JCP&L GPU

Jersey Central Power & Light Company
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November 20, 1979

Mr. William Kane
Bulletins & Orders Task Force
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Kane:

Subject: Bulletins and Orders Task Force
Long Term Systems Information

Reference: (a) Division of Operating Reactors Letter dated 7/17/79, Additional Information Required for NRC Staff Generic Report on Boiling Water Reactors.

(b) USNRC Letter to General Electric "Summary of July 12, 1979 Meeting to Discuss BWR Loss of Feedwater and Small Break LOCA" dated 7/26/79.

(c) Letter from T. D. Keenan, Chairman, General Electric Operating Plant Owners' Group, to Mr. D. F. Ross, Jr. of the NRC dated 8/17/79, General Electric Report "NEDO-24708, Additional Information Required for NRC Staff Generic Report on Boiling Water Reactors".

Enclosure: (1) Bulletins & Orders Task Force - Long Term Systems Information

By letter dated July 17, 1979 (reference a), the NRC had requested that Jersey Central Power & Light Company provide additional information which was deemed necessary to enable the NRC staff to issue a generic report on BWRs. This information request was later modified by reference (b). Part of the information requested was sent to the NRC on August 17, 1979 (Reference c). Enclosure (1) to this letter provides the remainder of the requested information in accordance with the schedule provided in reference (b) except for the following: the containment isolation information requested by Item I of Attachment 2 to Enclosure 1 of reference (a) is still being compiled, and has not been included in this package; it will be forwarded to you as soon as

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possible, but no later than December 1, 1979.

If you need any clarification of our responses during your review of the information provided, please contact Mr. Jim Knubel, Supervisor, Nuclear Safety & Licensing, (201-455-8753) of my staff.

Very truly yours,

Ivan R. Finfrock, Jr.
Vice President

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ENCLOSURE 1.

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PLANT Oyster Creek UNIT(S) 1

BYPASS CAPACITY

Plant Steam Bypass Capacity, % Rated 40

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PLANT Oyster Creek

SYSTEMS AND COMPONENTS SHARED BETWEEN UNITS

PAGE____ CONTINUED PAGE ____

Single-unit plant check here [X] and do not complete

System or Component	Shared Between Units Numbers

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PLANT Oyst.: Creek UNIT(S) 1

PLANT-SPECIFIC SYSTEM INFORMATION

Page 1, continued on page 2.

System	General: Safety Classification	General: Seismic Category	Water Sources: Safety Classification	Water Sources: Seismic Category	Instrumentation and Control: Safety Classif.	Instrumentation and Control: Seismic Category	Frequency of * System and Component Tests
1. RCIC	NA**	NA	NA	NA	NA	NA	NA
2. Isolation Condenser	Note 1	I	Note 1	I	Note 1	Note 2	EVERY REFUELING OUTAGE
3. HPCS	NA	NA	NA	NA	NA	NA	NA
4. HPCI	NA	NA	NA	NA	NA	NA	NA
5. LPCS	Note 1	I	Note 1	I	Note 1	Note 2	EVERY 3 MONTHS
6. LPCI	NA	NA	NA	NA	NA	NA	NA
7. ADS	Note 1	I	NA	NA	Note 1	Note 2	EVERY REFUELING OUTAGE
8. SRV	"	I	NA	NA	Note 1	"	ONCE EVERY THREE REFUELING OUTAGES
9. RHR (including	—	—	—	—	—	—	—
shutdown cooling,	Note 1	II	Note 1	I	Note 1	Unknown	NOT TESTED
steam condensing,	"	I	"	I	"	Note 2	EVERY 3 MONTHS
suppression pool cooling,	"	II	"	II	"	Unknown	EVERY 3 MONTHS
containment spray modes)	"	I	"	I	"	Note 2	EVERY 3 MONTHS
10. SSW (Service Water System)	"	I	"	II	"	Unknown	NA
11. RBCCW	"	I	CLOSED LOOP	NA	"	"	NA
12. CRDS	"	I	Note 1	II	"	Note 2	ONCE PER MONTH
13. CST	"	II	NA	NA	"	Unknown	NA
14. Main Feedwater	"	I	Note 1	II	"	II	NA
15. Recirculation Pump/Motor Cooling	"	I	CLOSED LOOP	NA	"	Unknown	NA

Note 2: Original Burns & Roe design specifications calls for Category I design criteria, actual conditions in field indicate a probable non-seismic I installation.

