Exhibit B

Prairie Island Nuclear Generating Plant

License Amendment Request Dated October 25, 1996

Proposed Changes Marked Up
On Existing Technical Specification Pages

Exhibit B consists of existing Technical Specification pages with the proposed changes highlighted on those pages. The pages affected by this License Amendment Request are listed below:

TS-viii
TS.4.4-1
TS.4.4-2
TS.4.4-3
TS.4.4-4
TS.4.4-5
TS.6.5-8
B.4.4-1
B.4.4-2
B.4.4-3
B.4.4-4
B.4.4-5

TABLE OF CONTENTS (Continued)

4.4 CONTAINMENT SYSTEM TESTS

Applicability

Applies to integrity testing of the steel containments, shield buildings, auxiliary building special ventilation zone, and the associated systems including isolation valves end emergency ventilation systems.

Objective

To assure that potential leakage from containment of either unit to the environs following a hypothetical loss of coolant accident in that unit is held within values assumed in the accident analysis.

Specification

A. Containment Leakage Tests

1. Perform required visual examinations and leakage rate testing in accordance with the Containment Leakage Rate Testing Program.

2. Containment Airlock Leakage Tests

   Perform required containment air lock leakage testing in accordance with the Containment Leakage Rate Testing Program.

3. Containment Isolation Valve Leakage Tests

   Perform required containment isolation valve leakage testing in accordance with the Containment Leakage Rate Testing Program.

~~Periodic and post-operational integrated leakage rate tests of each containment shall be performed in accordance with the requirements of 10CFR50, Appendix J, "Reactor Containment Leakage Testing for Water Cooled Power Reactors," as published in the Federal Register, Volume 38, February 14, 1973.~~

~~1. Type A tests shall initially be performed in accordance with the reduced pressure test program as defined in paragraph III A4(a)(1) of Appendix J. Periodic tests shall be in accord with either the reduced or peak pressure test program defined in Paragraph III A5. Tests shall include the following conditions:~~

   ~~a. The absolute method of leakage rate testing will be used as the method for performing the test. The controlled leak-off method of leakage rate testing will be used for verification. Test will be conducted in accordance with the provisions of ANSI N45.4-1972.~~

b. A Type A test may be terminated in less than 24 hours if the procedures of Bechtel Topical Report BN-TOP-1 Revision 1 are followed completely.

c. An initial leakage rate test will be performed at a pressure of 23 psig (Pt) and a second test at 46 psig (Pa).

d. The design basis accident leakage rate (La) shall be 0.25 weight percent per 24 hours at pressure Pa.

2. Initial and periodic type B (except airlocks) and type C tests of penetrations shall be performed at a pressure of 46 psig (P_a) in accordance with the provisions of Appendix J, Section III.B and Section III.C, and Specification 4.4.A.5. The airlocks shall be tested initially and atsix-month intervals at 46 psig by pressurizing the inner volume. In addition, when CONTAINMENT INTEGRITY is required, each airlock shall be tested every 3 days if it is in use by pressurizing the intergasket space to 10 psig.

3. Type A tests will be considered to be satisfactory if the acceptance criteria delineated in Appendix J, Section III.A are met.

4. Type B and C tests will be considered to be satisfactory if the combined leakage rate of all components subjected to Type B and C tests does not exceed 60% of the L_a and if the following conditions are met.

   a. For pipes connected to systems that are in the auxiliary building special ventilation zone, the total leakage past isolation valves shall be less than 0.1 weight percent per 24 hours at pressure P_a.

   b. For pipes connected to systems that are exterior to both the shield building and the auxiliary building special ventilation zone, the total leakage past isolation valves shall be less than 0.01 weight percent per 24 hours at pressure P_a.

   c. For airlocks, the leakage shall be less than 1% of the L_a at 10 psig for door intergasket tests and 5% of the L_a at 46 psig for overall airlock tests.

5. The retest schedules for Type A, B, and C tests will be in accordance with Section III.D of Appendix J and all approved exemptions. Each shield building shall be retested in accordance with the Type A test schedule for its containment. The auxiliary building special ventilation zone shall be retested in accordance with the Type A test schedule for Unit 1 containment.

6. Type A, B and C tests will be in accordance with Section V of Appendix J. Inspection and reporting requirements of each shield building test shall be the same for Type A tests. The auxiliary building special ventilation zone shall have the same inspection and reporting requirements as for the Type A tests of Unit 1.

B. Emergency Charcoal Filter Systems

1. Periodic tests of the Shield Building Ventilation System shall be performed monthly to demonstrate OPERABILITY. Each redundant train shall be initiated from the control room and determined to be OPERABLE at the time of its periodic test if it meets drawdown performance computed for the test conditions with 75% of the shield building in leakage specified in Figure TS 4.4-1 after initiation and achieve a pressure -2.0 inches of water gage.

2. Periodic test of the Auxiliary Building Special Ventilation System shall be performed at approximately quarterly intervals to demonstrate its OPERABILITY. Each redundant train shall be initiated from the control room and determined to be OPERABLE at the time of periodic test if it isolates the normal ventilation system and produces a measurable negative pressure in the ABSVZ within 6 minutes after initiation.

