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

ARKANSAS POWER & LIGHT COMPANY

DOCKET NO. 50-313

ARKANSAS NUCLEAR ONE - UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 25
License No. DPR-51

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

   A. The application for amendment by Arkansas Power & Light Company (the licensee) dated September 30, 1976, 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;

   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-51 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 25, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

for Don K. Davis, Acting Chief
Operating Reactors Branch #2
Division of Operating Reactors

Attachment:
Changes to the Technical Specifications

Date of Issuance: June 1, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 25

FACILITY OPERATING LICENSE NO. DPR-51

DOCKET NO. 50-313

Change the Appendix A portion of the Technical Specifications to add the following revised pages. The changed areas on the revised pages are identified by marginal lines.

Pages

1*
2
67
68
72a
73
73a
83
92
93
94*
95
96*
100
100a
101
105
106*
107
109
109a
109b
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110h
110i

*There were no changes on these pages. They are included as a matter of convenience in updating the Technical Specifications.

1 DEFINITIONS

The following terms are defined for uniform interpretation of these specifications.

1.1 RATED POWER

Rated power is a steady state reactor core output of 2568 MWt.

1.2 REACTOR OPERATING CONDITIONS

1.2.1 Cold Shutdown

The reactor is in the cold shutdown condition when it is subcritical by at least 1 percent $\Delta k/k$ and T_{avg} is no more than 200 F. Pressure is defined by Specification 3.1.2.

1.2.2 Hot Shutdown

The reactor is in the hot shutdown condition when it is subcritical by at least 1 percent $\Delta k/k$ and T_{avg} is at or greater than 525 F.

1.2.3 Reactor Critical

The reactor is critical when the neutron chain reaction is self-sustaining and $K_{eff} = 1.0$.

1.2.4 Hot Standby

The reactor is in the hot standby condition when all of the following conditions exist:

A. T_{avg} is greater than 525 F.

B. The reactor is critical.

C. Indicated neutron power on the power range channels is less than 2 percent of rated power.

1.2.5 Power Operation

The reactor is in a power operating condition when the indicated neutron power is above 2 percent of rated power as indicated on the power range channels.

1.2.6 Refueling Shutdown

The reactor is in the refueling shutdown condition when, even with all rods removed, the reactor would be subcritical by at least 1 percent $\Delta k/k$ and the coolant temperature at the decay heat removal pump suction is at the refueling temperature (normally 140F). Pressure is defined by Specification 3.1.2. A refueling shutdown refers to a shutdown to replace or rearrange all or a portion of the fuel assemblies and/or control rods.

1.2.7 Refueling Operation

An operation involving a change in core geometry by manipulation of fuel or control rods when the reactor vessel head is removed.

1.2.8 Startup

The reactor shall be considered in the startup mode when the shutdown margin is reduced with the intent of going critical.

1.3 OPERABLE

A component or system is operable when it is capable of performing its intended function within the required range. The component or system shall be considered to have this capability when: (1) it satisfies the limiting conditions for operation defined in Specification 3, and (2) it has been tested periodically in accordance with Specification 4, and has met its performance requirements.

1.4 PROTECTION INSTRUMENTATION LOGIC

1.4.1 Instrument Channel

An instrument channel is the combination of sensor, wires, amplifiers and output devices which are connected for the purpose of measuring the value of a process variable for the purpose of observation, control and/or protection. An instrument channel may be either analog or digital.

1.4.2 Reactor Protection System

The reactor protection system is shown in Figures 7-1 and 7-9 of the FSAR. It is that combination of protective channels and associated circuitry which forms the automatic system that protects the reactor by control rod trip. It includes the four protection channels, their associated instrument channel inputs, manual trip switch, all rod drive control protective trip breakers and activating relays or coils.

A protection channel, as shown in Figure 7-1 of the FSAR (one of three or one of four independent channels, complete with sensors, sensor power supply

4 SURVEILLANCE STANDARDS

Specified surveillance intervals may be adjusted plus or minus 25 percent to accommodate normal test and surveillance schedules. The maximum combined interval for any 3 consecutive tests shall not exceed 3.25 times the specified surveillance interval. Surveillance requirements are not applicable when the plant operating conditions are below those requiring operability of the designated component. However, the required surveillance must be performed prior to reaching the operating conditions requiring operability. For example, instrumentation requiring twice per week surveillance when the reactor is critical need not have the required surveillance when the reactor is shutdown.

