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10CFR50,Ap J exemption request.W/four oversize drawings.

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United States Nuclear Regulatory Commission
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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING 10CFR50, APPENDIX J TEST PROGRAM EXEMPTION

Gentlemen:

Your letter dated April 8, 1987 transmitted questions regarding our 10CFR50, Appendix J exemption request dated June 30, 1983. Our responses are enclosed.

Yours very truly,

S. R. Zimmerman
Manager
Nuclear Licensing Section

SRZ/JSK/lah (5246JSK)

Enclosure

cc: Dr. J. Nelson Grace
Mr. K. Eccleston
Mr. H. Krug

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RESPONSE TO QUESTIONS REGARDING
10CFR50, APPENDIX J PROGRAM

QUESTION

1. Concerning the two specific Type A (containment integrated leakage rate) test exemption requests (Enclosure 1 to Ref.), the staff considers that the first may be acceptable if its intent can be clarified, and that the second is unacceptable.

   a. The first exemption request may be acceptable; its intent is not clear to the staff. In order for your approach to be acceptable, the locally measured "as found" leakage rates of penetrations isolated during a Type A test should be added to the Type A test results (i.e., 95 percent upper confidence limit); when the total exceeds the acceptance criterion of Appendix J, then this should constitute an "as found" Type A test failure. A similarly determined "as left" Type A result must also meet the acceptance criterion of Appendix J before the plant may leave cold shutdown and restart.

   Provide a clarification of this exemption request. A revised basis is needed for the staff to approve the request.

RESPONSE

1. a. The clarification sought through this exemption request is provided in Section III.A.7(c) of the proposed revision to Appendix J. As currently written in Section III.A.1.(a), 10 CFR 50, Appendix J would require termination of an ILRT to repair leaks observed after pressurization. Strict compliance to this section would not allow isolation of leaks and a continuation of the test. The exemption request seeks only to clarify what is currently industry practice of dealing with leakage observed during a Type A test. As stated in the exemption request, as-found local leak rate testing would be performed on any component isolated due to observed leakage. The results of this testing would be added to the Type A test results (95 percent UCL) for determination of the success or failure of the test. Additionally, should maintenance be required on the components isolated due to excessive as-found leakage, the Type A test would be declared a failure due to an exceeded L_a criteria. Maintenance would then be performed and the as-left leakage would be determined. This as-left leakage would be added to the Type A test result to ensure the 0.75 L_a criteria required by Appendix J and the Robinson Plant Technical Specifications is not exceeded.

QUESTION

1. b. The second exemption request has merit, but is too vague and general to be acceptable before the particulars of testing failures are known. A proposed corrective action plan cannot be accepted by the staff until its details are described, which cannot be done until actual test failures are experienced. It is especially inappropriate to grant an exemption from the requirement for increased Type A testing frequency (after two consecutive test failures) before the failures have occurred, the reasons for the failures have been revealed, and a corrective action plan has been defined.

(5246JSK/lah)

It is also inappropriate to change the acceptance criteria of Appendix J to 10CFR50 by exemption from 0.75 L_a to L_a or from 0.75 L_t to L_t, before there is any need for such exemption. If a test fails, then an exemption may be considered based on the particulars of the case.

RESPONSE

1. b. Since the concept of corrective action plans is endorsed in the proposed revision to Appendix J in Section III.A.8(b)(ii), it is anticipated that the relief requested will be approved by revision to Appendix J prior to the next scheduled Type A test. Therefore, this request for relief is hereby withdrawn. This withdrawal is based on the understanding that a Type A test failure corrective action plan could be submitted and considered as an alternative to repetitive testing on the particulars of each individual case.

