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SHIELDS L. DALTROFF
VICE PRESIDENT
ELECTRIC PRODUCTION

August 8, 1979

Re: Docket Nos.: 50-277
50-278

IE Bulletin 79-08
Additional Information

Mr. Boyce H. Grier, Director
Office of Inspection & Enforcement
Region I
United States Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Dear Mr. Grier:

This correspondence is in response to your "Request for Additional Information on IE Bulletin 79-08" as received by telecopy in our office on July 24, 1979. Responses to your questions are presented below.

Item 2, Question 1

1. Item 2 of IEB 79-08 requires that containment isolation initiation design and procedures be reviewed to assure that manual or automatic isolation is initiated for all lines whose isolation does not degrade needed safety features or cooling capability upon all automatic initiations of safety injection. This includes those lines designed to transfer potentially radioactive gases and liquids out of containment. Clarify your response to indicate whether your design and procedures conform to these requirements.

Response

The containment isolation provisions for each fluid system and instrument line which penetrates primary containment have been

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reviewed. Attached is a tabulation of these lines and their isolation provisions.

The Peach Bottom design, as other BWR's, does not utilize "initiation of safety injection" as a signal to initiate isolation of the primary containment. Automatic isolation valves receive diverse actuation signals from the Primary Containment and Reactor Vessel Isolation Control System (FSAR Section 7.3). These isolation signals are listed and described on the attached table.

Automatic isolation is initiated for all fluid lines which penetrate the primary containment whose isolation does not degrade needed safety features or cooling capability, with the following exceptions:

a. Closed Cooling Systems - Closed cooling water lines are provided with one remote manual isolation valve outside containment (see penetrations N-23, 24, 53, 54, 55, 56). Automatic isolation of these lines is not provided since they provide a heat sink for in containment equipment.

b. Torus Vacuum Relief Lines - Vacuum in the torus is relieved by two lines between the suppression chamber and the reactor building. One valve in each line is air operated and is opened when a differential pressure switch de-energizes a dc solenoid valve to release air from the air operator. This valve fails open upon loss of air supply. The other valve in each line is a self-operating vacuum breaker (see penetrations N-205A, B`.

c. CRD Hydraulic System - The CRD insert and withdrawal lines are each provided with two isolation barriers. The first is a ball check valve which is internal to the control rod drive mechanism. The outer barrier is provided by valves within each hydraulic control unit (see penetrations N-37, 38). It has been accepted practice not to provide automatic isolation valves for these lines to preclude a possible failure mechanism of the scram function.

d. Each TIP System guide tube is provided with an isolation valve which closes automatically upon receipt of a containment isolation signal after the TIP cable and fission chamber have been retracted. In series with the isolation valve, an additional isolation shear valve is included. Both valves are located outside the drywell. In the event of a containment isolation signal, the TIP System receives a command to retract the traveling probes. Upon full retraction, the isolation valve is closed automatically. Valve position (full open or full closed) of the automatic closing valve is indicated in the main control room. If a traveling probe does not retract, this information would be supplied to the operator who would investigate the situation to determine if the shear valve should be operated. This valve is designed to shear the cable and seal the guide tube upon an actuation signal. Closing of the shear valve is performed by operator action from the main control room. Each shear valve is operated independently. The valve is an explosive-type valve, dc operated, with monitoring of each actuating circuit provided.

The isolation provisions for all systems designed to transfer potentially radioactive gases and liquids out of containment have also been reviewed. It has been verified that all of those lines which could transport contaminated fluid to undesirable locations, with the exception of the four sample lines reported previously, have suitable isolation provisions. Isolation of these lines is provided by normally closed, check, or automatic valves.

The following automatic isolation valves are provided for this purpose. Each receives an isolation signal upon initiation of its respective system:

MO-13-34, 35	RCIC Stm. Line Drain
MO-13-12, 13	RCIC Condensate Pump Discharge to Radwaste
MO-23-42, 43	HPCI Stm. Line Drain
MO-23-39, 40	HPCI Condensate Pump Discharge to Radwaste

<u>Item 2, Question 2</u>

2. The isolation procedure for the four conductivity sample lines discussed in your response should be revised to include manual or automatic isolation on all automatic initiations of safety injection. Provide the results of your engineering design review to determine whether automatic isolation of these lines is required.

