPERABILITY. Once/3 months
 - c. Flow Rate Test

Each emergency service water pump shall deliver at least that flow determined from Figure 4.8.E-1 for the existing river water temperature.	After major pump maintenance and once per 3 months, except weekly during periods of time the river water temperature exceeds 80°F.
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 2. With one emergency service water system pump or loop inoperable, the OPERABLE pump and loop shall be verified to be OPERABLE. In addition, the requirements of Specification 4.5.G.1 shall be met.

Total Emergency Service Water Flow Required - GPM



River Water Temperature - Degrees F

Duane Arnold Energy Center
Iowa Electric Light and Power Company
Technical Specifications

DAEC Emergency Service
Water Flow Requirement
Figure 4.8.E-1

3.8 BASES:

The objective of this specification is to assure that adequate power will be available to operate essential equipment. Adequate AC power can be provided by any one of the following sources: The startup transformer, the standby transformer or either of the two emergency diesel generators. The startup transformer provides all auxiliary power during plant startup and until the main generator is synchronized with the system. After synchronization, the plant auxiliary buses 1A1 and 1A2 are manually transferred to the auxiliary transformer. The startup transformer continues to provide the normal source of power to essential AC buses 1A3 and 1A4. The standby transformer is connected to either of the two essential AC buses by automatic switching upon loss of power from the startup transformer.

This specification assures that at least two offsite and two onsite AC power sources will be available before the reactor is taken beyond "just critical" testing. The two offsite sources are 161 KV and 345 KV power which are supplied to the startup and standby transformers respectively, through the DAEC site switch yard. These power sources are provided through the several transmission lines tied to the regional power grid. In addition to assuring power source availability, all of the associated essential AC switchgear must be operable as specified to assure that the emergency core cooling equipment can be operated, if required, from the power sources.

The minimum diesel fuel supply of 36,317 gallons will supply one emergency diesel generator for a minimum of seven days of operation satisfying the load requirements for the operation of the essential equipment. Additional fuel can be obtained and delivered to the site from nearby sources within the seven day period.

A battery charger is supplied with each of the two 125 volt DC station batteries. In addition, a spare charger is available and can supply power to either 125 volt DC system. Since this alternative source is available, one battery charger can be allowed out of service for maintenance and repairs. Similarly, one of the two battery chargers provided for the 250 volt DC station battery can be allowed out of service for maintenance and repairs.

Adequate power is available to operate all essential equipment from either the startup transformer or the standby transformer. In addition, each of the emergency diesel generator units is capable of supplying the essential AC-powered loads required under postulated design basis accident conditions. Each unit is physically and electrically independent of the other and of any offsite power source. Therefore, one emergency diesel generator can be allowed out of service for a period of seven days to allow reasonable repairs. In such cases, emergency diesel generator operability demonstrations will be limited to an unloaded start test.

In the event that the startup or standby transformer and one emergency diesel generator is inoperable, adequate power is available to operate the essential equipment from either the operable transformer or the operable emergency diesel generator. If both the startup and standby transformers are inoperable, either emergency diesel generator is sufficient to operate 100 percent of the required emergency loads.

Each of the two 125 volt DC and the 250 volt DC station batteries has enough capacity to energize its vital buses and supply DC power to the other essential DC-powered equipment for four hours without being recharged. Due to the high reliability of battery systems, one of the two batteries may be out of service for up to three days. This minimizes the probability of unwarranted shutdown by providing adequate time for reasonable repairs. A station battery is considered inoperable if more than one cell is out of service. A cell will be considered out of service if its float voltage is below 2.13 volts and the specific gravity is below 1.190 at 77°F.

The 250 volt DC system provides power for the HPCI system. If the battery is taken out of service, the HPCI system would be inoperable and the requirements of Specification 3.5.D for this condition must be satisfied.

The 24 volt DC system provides power for reactor neutron monitoring and liquid process radiation monitoring. The neutron monitoring function is fail-safe in that loss of 24 volt DC power would cause the associated trip to occur (UPSAR Section 8.3.2).

The battery room is ventilated to prevent accumulation of hydrogen gas exceeding 4 percent concentration. On loss of battery room ventilation, the use of portable ventilation equipment and daily sampling provides assurance that potentially hazardous quantities of hydrogen gas will not accumulate.

