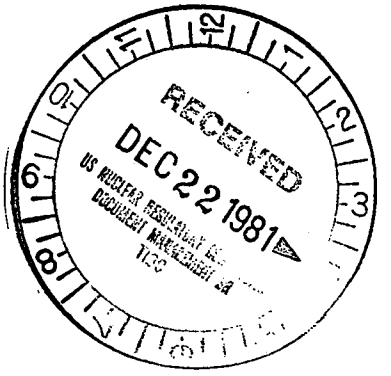
December 18, 1981



Docket No. 50-237
LS05-81-12-063

Mr. L. Del George
Director of Nuclear Licensing
Commonwealth Edison Company
Post Office Box 767
Chicago, Illinois 60609

Dear Mr. Del George:

SUBJECT: FORWARDING DRAFT EVALUATION REPORT OF SEP TOPIC VI-4, CONTAINMENT ISOLATION SYSTEM FOR THE DRESDEN NUCLEAR POWER PLANT, UNIT 2

Enclosed is a copy of our draft evaluation of SEP Topic VI-4, Containment Isolation System. This assessment compares your facility, as described in Docket No. 50-237, with the criteria currently used by the regulatory staff for licensing new facilities. Please inform us if your as-built facility differs from the licensing basis assumed in our assessment.

Two of the more significant issues contained in the conclusion are use of manual and locked open valves as isolation valves; and use of check valves as isolation valves outside containment. Both of these items appear not to comply with the explicit wording of the regulation and no other acceptable defined basis could be determined from the information provided. In addition, sufficient information was not available for us to evaluate if the automatic isolation valves indeed took the position of greater safety upon loss of actuating power, as required by Appendix A to 10 CFR 50.

To enable us to perform our assessment of the deviations identified in this report, we will need the defined basis upon which the specific isolation configurations at the Dresden Unit 2 Plant were judged to be acceptable by you. Please provide this information as a part of your comments on this report.

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DATE ▶							

Comments are required within 30 days of receipt of this letter so that they may be included in our final report. This evaluation will be a basic input to the integrated safety assessment for your facility unless you identify changes needed to reflect the as-built conditions at your facility. This assessment may be revised in the future if your facility design is changed or if NRC criteria relating to this subject are modified before the integrated assessment is completed.

Sincerely,

Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

J. Lanie JCL 11/3 J. Kudrick 11/4 W. Butler WB 11/4/81

OFFICE	SEP	SEP:SL	SEP:BC	ORB#5 PM	ORB#5/C	AD:SA:DL	
SURNAME	SBrown:dp	BHermann	WRussell	POConnor	DCrutchfield	GLainas	
DATE	10/5/81	10/6/81	10/6/81	11/12/81	12/18/81	12/18/81	

CONTAINMENT SYSTEMS BRANCH

EVALUATION REPORT ON SEP TOPIC VI-4

CONTAINMENT ISOLATION SYSTEM FOR THE

DRESDEN NUCLEAR PLANT, UNIT 2

DOCKET NO. 50-237

I. INTRODUCTION

This report is a compilation of those aspects of the Containment Isolation System for the Dresden Nuclear Power Plant, Unit 2 (Dresden 2) which do not meet the current licensing criteria in use by the NRC. The information for this report was obtained from a search of NRC docket information, including the following principal documents:

A) Dresden Nuclear Power Station, Units 2 and 3, Safety Analysis Report, Volume 1.

B) Letter dated February 25, 1980 from D. L. Peoples, CE, to H. R. Denton, NRC, "Compliance with Category A Items of NUREG-0578 at Dresden 2/3 and Quad Cities Station."

C) Attached piping and instrumentation drawings included as part of Inservice Inspection and Testing Programs for Dresden, Units 2 & 3, July 31, 1978.

D) Letter dated August 18, 1980 from R. F. Janecek, CE to Gus Lainas, NRC, "SEP Topic XV-16."

E) Appendix A to Operating License DPR-19, "Technical Specifications and Bases for Dresden Nuclear Power Station, Unit 2," May 5, 1971.

II. REVIEW CRITERIA

The safety criteria used in the current evaluation of the containment isolation system for Dresden 2 are contained in the following references:

1) 10 CFR Part 50, Appendix A, General Design Criteria for Nuclear Power Plants (GDC 54, 55, 56 and 57).
2) NUREG-75/087, Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants (SRP 6.2.4, Containment Isolation System).
3) Regulatory Guide 1.11, Instrument Lines Penetrating Primary Reactor Containment.
4) Regulatory Guide 1.141, Revision 1, Containment Isolation Provisions for Fluid Systems.