<u>Response</u>

Engineering review has indicated that the four conductivity sample lines from the Residual Heat Removal System heat exchangers should be provided with an automatic isolation feature. A single solenoid valve controlled by the Primary containment Isolation system is planned for each sample line. These valves will be seismically and environmentally qualified for this service. Until these valves can be procured, installed and tested, the isolation procedure discussed in our response to IE Bulletion 79-08 will remain in effect.

Item 2, Question 3

3. Discuss how you intend to provide permanent positive control of the three 3/4-inch lines used for the integrated leak rate test to assure compliance with the requirements of IEB 79-08.

Response

Provisions are being added to lock these valves closed. As mentioned in our response to IE Bulletin 79-08, a special block (Supervision Safety Block Permit) has been applied to the three 3/4 inch Integrated Leak Rate Test (ILRT) test lines. Since the only time that these test valves would be used is during a refueling outage for the conduct of the ILRT, a procedural sign-off step is being added to the controlling ILRT procedure to require application of the Safety Block Permit and locking the valve closed for completion of the procedure. The ILRT procedure must be complete prior to reactor start-up. These valves will also be on the locked valve list.

Item 2, Question 4

4. Confirm that containment isolation of the Residual Heat Removal Sample Lines is initiated either manually or automatically on all automatic initiations of safety injection. In addition, provide the results of your engineering design review to determine whether automatic isolation of these lines is required.

Response

The four conductivity sample lines from the Residual Heat Removal System heat exchangers as discussed in question 2 above do not presently have automatic isolation on all automatic initiations of the Core Standby Coolant Systems. This situation will be remedied by adding solenoid valves in each sample line to be controlled by the Primary Containment Isolation System.

Item 2, Question 5

5. Provide a schedule for any actions on item 2 that have not yet been completed.

Response

Our present goal is to procure, install and test the Residual Heat Removal System heat exchanger conductivity sample line isolation valves by December 31, 1979. Until that time, manual isolation will continue to be accomplished as discussed in our response to IE Bulletin 79-08.

Item 7, Question 1

Provide the results of your review of the design of systems capable of transferring radioactive gases and liquids out of containment.

Response

1. The review for the inadvertent release paths has been completed. No pathways were found which could inadvertently transfer either radioactive liquid or gas out of primary containment. Those engineered safety features (ESF) systems which are not required to initiate in the event of an accident are isolated and interlocked to prevent inadvertent transfer of radioactive liquids and gases. Those ESF systems which are required following an accident are not isolated.

Item 7, Question 2

2 Verify that inadvertent transfer of radioactive gases or liquids from containment will not occur on resetting engineered safety features instrumentation.

Response

No means were found which could result in an inadvertent transfer of radioactive liquid or gas due to the resetting of engineered safety features (ESF) instrumentation. The ESF system designs are such that an action is carried to completion. Resetting of the isolation requires manual operator action under controlled conditions following instrumentation reset.

Item 7, Question 3

3. Discuss the basis upon which continued operability is assured of the features designed to prevent inadvertent transfer of radioactive gases and liquids out of containment.

Response

The functional capability of the Primary Containment Isolation Systems is verified by Technical Specification mandated surveillance tests as follows:

a) All of the initiating devices are functionally tested every month.

b) Each logic system is functionally tested every 6 months.

Additionally, administrative procedures assure that these systems are not worked on without specific approval of shift supervision. Work is performed in accordance with approved work procedures.

Item 8, Question 1

1. We understand from your response that operability tests are performed on redundant safety-related systems prior to removal of any safety-related system from service. Since you may be relying on prior operability verification within the current Technical Specification surveillance interval, operability should be further verified by at least a visual check of the system to the extent practicable, prior to removing the redundant equipment from service. Please supplement your response to provide a commitment that you will revise your maintenance and test procedures to adopt this position.