3. At least once per operating cycle, or once each 18 months, whichever comes first, tests of the filter units in the Shield Building Ventilation System and the Auxiliary Building Special Ventilation System shall be performed as indicated below:

   a. The pressure drop across the combined HEPA filters and charcoal adsorbers shall be demonstrated to be less 6 inches of water at system design flow rate (±10%).

   b. The inlet heaters and associated controls for each train shall be determined to be OPERABLE.

   c. Verify that each train of each ventilation system automatically starts on a simulated signal of safety injection and high radiation (Auxiliary Building Special Ventilation only).

4. a. The tests listed below shall be performed at least once per operating
cycle, or once every 18 months whichever occurs first, or after every 720 hours of system operation or following painting, fire or chemical release in any ventilation zone communicating with the system that could contaminate the HEPA filters or charcoal adsorbers.

      (1) In-place DOP and halogenated hydrocarbons tests at design flows on HEPA filters and charcoal adsorbers banks respectively shall show ≥99% DOP removal for particles having a mean diameter of 0.7 microns and ≥99% halogenated hydrocarbons removal.

      (2) Laboratory carbon sample analysis shall show ≥90% radioactive methyl iodide removal efficiency (130°C, 95% RH).

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

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

d. Each circuit shall be operated with the heaters on at least 10 hours every month.

5. Perform an air distribution test on the HEPA filter bank after any maintenance or testing that could affect the air distribution within the systems. The test shall be performed at rated flow rate (±10%). The results of the test shall show the air distribution is uniform within ±20%.

C. Containment Vacuum Breakers

The air-operated valve in each vent line shall be tested at quarterly intervals to demonstrate that a simulated containment vacuum of 0.5 psi will open the valve and a simulated accident signal will close the valve. The check valves as well as the butterfly valves will be leak-tested ~~during each refueling shutdown~~ in accordance with the requirements of Specification 4.4.A.~~2~~3.

D. Residual Heat Removal System

1. Those portions of the residual heat removal system external to the isolation valves at the containment, shall be hydrostatically tested for leakage during each refueling shutdown.

2. Visual inspection shall be made for excessive leakage from components of the system. Any visual leakage that cannot be stopped at test conditions shall be measured by collection and weighing or by another equivalent method.

3. The acceptance criterion is that maximum allowable leakage from either train of the recirculation heat removal system components (which includes valve stems; flanges and pump seals) shall not exceed two gallons per hour when the system is at 350 psig.

4. Repairs shall be made as required to maintain leakage within the acceptance criterion in Specification 4.4.D.3

5. If repairs are not completed within 7 days, the reactor shall be shut down and depressurized until repairs are effected and the acceptance criterion in 3. above is satisfied.

E. Containment Isolation Valves

During each refueling shutdown, the containment isolation valves, shield building ventilation valves, and the auxiliary building normal ventilation system isolation valves shall be tested for operability by applying a simulated accident signal to them.

F. Post Accident Containment Ventilation System

During each refueling shutdown, the operability of system recirculating fans and valves, including actuation and indication, shall be demonstrated.

G. Containment and Shield Building Air Temperature

Prior to establishing reactor conditions requiring containment integrity, the average air temperature difference between the containment and its associated Shield Building shall be verified to be within acceptable limits.

H. Containment Shell Temperature

Prior to establishing reactor conditions requiring containment integrity, the temperature of the containment vessel wall shall be verified to be within acceptable limits.

I. Electric Hydrogen Recombiners

Each hydrogen recombiner train shall be demonstrated Operable at least once each refueling interval by:

a. Verifying during a recombiner system functional test that the minimum heater sheath temperature increases to greater than or equal to 700°F within 90 minutes. Upon reaching 700°F, increase the power setting to maximum power for 2 minutes and verify that the power meter reads greater than or equal to 60kw.

b. Verifying through a visual examination that there is no evidence of abnormal conditions within the recombiner enclosures (i.e., loose wiring or structural connections, deposits of foreign materials, etc.), and

c. Verifying the integrity of all heater electrical circuits by performing a resistance to ground test. The resistance to ground for any heater phase shall be greater than or equal to 10,000 ohms.

6.5.J. Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995.

The peak calculated containment internal pressure for the design basis loss of coolant accident is less than the containment internal design pressure, P_a, of 46 psig.

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 0.25% of primary containment air weight per day. For pipes connected to systems that are in the auxiliary building special ventilation zone, the total leakage shall be less than 0.1% of primary containment air weight per day at pressure P_a. For pipes connected to systems that are exterior to both the shield building and the auxiliary building special ventilation zone, the total leakage past isolation valves shall be less than 0.01% of primary containment air weight per day at pressure P_a.

Leakage Rate acceptance criteria are:

a. Primary containment leakage rate acceptance criterion is $\leq 1.0\ L_a$. Prior to unit startup, following testing in accordance with the program, the combined leakage rate acceptance criteria are $\leq 0.60\ L_a$ for all components subject to Type B and Type C tests and $\leq 0.75\ L_a$ for Type A tests;

b. Air lock testing acceptance criteria are:

   1) Overall air lock leakage rate is $\leq 0.05\ L_a$ when tested at $\geq$46 psig

   2) For each door intergasket test, leakage rate is $\leq 0.01\ L_a$ when pressurized to $\geq$10 psig.