III. RELATED SAFETY TOPICS

In order to avoid duplication of effort the review areas identified below are not covered in this report since they will be reviewed under other topics or ongoing generic reviews. However, they are related and essential to the completion of the reevaluation of the containment isolation system for Dresden 2.

They are:

1) III-1, Classification of Structures, Components and Systems (Seismic and Quality)
2) III-4.C, Internally Generated Missiles
3) III-5.A, Effects of Pipe Break on Structures, Systems and Components Inside Containment

4) III-5.B, Pipe Break Outside Containment

5) III-6, Seismic Design Considerations

6) III-12, Environmental Qualification of Safety Related Equipment

7) VI-6, Containment Leak Testing

8) VII-2, Engineered Safety Feature System Control Logic and Design

9) VIII-2, Onsite Emergency Power Systems - Diesel Generator

10) VIII-4, Electric Penetrations of Reactor Containment

11) NUREG-0737, Clarification of TMI Action Plan Requirements, Item II.E.4.2, Containment Isolation Dependability

12) NUREG-0660, NRC Action Plan Developed as a Result of the TMI-2 Accident, Item II.E.4.4, Containment Purging and Venting Requirements

13) NUREG-0803, Generic Safety Evaluation Report Regarding Integrity of BWR Scram System Piping

IV Review Guidelines

The containment isolation system of a nuclear power plant is an engineered safety feature that functions to allow the normal or emergency passage of fluids through the containment boundary while preserving the ability of the boundary to prevent or limit the escape of fission products to the environs that may result from postulated accidents. General Design Criteria 54, 55, 56, and 57 of Appendix A to 10 CFR Part 50 pertain to the containment isolation system of a nuclear power plant.

General Design Criterion 54 establishes design and test requirements for the leak detection provisions, the isolation function and the containment capability of the isolation barriers in lines penetrating the primary reactor containment. From the standpoint of containment isolation, leak detection provisions should be capable of quickly detecting and responding to a spectrum of postulated pipe break accident conditions. To accomplish this, diverse parameters should be monitored to initiate the containment isolation function. The parameters selected should assure a positive, rapid response to the developing accident condition. This aspect of the containment isolation system review will be addressed during the review of the post-TMI requirements approved for implementation, as stated in NUREG-0737 at Item II.E.4.2.

Leak detection capability should also be provided at the system level to alert the operator of the need to isolate a system train equipped with remote manual isolation valves. SRP 6.2.4, at Item II.6.b provides guidance in this regard.

With respect to the design requirements for the isolation function, all non-essential systems should be automatically isolated (with manual valves sealed closed), and valve closure times should be selected to assure rapid isolation of the containment in the event of an accident. The review of the classification of systems as essential or non-essential, and the automatic isolation provisions for non-essential systems by appropriate signals, will be addressed in conjunction with the review of the post-TMI requirements as stated in NUREG-0737 at Item II.E.4.2. The closure time of the containment ventilation system isolation valves will be evaluated in conjunction with the ongoing generic review of purging practices at operating plants (see NUREG-0660 at Item II.E.4.4).

The electrical power supply, instrumentation and control systems should be designed to engineered safety feature criteria to assure accomplishment of the containment isolation function. This aspect of the review is covered under SEP Topics VII-2 and VIII-2. Also, resetting the isolation signal should not result in the automatic re-opening of containment isolation valves. This will be addressed in conjunction with the review of the post-TMI requirements approved for implementation, as stated in NUREG-0737, at Item II.E.4.2.

With respect to the capabilities of containment isolation barriers in lines penetrating primary containment, the isolation barriers should be designed to engineered safety feature criteria, and protected against missiles, pipe whip and jet impingement. Typical isolation barriers include valves, closed systems and blind flanges. Furthermore, provisions should be made to permit periodic leak testing of the isolation barriers.

The adequacy of the missile, pipe whip and jet impingement protection will be covered under SEP Topics III-4.C, III-5.A and III-5.B. The acceptability of the design criteria originally used in the design of the containment isolation system components will be covered in SEP Topics III-1, III-6 and III-12.