Response

We have revised our "Procedure for Corrective Maintenance" to require that "Shift Supervision shall verify by test or inspection the operability of redundant safety-related (Q-listed) systems required by the Technical Specifications."

The applicable test procedures have been reviewed and revised as necessary to require that any testing that could adversely affect the operability or reliability of a safety-related system is not permitted until verification of any redundant safety-related systems is either done by test or inspection.

Item 8, Question 2

2 It is not clear from your response that all involved reactor operational personnel in the oncoming shift are explicitly notified above the status of systems removed from or returned to service. Please indicate how this information is transferred at shift turnover.

Response

Shift Supervision and Operators reporting for duty receive a verbal report from the previous shift covering the following:

a. General operating condition of the plant.
b. Specific operations performed and difficulties encountered during the previous shift.
c. Scheduled plant operations.
d. Equipment outages and maintenance work in progress.
e. Status of all safety related equipment and conditions.

In addition, Shift Supervision and Operators read past entries in the applicable logs to familiarize themselves with recent plant performance, operations, and problems. The on-coming man assumes shift responsibility at this point.

Following shift relief, Shift Supervision and Operators make an inspection of instruments, equipment, and areas under their control as early as possible during their shift unless specifically directed otherwise by Shift Supervision or Station Supervision. During this inspection, priority is given to work areas identified by the previous shift. This inspection includes a test of Control Room annunciators to verify their operability and a front panel check of ECCS to verify switch, valve and controller status.

In addition, tags are used in the Control Room to indicate the system and equipment status. These tags are used for mechanical and electrical blocking of equipment and for information regarding equipment status. The tags do not obscure indicating lights or controls when mounted on the control board.

A meeting is held in the Control Room at the beginning of each shift. The meeting includes all shift personnel and is lead by the Shift Superintendent and covers applicable topics as follows:

1. Plant status
2. Special operations taking place.
3. Significant maintenance
4. Operating procedure changes
5. Tech. Spec. changes.
6. Scheduled operations
7. Shift Superintedent's goals for that shift.

Item 10, Question 1

1. The existing procedures are stated to be under revision. Please provide your schedule for completion.

Response:

The existing procedures are presently undergoing review and revision with final PORC approval expected prior to August 25, 1979.

Should you have any questions or require additional information, please do not hesitate to contact us.

Very truly yours,

Attachment

cc: United States Nuclear Regulatory Commission
Office of Inspection and Enforcement
Division of Reactor Operations Inspection
Washington, DC 20555

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Peach Bottom Atomic Power Station – Units 2+3
Containment Isolation Valves