4.1 OPERATIONAL SAFETY ITEMS

Applicability

Applies to items directly related to safety limits and limiting conditions for operation.

Objective

To specify the minimum frequency and type of surveillance to be applied to unit equipment and conditions.

Specification

a. The minimum frequency and type of surveillance required for reactor protective system and engineered safeguards system instrumentation when the reactor is critical shall be as stated in Table 4.1-1.

b. Equipment and sampling test shall be performed as detailed in Tables 4.1-2 and 4.1-3.

c. Discrepancies noted during surveillance testing will be corrected and recorded.

d. A power distribution map shall be made to verify the expected power distribution at periodic intervals at least every 10 effective full power days using the incore instrumentation detector system.

Bases

Check

Failures such as blown instrument fuses, defective indicators, faulted amplifiers which result in "upscale" or "downscale" indication can be easily recognized by simple observation of the functioning of an instrument or system. Futhermore, such failures are, in many cases, revealed by alarm or annunciator action. Comparison of output and/or state of independent channels measuring the same variable supplements this type of built-in surveillance. Based on experience in operation of both conventional and nuclear plant systems, when the plant is in operation, the minimum checking frequency stated is deemed adequate for reactor system instrumentation.

Other channels are subject only to "drift" errors induced within the instrumentation itself and, consequently, can tolerate longer intervals between calibrations. Process system instrumentation errors induced by drift can be expected to remain within acceptable tolerances if recalibration is performed once every 18 months.

Substantial calibration shifts within a channel (essentially a channel failure) will be revealed during routine checking and testing procedures.

Thus, minimum calibration frequencies for the nuclear flux (power range) channels, and once every 18 months for the process system channels is considered acceptable.

Testing

On-line testing of reactor protective channels is required once every 4 weeks on a rotational or staggered basis. The rotation scheme is designed to reduce the probability of an undetected failure existing within the system and to minimize the likelihood of the same systematic test errors being introduced into each redundant channel.

The rotation schedule for the reactor protective channels is as follows:

Channels A, B, C, D	Before Startup if shutdown greater than 24 hours
Channel A	One Week After Startup
Channel B	Two Weeks After Startup
Channel C	Three Weeks After Startup
Channel D	Four Weeks After Startup

The reactor protective system instrumentation test cycle is continued with one channel's instrumentation tested each week. Upon detection of a failure that prevents trip action, all instrumentation associated with the protective channels will be tested after which the rotational test cycle is started again. If actuation of a safety channel occurs, assurance will be required that actuation was within the limiting safety system setting.

The protective channels coincidence logic and control rod drive trip breakers are trip tested every four weeks. The trip test checks all logic combinations and is to be performed on a rotational basis. The logic and breakers of the four protective channels shall be trip tested prior to startup and their individual channels trip tested on a cyclic basis. Discovery of a failure requires the testing of all channel logic and breakers, after which the trip test cycle is started again.

The equipment testing and system sampling frequencies specified in Table 4.1-2 and Table 4.1-3 are considered adequate to maintain the status of the equipment and systems to assure safe operation.

REFERENCE

FSAR Section 7.1.2.3.4

Table 4.1-1 (cont'd)

Channel Description	Check	Test	Calibrate	Remarks
37. Boric Acid Addition Tank				
a. Level Channel	NA	NA	R	
b. Temperature Channel	M	NA	R	
38. Sodium Thiosulfate Tank Level Indicator	NA	NA	R	
39. Sodium Hydroxide Tank Level Indicator	NA	NA	R	
40. Incore Neutron Detectors	M(1)	NA	NA	(1) Check Functioning
41. Emergency Plant Radiation Instruments	M(1)	NA	R	(1) Battery Check
42. Deleted				
43. Strong Motion Acceleographs	Q(1)	NA	Q	(1) Battery Check
44. ESAS Manual Trip Functions				
a. Switches & Logic	NA	R	NA	
b. Logic	NA	M	NA	
45. Reactor Manual Trip	NA	P	NA	
46. Reactor Building Sump Level	NA	NA	R	