4.4 BASES:

- | Offsite power availability and onsite power distribution is continuously
| monitored by instrumentation which alerts operators to any problems so that
| appropriate action can be taken. In addition to the annunciators, automatic
| switching occurs to maintain power to the emergency buses at all times. The
| breakers and distribution panels are subjected to preventive maintenance based
| on manufacturer's recommendations. The schedule is based on performance of
| maintenance on one of the buses (1A1, 1A2, 1A3 and 1A4) each Refuel Outage.
- | The monthly tests of the emergency diesel generators (EDGs) are conducted to
| demonstrate satisfactory system performance and operability. To prevent
| excessive wear and stress on the diesel engines, the diesels are manually
| started and the speed incrementally increased to synchronous speed. With one
| EDG inoperable, the remaining EDG can be demonstrated to be OPERABLE by
| starting and verifying proper output voltage and frequency. Once every six
| months, a fast-start test is performed to demonstrate the capabilities of the
| diesel engines to accelerate to rated speed as required for the design basis
| for the plant. The test of the automatic starting circuits will prove that
| each EDG will receive all automatic start signals. The loading of each EDG is
| conducted to demonstrate proper operation at maximum expected emergency
| loading and at equilibrium operating conditions. Generator experience at
| other generating stations, and NRC published guidance (Generic Letter 84-15),
| indicates that the testing frequency is adequate to assure a high reliability
| of operation should the system be required.
- | Each EDG has two independent starting air supply systems. One consists of a
| motor driven air compressor which automatically recharges two air receivers
| and the other consists of a diesel driven air compressor which is manually
| operated to recharge a third air receiver. During the monthly check of the
| EDG, both air start systems will be checked for proper operation.

Following the tests (at least monthly) or other operation of the EDGs, the fuel volume remaining in the diesel oil storage tank will be checked.

At the end of the monthly load test of the EDG, the fuel oil transfer pump will be operated to refill the day tank and to check the operation of this pump. The day tank level indicator and alarm switches and fuel oil transfer pump control switches will be checked at this time.

The test of the EDGs once each operating cycle will be more comprehensive in that it will functionally test the system; i.e., it will check starting of the diesel and closure of electrical breakers and sequencing of essential loads. The test will be initiated by simulation of a loss-of-coolant accident. In addition, a loss of normal AC power condition will be imposed to simulate a loss of off-site power. The essential load sequence timing will be checked to assure proper loading in the time required. Periodic tests check the capability of the units to start in the required time and to deliver the expected emergency load requirements. Periodic testing of the various components plus a functional test each operating cycle are sufficient to maintain adequate reliability.

Recording the diesel fuel supply after each operation (at least monthly) assures that the minimum fuel supply requirements will be maintained. New fuel is tested against the specification, ASTM D975-77 (API gravity, viscosity and water and sediment prior to addition, and the other characteristics within 30 days of addition to the storage tank). A monthly test for quality of the diesel fuel oil will be performed to verify that viscosity and water and sediment are within the limits specified in ASTM D975-77. The quality of the diesel fuel oil will be acceptable if the results of the tests are within the limiting requirements for diesel fuel oils shown on Table 1 of ASTM D975-77. Additionally, a quarterly test for particulate accumulation in the stored fuel oil will provide further assurance that the fuel oil is not deteriorating to

the point that EDC operation would be affected. This characteristic is trended so that actions can be taken to restore fuel quality prior to reaching unacceptable levels. Should a test result show unacceptable particulate accumulation which does not fit an established trend, a second sample is allowed to be tested prior to taking actions to restore the fuel.

Although the station batteries will deteriorate with time, utility experience indicates there is almost no possibility of precipitous failure. The type of surveillance described in this specification is that which has been demonstrated over the years to provide an indication of a cell becoming irregular or unserviceable long before it becomes a failure.

The Service Discharge Test provides adequate indication of the batteries' ability to satisfy the design requirements (battery duty cycle) of the associated DC system. This test will be performed using simulated loads at the rates and for the durations specified in the design load profile.

The Performance Discharge Test provides adequate indication and assurance that the batteries have the specified ampere hour capacity. The rate of discharge during this test shall be in accordance with the manufacturer's discharge characteristic curves. The result of these tests will be recorded and compared with the manufacturer's recommendations of acceptability.

The Emergency Service Water System has two loops with one pump each. If one emergency service water system loop becomes inoperable, the other loop provides sufficient cooling to components to assure performance of the safety function after an accident. Continued plant operation with one loop inoperable is restricted to a seven-day period during which time the operable emergency service water loop is verified to be OPERABLE.

The surveillance test intervals for the Emergency Service Water pumps and associated valves are based on Section XI of the ASME Code.

ENVIRONMENTAL CONSIDERATION

10 CFR 51.22(c)(9) identifies certain licensing and regulatory action which are eligible for categorical exclusion from the requirement to perform an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazard; consideration; (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite; and (3) result in an increase in individual or cumulative occupational radiation exposure. Iowa Electric Light and Power has reviewed this request and determined that the proposed 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 needs to be prepared in connection with the issuance of the amendment. The basis for this determination follows:

Basis

The change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) for the following reasons:

1. As demonstrated in Attachment 1, the proposed amendment does not involve a significant hazards consideration.
2. The proposed revision to the Limiting Conditions For Operation and Surveillance Requirements for the systems and equipment of TS Section 3.8, "Auxiliary Electrical Systems" have no effect on the types or amounts of effluents released offsite.
3. The proposed revisions to TS Section 3.8, "Auxiliary Electrical Systems" have no effect on individual or cumulative occupational radiation exposures.