The adequacy of the leak testing program will be covered under SEP Topic VI-6. The acceptability of electrical penetrations will be covered in SEP Topic VIII-4.

General Design Criteria 55, 56 and 57 establish explicit requirements for isolation valving in lines penetrating the containment. Specifically, they address the number and location of isolation valves (e.g., redundant valving with one located inside containment and the other located outside containment), valve actuation provisions (e.g., automatic or remote manual isolation valves), valve position (e.g., locked closed, or the position of greater safety in the event of an accident or power failure), and valve type (e.g., a simple check valve is not a permissable automatic isolation valve outside containment).

GDC 55 and 56 also permit containment isolation provisions for lines penetrating the primary containment boundary that differ from the explicit requirements, provided the basis for acceptability is defined. This proviso is typically invoked when establishing the containment isolation requirements for essential (i.e., safety related) systems, or there is a clear improvement in safety.

Standard Review Plan 6.2.4, Item II.6 presents guidelines for acceptable alternate containment isolation provisions for certain classes of lines. Containment isolation provisions that are found acceptable on the "other defined basis" represent conformance with the GDC and do not constitute exceptions.

V. EVALUATION

The containment isolation provisions for the lines penetrating the primary reactor containment of the Dresden Nuclear Power Plant, Unit 2 are tabulated in Table 1. This information was obtained from the documents referenced in Section I, and questions sent to Commonwealth Edison on April 23, 1981 (Re: D. M. Crutchfield to J. S. Abel). There was insufficient information to complete Table 1; therefore, the licensee should provide the missing information, and make any necessary corrections.

The containment isolation provisions, as tabulated in Table 1, were evaluated against the requirements of General Design Criteria (GDC) 54, 55, 56 and 57 (Appendix A to 10 CFR Part 50), and the supplementary guidance of Standard Review Plan (SRP) 6.2.4 (Containment Isolation System), where applicable. Deviations from the explicit requirements of GDC 54, 55, 56 and 57, and the acceptance criteria of SRP 6.2.4 are summarized below:

1. Insufficient administrative control;
2. Insufficient leak detection capability on remote manual valves;
3. Use of manual and locked open valves as isolation valves; and
4. Check valves as isolation valves outside containment.

In addition, SRP Section 6.2.4.1.1.c states that the Containment Systems Branch review covers the verification of isolation valve positions in the normal, shutdown, post-LOCA and power failure modes. The licensee was requested to provide this information so that this review area could be completed. To date, only the normal valve position has been provided. The licensee is again requested to provide this information.

VI. CONCLUSION

The results of evaluation of the containment isolation system is best summarized by listing the areas of non-conformance to current licensing criteria, which were provided above. The remainder of this report gives a detailed discussion of these deficiencies. With these exceptions of the items identified above, the remainder of the Containment Isolation System for Dresden 2 listed in SAR Table 5.2.4 is found acceptable and in conformance with current licensing standards.

ADMINISTRATIVE CONTROL

All valves located between the inboard containment isolation valves or before the final outboard isolation valve (in the event there are none inside containment) should be locked closed to ensure the integrity of the piping between these valves. Typically, these valves are for test connections, vent lines, or capped branch lines. Listed below is a compilation of the valves in the Dresden 2 plant which need to be locked closed. The available piping and instrumentation diagrams indicate that many of these valves are "normally closed." It does not appear, however,

that this designation meets the NRC definition of "locked closed" because there are no tags, mechanical lock devices or administrative procedures in existence to prevent the valves from being inadvertently opened. Administrative control, as discussed in SRP Section 6.2.4.II.6.f, need to be implemented at Dresden 2.

VALVES REQUIRED TO BE LOCKED CLOSED

PENETRATION	VALVE NUMBER
X-105A,B,C,D	Test Connections inside Containment
X-106	220-5,6
X-107A,B	220-103A,B; -104A,B; Valves on Hose Connection
X-108A	1301-34, 35, 505, 506
X-109B	1301-32, 33, 600, 601
X-111A,B	1001-45A, 46A, 47A,B; -48A,B; -90A,B,C; -91A,B,C; -92A,B,C; -206A,B,C
X-113	1299-7, 8; 1201-31, 32; Valve on Capped Line
X-115A	2301-16, 17
X-116A,B	1501-23A,B; -24A,B
X-122	220-42, 43
X-130	1199-106, 107
X-144	301-96, 97
X-145	1501-29B, 30B
X-147	205-25, 26
X-149A,B	1402-32A,B; -33A,B

