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NED 79- 73

October 5, 1979

Harold R. Denton, Director
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, DC 20555

SUBJECT: Response to Letter Entitled, "Potential Unreviewed Safety Question on Interaction Between Non-Safety Grade Systems and Safety Grade Systems", Harold R. Denton to All Operating Light Water Reactors, September 17, 1979

Dear Mr. Denton:

Please find enclosed per the request of the subject letter an assessment of Pilgrim Nuclear Power Station I concerning the potential effects of non-safety system failures (caused by a high energy pipe break) on safety system performance. More specific and comprehensive information and analysis requested by the NRC Staff (Thursday briefing, September 20, 1979) is also contained.

The assessment has identified no impacts on required safety actions and one potential analysis conclusion which would increase the consequences of a high energy pipe break. The consequences of analyzed high energy pipe breaks considered are:

1. Calculated Peak Clad Temperature
2. Peak Containment Pressure
3. Peak Suppression Pool Temperature
4. Radiological Releases

In particular, the assessment concludes that Pilgrim Station air operated reactor head vent valves (2" line) utilize solenoid valves of the generic type outlined in NRC Bulletin 79-01A and a high energy pipe break environment could cause the two series head vent valves to open during the initial phases of the event. An analysis shows that such a bounded worst case may have a $\pm$ 10°F impact on Peak Clad Temperature. The analysis conservatively assumes that both head vent valves open completely and instantaneously coincident with the worst pipe break inside containment.

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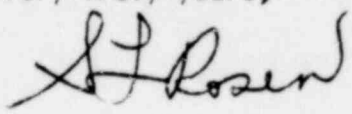
Boston Edison justifies continued operation of Pilgrim Nuclear Power Station I based on:

1. The comprehensive review of the environmental interactions (due to analyzed high energy pipe breaks) between non-safety systems and safety systems; and

2. The combined low probability and relative insignificant effect of a "Pipe Break Inside Containment" resulting in inadvertent operation of the reactor head vent valves.

It is Boston Edison's intent to eliminate the potential interaction of a "Pipe Break Inside Containment" and reactor head vent valve maloperation during the next scheduled or unscheduled plant outage.

Very truly yours,



Enclosures:

1. Legend and abbreviations used in the "Environmental Interaction Table", Parts I and II.

2. Environmental Interaction Table, Part I

3. Environmental Interaction Table, Part II

Commonwealth of Massachusetts)
County of Suffolk)

Then personally appeared before me Stephen L. Rosen, who being duly sworn, did state that he is the Nuclear Engineering Manager of Boston Edison Company, that he is duly authorized to execute the foregoing statement in the name and on behalf of Boston Edison Company and that the statements are true to the best of his knowledge and belief.

Dorothy M. Lopes

/s/ Dorothy M. Lopes
Notary Public

My Commission Expires: July 6, 1984

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PILGRIM NUCLEAR POWER STATION 1
ENVIRONMENTAL INTERACTION TABLE
PARTS I & II

Legend

1. Environmental Induced malfunction may provide adverse response, i.e.

   - Increased Drywell pressure
   - Increased wetwell pressure
   - Increased suppression pool temperature
   - Increased Fuel Clad Temperature

2. Environmental induced malfunction will not provide adverse response.

3. System is qualified for adverse environment.

4. System will not experience adverse environment.

Abbreviations

M.G.	-Motor Generator
MCC	-Motor Control Center
SYS	-System
INST	-Instrumentation
TRANS	-Transmitter
MONIT	-Monitoring
RPS	-Reactor Protection System
RBCCW	-Reactor Building Closed Cooling Water System
RWCU	-Reactor Water Clean Up System
ISOL	-Isolation
RPV	-Reactor Pressure Vessel
LIQ	-Liquid
CRD	-Control Rod Drive
RHR	-Residual Heat Removal System
DW	-Drywell
RB	-Reactor Building
TB	-Turbine Building
CB	-Control Building
CR	-Control Room
N/A	-Not Applicable
OPER	-Valve Operator
FDWTR	-Feedwater

PILGRIM NUCLEAR POWER STATION
ENVIRONMENTAL INTERACTION TABLE
PART I

Non-safety systems whose environmentally induced malfunction cannot affect plant safety response during a high energy pipe break.

