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July 1, 1983

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Limerick Generating Station, Units 1 & 2
Information for Containment Systems Branch (CSB)

REFERENCE:
1. PECo. letter E. J. Bradley to A. Schwencer dated May 10, 1983
2. PECo. letter from E. J. Bradley to A. Schwencer dated June 23, 1983

Dear Mr. Schwencer:

Attached are draft revised Sections 6.2.4 and 7.3 and Table 6.2-17 of the FSAR reflecting our position on CSB draft SER item 15 with regards to automatic isolation of the DCW and RECW containment isolation valves. This revises some of the pages transmitted in Reference 1 for item 15.

The attached Table 6.2-17 supercedes the draft revised table transmitted in reference 2. This should close out CSB draft SER item 15.

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The information contained on these draft FSAR page changes will be incorporated into the FSAR, exactly as it appears on the attachments, in the revision scheduled for July, 1983.

Sincerely,

Eugene J. Bradley

SAJ/mjb 6/21/83-1

Copy to: See attached service list.

cc: Judge Lawrence Brenner (w/o enclosure)
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Judge Peter A. Morris (w/o enclosure)
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Docket and Service Section (w/o enclosure)

6.2.4.3.1.3.2.8 Drywell Radiation Sampling Lines

The sampling system lines that penetrate the containment and connect to the drywell and suppression chamber air volume are equipped with two normally open solenoid-operated isolation valves in series, located outside and as close to the containment as possible. These valves ensure isolation of these lines if there should be a break; they also provide long-term leakage control.

In addition, the piping is considered an extension of the containment boundary and, as such, is designed to the same quality standards as the primary containment. The drywell radiation sampling isolation valves have ganged controls for reopening. Inboard sample and return isolation valves SV-190A and SV-190C are ganged on HS-190A. Outboard sample and return isolation valves SV-190B and SV-190D are ganged on HS-190B.

6.2.4.3.1.3.2.9 Primary Containment Instrument Gas

The influent lines are provided with a normally-open power-operated globe valve outside the containment and a check valve inside the containment. Motor-operated valves are used on the influent lines that contain the ADS gas supply. These are essential lines that provide a long-term backup to the ADS accumulators inside containment. The valves on these essential lines are remote manually operated and automatically isolate only when flow out of containment through these lines would be possible (i.e., low differential pressure between the containment and the instrument gas line). The remaining influent lines are non-essential lines that use air-operated valves that are automatically closed on receipt of a containment isolation signal. The effluent lines are provided with normally-open air-operated globe valves inside and outside the containment that close automatically on receipt of a containment isolation signal.

6.2.4.3.1.3.2.10 Reactor Enclosure Cooling Water

Each influent and effluent line is provided with two gate valves located outside containment. The inboard valves are motor-operated. The outboard valves on the emergency service water intertie lines are locked closed. The outboard valves on the RECW lines (HV-108 and HV-111) are motor-operated and their controls are ganged on HS-108. Each of the motor-operated valves can be remote manually closed from the control room. ~~Remote manual actuation is preferable because system operation is necessary to prevent recirculation pump seal failure and subsequent system leakage.~~ Automatic, diverse isolation signals will be provided to these valves by the end of the first refueling cycle. In the interim, operating procedures will require manual isolation under appropriate conditions.

6.2.4.3.1.3.2.11 Drywell Chilled Water

Each influent and effluent line is provided with two motor-operated gate valves located outside containment. The controls for these valves are ganged as follows:

a. Loop A inboard influent and effluent isolation valves HV-128 and HV-129 are ganged on HS-128.

b. Loop B inboard influent and effluent isolation valves HV-122 and HV-123 are ganged on HS-122.

c. Loop A outboard influent and effluent isolation valves HV-120A, 121A, 124A and 125A are ganged on HSS-121A.

d. Loop B outboard influent and effluent isolation valves HV-120B, 121B, 124B and 125B are ganged on HSS-121B.

The inboard valves are provided with automatic isolation signals as indicated in Table 6.2-17. The outboard isolation valves are aligned to either the drywell chilled water system or the reactor enclosure cooling water system. By the end of the first refueling outage, the controls for the outboard valves will be modified to ~~permit remote manual closure from the control room.~~ incorporate diverse, automatic isolation signals.

6.2.4.3.1.3.3 Conclusion on Criterion 56

In order to ensure protection against the consequences of accidents involving release of significant amounts of radioactive materials, pipes that penetrate the containment have been demonstrated to provide isolation capabilities on a case-by-case basis in accordance with Criterion 56.

