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April 19, 1983

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Byron Station Units 1 and 2
Braidwood Station Units 1 and 2
Containment Leak Rate Testing
NRC Docket Nos. 50-454, 50-455,
50-456, and 50-457

Dear Mr. Denton:

This is to provide additional information regarding leak testing of the reactor containments at Byron and Braidwood Generating Stations. Staff review of this information should close Confirmatory Issue 20 of the Byron Safety Evaluation Report. Specific exemptions from the requirements of Appendix J are also requested.

In general, fluid systems will be vented and drained during containment integrated leak rate tests in accordance with the requirements of paragraph III.A.1(d) of Appendix J to 10 CFR 50. Attachment A to this letter contains a list of the fluid systems which will not be vented and drained. The line numbers identified pertain to Unit 1 at each station. The Unit 2 list will have different line numbers but will cover functionally equivalent piping. Attachment B to this letter provides the basis for not draining and venting each pipe listed in Attachment A. In some cases Type C leak testing is required by Appendix J but is not necessary at Byron and Braidwood. For those cases, an exemption is requested and the basis for the request is provided.

We believe that the attachments provide the information necessary to complete NRR's review of our integrated leak rate testing plans. If additional information is required to close the SER Outstanding Item, please contact this office.

One signed original and fifteen copies of this letter and the attachment are provided for your review and approval.

Very truly yours,

F. G. Lentine

F. G. Lentine
Nuclear Licensing Administrator

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Attachments

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ATTACHMENT A

Portions of Systems that will not be vented and drained during the ILRT and Containment Isolation valves that will not receive a Type C Test.

	SYSTEM	PENETRATION, LINE # & CONT. ISOL. VLVS	M-PRINT
1)	RHR System	1PC-68 (1RH01BA-12"), 1PC-75 (1RH01BB-12") RHR Pump Suctions -MOV-8701A & B, MOV-8702A & B	M-62-1
2)	SX System	1PC-7 (1SX06BB-16"), 1PC-9 (1SX07FB-16") 1PC-14 (1SX07FA-16"), 1PC-15 (1SX06BA-16") SX Inlet and Outlet to RCFC SX water coils - MOV-SX016A&B, MOV-SX027A&B	M-42-5
3)	MS System	1PC-77 (1MS01BD-30"), 1PC-78 (1MS01BA-30") 1PC-85 (1MS01BB-30"), 1PC-86 (1MS01BC-30") S/G Mainsteam Lines - HOV-MS001A, B, C & D	M-35-1, 2
4)	FW System	1PC-76 (1FW03DD-16"), 1PC-79 (1FW03DA-16") 1PC-84 (1FW03DB-16"), 1PC-87 (1FW03DC-16") FW Inlet to S/Gs - HOV-FW009A, B, C & D 1PC-99 (1FW87CD-6"), 1PC-100 (1FW87CA-6") 1PC-101 (1FW87CB-6"), 1PC-102 (1FW87CC-6") Aux FW Inlet to S/Gs - AOV-FW035A, B, C & D & 1FW037A, B, C & D	M-36-1
5)	FP System	1PC-34 (1FP04B-4") FP Containment Inlet Line - AOV-FP010 & AOV-FP011	M-52-1
6)	CC System	1PC-48 (1CC03E-3"), 1PC-22 (1CC05BA-3") Excess Letdown HX Inlet & Outlet - AOV-CC9437A & B	M-66-1
7)	SI System	1PC-26 (1SI08D-3") Cent Chg SI Line MOV-SI8801A & B, SI8815, AOV-SI8843 1PC-66 (1SI04B-12"), RHR Hot Leg Inj MOV-SI8840 1PC-50 (1SI05BA-8"), 1PC-51 (1SI05BB-8") RHR Cold Leg Inj. MOV-SI8809A & B 1PC-59 (1SI03BA-4") MOV-SI8802A, SI Hot Leg Inj 1PC-73 (1SI03BB-4") MOV-SI8802B, SI Hot Leg Inj 1PC-60 (1SI18C-4") MOV-SI8835, SI Cold Leg Inj	M-61-2,3,4,6
8)	CV System	1PC-37 (1CV43A-2") 1CV8348, 1CV8346 Loop Fill Hdr 1PC-71 (1CV09D-3") MOV-CV8105, MOV-CV8106 Chg Hdr 1PC-33, 53 (1CV14EA, B, C, D-2") MOV-CV8355A, B, C & D, CV8368A, B, C & D RCP Seal Inj	M-64-1,2,3

ATTACHMENT B

Basis For Not Draining and Venting Portions of Systems and For Not Performing Type C Valve Tests

Reference (1): D. G. Eisenhut letter to L. O. DelGeorge dated September 30, 1981

1) The Residual Heat Removal (RHR) system's pump suction lines, penetrations 1PC-68 and 1PC-75.