Note 1: Safety classification did not exist when Oyster Creek was built, see next seven pages for design code specifications, information provided may be incomplete.

* Some components of these systems are tested more frequently than indicated.

** An entry of "NA" is provided when the question does not apply to a particular system or when the system does not exist at the plant.

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PLANT-SPECIFIC SYSTEM INFORMATION

Page 2, continued on page 3.

Sheet 1

NOTE 1	OYSTER CREEK COMPONENT/SUBSYSTEM	QUALITY GROUP: PLANT DESIGN	QUALITY GROUP: R.G. 1.26 SRP 3.2.2	SEISMIC: PLANT DESIGN	SEISMIC: R.G. 1.29 SRP 3.2.1	REMARKS
	STRUCTURES					
	1. REACTOR BLDG			CLASS I	SEISMIC CATEGORY I	R.G. 1.29 C.1.0/(V.3.5)
	2. DRYWELL, TORUS, VENTS	ASME SEC. VIII 1962 Edition & IV 1270N-5		CLASS I	(SEE)	R.G. 1.29 C.1.o/(V.3.5)
	3. CONTROL ROOM PANELS	1272N-5 1271N		CLASS I	I	R.G. 1.29 C.1.n/(V.3.5)
	4. SPENT FUEL POOL	SEC. VIII		CLASS I	I	R.G. 1.29 C.1.1/(V.3.5)
	5. VENT STACK	ASA, IEEE, ASTM, AWS, NBFU & FED STATE & LOCAL	N/A	CLASS I	NSI (OBE)	
	6. TURBINE BLDG.			CLASS II		
	7. RADWASTE BLDG.			CLASS II	NONSEISMIC CATEGORY I (OBE)	SEE SRP 11.3
2,3	9. INTAKE & DISCHARGE			CLASS II	SEISMIC I	IF THIS IS ULTIMATE HEAT SINK IT SHOULD BE SI R.G. 1.29(1g).
	10. SCREEN HOUSE			CLASS II		
	EQUIPMENT NSSS					
1,2,3	1. REACTOR VESSEL	ASME BPV SECT. I	ASME BPV SECT. III A	CLASS I	SEISMIC I	Pg. IV-1-1/R.G. 1.29 C.1.a/(V.3.5)
1,2	2. CRDS Housing	ASME BPV SECT. I	A	CLASS I	SEISMIC	R.G. 1.29 (C.2/(V.3.5)
1,2	Supports	GE	-----------	CLASS I	SEISMIC I	R.G. 1.29 C.2/(V.3.5)
1,2,3	3. RV SUPPORTS	GE		CLASS I	SEISMIC I	R.G. 1.29 C.2/(V.3.5)
1,2,3	4. FUEL ELEMENTS	GE	N/A	CLASS I	SEISMIC I	R.G. 1.29 C.1.b/(V.3.5)
1,2,3	5. CORE SHROUD	GE		CLASS I	SEISMIC I	R.G. 1.29 C.1.b/(V.3.5)
1,2,3	6. CORE SUPPORTS	GE		CLASS I	SEISMIC I	R.G. 1.29 C.1.b/(V.3.5)
1,2,3	7. STEAM SEPARATOR	ASME & IX		CLASS I	SEISMIC I	R.G. 1.29 C.1.b/(V.3.5)