In addition to meeting isolation requirements, the pressure retaining components of these systems are designed to the same quality standards equivalent to those used for the primary containment.

6.2.4.3.1.4 Evaluation Against Criterion 57

Criterion 57 describes criteria for closed system isolation valves.

Influent and effluent lines of this group are isolated by automatic or remote manual isolation valves located as close as possible to the containment boundary.

TABLE 6.2-17 (CONT'D)

CONTAINMENT PENETRATION NUMBER	LINE ISOLATED	FLUID	LINE SIZE (in.)	NRC GENERAL DESIGN CRITERION	ESF SYSTEM	ESSENTIAL SYSTEM	VALVE NUMBER	VALVE TYPE [1]	VALVE LOCATION	VALVE ARRANGEMENT [2]	TYPE C TEST	LENGTH OF PIPE FROM CONT TO OUTSIDE V-VLVES	PRIMARY METHOD OF ACTUATION [3]	SECONDARY METHOD OF ACTUATION	NORMAL VALVE POSITION [4]	SHUTDOWN VALVE POSITION	POST-ACCIDENT POSITION	POWER FAILURE VALVE POSITION	ISOLATION SIGNAL [5]	DIVERSE ISOLATION SIGNAL [17]	VALVE CLOSURE TIME [6]	POWER SOURCE [7]	REMARKS
X-20B	Instrumentation-w/R level	water	1	55	-	-	F040C	XFC	Outside	(37)	No	2'-2"	Flow	-	0 4	0	0	-	-	-	-	-	
X-20B	Instrumentation-LPCI	water	1	55	-	-	102C	XFC	Outside	(40)	No	13"	Flow	-	0	0	0	-	-	-	-	-	
X-21	Service air	Gas	3	56	No No	No No	1140 1139	GT GT	Inside Outside	(8)	Yes	- 0"	Manual Manual	-	C C	C C	C C	-	-	-	-	-	
X-22	Instrumentation - drywell pressure	Gas	1	56	-	-	147C	GB	Outside	(41)	No	8"	AC motor	Manual	0	0	0	AS IS	RM	-	30 sec	C	
X-23	Recirc pump cooling water supply	water	4	56	No No No	No No No	106 108 1090	GT GT GT	Outside Outside Outside	(13)	Yes	0" 3'-11" 5'-2"	AC motor AC motor Manual	Manual Manual -	0 0 C	0 0 C	C C C	AS IS AS IS -	RM RM -	No No -	Standard Standard -	C D -	DC (16) (16)
X-24	Recirc pump cooling water return	water	4	56	No No No	No No No	107 111 1089	GT GT GT	Outside Outside Outside	(13)	Yes	0" 3'-8" 5'-0"	AC motor AC motor Manual	Manual Manual -	0 0 C	0 0 C	C C C	AS IS AS IS -	RM RM -	No No -	Standard Standard -	C D -	DC (16) (16)
X-25	Drywell purge supply	Gas	24	56	No Yes No Yes Yes No	No Yes No Yes Yes No	135 121 123 111 163 109	BF BF BF BF BF BF	Outside Outside Outside Outside Outside Outside	(5)	Yes	16'-7" 3'-11" 3'-4" 60'-7" 3'-8" 42'-2"	AC motor Comp air Comp air Comp air AC motor AC motor	Manual Spring Spring Spring Manual Manual	C C C C C C	O O C C C C	C C C C O C	AS IS C C C AS IS AS IS	O,H,R,W O,H,R,W O,H,R,W O,H,R O,H,R O,H,R,W	Yes NA Yes NA NA Yes	5** sec 5** sec 5** sec 5 sec 5 sec 5** sec	B A A D D B	
X-26	Drywell purge exhaust	Gas	24	56	No Yes No No Yes No	No Yes No No Yes No	115 145 111 114 161 117	BF GT GB BF BF GB	Outside Outside Outside Outside Outside Outside	(27)	Yes	53'-7" 66'-9" 6'-6" 49'-7" 4'-5" 60'-3"	AC motor AC coil AC motor Comp air AC motor Comp air	Manual - Manual Spring Manual Spring	C C C C C C	O O C O C C	C C C C O C	AS IS C AS IS C AS IS C	O,H,R O,H,R O,H,R O,H,R,W O,H,R O,H,R	NA Yes Yes NA Yes	2 sec 30** sec 5** sec 5 sec 5** sec	D B B C A	
X-27A	Instrument gas supply	Gas	1	56	No No	Yes Yes	1128 151A	CK GB	Inside Outside	(48)	Yes	- 7"	Flow AC motor	Manual	0 0	0 0	C C	AS IS	M	NA	30 sec	C	
X-27B	Instrumentation-HPCI	Steam	1	55	-	-	F024B	XFC	Outside	(40)	No	12"	Flow	-	0	0	0	-	-	-	-	-	
X-27B	Instrumentation-HPCI Flow	Steam	1	55	-	-	F024D	XFC	Outside	(40)	No	12"	Flow	-	0	0	0	-	-	-	-	-	rev. 21, 08/83