Pene. Number	Line Description	Fluid Contained	Line Size	Valve Number	Valve Location	Valve Type	Isolation Group (Signals)
N-7A to D	Main Steam	steam	26"	AO-2-80A to D	Inside	GB	I (A, B, C, D, E)
				AO-2-86A to D	Outside	GB	I (A, B, C, D, E)
N-8	Main Steam Drain	steam/water	3"	AO-2-74	Inside	GB	I (A, B, C, D, E)
				AO-2-77	Outside	GB	I (A, B, C, D, E)
N-9A	Feedwater	water	24"	2-28A	Inside	CK	–
				2-96A	Outside	CK	–
				MO-2-38A	Outside	GT	II (A, B, F)
				MO-23-19	Outside	GT	RM
N-9B	Feedwater	water	24"	2-28B	Inside	CK	–
				2-96B	Outside	CK	–
				MO-13-21	Outside	GT	RM
				MO-12-68	Outside	GB	II (A, C, D, G)
				MO-2-38B	Outside	GT	II (A, B, F)
N-10	Steam to RCIC Turbine	steam	3"	MO-13-15	Inside	GT	IV (A, B, C)
				MO-13-16	Outside	GT	IV (A, B, C)
N-11	Steam to HPCI Turbine	steam	10"	MO-23-15	Inside	GT	V (A, B, C)
				MO-23-16	Outside	GT	V (A, B, C)
N-12	RHR Shutdown Cooling Suction	water	20"	MO-10-17	Inside	GT	II (A, B, E)
				MO-10-18	Outside	GT	II (A, B, E)
N-13A,B	RHR Shutdown Cooling Return	water	24"	MO-10-25A,B	Outside	GT	II (A, B) – if in shutdown cooling
				AO-10-46A,B	Inside	CK	–
				AO-10-163A,B	"	DCV	RMP
N-14	RWCU Pump Suction	water	6"	MO-12-15	Inside	GT	II (A, C, D, G)
				MO-12-18	Outside	GT	II (A, C, D, G)
N-16A,B	Core Spray Pump Discharge	water	12"	MO-14-11A,B	Outside	GT	RM
				AO-14-13A,B	Inside	CK	–
				AO-14-15A,B	"	DCV	RMP
N-17	RHR Head Spray	water	6"	MO-10-32	Inside	GT	II (A, B, E)
				MO-10-33	Outside	GT	II (A, B, E)
N-18	Drywell Fl. Dr. Pump Disch.	water	3"	AO-20-82	Outside	DCV	II (A, B)
				AO-20-83	Outside	DCV	V (A, B)
N-19	Drywell Equip. Dr. Pump Disch.	water	3"	AO-20-94	Outside	DCV	II (A, B)
				AO-20-95	Outside	DCV	II (A, B)
N-21	Service Air Supply	air	1"	–	Inside	GB	LC
				–	Inside	GB	LC
N-22	Inst. Gas Supply	air	1"	–	Outside	CK	–
				AO-2969A	Outside	DCV	II (A, B)

N-23	RECW to Recirc. Pumps	water	4"	MO-34-2373	Outside	GT	RM
N-24	RBCW from Recirc. Pumps	water	4"	MO-34-2374	Outside	GT	RM
N-25	Drywell Purge Supply	air	18"	AO-2505	Outside	B	III
				AO-2519	"	B	III
				AO-2520	"	B	III
				AO-2521A	"	B	III
				AO-2521B	"	B	III
				AO-2523	"	DCV	III
				—	"	CK(2)	-
N-26	Drywell Purge Exhaust	air	18"	AO-2509	Outside	DCV	III
				AO-2510	"	DCV	III
				AO-2506	"	B	III
				AO-2507	"	B	III
				AO-4235	"	DCV	III
				SV-2671G	"	SV	III
				SV-2978G	"	SV	III
				SV-4960B	"	SV	RM
				SV-4961B	"	SV	RM
				SV-4966B	"	SV	RM
N-27E,F	Inst. Lines - Core Plate Pressure	water	1"	— 25,27	Inside Outside	RO XFCV	— —
N-28A, B,C,E,F	Inst. Lines - RPV Level + Pressure	water/steam	1"	— 17A, 19A, 11, 13A, 15A	Inside Outside	RO XFCV	— —
N-28D	Inst. Lines - RPV Head Pressure	steam	1"	— 23	Inside Outside	RO XFCV	— —
N-29A,B, E,F	Inst. Lines - RPV Level + Pressure	water/steam	1"	— 17B, 19B, 13B, 15B	Inside Outside	RO XFCV	— —
N-30A,B, C,D	Inst. Lines - Main Stm. Pressure	steam	1"	— 73A,C,E,G	Inside Outside	RO XFCV	— —
N-30E,F	Inst. Lines - Recirc. Loop B Flow	water	1"	64C,D	Outside	XFCV	-
N-32A,B	Inst. Lines - Recirc. Loop A Flow	water	1"	63A,B	Outside	XFCV	-
N-32C,D	ILRT Connections	air	3/4"	—	Outside	GB(2)	LC
N-32E,F	Inst. Lines - CS Inj. Pressure	water	1"	— 30A,B	Inside Outside	RO XFCV	— —
N-33A,B, C,D	Inst. Lines - Recirc. Pump ΔP	water	1"	— 62A,B,C,D	Inside Outside	RO XFCV	— —
N-33E	Inst. Line - Recirc. Pump Motor Cooler Flow	water	1"	—	Outside	GB	M
N-33F	Inst. Line - Drywell Pressure	air	1"	—	Outside	GB	M