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Sheet 2

NOTE	OYSTER CREEK COMPONENT/SUBSYSTEM	PLANT-SPECIFIC SYSTEM INFORMATION QUALITY GROUP: PLANT DESIGN	QUALITY GROUP: R.G. 1.26 SRP 3.2.2	SEISMIC: PLANT DESIGN	SEISMIC: R.G. 1.29 SRP 3.2.1	REMARKS
1,2 3	8. STEAM DRYER	ASME 8 IX	N/A	CLASS I	SEISMIC I	R.G. 1.29 C.1.b/V.3.5
	9. PIPING FROM REACTOR VESSEL TO 1st ISOLATION VALVE EXTERNAL TO DRYWELL	ASME SI 1965 to first ISO VALVE OUTSIDE DRYWELL then ANSI B31.1-1965 & NUC Code Cases to 2nd ISO valve.	ASME BPV SIII C1 A	CLASS I	SEISMIC I	R.G. 1.29 C.1.a
	RECIRCULATION SYSTEM					
1	1. PUMPS	ASA B31.1	ASME BPV SIII C1 A	CLASS I	SEISMIC I	VI-1-1/R.G. 1.29 C.1.a
1	2. VALVES	ASME BPV I	" A	CLASS I	SEISMIC I	IV-1 [illegible]/R.G. 1.29 C.1.a
1	3. PIPING	ASME BPV I ASA B31.1	" A	CLASS I	SEISMIC I	IV-1-2/R.G. 1.29 C.1.A
	EMERGENCY SYSTEMS					
	1. ISOLATION CONDENSER					IV-1-2
2,3	SHELL	ASME BPV SECT. VIII	C	CLASS I	SEISMIC I	R.G. 1.29 C.2
1,2 3	TUBE	ASME BPV S.III C1.A	ASME BPV SIII C2 B	CLASS I SIII CLASS 2	SEISMIC I	R.G. 1.29 C.1.b
1,2 3	PIPING	ASME Sec. 1 1965	ASME BPV SIII CLASS 2 B	CLASS I	SEISMIC I	R.G. 1.29 C.1.b
3*	2. LIQUID POISON SYS.	ASME 31-1965				
	* Only if CRDS fails to operate	ANSI B-31.1-1965 & NCC	ASME BPV SIII CLASS 2 B	CLASS I	SEISMIC I	R.G. 1.29 C.1.b
	PUMP	ASME SIII C1C	B			
	TANK	API	B			
	3. CORE SPRAY SYS.		ASME BPV SIII C2	CLASS I	SEISMIC I	R.G. 1.29 C.1.c/VI.6.2
1,3	PIPING	ASA B31.1	A/B	"		
	4. REACTOR BLDG				CLASS I	
2	CLOSED LOOP COOLING	ANSI-B31.1-1965 & Nuclear Code Cases	ASME BPV SIII CL 3 C	CLASS I	SEISMIC I	V.3.5/R.G. 1.29 C.1.g
3	5. AUTOMATIC DEPRESSUR-		A			Part of ECCS; should be Seismic I, Class 2