X-150A	1501-29A, 30A
X-303A,B,C,D	1501-70A,B; -72A,B; -73A,B 2301-37, 38; 2 Valves on Drain Line (Dwg. "M-51")
X-304	1699-50, 51
X-310A,B	1501-87B; Valve on Capped End of Line 2-1522-14-LX
X-311A,B	1501-40A,B; -41A,B
X-312	2301-41B, 42B

LEAK DETECTION

SRP Section 6.2.4.II.6b & c states that remote manually operated valves located in lines in engineered safety features systems, engineered safety feature-related systems or used for safe shutdown of the plant should be provided with leak detection capability for leaks outside containment. Below, is a list of the remote manual valves at Dresden 2 which meet the description above and are required to have leak detection capability. Upon questioning the licensee, it appears that these valves do not have the requisite leak detection capability:

SYSTEM	PENETRATION	VALVE NUMBER
LPCI	X-303A,B,C,D	1501-5A,B,C,D
LPCI	X-116A,B	1501-22A,B
Core Spray	X-303A,B,C,D	1402-3A,B
Core Spray	X-149A,B	1402-25A,B
Reactor Bldg. Closed Cooling Water System	X-123	3702
Ditto	X124	3703

Manual Isolation Valves

General Design Criteria (GDC) 55, 56 and 57, Appendix A of 10 CFR Part 50 state that unless it can be demonstrated acceptable on some other defined basis, isolation valves should be either automatic or locked closed. A non-locked closed manual valve serving the purpose of a containment isolation barrier does not meet current regulations.

SYSTEM	PENETRATION	VALVE NUMBER
Service Water Supply	X-119	4337-500, 502; 1916-500
Service Air Supply	X-120	4609-501, "Miscellaneous" Valve (SR Table 5.2.4)
HPCI Condensate Drain	X-312	2301-81 (Locked Open)
HPCI Turbine Exhaust	X-317A	2301-74 (Locked Open)

Furthermore, the last two manual valves, valves 2301-71 and 74, are locked open. Therefore, they were not considered isolation barriers.

CHECK VALVES AS ISOLATION VALVES

GDC 55 and 56 state that a check valve alone outside containment cannot be considered an isolation barrier. The feedwater penetrations, X-107A and B, however, do contain only single check valves outside containment. Consequently, this does not meet current criteria. In light of the safety significance of the feedwater penetrations the staff believes that an acceptable isolation barrier for this penetration would consist of the check valve outside containment along with a remote manual valve.

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS

TABLE I

PLANT: DRESDEN-2

PENETRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION O.C.	LOCATION I.C.	POSITION NORMAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESSENTIAL	ACTUATION	REMARKS
105A, B, C, D	MAIN STEAM (20")		203-1A,B,C,D 203-2A,B,C,D	AO GLOBE AO GLOBE	X	X	O O				E	B,C,D,P B,C,D,P	
106	MAIN STEAM LINE DRAIN (2")		220-1 220-2	MO GLOBE MO GLOBE	X	X	C C				NE	B,C,D,P B,C,D,P	
107A,B	FEEDWATER (18")		220-58A,B 220-62A,B	CHECK CHECK	X	X	O O				E	RF RF	
108A	ISOLATION COND. STEAM SUPPLY (14")		1301-1 1301-2	MO GATE MO GATE	X	X	O O				E	K K	
109B	ISOLATION COND. CONDENSATE RET. (12")		1301-3 1301-4	MO GATE MO GATE	X	X	C O				E	K K	
111A,B	SHUTDOWN COOLING SUPPLY	(16") (14")	1001-1A,B 1001-2A,B,C	MO GATE MO GATE	X	X	C C				NE	B,U B,U	
113	CLEANUP SYS SUP. (8")		1201-1 1201-2,3	MO GATE MO GATE	X	X	O O/C				NE	B,W,Y,E,I,J B,W,Y,E,I,J	
115A	HPCI TURBINE STEAM SUPPLY (10")		2301-4 2301-5	MO GATE MO GATE	X	X	O O				E	L L	
116A,B	LPCI CORE FLOODING (16")		1501-22A,B 1501-25A,B	MO GATE AO CHECK	X	X	C C				E	RM RM	
116A,B	SHUTDOWN COOLING RETURN (14")		1001-5A, B	MO GATE	X		C				NE	B,U	
117	DRYWELL FLOOR DRAIN SUMP DISCH (3")		2001-105, 106	AO GATE	X		O				NE	B,F	
118	DRYWELL EQUIP DR SUMP DISCH (3")		2001-5,6	AO GATE	X		O				NE	B,F	
119	SERVICE WATER SUPPLY (3")		4327-500 4327-502	HAND GATE HAND GLOBE	X	X	C C				NE	HAND	
120	SERVICE AIR SUPPLY (1")		4609-501	HAND GLOBE HAND GATE, PLUG	X	X	C C				NE	HAND	
121	INST. AIR SUPPLY (1")		4722 1601-4B	AO GLOBE HAND GATE	X X		C C				E	HAND	
122	Rx WATER (3/4") SAMPLE		220-44 220-45	SOLENOID SOLENOID	X	X	C C				NE	B,C,D,P B,C,D,P	
123	R. BLDG. CLOSED C.W. SUP. (6")		3702 3769-500	MO GATE CHECK	X	X	O O				E	RM RF	
124	R. BLDG. CLOSED C.W. RET. (6")		3703 3706	MO GATE MO GATE	X	X	O O				E	RM RM	