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TABLE 6.2-17 (Cont'd)

CONTAINMENT PENETRATION NUMBER	LINE ISOLATED	FLUID	LINE SIZE(in.)	NRC GENERAL DESIGN CRITERION	ESF SYSTEM	ESSENTIAL SYSTEM	VALVE NUMBER	VALVE TYPE(1)	VALVE LOCATION	VALVE ARRANGEMENT(2)	TYPE C TEST	LENGTH OF PIPE FROM CONT. TO OUTSIDE VALVE	PRIMARY METHOD OF ACTUATION(3)	SECONDARY METHOD OF ACTUATION	NORMAL VALVE POSITION(4)	SHUTDOWN VALVE POSITION	POST-ACCIDENT POSITION	POWER FAILURE VALVE POSITION	ISOLATION SIGNAL(5)	DIVERSE ISOLATION SIGNAL(17)	VALVE CLOSURE TIME(6)	POWER SOURCE(7)	REMARKS
X-50A	Instrumentation - drywell pressure	Gas	1	56	-	-	147B	GB	Outside	(41)	No	?'	AC motor	Manual	C	O	O	AS IS	RM	-	30 sec	R	
X-50A	Instrumentation - recirc flow	Water	1	55	-	-	F011A	XFC	Outside	(40)	No	2'-9"	Flow	-	O	O	O	-	-	-	-	-	
					-	-	F011B	XFC	Outside			18"	Flow	-	O	O	O	-	-	-	-	-	
					-	-	F012A	XFC	Outside			2'-9"	Flow	-	O	O	O	-	-	-	-	-	
					-	-	F012B	XFC	Outside			18"	Flow	-	O	O	O	-	-	-	-	-	
X-50B	Instrumentation - recirc pump seal pressure	Water	1	55	-	-	F004A	XFC	Outside	(45)	No	4'-11"	Flow	-	O	O	O	-	-	-	-	-	
X-50B	Instrumentation - recirc pump cooler flow	Water	1	56	-	-	156A	XFC	Outside	(44)	No	22"	Flow	-	O	O	O	-	-	-	-	-	
					-	-	157A	XFC	Outside			20"	Flow	-	O	O	O	-	-	-	-	-	
X-51A	Instrumentation - recirc line flow	Water	1	55	-	-	F009A,B	XFC	Outside	(40)	No	18"	Flow	-	O	O	O	-	-	-	-	-	
					-	-	F010A,B	XFC	Outside			18"	Flow	-	O	O	O	-	-	-	-	-	
X-51B	Instrumentation - jet pump flow	Water	1	55	-	-	F059T	XFC	Outside	(37)	No	12"	Flow	-	O	O	O	-	-	-	-	-	
					-	-	F051C	XFC	Outside			3'-4"	Flow	-	O	O	O	-	-	-	-	-	
					-	-	F053C	XFC	Outside			12"	Flow	-	O	O	O	-	-	-	-	-	
X-52A	Instrumentation - main steam line B flow	Water	1	55	-	-	F070B	XFC	Outside	(40)	No	12"	Flow	-	O	O	O	-	-	-	-	-	
					-	-	F073B	XFC	Outside			12"	Flow	-	O	O	O	-	-	-	-	-	
X-52B	Instrumentation - recirc line flow	Water	1	55	-	-	F011C	XFC	Outside	(40)	No	2'-9"	Flow	-	O	O	O	-	-	-	-	-	
					-	-	F011D	XFC	Outside			18"	Flow	-	O	O	O	-	-	-	-	-	
					-	-	F012C	XFC	Outside			2'-3"	Flow	-	O	O	O	-	-	-	-	-	
					-	-	F012D	XFC	Outside			18"	Flow	-	O	O	O	-	-	-	-	-	
X-53	Chilled water supply "A"	Water	8	56	No	No	128	GT	Outside	(13)	Yes	0"	AC motor	Manual	O	O	C	AS IS	C,H,R	Yes	Standard	R	(15)
					No	No	127A	GT	Outside			63'-10"	AC motor	Manual	O	O	C	AS IS	RM	No	Standard	A	(16)
					No	No	125A	GT	Outside			63'-10"	AC motor	Manual	C	C	C	AS IS	RM	No	Standard	A	