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NOTE 1	OYSTER CREEK COMPONENT/SUBSYSTEM	QUALITY GROUP		SEISMIC		REMARKS
		PLANT DESIGN	R.G. 1.26 SRP 3.2.2	PLANT DESIGN	R.G. 1.29 SRP 3.2.1	
	REACTOR EMERGENCY SYS.					
3	SERVICE WATER SYSTEM	ASME BPV SI & IX TO 1st ISOLATION VALVE REST ASA 1331.1-1955+ CHANGES TO 1966	ASME BPV SIII CLASS 3 C	CLASS I	SEISMIC I	R.G. 1.29 C.1.g/X-3-2
3	CONTAINMENT SPRAY SYSTEM	ASA B31.1 ASME S VIII TO 1st VALVE OUTSIDE CONTAINMENT	ASME BPV SIII CLASS 2 B	CLASS I	SEISMIC I	R.G. 1.29 C.1.c/VI-7-1
X	STANDBY GAS TREAT. SYS	GE	B**	CLASS I	SEISMIC I*	No description of system *if system removes H_2 **no req't if post accid fission product removal is not basis. O.C. uses H_2 inerting system
X	SPENT FUEL AND NEW FUEL STORAGE FACILITIES	ASTM, A373, A245, 6VA, B&C ASTM, A240 C1 304L		CLASS I	SEISMIC	Fuel Handling Not Covered by R. G. 1.26:R.G. 129 C.1.L requires seismic I
	EMERGENCY ELEC. SYS.					
1,3	BATTERIES	ASA, ASTM, ASTM, IEEE NEMA, NFBU NEMA, LOCAL	N/A	CLASS I	SEISMIC I	R.G. 1.29 (C.1.q) CLASS IE ONSITE POWER SUPPLIES IEEE 344. SRP 8.3.2
2,3	DIESEL GENERATOR	ASME, ASA, ASTM, IEEE, NEMA, NFBU DEMH, LOCAL	N/A			R.G. 1.29 C.1.q Class IE Onsite Power
2,3	EMERGENCY BUSSES, ETC.	ASA, IEEE, ASTM, NEMA	N/A			R.G. 1.29 C.1.8 Class IE Onsite Power Supplies IEEE 344. SRP 8.3.1

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PLANT-SPECIFIC SYSTEM INFORMATION
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NOTE 1	OYSTER CREEK COMPONENT/SUBSYSTEM	QUALITY GROUP		SEISMIC		REMARKS
		PLANT DESIGN	R.G. 1.26 SRP 3.2.2	PLANT DESIGN	R.G. 1.29 SRP 3.2.1	
	STEAM SYSTEM					
1	1. Piping to Ist.I.V.	ASME BPV SECT. I	ASME BPV A III CLASS I A	CLASS I	SEISMIC I	R.G. 1.29 C.1.a/IV-1-2
	2. Piping to Turb SV	ASA B31.1	ASME BPV SIII CLASS 2 B		SEISMIC I	R.G. 1.29 C.1.e
1	3. MSIV VALVE	ASME BPV SECT. L ASA B31.1 GE SPECS	ASME BPV SIII CLASS 1 A	CLASS I	SEISMIC I	R.G. 1.29 C.1.a/IV-1-2
	4. TURBINE STOP VALVE		ANSI B31.1.1.0 D		NON SEISMIC I	SRP 3.2.1
1	5. SAFETY VALVE	ASME BPV SECT. I XNCC-1271N	ASME BPV SIII CLASS 1 A	CLASS I	SEISMIC I	R.G. 1.29 C.1.a/IV-1-2
1	6. RELIEF VALVE	ASME BPV SECT 1	ASME BPV SIII CLASS 1 A	CLASS I	SEISMIC I	R.G. 1.29 C.1.a/IV-1-2
	SHUTDOWN COOLING SYSTEMS	--------	-------	CLASS II	---------	X-2-2
2	PUMPS	ASME BPV SECT.III	ASME BPV SIII CLASS 2 C	CLASS II	SEISMIC I	R.G. 1.29-C.1.d
2	SHUTDOWN COOLING TUBE	ASME BPV SIII CLASS C	ASME BPV SIII CLASS 2 C	CLASS II	SEISMIC I	R.G. 1.29 C.1.d