The provisions of 4.0.A do not apply to the test frequencies specified in the Containment Leakage Rate Testing Program. The Containment Leakage Rate Testing Program stipulates acceptable extension of test intervals.

The provisions of 4.0.B (except that the allowed surveillance intervals are defined by the Containment Leakage Rate Testing Program) are applicable to the Containment Leakage Rate Testing Program.

4.4 CONTAINMENT SYSTEM TESTS

Bases

The Containment System consists of a steel containment vessel, a concrete shield building, the Auxiliary Building Special Ventilation Zone (ABSVZ), a Shield Building Ventilation System, and an Auxiliary Building Special Ventilation System. In the event of a loss-of-coolant accident, a vacuum in the shield building annulus will cause most leakage from the containment vessel to be mixed in the annulus volume and recirculated through a filter system before its deferred release to the environment through the exhaust fan that maintains vacuum. Some of the leakage goes to the ABSVZ from which it is exhausted through a filter. A small fraction bypasses both filter systems.

The freestanding containment vessel is designed to accommodate the maximum internal pressure that would result from the Design Basis Accident (Reference 1). For initial conditions typical of normal operation, 120°F and 15 psia, an instantaneous double-ended break with minimum safeguards results in a peak pressure of less than 46 psig at 268°F.

The containment was initially ~~will be strength-tested at 51.8 psig and~~ leak-tested at 46.0 psig to meet acceptance specifications.

Maintaining the containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of theContainment Leakage Rate Testing Program. Failure to meet air lock leakage testing or secondary containment bypass leakage testing criteria does not necessarily result in a failure to satisfy this surveillance requirement. The impact of the failure to meet any of these individual requirements must be evaluated against the Type A, B, and C acceptance criteria of the Containment Leakage Testing Program.

As left leakage prior to the first startup after performing a required leakage test is required to be $\leq 0.6\ L_a$ for combined Type B and C leakage, and $\leq 0.75\ L_a$ for overall Type A leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of $\leq 1.0\ L_a$. At $\leq 1.0\ L_a$ the offsite dose consequences are bounded by the safety analysis. The surveillance testing frequency is stipulated by the Containment leakage Rate Testing Program.

Maintaining containment air locks OPERABLE requires compliance with the leakage rate test requirements of the Containment Leakage Rate Testing Program. This surveillance requirement reflects the leakage rate testing requirements with respect to air lock leakage (Type B leakage tests). The acceptance criteria were established in the Safety Evaluation Report for License Amendment Nos. 62 and 56 dated February 23, 1983. The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall primary containment leakage rate. The surveillance testing frequency is stipulated by the Containment Leakage Rate Testing Program.

4.4 CONTAINMENT SYSTEM TESTS

Bases continued

An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA.

The results of the air lock leakage tests are evaluated against the acceptance criteria of the Containment Leakage Rate Testing Program to ensure that the air lock leakage is properly accounted for in determining the combined Type B and Type C primary containment leakage.

The surveillance requirements for secondary containment leakage bypass paths ensure that these leakage rates are less than the specified leakage rate. This provides assurance that the assumptions in the radiological evaluations of the safety analysis met. The leakage rate of each bypass leakage path is assumed to be the maximum pathway leakage (leakage through the worst of the two isolation valves) unless the penetration is isolated by use of one closed and de-activated automatic valve, a closed manual valve, or a blind flange (or similar device). In this case, the leakage rate of the isolated bypass leakage path is assumed to be the actual pathway leakage through the isolation device. If both isolation valves in the penetration are closed, the actual leakage rate is the lesser leakage rate of the two valves. The surveillance testing frequency is stipulated by the Containment Leakage Rate Testing Program.

License Amendment Nos. 62 and 56 dated February 23, 1983 revised the Prairie Island Technical Specifications to conform to the requirements of Appendix J to 10 CFR Part 50. That License Amendment approved several clarifications and exemptions to the Type B and C testing requirements of Appendix J to 10 CFR Part 50. Those clarifications and exemptions were incorporated into the Prairie Island Technical Specifications in the form of Notes 1, 2 and 5 of Table TS.4.4-1. Table TS.4.4-1 was subsequently relocated from the Prairie Island Technical Specifications in response to Generic Letter 91-08, "Removal of Component Lists From Technical Specifications". While the reference of these notes to specific containment penetrations was relocated out of the Technical Specifications with Table TS.4.4-1, the specific clarifications and exemptions approved by License Amendment Nos. 62 and 56 are still binding. The applicability of the Type B and C testing clarifications and exemptions contained in Notes 1, 2 and 5 of relocated Table TS.4.4-1, to specific containment penetrations, is maintained in the Prairie Island Updated Safety Analysis Report.

The safety analysis (References 2, 3) is based on a conservatively chosen reference set of assumptions regarding the sequence of events relating to activity release and attainment and maintenance of vacuum in the shield building annulus and the Auxiliary Building Special Ventilation Zone, the effectiveness of filtering, and the leak rate of the containment vessel as a function of time. The effects of variation in these assumptions, including that for leak rate, has been investigated thoroughly. A summary of the items of conservatism involved in the reference calculation and the magnitude of their effect upon off-site dose demonstrates the collective effectiveness of conservatism in these assumptions.