Note: S - Each Shift; T/W - Twice per Week; R - Once every 18 months

D - Daily; B/M - Every 2 Months; NA - Not Applicable

W - Weekly; Q - Quarterly

M - Monthly; P - Prior to Each Startup if Not Done Previous Week

Table 4.1-2

Minimum Equipment Test Frequency

Item	Test	Frequency
1. Control Rods	Rod Drop Times of All Full Length Rods 1/	Each Refueling Shutdown
2. Control Rod Movement	Movement of Each Rod	Every Two Weeks Above Cold Shutdown Conditions
3. Pressurizer Code Safety Valves	Setpoint	One Valve Every 18 Months
4. Main Steam Safety Valves	Setpoint	Four Valves Every 18 Months
5. Refueling System Interlocks	Functioning	Start of Each Refueling Shutdown
6. Reactor Coolant System Leakage	Evaluate	Daily
7. Deleted		
8. Reactor Building Isolation Trip	Functioning	Every 18 Months
9. Service Water Systems	Functioning	Every 18 Months
10. Spent Fuel Cooling System	Functioning	Every 18 Months when irradiated fuel is in the pool.
11. Decay Heat Removal System Isolation Valve Automatic Closure and Isolation System	Functioning	Every 18 Months

1/ Same as tests listed in Section 4.7

Table 4.1-2 (Continued)
Minimum Equipment Test Frequency

Item	Test	Frequency
12. Flow Limiting Annulus on Main Feedwater Line at Reactor Building Penetration	Verify, at normal operating conditions, that a gap of at least 0.025 inches exists between the pipe and the annulus.	One year, two years, three years, and every five years thereafter measured from date of initial test.
13. SLBIC Pressure Sensors	Calibrate	Every 18 Months.
14. Main Steam Isolation Valves	a. Excercise Through Approximately 10% Travel	a. Quarterly
	b. Cycle	b. Every 18 Months.
15. Main Feedwater Isolation Valves	a. Exercise Through Approximately 5% Travel	a. Quarterly
	b. Cycle	b. Every 18 Months.
16. Reactor Internals Vent Valves	Demonstrate Operability By: a. Conducting a remote visual inspection of visually accessible surfaces of the valve body and disc sealing faces and evaluating any observed surface irregularities. b. Verifying that the valve is not stuck in an open position, and c. Verifying through manual actuation that the valve is fully open with a force of ≤ 400 lbs (applied vertically upward).	Each refueling shutdown.

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4.4.1.2.5 Test Frequency

Local leak detection tests shall be performed during each reactor shutdown for refueling or other convenient intervals, but in no case at intervals >2 years except that:

(a) The equipment hatch and fuel transfer tube seals shall be additionally tested after each opening.

(b) If a personnel hatch or emergency hatch door is opened when reactor building integrity is required, the affected door seal shall be tested. In addition, a pressure test shall be performed on the personnel and emergency hatches every six months.

4.4.1.3 Reactor Building Modifications

Any major modification or replacement of components affecting the reactor building integrity shall be followed by either an integrated leak rate test or a local leak test, as appropriate, and shall meet the acceptance criteria specified in 4.4.1.1 and 4.4.1.2 respectively.

4.4.1.4 Isolation Valve Functional Tests

Every three months, remotely operated reactor building isolation valves shall be stroked to the position required to fulfill their safety function unless such operation is not practical during plant operation. The latter valves shall be tested once every 18 months.

4.4.1.5 Visual Inspection

A visual examination of the accessible interior and exterior surfaces of the reactor building structure and its components shall be performed during each refueling shutdown and prior to any integrated leak test, to uncover any evidence of deterioration which may affect either the reactor building's structural integrity or leak-tightness. The discovery of any significant deterioration shall be accompanied by corrective actions in accord with acceptable procedures, nondestructive tests, and inspections, and local testing where practical prior to the conduct of any integrated leak test. Such repairs shall be reported as part of the test results.

Bases (1)

The reactor building is designed for an internal pressure of 59 psig and a steam-air mixture temperature of 285F. Prior to initial operation, the reactor building will be strength tested at 115% of design pressure and leak rate tested at the design pressure. The reactor building will also be leak tested prior to initial operation at not less than 50% of

4.5 EMERGENCY CORE COOLING SYSTEM AND REACTOR BUILDING COOLING SYSTEM PERIODIC TESTING

4.5.1 Emergency Core Cooling Systems

Applicability

Applies to periodic testing requirement for emergency core cooling systems.

Objective

To verify that the emergency core cooling systems are operable.

Specification

4.5.1.1 System Tests

4.5.1.1.1 High Pressure Injection System

(a) Once every 18 months, a system test shall be conducted to demonstrate that the system is operable. A test signal will be applied to demonstrate actuation of the high pressure injection system for emergency core cooling operation.