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS

PLANT: DRESDEN 2

PENETRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION O.C.	LOCATION I.C.	POSITION NORMAL	POSITION SHUT DN	POSITION POST LOCA	POSITION PWR FAIL.	ESSENTIAL	ACTUATION	REMARKS
125	DRYWELL VENT (18")		1601-23 1601-24	AO BUTTERFLY AO BUTTERFLY	X X		C C				NE	B, F B, F	
125	DRYWELL VENT RELIEF (2")		1601-62	AO GLOBE	X		C				NE	B, F	
125	DRYWELL VENT TO EMER. GAS TR. SYS. (6")		1601-63	AO BUTTERFLY	X						NE	B, F	
126	DRYWELL INERT & PURGE	(18") (4")	1601-21 1601-55	AO BUTTERFLY AO BUTTERFLY	X X		C C				NE	B, F	
126	DRYWELL N_2 MAKEUP	(1½")	1601-59	AO BUTTERFLY	X		C				NE	B, F	
130	STANDBY LIQUID CONTROL (1½")		1101-16 1101-15	CHECK CHECK	X	X	C C				E	RF RF	
144	CRD HYD. SYS RET (4")		301-95 301-98	CHECK CHECK	X	X					NE	RF RF	
145	LPCI CONTAINMENT SPRAY (16")		1501-28B	MO GATE	X		C				NE	G	
147	RX HEAD COOLING (2½")		205-2-4 205-2-7	MO GATE CHECK	X	X					NE	B, F RF	
149A,B	CORE SPRAY TO Reactor (10")		1402-25A,B 1402-9A,B	MO GATE AO CHECK	X	X					E	RM RM	
150A	LPCI CONTAINMENT SPRAY (16")		1501-28A	MO GATE	X		C				NE	G	
303A, B,C,D	LPCI PUMP SUCT.	(14")	1501-5A, B,C,D	MO GATE	X		O				-	RM	
304	SUPPRESSION CHAM VAC. RELIEF (20")		1601-31A,B 1601-20A,B	CHECK AO BUTTERFLY	X X		C C				E	RF	
304	SUPPR. CHAMBER N_2 MAKE-UP	(1½)	1601-58 1601-57	AO Butterfly MO GLOBE	X X		C C				NE	B, F B, F	
304	SUPPR. CHAM. INERT & PURGE (18")		1601-56	AO Butterfly	X		C				NE	B, F	
304	SUPPR. CHAM. VENT FR R.B. BLDG. (18")		1601-22	AO BUTTERFLY	X		C				NE	B, F	
310A,B	LPCI TEST (14")		1501-38A,B 1501-20A,B	MO GLOBE MO GATE	X X		C C				NE	G G	
310A,B	LPCI PUMP MIN. FLOW	(3")	1501-13A,B	MO GATE	X		C				E	G	