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TABLE 6.2-17 (Cont'd)

CONTAINMENT PENETRATION NUMBER	LINE INSULATED	FLUID	LINE SIZE(in.)	NRC GENERAL DESIGN CRITERION	ESF SYSTEM	ESSENTIAL SYSTEM	VALVE NUMBER	VALVE TYPE(1)	VALVE LOCATION	VALVE ARRANGEMENT(2)	TYPE C TEST	LENGTH OF PIPE FROM CONT. TO OUTSIDE VALVES	PRIMARY METHOD OF ACTUATION(3)	SECONDARY METHOD OF ACTUATION	NORMAL VALVE POSITION(4)	SHUTDOWN VALVE POSITION	POST-ACCIDENT POSITION	POWER FAILURE VALVE POSITION	ISOLATION SIGNAL(5)	DIVERSE ISOLATION SIGNAL(12)	VALVE CLOSURE TIME(6)	POWER SOURCE(7)	REMARKS
X-54	Chilled water return "A"	Water	8	56	No No No	No No No	129 121A 124A	GT GT GT	Outside Outside Outside	(13)	Yes	0" 67'-0" 67'-0"	AC motor AC motor AC motor	Manual Manual Manual	O O C	O O C	C C C	AS IS AS IS AS IS	C,H,R RM RM	Yes No No	Standard Standard Standard	B A A	(16) (16)
X-55	Chilled water supply "B"	Water	8	56	No No No	No No No	122 120B 125B	GT GT GT	Outside Outside Outside	(13)	Yes	0" 46'-10" 46'-[illegible]"	AC motor AC motor AC motor	Manual Manual Manual	C O C	C O C	C C C	AS IS AS IS AS IS	C,H,R RM RM	Yes No No	Standard Standard Standard	B A A	(16) (16)
X-56	Chilled water return "B"	Water	8	56	No No No	No No No	123 121B 124B	GT GT GT	Outside Outside Outside	(13)	Yes	0" 37'-[illegible]" 37'-[illegible]"	AC motor AC motor AC motor	Manual Manual Manual	C O C	C O C	C C C	AS IS AS IS AS IS	C,H,R RM RM	Yes No No	Standard Standard Standard	B A A	(16) (16)
X-57	Instrumentation - RWCU flow	Water	1	55	-	-	102	CK	Outside	(40)	No	11"	Flow	-	O	O	O	-	-	-	-	-	
X-58A	Instrumentation - recirc loop B [illegible]	Water	1	55	-	-	F040B	CK	Outside	(40)	No	14"	Flow	-	O	O	O	-	-	-	-	-	
X-61	Recirc pump seal purge	Water	1	56	No -	No -	1004A,B 103A,B	CK XFC	Inside Outside	(45)	Yes	- 20"	Flow Flow	-	O O	C O	C O	-	-	-	-	-	
X-62	H_2/O_2 sample return; drywell purge makeup	Gas	1	56	Yes No Yes	Yes No Yes	150 116 159	GT GB GT	Outside Outside Outside	(12)	Yes	3'-3" 6'-6" 15'-9"	AC coil AC motor AC coil	- Manual -	O C O	O C O	O C O	C AS IS C	B,H,R B,H,R B,H,R	NA Yes NA	2 sec 30** sec 2 sec	B D D	
X-63	Instrumentation-recirc loop [illegible]	Water	1	55	-	-	F040D	XFC	Outside	(40)	No	3'-4"	Flow	-	O	O	O	-	-	-	-	-	
X-63	Instrumentation-recirc pump seal pressure	Water	1	55	- -	- -	F004B F003B	XFC XFC	Outside Outside	(45)	No	12" 12"	Flow Flow	-	O O	O O	O O	-	-	-	-	-	
X-65A,B	Instrumentation-RPV pressure	Water	1	55	- -	- -	F043B F043A	XFC XFC	Outside Outside	(37)	No	14" 14"	Flow Flow	-	O O	O O	O O	-	-	-	-	-	

(11) The control rod drive (CRD) insert and withdraw lines can be isolated by solenoid valves outside containment. Air operated scram inlet and outlet valves are also provided. Leakage may occur through the scram outlet valves. A low leakage flowrate will be treated by the clean radwaste system. Excessive leakage will result in either automatic scram or operator initiated scram. When scram is complete, the scram discharge volume system is automatically isolated by the redundant vent and drain valves.

(12) Only non-essential systems require diverse signals for automatic isolation. Therefore, this column is not applicable, (NA), for essential systems.