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N-34A to D	Inst. Lines - Main Stm. Pressure	steam	1"	– 73B, D, F, H	Inside Outside	RO XFCV	– –
N-34E, F	Inst. Lines - HPCI Stm. Pressure	steam	1"	– 37A, B	Inside Outside	RO XFCV	– –
N-36A to E	TIP Drives	air	3/8"		Outside Outside	BL XV	II(A, B) RM
N-35F	TIP Purge	air	1"	–	Outside	CK	–
N-36	CRD Return	water	4"	3-113 3-110	Inside Outside	CK CK	– –
N-37A to D	CRD Insert	water	1"	– –	Inside Outside	BCK HCU	– –
N-38A to D	CRD Withdrawal	water	1"	– –	Inside Outside	BCK HCU	– –
N-39A, B	RHR Containment Spray	water/air	14"	MO-10-31A, B MO-10-26A, B SV-4948 A, B SV-4949 A, B	Outside " " "	GT GT SV SV	III III RM RM
N-40A to D	Inst. Lines - Jet Pumps	water	1"	–	Outside	XFCV	–
N-41	Recirc. Loop Sample	water	3/4"	AO-2-39 AO-2-40	Inside Outside	DCV DCV	I(A, B, C, D, E) I(A, B, C, D, E)
N-42	Standby Liquid Control	Sodium Pentaborate Solution	1½"	11-16 11-17	Outside Inside	CK CK	– –
N-46A, B	Inst. Lines - Unit 3, Drywell Pressure	air	1"	10-53A, C 10-60A, C	Outside "	GB GB	M M
N-49B, C	Inst. Lines - Unit 3, Drywell Pressure	air	1"	10-53B, D 10-60B, D	Outside "	GB GB	M M
N-49E, F	Inst. Lines - Unit 2, Drywell Pressure	air	1"	10-53A, C 10-60A, C	Outside "	GB GB	M M
N-50A	Inst. Line - Recirc. Suct. Pressure	water	1"	– 305A	Inside Outside	RO XFCV	– –
N-50B, C	Inst. Lines - RCIC Stm. Pressure	steam	1"	– 54A, B	Inside Outside	RO XFCV	– –
N-50D, E	Inst. Lines - RWCU Pump Suct. Pressure	water	1"	125A, B 66A, B	Inside Outside	RO XFCV	– –
N-51A, B	CACS Sample Lines	air	1"	SV-2671E, D SV-2978E, D	Outside "	SV SV	III III
N-51C	CACS Sample Line	air	1"	SV-4966C SV-2671C SV-2978C SV-4960C SV-4961C	Outside " " " "	SV SV SV SV SV	RM III III RM RM