   The RHR pumps take suction from the RCS through these lines to remove core decay heat.

   This system falls under the provision of Appendix J Section III A.1.d: "Systems that are required to maintain the plant in a safe condition during the test shall be operable in their normal mode, and need not be vented".

   The RHR Pump suction line isolation valves are MOV-RH8701A and B and MOV-RH8702A and B. The valves do not fall under any of the three applicable definitions in Appendix J, Section II.H, for containment isolation valves requiring Type C tests. The valves remain closed thrugh the entire Leakage Design Basis Accident scenario. In a post-accident condition, the suction side of the RHR pumps is continuously water covered by the pressure head of the containment sump. Consequently, these valves are not relied upon to perform a containment isolation function, and therefore, Appendix J does not require that they be tested. (This determination was confirmed by the NRC for Zion in reference (1).

2) The SX systems's Inlet and Outlet lines to the Reactor Containment Fan Cooler (RCFC) Essential Service Water Coils. Penetrations 1PC-7, 1PC-9, 1PC-14 and 1PC-15.

   During normal and accident operation, essential service water flow is provided to the RCFC coils. This system falls under the provision of Appendix J, Section III.A.1.d: "Systems that are normally filled with water and operating under post-accident conditions, such as the containment heat removal system, need not be vented."

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The RCFC isolation valves MOV-SX016A and B and MOV-SX027A and B do not fall under any of the three applicable definitions in Appendix J, Section II.H, for containment isolation valves requiring Type C tests. The valves receive a confirmatory open signal on SI actuation and remain open through the accident. The coils and piping inside containment meet the requirements of ASME Code Section III, Class 3 and are tested to Class 2. They are qualified analytically to withstand the dynamic effect of the Loss of Coolant Accident concurrent with the Design-Basis seismic event. The SX system inside containment can therefore be considered a closed system with respect to the RCS and containment atmosphere under post-accident conditions. Consequently, the valves are not relied upon to perform a containment isolation function, and therefore, Appendix J does not require that they be tested.

3) The MS system's Steam Generator to Turbine main steam lines 1PC-77, 1PC-78, 1PC-85, and 1PC-86.

The Main Steam Lines transfer the steam from the steam generators to the turbine. The main steam system is neither a part of the Reactor Coolant System pressure boundary nor is it open directly to the containment atmosphere under post-LOCA conditions; therefore, the line does not need to be vented and drained during the ILRT.

The Main Steam isolation valves HOV-MS001A, B, C and D do not fall under any of the three applicable defintions in Appendix J, Section II.H, for containment isolation valves requiring Type C tests. They receive an isolation signal on Safety Injection actuation which is termed Main Steam Isolation. The intent of Main Steam Isolation is to minimize primary system cooldown and maintain secondary system water inventory. These valves are not relied upon to perform a containment isolation function, and therefore, Appendix J does not require that they be tested.

4) The FW systems's main feedwater lines and Auxiliary feedwater lines, penetrations 1PC-76, 1PC-79, 1PC-84, 1PC-87, 1PC-99, 1PC-100, 1PC-101, and 1PC-102.

These Feedwater lines normally transfer feedwater to the steam generators on the secondary side of the steam generator tubes. On a Safety Injection the main feedwater system is isolated and the auxiliary feedwater valves open to provide flow to the steam generators. The Main Feedwater and Auxiliary Feedwater systems are neither part of the Reactor Coolant System Pressure Boundary nor are they open directly to the Containment atmosphere under post-LOCA conditions. They do not need to be vented and drained during the ILRT.

The Main Feedwater Isolation valves HOV-FW009A, B, C and D do not fall under the three applicable definitions in Appendix J for containment isolation valves requiring Type C tests. They close upon receipt of a Feedwater Isolation signal. The intent of Feedwater Isolation is to minimize primary cooldown and to avoid overfilling the steam generators. Auxiliary Feedwater isolation valves AOV-FW035A, B, C and D and FW037A, B, C and D open to provide Auxiliary Feedwater flow to the steam generators under most post-accident conditions. Consequently, these valves are not relied upon to perform a containment isolation function, and therefore, Appendix J does not require that they be tested.

5) The Fire Protection (FP) system's containment inlet line, penetration 1PC-34.

This pipeline supplies water to numerous fire hose stations inside containment. This system falls under the provision of Appendix J, Section III.A.1.: "Systems that are required to maintain the plant in a safe condition during the test shall be operable in their normal mode, and need not be vented." Isolation of the FP header to the containment for venting and draining has the potential of increasing the severity of damage due to a fire in containment. For this reason the FP line will not be vented and drained. However, the containment isolation valves AOV-FP010 and AOV-FP011 will be closed during an ILRT to minimize the possibility of inleakage of water.