4.4 CONTAINMENT SYSTEM TESTS

Bases continued

Several penetrations of the containment vessel and the shield building could, in the event of leakage past their isolation valves, result in leakage being conveyed across the annulus by the penetrations themselves, thus bypassing the function of the Shield Building Ventilation System (Reference 5). Such leakage is estimated not to exceed .025% per day. A special zone of the auxiliary building has minimum-leakage construction and controlled access, and is designated as a special ventilation zone where such leakage would be collected by either of two redundant trains of the Auxiliary Building Special Ventilation System. This system, when activated, will supplant the normal ventilation and draw a vacuum throughout the zone such that all outleakage will be through particulate and charcoal filters which exhaust to the shield building exhaust stack.

The design basis loss-of-coolant accident was initially evaluated by the AEC staff (Reference 3) assuming primary containment leak rate of 0.5% per day at the peak accident pressure. Another conservative assumption in the calculation is that primary containment leakage directly to the ABSVZ is 0.1% per day and leakage directly to the environs is 0.01% per day. The resulting two-hour doses at the nearest SITE BOUNDARY and 30-day doses at the low population zone radius of 1½ miles are less than guidelines presented in 10CFR100.

Initial leakage testing of the shield building and the ABSV resulted in a greater inleakage than the design basis. The staff has reevaluated doses for these higher inleakage rates and found that for a primary containment leak rate of 0.25% per day at peak accident pressure, the offsite doses are about the same as those initially calculated for higher primary containment leakage and lower secondary containment in-leakage (Reference 6).

The Residual Heat Removal Systems functionally become a part of the containment volume during the post-accident period when their operation is changed over from the injection phase to the recirculation phase. Redundancy and independence of the systems permit a leaking system to be isolated from the containment during this period, and the possible consequences of leakage are minor relative to those of the Design Basis Accident (Reference 4); however, their partial role in containment warrants surveillance of their leak-tightness.

The limiting leakage rates from the recirculation heat removal system are judgment values based primarily on assuring that the components could operate without mechanical failure for a period on the order of 200 days after a design basis accident. The test pressure, 350 psig, gives an adequate margin over the highest pressure within the system after a design basis accident. A recirculation heat removal system leakage of 2 gal/hr will limit off-site exposure due to leakage to insignificant levels relative to those calculated for leakage directly from the containment in the design basis accident.

4.4 CONTAINMENT SYSTEM TESTS

Bases continued

The Shield Building Ventilation System consists of two independent systems that have only a discharge point in common, the shield building vent. Both systems are normally activated and one alone must be capable of accomplishing the design function of the system. During the first operating cycle, tests were performed to demonstrate the capability of the separate and combined systems under different wind conditions. During quarterly OPERABILITY tests, the drawdown transient of shield building pressure is compared to the computed predicted drawdown transient for non-accident conditions and leakage equal to 75% of Figure TS.4.4-1 (840 cfm at -2.0 INWG). The -2.0 INWG setpoint of the recirculation damper must be reached and the equilibrium pressure in the annulus must be less than -1.82 INWG to demonstrate adequate shield building leak tightness.

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 operating cycle to verify OPERABILITY.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. A charcoal adsorber tray which can accommodate a sufficient number of representative adsorber sample modules for estimating the amount of penetration of the system adsorbent through its life is currently under development. When this tray is available, sample modules will be installed with the same batch characteristics as the system adsorbent and will be withdrawn for the methyl iodide removal efficiency tests. Each module withdrawn will be replaced or blocked off. Until these trays can be installed, to guarantee a representative adsorbent sample, procedures should allow for the removal of a tray containing the oldest batch of adsorbent in each train, emptying of one bed from the tray, mixing the adsorbent thoroughly, and obtaining at least two samples. One sample will be submitted for laboratory analysis and the other held as a backup. If test results are unacceptable, all adsorbent in the train will be replaced. Adsorbent in the tray removed for sampling will be renewed. Any HEPA filters found defective will be replaced. Replacement charcoal adsorber and HEPA filters will be qualified in accordance with the intent of Regulatory Guide 1.52 - Rev. 1 June 1976.

4.4 CONTAINMENT SYSTEM TESTS

Bases continued

If significant painting, fire, or chemical release occurs such that the HEPA filters or charcoal adsorbers could become contaminated from the fumes, chemicals, or foreign material, the same tests and sample analysis will be performed as required for operational use.

Operation of each train of the system for 10 hours every month will demonstrate OPERABILITY of the system and remove excessive moisture which may build up on the adsorber.

Periodic checking of the inlet heaters and associated controls for each train will provide assurance that the system has the capability of reducing inlet air humidity so that charcoal adsorber efficiency is enhanced.

The in-place test results should indicate a HEPA filter leakage of less than 1% through DOP testing and a charcoal adsorber leakage of less than 1% through halogenated hydrocarbon testing. The laboratory carbon sample test results should indicate a radioactive methyl iodide removal efficiency of at least 90% under test conditions which are more severe than accident conditions. The satisfactory completion of these periodic tests combined with the qualification testing conducted on new filters and adsorber provide a high level of assurance that the emergency air treatment systems will perform as predicted in the accident analyses.

In-place testing procedures will be established utilizing applicable sections of ANSI N510 - 1975 standard as a procedural guideline only.