(13) These valves are normally sealed closed and will only be opened for flushing of the condensate and feedwater systems during startup (up to a reactor pressure of 600 psig).

(14) Diverse isolation signals are not sensed as discussed in Section 6.2.4.3.1.

(15) These valves are normally closed, will be open only during reactor shutdown, are interlocked to open only on low reactor pressure, and connect to a closed system outside containment. Therefore, closure times less than 60 seconds are not required.

(16) Diverse, automatic isolation logic to be added by the end of the first refueling outage.

RCIC and HPCI systems are placed in operation. The setting selected is low enough to allow the removal of heat from the reactor for a predetermined time following the scram and high enough to complete isolation in time for the operation of ECCS if there is a large break in the RCPB. The pipelines that are isolated when the reactor vessel water level falls to this second setting are listed below.

a. Reactor water cleanup

b. Containment atmospheric control including H_2O_2 sample lines

c. Traversing incore probe

d. Main steam sample

e. HPCI pump flush

f. RHR vacuum relief

g. Drywell sump drains

h. Suppression pool cleanup

i. Drywell radiation sample

j. Recirculation loop sample

k. drywell chilled water

The third (and lowest) of the reactor vessel low water level isolation settings (level 1) is the water level setting used to initiate RHR, core spray, and automatic depressurization system, and to start the diesel generators. The pipelines that are isolated when the reactor vessel water level falls to this third setting are the main steam, main steam line drain, containment instrument gas, RHR heat exchanger vent valves, suppression pool spray, and core spray pump test and flush.

Reactor vessel low water level signals are initiated from eight differential pressure sensors, four sensors for the level 1 and level 2 trip and four sensors for the level 3 trip, as shown in Figure 5.1-4. They sense the difference between the pressure caused by a constant reference leg of water and the pressure caused by the actual water level in the vessel.

Four pairs of instrument sensing lines, attached to taps above and below the water level on the reactor vessel, are required for the differential pressure measurement and terminate outside the drywell and inside the reactor enclosure. They are physically

Note: This was mistakenly deleted in Rev. 21. → DRAFT

RHR shutdown cooling injection outboard throttling motor-operated valves is initiated by logic trip relay B. Tripping of the logic trip relay requires tripping of the two-out-of-two logic for low reactor vessel water level signal or the one-out-of-two logic for reactor low pressure signals.

Closure of the inboard drywell chilled water isolation valves is initiated by any one of the following conditions in a one-out-of-one logic: reactor level below level 1 trip; high drywell pressure; high radiation in the reactor enclosure ventilation exhaust duct; high radiation in the refueling floor ventilation exhaust duct.

Closure of the inboard and outboard reactor water sample motor-operated valves and reactor steam sample air-operated valves is initiated by low reactor vessel water level and high steam line radiation signals, utilizing two-out-of-two logic. Logic trip relay A closes the inboard valves and logic trip relay B closes the outboard valves.

Retraction of the TIP drives is initiated by low reactor vessel water level 2 and high drywell pressure in a two-out-of-two logic. Logic trip relay A initiates retraction of the TIP system drives.

Closure of the primary containment purge valves is initiated by any one of the following conditions in a two-out-of-two logic: reactor level below level 2 trip; high drywell pressure; high radiation in the reactor enclosure ventilation exhaust duct; high radiation in the refueling floor ventilation exhaust duct.

Closure of the inboard and outboard RWCU isolation motor-operated valves is initiated by low reactor vessel water level utilizing two-out-of-two logic or by high area temperature and high differential RWCU flow utilizing one-out-of-one logic. Logic trip relay A closes the inboard valve and logic trip relay B closes the outboard valves.

Closure of the inboard containment instrument gas system (CIGS) suction valve is initiated by any one of the following conditions in a two-out-of-two logic: Reactor level below level 1 trip; high drywell pressure; high radiation in the reactor enclosure ventilation exhaust duct; or high radiation in the refueling floor ventilation exhaust duct.

Closure of the primary containment atmosphere sample isolation valves and the post-LOCA hydrogen recombiner isolation valves is initiated by any one of the following conditions in a one-out-of-one logic: Reactor level below level 2 trip; high drywell pressure; high radiation in the reactor enclosure ventilation exhaust duct; high radiation in the refueling floor ventilation exhaust duct.

Closure of outboard CIGS isolation valves not on ADS gas supply lines is initiated by any one of the following conditions in a two-out-of-two logic: Reactor level below level 1 trip; high drywell pressure; high radiation in the reactor enclosure ventilation exhaust duct.