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NOTE	OYSTER CREEK COMPONENT/SUBSYSTEM	QUALITY GROUP		SEISMIC		REMARKS
		PLANT DESIGN	R.G. 1.26 SRP 3.2.2	PLANT DESIGN	R.G. 1.29 SRP 3.2.1	
1						
2	x SHELL	ASME BPV SECT. VIII	ASME BPV SIII CLASS 2 C	CLASS II SIII CLASS 2	SEISMIC I	R.G. 1.29 C.1.g
	CONDENSATE STORAGE TANKS & PUMPS			CLASS II Analysed for 0.11g seismic event - O.K.	SEISMIC II	CONDENSATE STORAGE SYSTEM IS RELATED TO SAFETY; ECCS SMALL BREAKS USE CRD WHICH HAS NORMAL SUCTION FROM CST ISOLATION CONDENSER CAN ALSO TAKE SUCTION FROM CST.
X	LIQUID WASTE SYSTEM	API 650 STANDARD	ASME BPV SIII CLASS 3 D	CLASS II		WASTE MANAGEMENT SYSTEMS IS UNDER DEVELOPMENT SRP 5.4.8 REQUIRES THAT PIPING FROM THE RECIRCULATION LOOP TO THE OUTERMOST ISOLATION VALVE BE CLASS A, SEISMIC I
X	REACTOR CLEANUP SYS.	ASME BPV SIII CLASS C	ASME BPV SIII CLASS 3 C	CLASS II	NON-SEISMIC	X-2-1
X	AIR COMPRESSOR & RECEIVERS		NOT COVERED BY R.G. 1.26	CLASS II	NON-SEISMIC	AIR OPERATED VALVES IMPORTANT TO SAFETY ARE REQUIRED TO HAVE SEISMIC ACCUMULATORS
2,3	STATION AUXILIARY BUSSES		N/A	CLASS II		
X	MOISTURE SEPARATORS AND REHEATERS	ASME SEC. VIII	N/A	CLASS II		

NOTE 1 - #1 denotes equipment required to hold together to prevent a LOCA due to the seismic event
#2 denotes equipment required to shutdown & hold in safe shutdown condition following seismic event
#3 denotes equipment required if plant experiences a LOCA
X denotes equipment not needed for safety during seismic event

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NOTE	OYSTER CREEK COMPONENT/SUBSYSTEM	QUALITY GROUP		SEISMIC		REMARKS
		PLANT DESIGN	R.G. 1.26 SRP 3.2.2	PLANT DESIGN	R.G. 1.29 SRP 3.2.1	
1						
	INSTRUMENT AND CONTROL					
2, 3	REACTOR LEVEL INSTR.	B31.1 SI & VI		CLASS I	SEISMIC I	R.G. 1.29 C.1.k/V.3.6
2, 3	FEED WATER CONTROL VALVES	ASA, IEEE, ASME, ASTM, ANS, NBFU, & STATE & LOCAL		"	"	"
2*	LIQUID POISON SYS. INSTR.			"	"	"
	ANUAL REACTOR CONTROL	ASA & IEEE	N/A	"	"	"
2, 3	CONTROL ROD INST			"	"	"
2, 3	CONT. ROD POSITION INDICATING SYST.			"	"	"
2, 3	REACTOR PROTECTION SYSTEM			"	"	"
2, 3	NEUTRON MONITOR SYSTEM	ASME III Cl.A		"	"	"
	FUEL RUPTURE DETECTION SYST.	Pressure Parts		"	"	"
	AREA MONITORS			CLASS I	---------	--------------------
X	TURBINE GENERATOR	ASME, ASA, ASTM, IEEE, NEMA, NBFU STDS OF TUBULAR EXCHANGER MANUFACTURERS ASSOCIATION CLASS R. NJ & LOCAL CODES	N/A	Class II		No Seismic Req't/V-3-6 — No Seismic Req't/V-3-6
X	CONDENSER	HEAT EXCHANGER INSTITUTE	N/A	Class II	Dynamic analysis for 0.11g seismic event	
	FEEDWATER SYSTEM HEATERS PUMPS	ASME S1-1965 RV TO 1st VALVE OUTSIDE CONTAINMENT ASME SECT, VIII & TFMA STDS.		CLASS II	*	*=The FWS is used as redundant ECCS to the ADS for Small Brks and single failure requirements. This would require that the FWS seismic I, Amend. 38 presents results of seismic analysis to show that the feedwater injection system meets Class I standards.