(b) The test will be considered satisfactory if control board indication verifies that all components have responded to the actuation signal properly; all appropriate pump breakers shall have opened or closed and all valves shall have completed their travel.

4.5.1.1.2 Low Pressure Injection System

(a) Once every 18 months, a system test shall be conducted to demonstrate that the system is operable. The test shall be performed in accordance with the procedure summarized below:

(1) A test signal will be applied to demonstrate actuation of the low pressure injection system for emergency core cooling operation.

(2) Verification of the engineered safeguard function of the service water system which supplies cooling water to the decay heat removal coolers shall be made to demonstrate operability of the coolers.

(b) The test will be considered satisfactory if control board indication verifies that all components have responded to the actuation signal properly; all appropriate pump breakers shall have opened or closed, and all valves shall have completed their travel.

4.5.1.1.3 Core Flooding System

(a) Once every 18 months, a system test shall be conducted to demonstrate proper operation of the system. During this test, verification shall be made that the check valves in the core flooding tank discharge lines operate properly.

(b) The test will be considered satisfactory if control board indication of core flood tank level verifies that all check valves have opened.

4.5.1.2 Component Tests

4.5.1.2.1 Pumps

Approximately quarterly, the high pressure and low pressure injection pumps shall be started and operated to verify proper operation. Acceptable performance will be indicated if the pump starts, operates for fifteen minutes, and the discharge pressure and flow are within $\pm$10% of the initial level of performance as determined using test flow paths.

4.5.1.2.2 Valves - Power Operated

(a) At intervals not to exceed three months, each engineered safety feature valve in the emergency core cooling systems and each engineered safety feature valve associated with emergency core cooling in the service water system which are designed to open in the event of a LOCA shall be tested to verify operability.

(b) The acceptable performance of each power operated valve will be that motion is indicated upon actuation by appropriate signals.

Bases

The emergency core cooling systems are the principle reactor safety features in the event of a loss of coolant accident. The removal of heat from the core provided by these systems is designed to limit core damage.

The high pressure injection system under normal operating conditions has one pump operating. At least once per month, operation will be rotated to another high pressure injection pump. This will help verify that the high pressure injection pumps are operable.

The requirements of the service water system for cooling water are more severe during normal operation than under accident conditions. Rotation of the pump in operation on a monthly basis will verify that two pumps are operable.

The low pressure injection pumps are tested singularly for operability by opening the borated water storage tank outlet valves and the borated water storage tank recirc line. This allows water to be pumped from the borated water storage tank through each of the injection lines and back to the tank.

With the reactor shutdown, the check valves in each core flooding line are checked for operability by reducing the reactor coolant system pressure until the indicated level in the core flood tanks verify that the check valves have opened.

REFERENCE

FSAR Section 6

4.5.2 Reactor Building Cooling Systems

Applicability

Applies to testing of the reactor building cooling systems.

Objective

To verify that the reactor building cooling systems are operable.

Specification

4.5.2.1 System Tests

4.5.2.1.1 Reactor Building Spray System

(a) Once every 18 months, a system test shall be conducted to demonstrate proper operation of the system. A test signal will be applied to demonstrate actuation of the reactor building spray system (except for reactor building inlet valves to prevent water entering nozzles).

(b) Station compressed air or smoke will be introduced into the spray headers to verify the availability of the headers and spray nozzles at least every five years.

(c) The test will be considered satisfactory if visual observation and control board indication verifies that all components have responded to the actuation signal properly.

4.5.2.1.2 Reactor Building Cooling System

(a) Once every 18 months, a system test shall be conducted to demonstrate proper operation of the system. The test shall be performed in accordance with the procedure summarized below:

(1) A test signal will be applied to actuate the reactor building cooling operation.

(2) Verification of the engineered safety features function of the service water system which supplies the reactor building coolers shall be made to demonstrate operability of the coolers.

(b) The test will be considered satisfactory if control board indication verifies that all components have responded to the actuation signal properly.

4.5.2.2 Component Tests

4.5.2.2.1 Pumps

At intervals not to exceed 3 months the reactor building spray pumps shall be started and operated to verify proper operation. Acceptable performance will be indicated if the pump starts, operates for fifteen minutes, and the discharge pressure and flow are within ±10% of a point on the pump head curve.

4.5.2.2.2 Valves

At intervals not to exceed three months each engineered safety features valve in the reactor building spray and reactor building cooling system and each engineered safety features valve associated with reactor building cooling in the service water system shall be tested to verify that it is operable.