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FORM 190-08262-REV'D. 3/70

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N-51D	CACS Sample Return	air	1"	– SV-2980	Outside "	CK SV	– III
N-51E	Inst. Line - Recirc. Suct. Pressure	water	1"	– 305B	Inside Outside	RO XFCV	– –
N-52E	Inst. Line - Core Plate Pressure	water	1"	– 33	Inside Outside	RO XFCV	– –
N-52F	Inst. Gas Supply	air	1"	– AO-2969B	Outside "	CK DCV	– II (A,B)
N-53	Chilled Wtr. from Drywell Coolers, Loop A	water	8"	MO-44-2201B	Outside	GT	RM
N-54	Chilled Wtr. from Drywell Coolers, Loop B	water	8"	MO-44-2200B	Outside	GT	RM
N-55	Chilled Wtr. to Drywell Coolers, Loop B	water	8"	MO-44-2200A	Outside	GT	RM
N-56	Chilled Wtr. to Drywell Coolers, Loop A	water	8"	MO-44-2201A	Outside	GT	RM
N-57	Main Stm. Line 'D' Sample	steam	3/4"	AO-2-316 AO-2-317	Inside Outside	DCV DCV	I(A,B,C,D,E) I(A,B,C,D,E)
N-102B	Inst. Line - Unit 2, Drywell Pressure	air	1"	53B,D 60B,D	Outside "	GB GB	M M
N-203	CACS Sample Line	air	1"	SV-2671B SV-2978B SV-4960D SV-4961D SV-4966D	Outside " " " "	SV SV SV SV SV	III III RM RM RM
N-205A	Torus Vacuum Breaker	air	20"	AO-2502B 9-26B	Outside "	B VB	RM –
N-205B	Torus Vacuum Breaker	air	20"	AO-2502A 9-26A AO-2521A AO-2521B – AO-2523	Outside " " " " "	B VB B B CK DCV	RM – III III – III
N-206A,B	Inst. Lines - Torus Level	air/water	2"	–	Outside	GB	II

FORM 190-08282-REV'D. 3/70

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N-210A,B	RHR Test + Pool Cooling Return	water	18"	MO-10-34A,B	Outside	GB	VII
				10-19A,B,C,D	"	CK	-
N-211A,B	RHR Torus Spray	water	6"	MO-10-38A,B	Outside	GB	VII
				MO-10-39A,B	"	GT	III
				MO-10-34A,B	"	GB	VII
				SV-4950A,B	"	SV	RM
				SV-4951A,B	"	SV	RM
N-212	RCIC Turbine Exhaust	water	12"	13-9	Outside	SCK	-
				13-50	"	CK	-
				AO-4240	"	DCV	TT
				AO-4241	"	DCV	TT
				AO-4244	"	GT	II (C,D,E)
N-213	Torus Drain (with level inst. line)	water	1"	—	Outside	GB	M
N-214	HPCI Turbine Exhaust	water	24"	23-12	Outside	SCK	-
				23-65	"	CK	-
				AO-4247	"	DCV	TT
				AO-4248	"	DCV	TT
				MO-4244A	"	GT	V (C,D,E)
N-215	Inst. Line - Unit 2, Torus Level	air	1"	—	Outside	GB	M
N-216	HPCI Min. Flow	water	4"	23-62	Outside	CK	-
N-217B	HPCI + RCIC Vacuum Relief	air	2"	MO-4244A	Outside	GT	V (C,D,E)
				MO-4244	"	GT	II (C,D,E)
N-218A	Inst. Gas Supply	air	1"	—	Outside	CK	-
				AO-2968	"	DCV	II (A,B)
N-218B	CACS Sample Line	air	1"	SV-2671A	Outside	SV	III
				SV-2978A	"	SV	III
N-218C	ILRT Connection	air	3/4"	—	Outside	GB(2)	LC
N-219	Torus Purge Exhaust	air	18"	AO-2511	Outside	B	II
				AO-2512	"	B	III
				AO-2513	"	DCV	II
				AO-2514	"	DCV	III
				SV-2671F	"	SV	II
				SV-2978F	"	SV	II
				SV-4960A	"	SV	RM
				SV-4961A	"	SV	RM
				SV-4966A	"	SV	RM
N-221	RCIC Vacuum Pump Discharge	air	2"	13-10	Outside	SCK	-
				13-38	"	CK	-