A minimum containment shell temperature of 30°F has been specified to provide assurance that an adequate margin above NDTT exists. Evalua- tion of data collected during the first fuel cycle of Unit No. 1 shows that this limit can be approached only when the plant is in COLD SHUTDOWN. Requiring containment shell temperature to be verified to be above 30°F prior to plant heatup from COLD SHUTDOWN provides assurance that this temperature is above NDTT prior to establishing conditions requiring CONTAINMENT INTEGRITY (Reference 7).

A maximum temperature differential between the average containment and annulus air temperatures of 44°F has been specified to provide assurance that offsite doses in the event of an accident remain below those cal- culated in the USAR. Evaluation of data collected during the first fuel cycle of Unit No. 1 shows that this limit can be approached only when the plant is in COLD SHUTDOWN. Requiring this temperature differen- tial to be verified to be less than 44°F prior to plant heatup from COLD SHUTDOWN provides assurance that this parameter is within accep- table limits prior to establishing conditions requiring CONTAINMENT INTEGRITY (Reference 7).

References

1. USAR, Section 5 and FSAR, Appendix 14-C
2. USAR, Section 14 and FSAR, Appendix G
3. Safety Evaluation Report, Sections 6.2 and 15.0
4. USAR, Section 14
5. USAR, Section 5.4.3
6. Letter to NSP from AEC dated November 29, 1973

Exhibit C

Prairie Island Nuclear Generating Plant

License Amendment Request Dated October 25, 1996

Revised Technical Specification Pages

Exhibit C consists of revised pages for the Prairie Island Nuclear Generating Plant Technical Specifications with the proposed changes incorpcrated. The revised pages are listed below:

TS-viii
TS.4.4-1
TS.4.4-2
TS.4.4-3
TS.4.4-4
TS.6.5-8
B.4.4-1
B.4.4-2
B.4.4-3
B.4.4-4
B.4.4-5

TABLE OF CONTENTS (Continued)

4.4 CONTAINMENT SYSTEM TESTS

Applicability

Applies to integrity testing of the steel containments, shield buildings, auxiliary building special ventilation zone, and the associated systems including isolation valves end emergency ventilation systems.

Objective

To assure that potential leakage from containment of either unit to the environs following a hypothetical loss of coolant accident in that unit is held within values assumed in the accident analysis.

Specification

A. Containment Leakage Tests

1. Perform required visual examinations and leakage rate testing in accordance with the Containment Leakage Rate Testing Program.

2. Containment Airlock Leakage Tests

   Perform required containment air lock leakage testing in accordance with the Containment Leakage Rate Testing Program.

3. Containment Isolation Valve Leakage Tests

   Perform required containment isolation valve leakage testing in accordance with the Containment Leakage Rate Testing Program.

B. Emergency Charcoal Filter Systems

1. Periodic tests of the Shield Building Ventilation System shall be performed monthly to demonstrate OPERABILITY. Each redundant train shall be initiated from the control room and determined to be OPERABLE at the time of its periodic test if it meets drawdown performance computed for the test conditions with 75% of the shield building in leakage specified in Figure TS 4.4-1 after initiation and achieve a pressure -2.0 inches of water gage.

2. Periodic test of the Auxiliary Building Special Ventilation System shall be performed at approximately quarterly intervals to demonstrate its OPERABILITY. Each redundant train shall be initiated from the control room and determined to be OPERABLE at the time of periodic test if it isolates the normal ventilation system and produces a measurable negative pressure in the ABSVZ within 6 minutes after initiation.

3. At least once per operating cycle, or once each 18 months, whichever comes first, tests of the filter units in the Shield Building Ventilation System and the Auxiliary Building Special Ventilation System shall be performed as indicated below:

   a. The pressure drop across the combined HEPA filters and charcoal adsorbers shall be demonstrated to be less 6 inches of water at system design flow rate (±10%).

   b. The inlet heaters and associated controls for each train shall be determined to be OPERABLE.

   c. Verify that each train of each ventilation system automatically starts on a simulated signal of safety injection and high radiation (Auxiliary Building Special Ventilation only).

4. a. The tests listed below shall be performed at least once per operating cycle, or once every 18 months whichever occurs first, or after every 720 hours of system operation or following painting, fire or chemical release in any ventilation zone communicating with the system that could contaminate the HEPA filters or charcoal adsorbers.

      (1) In-place DOP and halogenated hydrocarbons tests at design flows on HEPA filters and charcoal adsorbers banks respectively shall show ≥99% DOP removal for particles having a mean diameter of 0.7 microns and ≥99% halogenated hydrocarbons removal.

      (2) Laboratory carbon sample analysis shall show ≥90% radioactive methyl iodide removal efficiency (130°C, 95% RH).

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

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

d. Each circuit shall be operated with the heaters on at least 10 hours every month.

5. Perform an air distribution test on the HEPA filter bank after any maintenance or testing that could affect the air distribution within the systems. The test shall be performed at rated flow rate (±10%). The results of the test shall show the air distribution is uniform within ±20%.

C. Containment Vacuum Breakers

The air-operated valve in each vent line shall be tested at quarterly intervals to demonstrate that a simulated containment vacuum of 0.5 psi will open the valve and a simulated accident signal will close the valve. The check valves as well as the butterfly valves will be leak-tested in accordance with the requirements of Specification 4.4.A.3.