<u>Bases</u>

The reactor building cooling system and reactor building spray system are designed to remove the heat in the reactor building atmosphere to prevent the building pressure from exceeding the design pressure.

The delivery capability of one reactor building spray pump at a time can be tested by opening the valve in the line from the borated water storage tank, opening the corresponding valve in the test line, and starting the corresponding pump. Pump discharge pressure and flow indication demonstrate performance.

With the pumps shut down and the borated water storage tank outlet closed, the reactor building spray injection valves can each be opened and closed by operator action. With the reactor building spray inlet valves closed, low pressure air or smoke can be blown through the test connections of the reactor building spray nozzles to demonstrate that the flow paths are open.

The equipment, piping, valves, and instrumentation of the reactor building cooling system are arranged so that they can be visually inspected. The cooling units and associated piping are located outside the secondary concrete shield. Personnel can enter the reactor building during power operations to inspect and maintain this equipment. The service water piping and valves outside the reactor building are inspectable at all times. Operational tests and inspections will be performed prior to initial startup.

4.6 AUXILIARY ELECTRICAL SYSTEM TESTS

Applicability

Applies to the periodic testing and surveillance requirements of the auxiliary electrical system to ensure it will respond promptly and properly when required.

Specification

4.6.1 Diesel Generators

1. Each diesel generator shall be manually started each month and demonstrated to be ready for loading within 15 seconds. The signal initiating the start of the diesel shall be varied from one test to another (start with handswitch at control room panel and at diesel local control panel) to verify all starting circuits are operable. The generator shall be synchronized from the control room and loaded to full rated load and allowed to run until diesel generator operating temperatures have stabilized.

2. A test shall be conducted once every 18 months to demonstrate that the emergency power system is available to carry load within 15 seconds of a simulated ES signal of the safety features system coincident with the loss of offsite power. The diesel generator shall be fully loaded and run for one hour after operating temperatures have stabilized.

3. Each diesel generator shall be given an inspection once every 18 months following the manufacturer's recommendations for this class of standby service.

4. During the monthly diesel generator test specified in Paragraph 1 above, the following shall be performed:

   a. The diesel generator starting air compressors shall be checked for operation and their ability to recharge the air receivers.

   b. The diesel oil transfer pumps shall be checked for operability and their ability to transfer oil to the day tank.

   c. The day tank fuel level shall be verified.

   d. The emergency storage tank fuel level shall be verified.

e. Diesel fuel from the emergency storage tank shall be sampled and found to be within acceptable limits specified in Table 1 of ASTM D975-68 when checked for viscosity, water, and sediment.

5. Once every 18 months, the capability of each starting air compressor to charge the air receivers from 0 to 225 psig within 2 hours shall be verified.

   Also once every 18 months, the capacity of each diesel oil transfer pump shall be verified to be at least 10 gpm.

4.6.2 Station Batteries and Switchyard Batteries

1. The voltage, temperature and specific gravity of a pilot cell in each bank and the overall battery voltage of each bank shall be measured and recorded daily.

2. Measurements shall be made quarterly of voltage of each cell to the nearest 0.01 volt, of the specific gravity of each cell, and of the temperature of every fifth cell in each bank. The level of the electrolyte shall be checked and adjusted as required. All data, including the amount of water added to any cell, shall be recorded.

3. Once every 18 months, a performance discharge test shall be conducted in accordance with the manufacturer's instructions, for the purpose of determining battery capacity.

4. Any battery charger which has not been loaded while connected to its 125V d-c distribution system for at least 30 minutes during every quarter shall be tested and loaded while connected to its bus for 30 minutes. The third battery charger, which is capable of being connected to either of the two 125V d-c distribution systems, shall be loaded while connected to each bus for at least 30 minutes every quarter.

4.6.3 Emergency Lighting

The correct functioning of the emergency lighting system shall be verified once every 18 months.

Bases

The emergency power system provides power requirements for the engineered safety features in the event of a DBA. Each of the two diesel generators is capable of supplying minimum required engineered safety features from independent buses. This redundancy is a factor in establishing testing intervals. The monthly tests specified above will demonstrate operability and load capacity of the diesel generator. The fuel supply and diesel starter motor air pressure are continuously monitored and alarmed for abnormal conditions. Starting on complete loss of off-site power will be verified by simulated loss-of-power tests once every 18 months.