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QUALITY STANDARDS

NRC QUALITY GROUP A	NRC QUALITY GROUP B	NRC QUALITY GROUP C	NRC QUALITY GROUP D
ASME Boiler and Pressure Vessel Code, Section III	————	————	ASME, Sec. VIII (pressure vessels) ANSI B31.1.0 (piping and valves) Mfg. Stds. (pumps)
Class 1	Class 2	Class 3	
or	or		
ASME Boiler and Pressure Vessel Code, Section III	————		
Class A (pressure vessels)	Class C (pressure vessels)	--	--

NRC Quality Group A equivalent to Licensee Safety Class 1) Also seismic Category I
NRC Quality Group B equivalent to Licensee Safety Caiss 2
NRC Quality Group C equivalent to Licensee Safety Class 3) Not always seismic Category I
NRC Quality Croup D equivalent to Licensee Safety Class 4 or NNS) Non-seismic Category I

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PLANT: OYSTER CREEK NUCLEAR STATION UNIT 1

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DESIGN REQUIREMENTS FOR CONTAINMENT ISOLATION BARRIERS

Question: Discuss the extent to which the quality standards and seismic design classification of the containment isolation provisions follow the recommendations of Regulatory Guides 1.26, "Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Water-Containing Components of Nuclear Power Plants", and 1.29, "Seismic Design Classification".

Response: The table shown below lists quality standards and seismic design classification used for the containment isolation provisions for Oyster Creek Nuclear Station. Also listed in the table are the standards and classifications recommended by Regulatory Guide 1.26 and 1.29.

SYSTEM	QUALITY GROUP		SEISMIC DESIGN	
	PLANT DESIGN	R.G. 1.26	PLANT DESIGN	R.G. 1.29
Piping From Reactor Vessel to 1st Isolation Valve external to Drywell	ASME BPV Section I (1965)	ASME BPV Section III C 1, A	Class I	Category I
Recirculation line	ASME BPV Section 1 ASA B31.1	ASME BPV Section III C1, A	Class I	Category I
Isolation Condenser	ASME BPV Section 1 (1965)	ASME BPV Section III C2, B	Class I	Category I
Core Spray	ASME BPV Section I ASA B31.1	ASME BPV Section III C2, A/B	Class I	Category I
Containment Spray	ASME BPV Section VIII	ASME BPV Section III C2, B	Class I	Category I
Steam Line	ASME BPV Section I ASA B31.1 GE Spec.	ASME BPV Section III C1, A	Class I	Category I
Reactor Clean Up	ASME BPV Section III Class C	ASME BPV Section III C3, C	Class II	Non-Seismic

DESIGN REQUIREMENTS FOR CONTAINMENT ISOLATION BARRIERS

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SYSTEM	QUALITY GROUP		SEISMIC DESIGN	
	PLANT DESIGN	R.G. 1.26	PLANT DESIGN	R.G. 1.29
Feedwater System	ASME BPV Section I (1965)	D	Class II Amendment 38 to the Oyster Creek FSAR provides results of seismic analysis to show that the feedwater injection system meets Class I standards.	Category II If the FWS is used as redundant ECCS to the ADS for small breaks and single failure requirements, it would require that the FWS be Category I.

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PLANT Oyster Creek UNIT(S) 1

PROVISIONS FOR TESTING

Question: Discuss the design provisions for testing the operability of the isolation valves.

Response: The operability of primary containment isolation and reactor coolant isolation valves is tested during every refueling outage. Testing of primary containment isolation valve operability is performed in two ways: (1) by introducing a high drywell pressure signal to the drywell high pressure sensor and (2) by introducing a Lo Lo water level signal to the Yarway level sensors. Testing of reactor coolant isolation valve operability is performed by introducing a Lo Lo Water level signal to the Yarway level sensors.

Testing is performed by the following steps:

(1) Isolate the pressure sensor or the Yarway level sensor to be tested.

(2) Introduce an appropriate signal (either a high pressure signal or a level d/p signal) to the pressure sensor or level sensor until the appropriate relays trip.

(3) Verify that all relays function as specified.

(4) Restore the pressure sensor or level sensor back to service.