D. Residual Heat Removal System

1. Those portions of the residual heat removal system external to the isolation valves at the containment, shall be hydrostatically tested for leakage during each refueling shutdown.

2. Visual inspection shall be made for excessive leakage from components of the system. Any visual leakage that cannot be stopped at test conditions shall be measured by collection and weighing or by another equivalent method.

3. The acceptance criterion is that maximum allowable leakage from either train of the recirculation heat removal system components (which includes valve stems; flanges and pump seals) shall not exceed two gallons per hour when the system is at 350 psig.

4. Repairs shall be made as required to maintain leakage within the acceptance criterion in Specification 4.4.D.3

5. If repairs are not completed within 7 days, the reactor shall be shut down and depressurized until repairs are effected and the acceptance criterion in 3. above is satisfied.

E. Containment Isolation Valves

During each refueling shutdown, the containment isolation valves, shield building ventilation valves, and the auxiliary building normal ventilation system isolation valves shall be tested for operability by applying a simulated accident signal to them.

F. Post Accident Containment Ventilation System

During each refueling shutdown, the operability of system recirculating fans and valves, including actuation and indication, shall be demonstrated.

G Containment and Shield Building Air Temperature

Prior to establishing reactor conditions requiring containment integrity, the average air temperature difference between the containment and its associated Shield Building shall be verified to be within acceptable limits.

H. Containment Shell Temperature

Prior to establishing reactor conditions requiring containment integrity, the temperature of the containment vessel wall shall be verified to be within acceptable limits.

I. Electric Hydrogen Recombiners

Each hydrogen recombiner train shall be demonstrated Operable at least once each refueling interval by:

a. Verifying during a recombiner system functional test that the minimum heater sheath temperature increases to greater than or equal to 700°F within 90 minutes. Upon reaching 700°F, increase the power setting to maximum power for 2 minutes and verify that the power meter reads greater than or equal to 60kw.

b. Verifying through a visual examination that there is no evidence of abnormal conditions within the recombiner enclosures (i.e., loose wiring or structural connections, deposits of foreign materials, etc.), and

c. Verifying the integrity of all heater electrical circuits by performing a resistance to ground test. The resistance to ground for any heater phase shall be greater than or equal to 10,000 ohms.

6.5.J. Containment Leakage Rate Testing Program

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," dated September 1995.

The peak calculated containment internal pressure for the design basis loss of coolant accident is less than the containment internal design pressure, P_a, of 46 psig.

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 0.25% of primary containment air weight per day. For pipes connected to systems that are in the auxiliary building special ventilation zone, the total leakage shall be less than 0.1% of primary containment air weight per day at pressure P_a. For pipes connected to systems that are exterior to both the shield building and the auxiliary building special ventilation zone, the total leakage past isolation valves shall be less than 0.01% of primary containment air weight per day at pressure P_a.

Leakage Rate acceptance criteria are:

a. Primary containment leakage rate acceptance criterion is $\leq$ 1.0 L_a. Prior to unit startup, following testing in accordance with the program, the combined leakage rate acceptance criteria are $\leq$ 0.60 L_a for all components subject to Type B and Type C tests and $\leq$ 0.75 L_a for Type A tests;

b. Air lock testing acceptance criteria are:

   1) Overall air lock leakage rate is $\leq$ 0.05 L_a when tested at $\geq$46 psig

   2) For each door intergasket test, leakage rate is $\leq$ 0.01 L_a when pressurized to $\geq$10 psig.

The provisions of 4.0.A do not apply to the test frequencies specified in the Containment Leakage Rate Testing Program. The Containment Leakage Rate Testing Program stipulates acceptable extension of test intervals.

The provisions of 4.0.B (except that the allowed surveillance intervals are defined by the Containment Leakage Rate Testing Program) are applicable to the Containment Leakage Rate Testing Program.

4.4 CONTAINMENT SYSTEM TESTS

Bases

The Containment System consists of a steel containment vessel, a concrete shield building, the Auxiliary Building Special Ventilation Zone (ABSVZ), a Shield Building Ventilation System, and an Auxiliary Building Special Ventilation System. In the event of a loss-of-coolant accident, a vacuum in the shield building annulus will cause most leakage from the containment vessel to be mixed in the annulus volume and recirculated through a filter system before its deferred release to the environment through the exhaust fan that maintains vacuum. Some of the leakage goes to the ABSVZ from which it is exhausted through a filter. A small fraction bypasses both filter systems.

The freestanding containment vessel is designed to accommodate the maximum internal pressure that would result from the Design Basis Accident (Reference 1). For initial conditions typical of normal operation, 120°F and 15 psia, an instantaneous double-ended break with minimum safeguards results in a peak pressure of less than 46 psig at 268°F.

The containment was initially leak-tested at 46.0 psig to meet acceptance specifications.

Maintaining the containment OPERABLE requires compliance with the visual examinations and leakage rate test requirements of theContainment Leakage Rate Testing Program. Failure to meet air lock leakage testing or secondary containment bypass leakage testing criteria does not necessarily result in a failure to satisfy this surveillance requirement. The impact of the failure to meet any of these individual requirements must be evaluated against the Type A, B, and C acceptance criteria of the Containment Leakage Testing Program.