Considering system redundancy, the specified testing intervals for the station batteries should be adequate to detect and correct any malfunction before it can result in system malfunction. Batteries will deteriorate with time, but precipitous failure is extremely unlikely. The surveillance specified is that which has been demonstrated over the years to provide an indication of a cell becoming unserviceable long before it fails.

Routine battery maintenance specified by the manufacturer includes regularly scheduled equalizing charges in order to retain the capacity of the battery. A test discharge should be conducted to ascertain the capability of the battery to perform its design function under postulated accident condition. An excessive drop of voltage with respect to time is indicative of required battery maintenance or replacement.

Testing of the emergency lighting is scheduled every 18 months and is subject to review and modification if experience demonstrates a more effective test schedule.

References

FSAR, Section 8

4.8 EMERGENCY FEEDWATER PUMP

Applicability

Applies to the periodic testing of the turbine and electric motor driven emergency feedwater pumps.

Objective

To verify that the emergency feedwater pump and associated valves are operable.

Specification

4.8.1 Test

1. The turbine and electric motor driven emergency feedwater pumps shall be operated every three months for a minimum of one hour.

2. The emergency feedwater valves shall be cycled every three months.

3. Once every 18 months, a functional test of the emergency feedwater system shall be made using the electric motor driven emergency feedwater pump.

4.8.2 Acceptance Criteria

This test shall be considered satisfactory if control board indication and visual observation of the equipment demonstrates that all components have operated properly.

Bases

The three (3) month testing frequency will be sufficient to verify that both emergency feedwater pumps are operable. Verification of correct operation will be made both from the control room instrumentation and direct visual observation of the pumps. The cycling of the emergency valves will be done coincident with the pump testing, but not concurrently so that cold emergency feedwater is not pumped to the steam generator.

The functional test, performed once every 18 months, will verify that the flow path to the steam generators is open and that water reaches the steam generators from the emergency feedwater system. The test is done during shutdown to avoid thermal cycle to the emergency feedwater nozzles on the steam generator due to the lower temperature of the emergency feedwater.

4.9 REACTIVITY ANOMALIES

Applicability

Applies to potential reactivity anomalies.

Objective

To require the evaluation of reactivity anomalies of a specified magnitude occurring during the operation of the unit.

Specification

Following a normalization of the computed boron concentration as a function of burnup, the actual boron concentration of the coolant shall be periodically compared with the predicted value. If the difference between the observed and predicted steady-state concentrations reaches the equivalent of one percent in reactivity, an evaluation of this abnormal occurrance will be made to determine the cause of the discrepancy.

Bases

To eliminate possible errors in the calculations of the initial reactivity of the core and the reactivity depletion rate, the predicted relation between fuel burnup and the boron concentration, necessary to maintain adequate control characteristics, must be adjusted (normalized) to accurately reflect actual core conditions. When full power is reached initially, and with the control rod groups in the desired positions, the boron concentration is measured and the predicted curve is adjusted to this point. As power operation proceeds, the measured boron concentration is compared with the predicted concentration and the slop of the curve relating burnup and reactivity is compared with that predicted. This process of normalization should be completed after about 10 percent of the total core burnup. Thereafter, actual boron concentration can be compared with prediction, and the reactivity status of the core can be continuously evaluated. Any reactivity anomaly greater than 1 percent $\Delta k/k$ would be unexpected, and its occurrence would be thoroughly investigated and evaluated.

The value of 1 percent $\Delta k/k$ is considered a safe limit since a shutdown margin of at least 1 percent $\Delta k/k$ with the most reactive rod in the fully withdrawn position is always maintained.

4.10 CONTROL ROOM EMERGENCY AIR CONDITIONING SYSTEM SURVEILLANCE

Applicability

Applies to the surveillance of the control room emergency air conditioning system.

Objective

To verify an acceptable level of efficiency and operability of the control room emergency air conditioning system.

Specification

4.10.1 At intervals not to exceed 18 months, the pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 6 inches of water at system design flow (± 10%).

4.10.2 At intervals not to exceed 18 months, automatic initiation of the control room emergency air conditioning system shall be demonstrated.

4.10.3.a The tests and sample analysis of Specification 3.9.1.a,b, & c. shall be performed at intervals not to exceed 18 months or after every 720 hours of system operation and following significant painting, fire or chemical release in any ventilation zone communicating with the system.

b. Cold DOP testing shall also be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.

c. Halogenated hydrocarbon testing shall also be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

4.10.4 Each circuit shall be operated at least 1 hour every month.

Bases

The purpose of the control room filtering system is to limit the particulate and gaseous fission products to which the control area would be subjected during an accidental radioactive release in or near the Auxiliary Building. The system is designed with 100 percent capacity filter trains which consist of a prefilter, high efficiency particulate filters, charcoal adsorbers and a fan.