(5) Repeat steps (1) through (4) until all sensors are tested, step (4) is omitted for the last sensor tested in order to obtain a 2 out of 4 coincidence trip when step (6) is performed.

(6) Introduce an appropriate trip signal to one of the other sensors previously tested to obtain a 2 out of 4 coincidence trip.

(7) Verify that all isolation valves are closed in accordance with procedure requirements.

(8) Restore all sensors and other system components back to service.

(9) Individually close and record closing times of the reactor coolant isolation valves.

These tests are considered acceptable if all requirements specified in the appropriate procedures are met.

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PLANT Oyster Creek UNIT(S) 1

CODES, STANDARDS, AND GUIDES

Question: Identify the codes, standards, and guides applied in the design of the containment isolation system and system components.

Response: 1) Piping

A) From vessel to first - ASME Sec. I - 1965
Isolation Valve

B) After first ISO valve - ANSI B31.1 - 1965
to outside ISO valve

2) Valves and Operators - Revisions to 1965

American Standards Association
American Society for Testing Materials
ASME - Section I and VIII
Pipe Fabrication Institute
American Institute of Electrical Engineers
National Electrical Manufacturers Association

3) Instrumentation

Except for material used in fabrication of instrumentation, manufacturer's standards apply.

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PLANT Oyster Creek UNIT(S) 1

NORMAL OPERATING MODES AND ISOLATION MODES

Question: Discuss the normal operating modes and containment isolation provision and procedures for lines that transfer potentially radioactive fluids out of the containment.

Response:

Main Steam Isolation Valves

Each main steam line is provided with two isolation valves, one inside containment and one outside, which are open during normal operation. A test circuit is provided to permit slow speed exercising of each valve.

Automatic closure of the valves is initiated by the following signals:

a. High flow in the main steam line.
b. Rx Lo-Lo water level.
c. Steam line high radiation.
d. High temperature in steam tunnel.
e. Low pressure in main steam line (825psig).

Main Steam line drains are closed in normal operation. These valves are (automatically) closed by the same signals associated with Main Steam isolation valves.

Energy Condenser Valves

The system is operable and ready for service at all times during power operation. Conditions requiring use of the system are considered abnormal. The two series valves in the steam inlet lines are open and one of two series valves in the condensate return line is open during normal operation. The vent isolation valves are normally open.

Automatic opening of the condensate return line is initiated by the following signals:

a. Rx Lo-Lo water level.
b. Rx high pressure.

Isolation of the steam inlet line and condensate return line is initiated by excess flow in either line.

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Response: (Continued)

Feedwater System

Feedwater lines connected to the reactor vessel do not utilize automatic isolation valves, since operation of this system is essential following a loss of coolant accident. Check valves located in these lines inside the drywell and outside the drywell provide isolation when necessary.

Liquid Poison System

The liquid poison system is a stand-by system for use in the event that the control rod system is inoperable. The system is activated only by remote manual action from the control room; that is the squib valves are fired and pump started. Isolation is provided by two check valves.

Shutdown Cooling System

The shutdown cooling system removes fission product decay heat during shutdown with reactor pressure less than 150 psi. The isolation valves inside the drywell are interlocked to prevent system operation above 350°F.

Isolation valves in the suction and discharge headers are automatically closed by the following initialing signals:

a. Rx Lo-Lo water level.
b. High inlet temperature (350°F).

Clean Up System

The clean up demineralizer system is a filtration and ion exchange system for maintaining the purity of the water in the reactor vessel and is normally in service with isolation valves open. The influent piping has isolation valves inside and outside the drywell. The return pipe has an isolation valve outside drywell and a check valve inside the drywell.

Automatic isolation valve closure is initiated by any of the following conditions:

a. Rx Lo-Lo water level.
b. Low flow through the clean up filter.
c. High temperature Rx water from non-regenative heat exchanger.