As left leakage prior to the first startup after performing a required leakage test is required to be $\leq 0.6\ L_a$ for combined Type B and C leakage, and $\leq 0.75\ L_a$ for overall Type A leakage. At all other times between required leakage rate tests, the acceptance criteria is based on an overall Type A leakage limit of $\leq 1.0\ L_a$. At $\leq 1.0\ L_a$ the offsite dose consequences are bounded by the safety analysis. The surveillance testing frequency is stipulated by the Containment leakage Rate Testing Program.

Maintaining containment air locks OPERABLE requires compliance with the leakage rate test requirements of the Containment Leakage Rate Testing Program. This surveillance requirement reflects the leakage rate testing requirements with respect to air lock leakage (Type B leakage tests). The acceptance criteria were established in the Safety Evaluation Report for License Amendment Nos. 62 and 56 dated February 23, 1983. The periodic testing requirements verify that the air lock leakage does not exceed the allowed fraction of the overall primary containment leakage rate. The surveillance testing frequency is stipulated by the Containment Leakage Rate Testing Program.

4.4 CONTAINMENT SYSTEM TESTS

Bases continued

An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. This is reasonable since either air lock door is capable of providing a fission product barrier in the event of a DBA.

The results of the air lock leakage tests are evaluated against the acceptance criteria of the Containment Leakage Rate Testing Program to ensure that the air lock leakage is properly accounted for in determining the combined Type B and Type C primary containment leakage.

The surveillance requirements for secondary containment leakage bypass paths ensure that these leakage rates are less than the specified leakage rate. This provides assurance that the assumptions in the radiological evaluations of the safety analysis met. The leakage rate of each bypass leakage path is assumed to be the maximum pathway leakage (leakage through the worst of the two isolation valves) unless the penetration is isolated by use of one closed and de-activated automatic valve, a closed manual valve, or a blind flange (or similar device). In this case, the leakage rate of the isolated bypass leakage path is assumed to be the actual pathway leakage through the isolation device. If both isolation valves in the penetration are closed, the actual leakage rate is the lesser leakage rate of the two valves. The surveillance testing frequency is stipulated by the Containment Leakage Rate Testing Program.

License Amendment Nos. 62 and 56 dated February 23, 1983 revised the Prairie Island Technical Specifications to conform to the requirements of Appendix J to 10 CFR Part 50. That License Amendment approved several clarifications and exemptions to the Type B and C testing requirements of Appendix J to 10 CFR Part 50. Those clarifications and exemptions were incorporated into the Prairie Island Technical Specifications in the form of Notes 1, 2 and 5 of Table TS.4.4-1. Table TS.4.4-1 was subsequently relocated from the Prairie Island Technical Specifications in response to Generic Letter 91-08, "Removal of Component Lists From Technical Specifications". While the reference of these notes to specific containment penetrations was relocated out of the Technical Specifications with Table TS.4.4-1, the specific clarifications and exemptions approved by License Amendment Nos. 62 and 56 are still binding. The applicability of the Type B and C testing clarifications and exemptions contained in Notes 1, 2 and 5 of relocated Table TS.4.4-1, to specific containment penetrations, is maintained in the Prairie Island Updated Safety Analysis Report.

The safety analysis (References 2, 3) is based on a conservatively chosen reference set of assumptions regarding the sequence of events relating to activity release and attainment and maintenance of vacuum in the shield building annulus and the Auxiliary Building Special Ventilation Zone, the effectiveness of filtering, and the leak rate of the containment vessel as a function of time. The effects of variation in these assumptions, including that for leak rate, has been investigated thoroughly. A summary of the items of conservatism involved in the reference calculation and the magnitude of their effect upon off-site dose demonstrates the collective effectiveness of conservatism in these assumptions.

4.4 CONTAINMENT SYSTEM TESTS

Bases continued

Several penetrations of the containment vessel and the shield building could, in the event of leakage past their isolation valves, result in leakage being conveyed across the annulus by the penetrations themselves, thus bypassing the function of the Shield Building Ventilation System (Reference 5). Such leakage is estimated not to exceed .025% per day. A special zone of the auxiliary building has minimum-leakage construction and controlled access, and is designated as a special ventilation zone where such leakage would be collected by either of two redundant trains of the Auxiliary Building Special Ventilation System. This system, when activated, will supplant the normal ventilation and draw a vacuum throughout the zone such that all outleakage will be through particulate and charcoal filters which exhaust to the shield building exhaust stack.

The design basis loss-of-coolant accident was initially evaluated by the AEC staff (Reference 3) assuming primary containment leak rate of 0.5% per day at the peak accident pressure. Another conservative assumption in the calculation is that primary containment leakage directly to the ABSVZ is 0.1% per day and leakage directly to the environs is 0.01% per day. The resulting two-hour doses at the nearest SITE BOUNDARY and 30-day doses at the low population zone radius of 1½ miles are less than guidelines presented in 10CFR100.

Initial leakage testing of the shield building and the ABSV resulted in a greater inleakage than the design basis. The staff has reevaluated doses for these higher inleakage rates and found that for a primary containment leak rate of 0.25% per day at peak accident pressure, the offsite doses are about the same as those initially calculated for higher primary containment leakage and lower secondary containment in-leakage (Reference 6).