QUESTION

2. Personnel Air Lock Testing:

   a. Confirm that the test pressure for the six month tests required by Section III.D.2.(b)(i) of Appendix J is not less than Pa.

   b. It is stated that air lock testing is performed in accordance with Sections III.D.2.(b)(i) and (iii) of Appendix J. Describe the testing which is done to satisfy the requirements of Section III.D.2.(b)(ii) of Appendix J.

   c. Section III.D.2.(b)(iv) requires the acceptance criteria for all types of air lock leakage rate testing to be stated in the plant Technical Specifications. If the testing required by Section III.D.2.(b)(iii) is not performed at Pa, the test pressure must also be stated in the Technical Specifications. Describe the Technical Specification sections that contain these criteria; if certain criteria are not stated in the Technical Specifications as required, propose appropriate revisions to the Technical Specifications.

RESPONSE

2. a. This six-month air lock testing required by Section III.D.2.(b)(i) of Appendix J is performed at a pressure not less than Pa.

   b. The requirements of Section III.D.2.(b)(ii) of Appendix J are met by pressurizing the door seals with air from a continuous monitoring system. This practice is allowed in Section III.D.2.(b)(iii) for air locks having testable seals.

   c. The acceptance criteria for all leakage from the continuous monitoring system (PPS) and overall air lock leakage is set at $< .3\ L_p$ in Technical Specification 4.4.1.2.b (note: Lp = La).

QUESTION

3. Section IV.D of the referenced letter states that continuous testing is performed on components served by the Penetration Pressurization System (PPS). Describe the actions required by the plant Technical Specification or license to maintain this condition; that is, those actions required if the PPS becomes inoperable.

RESPONSE

3. Remedial action is required by Technical Specification 4.4.1.2.b should leakage from the PPS exceed .3 Lp. This limit is listed in the Minimum Equipment List for criticality, and leakage is monitored each shift during power operation. Should PPS become inoperable to the extent that this leakage could not be continuously monitored, corrective action would be taken expeditiously. Unlike the IVSW system, PPS is not a qualified seal system capable of a 30-day fluid supply at a pressure of 1.1 La. It is designed as a monitoring system capable of "... continuous or intermittent pressurization ..." as described in Appendix J. Since it serves no safety-related function for accident mitigation, there are no LCOs associated with this system. It is used in lieu of individual, refueling interval Type B tests for the penetrations it serves.

QUESTION

4. Section V.B of the referenced letter states that "Periodic Test 2.6" contains the acceptance criteria for leakage rate tests performed on valves by the isolation valve seal water system. However, Section III.C.3 of Appendix J requires that the leakage rates of the valves not exceed those specified in the Technical Specifications or associated bases. Provide the appropriate specific values (and their bases) and confirm that they are specified in the Technical Specifications or associated bases. If they are not, propose appropriate revisions to the Technical Specifications.

RESPONSE

4. The maximum acceptable leakage for each valve served by the isolation valve seal water is 10 cc/hr/in of nominal pipe diameter. The bases for Technical Specification 3.3 which address limiting conditions for operation for the IVSW system reference the FSAR section that contains this leakage limit.

QUESTION

5. Justify not venting penetrations P-35 and P-36 (containment air sample in and out) outside containment during Type A tests.

RESPONSE

5. Since the June 30, 1983 submittal of this program for NRC review, a change to the venting of penetrations P-35 and P-36 outside containment has been made. These penetrations are now vented inside and outside containment during an ILRT and were in this configuration for the 1984 and 1987 Type A tests.

QUESTION

6. A number of containment isolation valves do not undergo Type C (local) testing at H. B. Robinson, Unit 2. The following sections request additional information concerning the bases for not performing these tests:

   a. Certain valves in penetrations P-3, P-6, P-66, and P-72 are not Type C tested because, the licensee states, the categories of Section II.H of Appendix J do not apply to the valves in question. This justification is also used as one of several reasons for not testing valves in penetrations P-16, P-17, P-25, P-26, P-27, P-34A, P-34B, P-34C, P-34D, P-43, P-49, P-50, P-51, P-52, P-53/53A, P-54/54A, P-55/55A, and P-56/56A.