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS

PLANT: DRESDEN 2

PENETRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PENE CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION		POSITION				ESSENTIAL	ACTUATION	REMARKS
					O.C.	I.C.	NORMAL	SHUT DN	POST LOCA	PWR FAIL.			
310A,B	CORE SPRAY TEST	(8")	1402-4A,B	MO GLOBE	X		C				NE	G	
310A,B	CORE SPRAY PUMP MIN. FLOW	(1½")	1402-38A,B	MO GATE	X		C				NE	SYSTEM FLOW	
310A	HPCI PUMP MIN. FLOW	(4")	2301-40	CHECK	X		C				E	RF	
311A,B	LPCI SUPPRESSION SPRAY	(6")	1501-18A,B 1501-19A,B	MO GLOBE MO GATE	X X		C C				NE	G G	
312	HPCI COND. DRAIN	(2")	2301-34	CHECK	X		O				E	RF	
318	SUPP. CHAMBER VENT (18")		1601-60	AO BUTTERFLY	X		C				NE	B,F	
318	SUPP. CHAMBER VENT RELIEF (2")		1601-61	AO GATE	X		C				NE	B,F	
	CONTAINMENT ISOLATION LINES PROVIDED IN ATTACHMENT B, JUNE 17, 1981 MEMO CE TO NRC, T.J. RAUSCH TO D. CRUTCHFIELD)												
101	DRYWELL AIR SAMPLE (1")		9207 A,B 9208A,B	AO GATE AO GATE	X X		O O				NE	B,F B,F	
119	SERVICE WATER SUPPLY (2")		1916-506	HAND GLOBE		X	C				NE	—	
125	ACAD		2599-4A 2599-4B	AO GLOBE AO GLOBE	X X		C C				NE	DRYWELL PRES. 43/165.	
139B	CRD TO RECIRC	(3/4") (3/4")	220-112A 220-112B	HAND GLOBE HAND GLOBE		X X	C C				NE	=	
"	" " "	(1") (1")	399-504 399-506	HAND GLOBE HAND GATE	X X		C C				NE	=	
139D	DRYWELL PNEUMATIC	(1")	4720 4721	AO GATE AO GATE	X X		O O				NE	B,G B,G	
143	DRYWELL AIR SAMPLE	(½")	9205A,B 9206A,B	AO GATE AO GATE	X X		O O				NE	B,F B,F	
			8501-5A,B	AO GATE	X		O				NE	B,F	
145	CONTAINMENT SPRAY		1501-27B	MO GATE	X		C				NE	G	

CONTAINMENT ISOLATION SYSTEM SEP REVIEW ITEMS

PLANT:

PENETRATION NO.	SYSTEM NAME AND SERVICE LINE SIZE	PEN CLASS NO.	VALVE IDENT. NUMBER	VALVE TYPE OR DESCRIPTION	LOCATION		POSITION				ESSENTIAL	ACTUATION	REMARKS
					O.C.	I.C.	NORMAL	SHUT D.N	POST LOCA	PWR FAIL.			
150A	CONTAINMENT SPRAY (16")		1501-27A	MO GATE	X		C					G	
202V	ACAD (1")		2599-2A	AO GLOBE	X		C					DRYWELL PRES. 43 lbs.	
"	ACAD (1")		2599-23B	CHECK	X		C					RF	
204	DRYWELL AIR SAMPLE	1	B501-3A -3B	AO GATE AO GATE	X X		O O				NE	B,F B,F	
204B	ACAD		2599-23B	CHECK	X		C					RF	
303A,B,C,D	HPCI PUMP SUCT. FROM TORUS (16")		2301-35	MO GATE	X		C					L	
303A,B,C,D	LPCI PUMP MOTOR COOLING LINE	2"	1599-13A -13B	RELIEF "	X X		C C					— —	
			-13C -13D	" "	X X		C C					— —	
310A	HPCI PUMP MIN FLOW (4")		2301-14 2301-53	MO GLOBE RELIEF	X X		C C				E	SYS. FLOW —	
312	HPCI COND. DRAIN	2"	2301-71	STOP CHECK	X		C				E	-	
316A	ACAD (1")		2599-24A -24B	CHECK CHECK	X X		C C					RF RF	
			-3A	AO GLOBE	X		C					-	
316B	ACAD (1")		2599-3B	AO GLOBE	X		C					DRYWELL PRES. 43 lbs.	
317A	HPCI TURBINE EXHAUST (24")		2301-45	CHECK	X		C				E	RF	
317A	DITTO		2301-74	STOP CHECK	X		O				E	RF	