The Residual Heat Removal Systems functionally become a part of the containment volume during the post-accident period when their operation is changed over from the injection phase to the recirculation phase. Redundancy and independence of the systems permit a leaking system to be isolated from the containment during this period, and the possible consequences of leakage are minor relative to those of the Design Basis Accident (Reference 4); however, their partial role in containment warrants surveillance of their leak-tightness.

The limiting leakage rates from the recirculation heat removal system are judgment values based primarily on assuring that the components could operate without mechanical failure for a period on the order of 200 days after a design basis accident. The test pressure, 350 psig, gives an adequate margin over the highest pressure within the system after a design basis accident. A recirculation heat removal system leakage of 2 gal/hr will limit off-site exposure due to leakage to insignificant levels relative to those calculated for leakage directly from the containment in the design basis accident.

4.4 CONTAINMENT SYSTEM TESTS

Bases continued

The Shield Building Ventilation System consists of two independent systems that have only a discharge point in common, the shield building vent. Both systems are normally activated and one alone must be capable of accomplishing the design function of the system. During the first operating cycle, tests were performed to demonstrate the capability of the separate and combined systems under different wind conditions. During quarterly OPERABILITY tests, the drawdown transient of shield building pressure is compared to the computed predicted drawdown transient for non-accident conditions and leakage equal to 75% of Figure TS.4.4-1 (840 cfm at -2.0 INWG). The -2.0 INWG setpoint of the recirculation damper must be reached and the equilibrium pressure in the annulus must be less than -1.82 INWG to demonstrate adequate shield building leak tightness.

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 operating cycle to verify OPERABILITY.

The frequency of tests and sample analysis are necessary to show that the HEPA filters and charcoal adsorbers can perform as evaluated. A charcoal adsorber tray which can accommodate a sufficient number of representative adsorber sample modules for estimating the amount of penetration of the system adsorbent through its life is currently under development. When this tray is available, sample modules will be installed with the same batch characteristics as the system adsorbent and will be withdrawn for the methyl iodide removal efficiency tests. Each module withdrawn will be replaced or blocked off. Until these trays can be installed, to guarantee a representative adsorbent sample, procedures should allow for the removal of a tray containing the oldest batch of adsorbent in each train, emptying of one bed from the tray, mixing the adsorbent thoroughly, and obtaining at least two samples. One sample will be submitted for laboratory analysis and the other held as a backup. If test results are unacceptable, all adsorbent in the train will be replaced. Adsorbent in the tray removed for sampling will be renewed. Any HEPA filters found defective will be replaced. Replacement charcoal adsorber and HEPA filters will be qualified in accordance with the intent of Regulatory Guide 1.52 - Rev. 1 June 1976.

4.4 CONTAINMENT SYSTEM TESTS

Bases continued

If significant painting, fire, or chemical release occurs such that the HEPA filters or charcoal adsorbers could become contaminated from the fumes, chemicals, or foreign material, the same tests and sample analysis will be performed as required for operational use.

Operation of each train of the system for 10 hours every month will demonstrate OPERABILITY of the system and remove excessive moisture which may build up on the adsorber.

Periodic checking of the inlet heaters and associated controls for each train will provide assurance that the system has the capability of reducing inlet air humidity so that charcoal adsorber efficiency is enhanced.

The in-place test results should indicate a HEPA filter leakage of less than 1% through DOP testing and a charcoal adsorber leakage of less than 1% through halogenated hydrocarbon testing. The laboratory carbon sample test results should indicate a radioactive methyl iodide removal efficiency of at least 90% under test conditions which are more severe than accident conditions. The satisfactory completion of these periodic tests combined with the qualification testing conducted on new filters and adsorber provide a high level of assurance that the emergency air treatment systems will perform as predicted in the accident analyses.

In-place testing procedures will be established utilizing applicable sections of ANSI N510 - 1975 standard as a procedural guideline only.

A minimum containment shell temperature of 30°F has been specified to provide assurance that an adequate margin above NDTT exists. Evalua- tion of data collected during the first fuel cycle of Unit No. 1 shows that this limit can be approached only when the plant is in COLD SHUTDOWN. Requiring containment shell temperature to be verified to be above 30°F prior to plant heatup from COLD SHUTDOWN provides assurance that this temperature is above NDTT prior to establishing conditions requiring CONTAINMENT INTEGRITY (Reference 7).

A maximum temperature differential between the average containment and annulus air temperatures of 44°F has been specified to provide assurance that offsite doses in the event of an accident remain below those calculated in the USAR. Evaluation of data collected during the first fuel cycle of Unit No. 1 shows that this limit can be approached only when the plant is in COLD SHUTDOWN. Requiring this temperature differen- tial to be verified to be less than 44°F prior to plant heatup from COLD SHUTDOWN provides assurance that this parameter is within acceptable limits prior to establishing conditions requiring CONTAINMENT INTEGRITY (Reference 7).

References

1. USAR, Section 5 and FSAR, Appendix 14-C
2. USAR, Section 14 and FSAR, Appendix G
3. Safety Evaluation Report, Sections 6.2 and 15.0
4. USAR, Section 14
5. USAR, Section 5.4.3
6. Letter to NSP from AEC dated November 29, 1973