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N-223	HPCI Turbine Drain	water	2"	23-13 23-56	Outside "	SCK CK	– –
N-224	Core Spray Test Line - Unit 2	water	10"	MO-14-26A – 14-66A,C	Outside " "	GB CK(3) CK	VI – –
N-225	CS + Torus Water Cleanup Suction	water	6"	MO-13-41 MO-13-39 MO-14-70 MO-14-71	" " " "	GT GT GT GT	RM RM II (A,B) II (A,B)
N-226A to D	RHR Pump Suction	water	24"	MO-10-13A to D RV-10-72A to D	Outside "	GT RV	RM –
N-227	HPCI Pump Suction	water	16"	MO-23-58 MO-23-57	Outside "	GT GT	V (A,B,C) V (A,B,C)
N-228A to D	CS Pump Suction	water	16"	MO-14-7A to D	Outside	GT	RM
N-229	CS Pump Min. Flow - Unit 2	water	4"	14-66B,D –	Outside "	CK CK(4)	– –
N-230	RCIC Pump Min. Flow	water	2"	13-29	Outside	CK	–
N-233	HPCI Test Line - Unit 2	water	4"	MO-23-31	Outside	GT	V (D,F)
N-234	CS Test Line - Unit 2	water	10"	MO-14-26B –	Outside "	GB CK(3)	VI –
N-234A	CS Test Line - Unit 3	water	10"	MO-14-26B –	Outside "	GB CK(3)	VI –
N-234B	CS Test Line - Unit 3	water	10"	MO-14-26A –	Outside "	GB CK(3)	VI –
N-235	HPCI Test Line - Unit 3	water	4"	MO-23-31	Outside	GT	V (D,F)
N-236A	CS Pump Min. Flow - Unit 3	water	4"	14-66B,D	Outside	CK	-
N-236B	CS Pump Min. Flow - Unit 3	water	4"	14-66A,C –	Outside "	CK CK(4)	– –
N-250	Inst Line - Unit 3, Torus Level	air	1"	–	Outside	GB	M

Notes:

1) Valve Types:

- GB - Globe
- GT - Gate
- CK - Check
- BL - Ball
- B - Butterfly
- SV - Solenoid
- RV - Relief
- SCK - Stop Check
- DCV - Diaphram Control Valve
- VB - Vacuum Breaker
- XV - Explosive Valve
- RO - Restricting Orifice
- BCK - Ball Check
- HCU - Hydraulic Control Unit
- XFCV - Excess Flow Check Valve

2) Isolation Signals:

Group I
- A. Reactor Low Water Level (-48")
- B. High Steam Line Flow (140%)
- C. High Steam Tunnel Temp. (200°F)
- D. Low Steam Line Pressure (850 psi in Run mode)
- E. High Steam Line Radiation (3X normal)

Group II
- A. Reactor Low Water Level (0")
- B. High Drywell Pressure (2 psig)
- C. RWCU High Flow (300%)
- D. RWCU non-regen. heat exch. High Temp. (200°F) *
- E. High Reactor Pressure (shutdown cooling - 75 psig)
- F. High Reactor Pressure (600 psig)
- G. Standby Liquid Control System Operation *

Group III
- Reactor Low Water Level (0")
- High Drywell Pressure (2 psig)
- Reactor Bldg. High Radiation (16 mr/hr)
- Refueling Floor High Rad. (16 mr/hr)

Group IV
- A. RCIC Steam Line High Flow (300%)
- B. RCIC Steam Tunnel High Temp (200°F)
- C. RCIC Steam Line Low Pressure (50 psig) *
- D. High Drywell Pressure (2 psig)
- E. RCIC Steam Line Isolated

Group V
- A. HPCI Stm Line High Flow (300%)
- B. HPCI Stm Tunnel High Temp (200°F)
- C. HPCI Stm Line Low Pressure (100 psig) *
- D. High Drywell Pressure (2 psig)
- E. HPCI Stm Line Isolated
- F. Reactor Low Water Level (-48")

Group VI
- Reactor Low Water Level (-144")
- High Drywell Pressure (2 psig)

Group III LPCI Initiation:
- Reactor Low Water Level (-144")
- High Drywell Pressure (2 psig) + Reactor Low Pressure (450 psig)

- RM - Remote Manual
- M - Manual (local only)
- LC - Locked Closed
- TT - Turbine Trip *
- RMP - Push Button, momentary contact opens valve for test

* Process Signals

3) Valve Numbering: All valve numbers apply to both units, except 4 digit numbers. For those valves, the first digit designates the unit:

2 or 4 - Unit 2
3 or 5 - Unit 3

POOR ORIGINAL

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