   This is not adequate justification. The purpose of Type C testing is to measure the leakage through containment penetrations that may potentially leak containment atmosphere out of the containment during a LOCA. Section II.H of Appendix J defines Type C tests as including certain categories of containment isolation valves; it does not, however, constitute a complete list.

   Section III.A.1.(d) of Appendix J also specifies certain valves that are subject to Type C testing. These are valves in lines that are:

   (1) Part of the reactor coolant pressure boundary and are open directly to the containment atmosphere under post-accident conditions and become an extension of the containment boundary;

   (2) Portions of closed systems inside containment that penetrate containment and rupture as a result of a LOCA; or

   (3) Not vented during Type A tests because they are in systems required to be operating during the test to maintain the plant in a safe condition.

   These requirements, in part, implement the objective to test potential containment atmosphere leak paths.

   Provide additional or revised justification for excluding Type C testing of valves in the penetrations listed above.

RESPONSE

6. a. Penetrations P-3 and P-6

   These penetrations incorporate one vent/drain valve each within the containment boundary. These vent/drain valves are locked closed, capped, and under administrative control. These administrative controls ensure the valves are locked closed and capped prior to unit startup. This results in two fixed barriers being provided. Based on the redundant barriers provided, these vent/drain valves are not considered leak paths and are not local leak rate tested.

Penetrations P-66 and P-72

Both penetrations are fitted with two locked closed 3/8" valves in series outside containment. The valves are administratively controlled in this position. Both penetrations are in portions of systems no longer in use, thereby negating the need to cycle these valves. Penetration P-72 tubing is routed outside the missile barrier inside containment and is not considered to be a postulated leak path. Penetration P-66 is pressurized up to the outboard containment isolation valve by the PPS which provides a continuous monitoring of the manual isolation valve in the reverse direction. These penetrations are not locally tested due to the design of the penetrations, the administrative controls in place, and the absence of cycling the manual isolation valves.

Penetrations P-16 and P-17

See response to Question 6.b.

Penetrations P-25, P-26, and P-27

See response to Question 6.c.

Penetrations P-34A, 34B, 34C, and P-34D

See response to Question 6.f.

Penetration P-43

See response to Question 6.e.

Penetrations P-49 through P-56A

See response to Question 6.d.

Question

6. b. The valves in penetrations P-16 and P-17 (RHR System) are not Type C tested because, the licensee states, the system is in service during a LOCA and is a closed system outside containment, therefore, not constituting a potential leak path.

Appendix J does not attempt to account for what may happen to leakage after it has leaked out of the containment; therefore, a closed system outside containment provides no benefit for this evaluation.

Provide assurance that the RHR System will maintain these penetrations water filled and pressurized during a LOCA; for example, provide the following:

(5246JSK/lah)

(1) The design criteria for the pump(s) and associated piping between the water source and the containment penetrations; i.e., quality group or safety class; seismic design category; protection against missiles, pipe whip, and jet forces; ability to withstand LOCA transient protection against high energy line break outside containment when required to function; and design class of power supply to pump motors.

(2) A description of the water source and the available post-accident inventory (if the water inventory is limited, the valves will require periodic leakage testing with water to demonstrate that sufficient water is available to provide a sealing function for 30 days after onset of an accident).

(3) A single failure analysis of active components to determine the capability to maintain pressure head on the containment penetrations. For example, if one pump failed to operate, discuss whether a head of water could still be applied to the containment penetrations in question; if cross-tie lines would be required to deliver water from one pump train to another to maintain pressure on the penetrations, discuss the operator actions that would be necessary to open valves in the cross-tie lines, and whether electrical power would be available to open the valves (e.g., in case of diesel generator failure).

(4) A description of the containment isolation valve type and orientation in the lines in question, and the capability of the sealing water from the pumps to preclude containment atmosphere leakage from the valve stems and packing. That is, discuss whether a water head acting against the valve disk side which faces outward will preclude air inside containment from leaking out past the valve stem or packing.

(5) The water pressure which will be maintained at the penetrations under the above conditions.