Since the system is not normally operated, a periodic test is required to insure operability when needed. During this test the system will be inspected for such things as water, oil, or other foreign material; gasket deterioration,

4.11 PENETRATION ROOM VENTILATION SYSTEM SURVEILLANCE

Applicability

Applies to the surveillance of the penetration room ventilation system.

Objective

To verify an acceptable level of efficiency and operability of the penetration room ventilation system.

Specification

4.11.1 At intervals not to exceed 18 months, the pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 6 inches of water at system design flow rate ($\pm$ 10%).

4.11.2 Initially and after any maintenance or testing that could affect the air distribution within the penetration room ventilation system, air distribution shall be demonstrated to be uniform within $\pm$20% across HEPA filters and charcoal adsorbers.

4.11.3 At intervals not to exceed 18 months, automatic initiation of the penetration room ventilation system shall be demonstrated.

4.11.4a The tests and sample analysis of Specification 3.13.1a, b, & c. shall be performed at intervals not to exceed 18 months or after every 720 hours of system operation and following significant painting, fire or chemical release in any ventilation zone communicating with the system.

b. Cold DOP testing shall also be performed after each complete or partial replacement of the HEPA filter bank or after any structural maintenance on the system housing.

c. Halogenated hydrocarbon testing shall also be performed after each complete or partial replacement of the charcoal adsorber bank or after any structural maintenance on the system housing.

4.11.5 Each circuit shall be operated at least 1 hour every month. This test shall be considered satisfactory if control board indication verifies that all components have responded properly to the actuation signal.

Bases

The penetration room ventilation system is designed to collect and process potential reactor building penetration room leakage to minimize environmental activity levels resulting from post accident reactor building leaks. The system consists of a sealed penetration room, two redundant filter trains and two redundant fans discharging to the unit vent. The entire system is activated by a reactor building pressure engineered safety features signal and initially requires no operator action.

Since the system is not normally operated, a periodic test is required to show that the system is available for its engineered safety features function. During this test the system will be inspected for such things as water, oil, or other foreign material, gasket deterioration in the HEPA units, and unusual or excessive noise or vibration when the fan motor is running.

Pressure drop across the combined HEPA filters and charcoal adsorbers of less than 6 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Pressure drop should be determined at least once per 18 months to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. The charcoal adsorber efficiency test procedures should allow for obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. Tests of the charcoal adsorbers with halogenated hydrocarbon refrigerant and of the HEPA filter bank with DOP aerosol shall be performed in accordance with ANSI N510 (1975) "Standard for Testing of Nuclear Air Cleaning Systems." Any HEPA filters found defective shall be replaced with filters qualified according to Regulatory Position C.3.d. of Regulatory Guide 1.52. Radioactive methyl iodide removal efficiency tests shall be performed in accordance with RDT Standard M16-IT. If laboratory test results are unacceptable, all charcoal adsorbents in the system shall be replaced with charcoal adsorbents qualified according to Regulatory Guide 1.52.

Operation of the system each month for 1 hour will demonstrate operability of the active system components and the filter and adsorber system. If significant painting, fire or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals or foreign material, the same tests and sample analysis shall be performed as required for operational use. The determination of significant shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

4.12 HYDROGEN PURGE SYSTEM SURVEILLANCE

Applicability

Applies to the surveillance of the hydrogen purge system.

Objective

To verify an acceptable level of efficiency and operability of the hydrogen purge system.

Specification

4.12.1 At intervals not to exceed 18 months, the following conditions shall be demonstrated:

a. The pressure drop across the combined HEPA filters and charcoal adsorber banks is less than 16 inches of water at system design flow rate (± 10%).

b. Each system inlet heater unit operates at rated power.

4.12.2.a. The tests and sample analysis of Specification 3.14.1.a,b, & c. shall be performed at intervals not to exceed 18 months or after every 720 hours of system operation and following significant painting, fire or chemical release in any ventilation zone communicating with the system.

b. Cold DOP testing shall also be performed after each complete or partial replacement of a HEPA filter bank or after any structural maintenance on the system housing.

c. Halogenated hydrocarbon testing shall also be performed after each complete or partial replacement of a charcoal adsorber bank or after any structural maintenance on the system housing.