The Fire Protection System in the Auxiliary Building and Containment has been built to ASME Code Section III, Class 3. The minimum static pressure maintained outside the FP containment isolation valves AOV-FP010 and AOV-FP011 is 100 psig. While the Fire Protection system components are not safety-related, the system is designed to high reliability standards. Also, the safety-related Essential Service Water system can be cross-tied to the FP system to provide a back-up water source. Therefore, the fire protection system effectively serves as a seal water system to the FP isolation valves, in accordance with Section III.C.3 of Appendix J.

Because the fire protection system is a closed system inside containment which is unlikely to rupture, and because the penetration is water sealed, Type C testing is not required. (This determination was confirmed by the NRC for Zion in reference (1).)

6. The Component Cooling (CC) System's Excess Letdown HX Inlet and Outlet lines, penetrations 1PC-48 and 1PC-22.

   These lines supply CC water to and return CC water from the Excess Letdown Heat Exchangers. The Excess Letdown Heat Exchangers and all the associated CC piping inside containment has been built to ASME Code Section III, Class 2. In addition, the piping is protected from LOCA missiles. This piping is neither a part of the RCS pressure boundary nor is it open directly to the containment atmosphere under post-LOCA conditions. This system is therefore considered a closed system, and venting and draining is not necessary during an ILRT.

   The safety-related component cooling system maintains a static pressure of 100 psig outside the CC containment isolation valves CC9437A and CC9437B. Therefore, the component cooling system effectively serves as a seal water system in accordance with Section III.C.3 of Appendix J. Because the component cooling system is a closed system inside containment which is unlikely to rupture, and because the penetration is water sealed, Type C testing is not required. (This determination was confirmed by the NRC for Zion in reference (1).)

7) The Safety Injection (SI) System injection lines:

   a) Centrifugal Charging Pu.'p SI line to RCS Cold Legs 1PC-26
   b) RHR Pump SI line to RCS Hot Legs 1PC-66
   c) RHR Pump SI line to RCS Cold Legs 1PC-50 and 51
   d) SI Pump SI line to RCS Hot Legs 1PC-59 and 73
   e) SI Pump SI line to RCS Cold Legs 1PC-60

   These lines are normally filled with water and are required to be operated during post-accident conditions. In addition, they may be considered lines that are required to maintain the plant in a safe condition during the test. Therefore, they need not be vented according to Appendix J, Section III.A.1.(d) during an ILRT.

   These injection line isolation valves do not fall under any of the three applicable definitions in Appendix J, Section II.H, for containment isolation valves requiring Type C tests. During the various modes of ECCS operation (cold leg injection, cold leg recirculation, simultaneous hot and cold leg recirculation), the configuration of the lines will be as follows:

   Either 1) The lines will be passing injection water to the RCS Cold Legs at a minimum pressure of 200 psig.

or 2) The lines to the Hot Leg injection path will be isolated by the outboard isolation valve which is sealed with a minimum injection pressure of 200 psig.

or 3) The lines will be passing injection water to both the Hot Legs and the Cold Legs at a minimum pressure of 200 psig.

Consequently, the valves are not relied upon to perform a containment isolation function, and therefore, Appendix J does not require that they be tested.

8) The Chemical and Volume Control (CV) system's charging, loop fill header and seal injection lines, penetrations 1PC-71, 1PC-37, 1PC-33, and 1PC-53, respectively.

The charging and loop fill headers fall under the provision of Appendix J, Section III.A.1.d: "Systems that are required to maintain the plant in a safe condition during that test shall be operable in their normal mode, and need not be vented." These systems must remain operable to provide make-up capability for maintaining reactor coolant inventory. In addition, draining and venting of these lines would require draining of the reactor coolant loops. The seal injection lines fall under the provision of Appendix J, Section III.A.i.d: "Systems that are normally filled with water and operating under post-accident condition...need not be vented."

Since these lines are part of the reactor coolant pressure boundary and may be open to the containment atmosphere under post-accident condition, Type C testing of their isolation valves (listed in Appendix A) is required by Appendix J. Commonwealth Edison hereby requests an exemption from Type C testing of these valves, on the following basis: The charging and loop fill header lines are isolated during a LOCA and are sealed with the discharge pressure of the Centrifugal Charging pumps (approximately 2400 psig) external to the containment. For the duration of the accident a pressure greater than that of the peak containment pressure can be maintained. Similarly, the seal injection flow is supplied by the centrifugal charging pumps at a pressure greater than the peak containment accident pressure. Therefore, there is no possibility of containment leakage through these penetrations.