RESPONSE

6. b. Penetrations P-16 and P-17

The RHR System is an ESF System required to be in operation during and following a LOCA. It directs water into the reactor coolant system and recirculates this water when long-term recirculation from the containment floor is required. The isolation valves associated with penetration P-16 automatically open on a safety injection system, thereby negating the need for seat leakage testing. The valves associated with P-17 do not change position until the plant is to be placed in the RHR mode after the accident has been controlled. This is a Seismic Class 1, Safety Class 2, single failure proof system with seismically qualified emergency power supplies to safety-related pumps and valves.

Since the system recirculates reactor coolant inside and outside containment during a LOCA, seat leakage testing of the valves is not applicable. Reliance is placed on the closed system outside containment. The operation of this system is recognized by the restrictions of Technical Specification 4.4.3.c. Realizing the reliance on the closed system outside containment, this Technical Specification requires leakage to be maintained less than two GPH for the RHR System. A description of the system and its post-LOCA operation is described in Section 6.3 of the Robinson Plant UFSAR.

QUESTION

6. c. Certain valves in penetrations P-18, P-23, P-25, P-26, and P-27 are not Type C tested because, the licensee states, other valves in the same penetrations are served by the isolation valve seal water system.

Provide a single active failure analysis that demonstrates that the untested valves will not be solely relied upon to isolate the containment.

For example, show for each penetration that, if a valve or valves (should a common mode failure such as a failed diesel generator affect a group of valves) served by the isolation valve seal water system fail open, that this would not leave only untested, unsealed valves isolating the penetration. Consider also possible failures of the isolation valve seal water system itself.

RESPONSE

6. c. Penetration P-18

The CCW line served by the CC-716 A and B valves is considered a closed, missile protected system inside of containment. The inboard valve CC-716B is sealed by the isolation valve seal water system after an accident. The justification for not testing the outboard valve, CC-716A, is based upon the pressure gradient that exists in the Seismic Class I CCW system outside containment that would oppose any out leakage from containment. The CCW system is capable of 30-day post-accident operation at a pressure $> 1.10\ P_a$. Therefore, a single active failure of the CC-716B valve would not constitute a breach of containment integrity.

Penetration P-23

Valves CVC-200A, 200B, and 200C are reactor coolant system letdown orifice isolation valves. These valves close on the Phase "A" containment isolation signal for the purpose of isolating the reactor coolant system. These valves are located inside containment.

Valves CVC-204A and B also close on a Phase "A" containment isolation signal, but for the purpose of containment isolation. These valves are oriented in series and located outside containment and are leak tested with fluid from the isolation valve seal water system. Therefore, valves CVC-200A, 200B, and 200C are not tested for seat leakage. A flow diagram detailing this penetration is enclosed.

Penetrations P-25, P-26, and P-27

Each reactor coolant pump seal injection line employs a series check valve arrangement inside containment. The line does not have automatic isolation features due to the operation of the charging pumps. These lines would be isolated manually and sealed with isolation valve seal water should RCP seal injection require termination. The manual valves outside containment are seat leakage tested. Single active failure is not a concern due to the manual valve arrangement. A flow diagram detailing this penetration is enclosed.

The isolation valve seal water system is a Seismic Class I, missile protected system and designed against single active failure. Therefore, possible failure of the system is not a consideration.

QUESTION

6. d. The valves in penetrations P-21, P-22, and P-49 through P-56A (service water system) are not Type C tested because, the licensee states, they are part of closed systems inside containment that are not postulated to rupture during a LOCA; the service water system penetrations are also said to be in service during a LOCA.

In order to demonstrate that these closed systems would remain intact during a LOCA, provide the design criteria of the systems; i.e., quality group or safety class; seismic design category; protection against missiles and pipe whip; and ability to withstand a LOCA transient. Also verify that the systems do not communicate with either the reactor coolant system or the containment atmosphere.