4.12.3 Each circuit shall be operated at least 10 hours each month.

4.12.4 Hydrogen concentration instruments shall be calibrated once every 18 months with proper consideration to moisture effect.

Bases

Since the hydrogen purge system is not normally operated, a periodic test is required to show that the system is available for hydrogen control following an accident. During this test, the system will be inspected for such things as water, oil, or other foreign material, gasket deterioration in the HEPA units, and unusual or excessive noise or vibration when the fan motor is running.

Pressure drop across the combined HEPA filters and charcoal adsorbers of less than 6 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Pressure drop should be determined at least once per 18 months to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. The charcoal adsorber efficiency test procedures should allow for obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. Tests of the charcoal adsorbers with halogenated hydrocarbon refrigerant and of the HEPA filter bank with DOP aerosol shall be performed in accordance with ANSI N510 (1975) "Standard for Testing of Nuclear Air Cleaning Systems." Any HEPA filters found defective shall be replaced with filters qualified according to Regulatory Position C.3.d. of Regulatory Guide 1.52. Radioactive methyl iodide removal efficiency tests shall be performed in accordance with RDT Standard M16-IT. If laboratory test results are unacceptable, all charcoal adsorbents in the system shall be replaced with charcoal adsorbents qualified according to Regulatory Guide 1.52.

Operation of the hydrogen purge system each month for at least ten (10) hours will demonstrate operability of the filters and adsorber system including the heater and remove excessive moisture built up on the adsorber.

If significant painting, fire or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals or foreign material, the same tests and sample analysis shall be performed as required for operational use. The determination of significant shall be made by the operator on duty at the time of the incident. Knowledgeable staff members should be consulted prior to making this determination.

4.17 FUEL HANDLING AREA VENTILATION SYSTEM SURVEILLANCE

Applicability

Applies to the surveillance of the fuel handling area ventilation system.

Objective

To verify an acceptable level of efficiency and operability of the fuel handling area ventialtion system.

Specification

4.17.1 At intervals not to exceed 18 months, pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 6 inches of water at system design flow rate ($\pm$ 10%).

4.17.2 Initially and after any maintenance or testing that could affect the air distribution within the fuel handling area ventilation system, air distribution shall be demonstrated to be uniform within $\pm$20% across HEPA filters and charcoal adsorbers.

4.17.3.a. The tests and sample analysis of Specification 3.15.1.a,b, & c. shall be performed within 720 system operating hours prior to irradiated fuel handling operations in the auxiliary building, and prior to irradiated fuel handling in the auxiliary building following significant painting, fire or chemical release in any ventilation zone communicating with the system.

b. Cold DOP testing shall also be performed prior to irradiated fuel handling in the auxiliary building after each complete or partial replacement of a HEPA filter bank or after any structural maintenance on the system housing.

c. Halogenated hydrocarbon testing shall also be performed prior to irradiated fuel handling in the auxiliary building after each complete or partial replacement of a charcoal adsorber bank or after any structural maintenance on the system housing.

4.17.4 The system shall be operated for at least 10 hours prior to initiation of irradiated fuel handling operations in the auxiliary building if it has not been operated for at least 10 hours within the previous 30 days.

Bases

Since the fuel handling area ventilation system may be in operation when fuel is stored in the pool but not being handled, its operability must be verified before handling of irradiated fuel. Operation of the system for 10 hours before irradiated fuel handling operations and performance of Specification 4.17.3 will demonstrate operability of the active system components and the filter and adsorber systems.

Pressure drop across the combined HEPA filters and charcoal adsorbers of less than 6 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Pressure drop and air distribution should be determined once every 18 months to show system performance capability.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. The charcoal adsorber efficiency test procedures should allow for obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. Tests of the charcoal adsorbers with halogenated hydrocarbon refrigerant and of the HEPA filter bank with DOP aerosol shall be performed in accordance with ANSI N510 (1975) "Standard for Testing of Nuclear Air Cleaning Systems." Any HEPA filters found defective shall be replaced with filters qualified according to Regulatory Position C.3.d. of Regulatory Guide 1.52. Radioactive methyl iodide removal efficiency tests shall be performed in accordance with RDT Standard M16-IT. If laboratory test results are unacceptable, all charcoal adsorbents in the system shall be replaced with charcoal adsorbents qualified according to Regulatory Guide 1.52.