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Response: (Continued)

Clean Up System (Continued)

d. High pressure from the pressure reducing station.
e. High temperature cooling water from the auxiliary clean-up pump.
f. Liquid poison system flow to vessel.

An exception to the above is the return valve V-16-61 which closes on lo-lo reactor water level only.

Core Spray System

The core spray system is a low pressure stand-by core cooling system which provides an alternate supply of reactor cooling water in the event of a pipe break accident in the primary system. The isolation parallel valves are normally closed and do not open until after the system initiates from Rx lo-lo water level or high drywell pressure and reactor pressure is less than 285 psi.

Check valves are provided in each header inside drywell which provide isolation. The manual isolation valves inside the drywell are locked open and all other system valves in the flow path are open. The valves which recirculate water to the torus are closed except during testing.

Control-Rod Drive System

The control rod hydraulic system has two isolation valves. The first is a ball check which is part of the control drive mechanism and a normally closed hydraulic system control valve. The exhaust header takes water discharged by the drives during operation and returns this water to the reactor check valves and effectively isolates this line.

Instrument Air/Nitrogen

Control air and nitrogen valves are open for control instrument use during power operation. No automatic isolation is presently provided.

Drywell & Torus O_2 Sample System

The isolation valves in this system are open during power operation.

Response: (Continued)

Drywell & Torus O_2 Sample System (Continued)

Isolation is provided automatically from the following signals:

a. Rx Lo-Lo water level.
b. Drywell high pressure.

Rx Building Closed Cooling Water System

The closed cooling water lines do not connect to the reactor primary system and are not open to the containment atmosphere. They are provided with isolation valves in the supply and return headers. No automatic isolation provided.

Reactor Primary-System Instrument Lines

Reactor primary-system instrumentation piping which leaves the primary containment are dead-ended at devices' location in the reactor building. These lines are provided with manual isolation valves outside drywell and excess flow checks in each line which close automatically with leakage flow.

Containment Spray System

The containment spray system is not provided with automatic isolation valves, but does have motor operated isolation valve that can be operated from the Control Room.

Reactor Head Cooling System

The head cooling system is used in conjunction with reactor vessel flooding and shutdown cooling system for vessel cool down. Manual and motor operated isolation valves are closed during power operation. No automatic isolation is required.

Drywell Equipment Drain Tank (DEDT) & Sump Drain

Floor and equipment drains are segregated in the drywell with the floor drains collected in a sump and the equipment drains collected in a drain tank. The contents of each are transferred to Radwaste Building. The DEDT tank is provided with overflow and vent lines to the sump.

Each discharger has dual isolation valves that are closed automatically by the following signals:

a. Rx Lo-Lo water level.
b. High drywell pressure.

Response: (Continued)

Drywell Purge & Exhaust System

During reactor operation, the nitrogen atmosphere is isolated within the drywell and recirculated by the drywell cooler blowers. The make up is automatic on pressure control to the drywell only. In each supply line, drywell and torus series isolation valves are closed during reactor operation to isolate the containment vessel from the make up line, except when make up is required. All isolation valves are automatically closed by the following signals:

a. Rx Lo-Lo water level.
b. High drywell pressure.

A keylock bypass switch is installed which bypasses any drywell isolation signal allowing the operator to open any of the drywell purge as vent valves. The exhaust is vented normally to the stack with isolation valve normally closed and interlocked to close automatically by the following signals:

a. Rx Lo-Lo water level.
b. High drywell pressure.

All operable isolation valves in the containment inerting system are automatically closed. A keylock bypass switch is provided in the exhaust line to the gas treatment system to reduce pressure in the torus and drywell in the post accident phase.

Vacuum Relief System

Automatic vacuum-relief devices are used to prevent the primary containment from exceeding the external design pressure. The drywell vacuum-relief device draws atmosphere from the pressure absorption chamber and the pressure absorption chamber vacuum-relief device draws air from the reactor building. Two vacuum breakers in series are used in each of the two lines to atmosphere. One valve is activated by a differential pressure signal while the second valve is a check valve.

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