RESPONSE

6. d. Penetrations P-21 and P-22

These lines do not communicate with the containment atmosphere or the RCS and are missile protected throughout their length inside containment. These lines are not postulated to be severed or otherwise opened to the containment atmosphere as a result of a LOCA. These Seismic Class I, Safety Class 3 lines are not potential leak paths (UFSAR 6.8.2.2, page 6.8.2-4).

Penetrations P-49 through P-56A

These lines do not communicate with the containment atmosphere or the RCS and are missile protected throughout their length inside containment. These lines are not postulated to be severed or otherwise opened to the containment atmosphere as a result of a LOCA. These Seismic Class I, Safety Class 3 lines are not potential leak paths (UFSAR 6.8.2.2, page 6.8.2-4).

Pen. No.	Safety Class	Seismic Design Category	Missile and Pipe Whip Protection/Able to Withstand LOCA	Communicate With Containment Atmosphere or Reactor Coolant System
21	2/3	1	Yes	No
22	3	1	Yes	No
49	3	1	Yes	No
50	3	1	Yes	No
51	3	1	Yes	No
52	3	1	Yes	No
53	3	1	Yes	No
53A	3	1	Yes	No
54	3	1	Yes	No
54A	3	1	Yes	No
55	3	1	Yes	No
55A	3	1	Yes	No
56	3	1	Yes	No
56A	3	1	Yes	No

QUESTION

6. e. Certain valves in penetrations P-16, P-17, P-43, and P-49 through P-56A (service water system) are not Type C tested, the licensee states, in part because the associated systems are in service during a LOCA.

In order to demonstrate that these systems would remain in service during a LOCA, provide the information requested in 6.b.(1) through 6.b.(5) above. This information is not necessary for the service water system if it can be adequately demonstrated that the service water system is a qualified closed system inside containment (see 6.d. above).

RESPONSE

6. e. Penetrations P-16 and P-17

See response to Question 6.b.

Penetration P-43

This penetration is pressurized by the safety injection system pumps during a LOCA. The only exception to this would be during the time required to switch to cold leg recirculation. This would be less than 10 minutes during which the safety injection pumps would be stopped. This pressure supplied by the pumps would oppose any outleakage from containment. The safety injection system is designed to Safety Class 2, Seismic Class 1 criteria. Seismically qualified power supplies are provided for the safety injection pumps. The effect of missiles generated outside containment has been evaluated not to cause a loss of redundancy of any of the safety injection system.

The water source for the safety injection system is the 300,000 gallon refueling water storage tank. The NPSH to pumps is provided by the head of the tank or the RHR pumps while operating in the recirculation mode.

The system is single active failure proof with cross connects provided in the system. Valves required for cross connection can be remotely operated from the control room. Electrical power would be available to operate these valves since they are provided with emergency power supplies.

Safety injection to Loop 2 and Loop 3 hot legs is supplied by one line penetrating containment which can be isolated by SI-869. Inside containment, this line branches to Loop 2 and Loop 3 through valves SI-866A and 866B, respectively. SI-869 is a double disk gate valve that receives IVSW into the valve body and between these disks should the valve require closure for containment isolation. This valve is locally tested for seat leakage. Additionally, the shutoff head of the safety injection pumps is approximately 1500 psig. Pressure provided to this penetration during a LOCA will vary due to the downstream system resistance present but will not drop below P_a. A flow diagram detailing this penetration arrangement is enclosed.

QUESTION

6. f. The valves in penetrations P-34A, P-34B, P-34C, and P-34D are not Type C tested because, the licensee states, they do not constitute potential leakage paths. This simple statement is not supported. Provide additional detailed justification.

RESPONSE

6. f. Penetrations P-34A, P-34B, P-34C, and P-34D

There are two locked closed valves oriented in series for each penetration (P-34A, P-34B, P-34C, and P-34D). These valves are under administrative control and are not opened during power operation. The lines associated with these penetrations supply motive nitrogen force to the post accident containment vent system valves. These lines are seismically qualified and are missile protected throughout their length. Therefore, these penetrations are not postulated leak paths.