1. Air Ejector Offgas Radiation Monitoring System
2. Main Stack Radiation Monitoring System
3. Building Exhaust Vent Radiation Monitoring System
4. Radwaste Liquid Discharge Radiation Monitoring System
5. RBCCW Liquid Radiation Monitoring System
6. Condensate Storage Inlet Radiation Monitoring System
7. Standby Gas Treatment Exhaust Radiation Monitoring System
8. Control Room Ventilation Intake Radiation Monitoring System
9. Area Radiation Monitoring System
10. Environs Radiation Monitoring System
11. Fuel Pool Cooling and Cleanup System
12. Service Air System
13. Portable and Sanitary Water system
14. Process Sampling System
15. Communications System
16. Station Lighting
17. Main Condenser Gas Removal and Turbine Sealing System
18. Process Computer (Parts - Rod Worth Minimizer Program when <10% Rx. Power is Safety Related)
19. Instrument Air System (Parts - Safety Related Accumulators, Valves and Piping not included)
20. Standby Liquid Control Sys (Parts)
21. Fuel Handling Equipment
22. Screen Wash and Hypo-Chlorination System
23. Maintenance Monorails and Hoists

24. Generator
25. Generator Cooling
26. Generator Excitation
27. Turbine Building Closed Cooling Water System
28. Security System
29. 120 VAC POWER SYSTEM

PILGRIM NUCLEAR POWER STATION 1
ENVIRONMENTAL INTERACTION TABLE
PART II

Systems	Location	Main Steam				Feedwater			LOCA		RWCU	RCIC	HPCI
		Inside Small	Inside Large	Reactor Building	Turbine Building	Inside	Reactor Building	Turbine Building	Small	Large	Reactor Building	Reactor Building	Reactor Building
Neutron Monitoring Sys.													
•Source Range	DW/RB/CR	2	2	2	4	2	2	4	2	2	2	4	4
•Local Power Range	DW/RB/CR	2	2	2	4	2	2	4	2	2	2	4	4
•Rod Block Monitor	DW/RB/CR	2	2	2	4	2	2	4	2	2	2	4	4
•Transverse In-core Probe	DW/RB/CR	2	2	2	4	2	2	4	2	2	2	4	4
RBCCW (Pumps)	RB	4	4	2	4	4	2	4	4	4	2	4	4
Fire Protection	RB/TB	4	4	2	2	4	2	2	4	4	2	2	2
HVAC	All	2	2	2	2	2	2	2	2	2	2		2
Makeup Water Treatment	TB	4	4	2	2	4	2	2	4	4	2	2	2
Equipment and Floor Drain System	RB/TB/DW	2	2	4	4	2	4	4	2	2	4	4	4
Main Cond. Gas Removal & Turb. Sealing Sys.	TB	4	4	2	2	4	2	2	4	4	2	2	2
Circulating Water Sys.	Circ. Wtr. House	4	4	4	4	4	4	4	4	4	4	4	4
Condensate Demineralizer System	TB	4	4	2	2	4	2	2	4	4	2	2	2
Condensate System	TB	4	4	4	2	4	4	2	4	4	4	4	4
Condensate Transfer & Storage System	TB	4	4	4	2	4	4	2	4	4	4	4	4
Unit AC Power Source	TB	4	4	2	2	4	2	2	4	4	2	2	2

PILGRIM NUCLEAR POWER STATION 1
ENVIRONMENTAL INTERACTION TABLE
PART II

Systems	Location	Main Steam				Feedwater			LOCA		RWCU	RCIC	HPCI
		Inside Small	Inside Large	Reactor Building	Turbine Building	Inside	Reactor Building	Turbine Building	Small	Large	Reactor Building	Reactor Building	Reactor Building
24V DC Power Sys.	RB	4	4	2	2	4	2	2	4	4	2	2	2
Cont. Atmos. Monitoring	DW/RB	2	2	2	4	2	2	4	2	2	2	2	2
Reactor Vessel Hd Vent	DW	2	2	4	4	2	4	4	(1)	(1)	4	4	4
Main Turb. & Controls	TB	4	4	4	2	4	4	2	4	4	4	4	4
Reactor Manual Control	CR	4	4	4	4	4	4	4	4	4	4	4	4
CRD Hydraulic System (Non-SCRAM)	RB	4	4	2	4	4	2	4	4	4	4	4	4
Safety/Relief Valve Sys. (Non-ADS)	DW/RB	3	3	3	4	3	3	4	3	3	4	4	4
Recirculation System													
•Pumps	DW	2	2	4	4	2	4	4	2	2	4	4	4
•Valve & Operators	DW	2	2	4	4	2	4	4	2	2	4	4	4
•MG Sets	TB/RB	4	4	4	4	4	4	4	4	4	4	4	4
•MCC	TB/RB	4	4	4	4	4	4	4	4	4	4	4	4
•Flow Control	CR/RB	4	4	4	4	4	4	4	4	4	4	4	4
•Control Inst. Transmitters	RB	4	4	4	4	4	4	4	4	4	4	4	4

PILGRIM NUCLEAR POWER STATION 1
ENVIRONMENTAL INTERACTION TABLE
PART II

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		Inside Small	Inside Large	Reactor Building	Turbine Building	Inside	Reactor Building	Turbine Building	Small	Large	Reactor Building	Reactor Building	Reactor Building
Feedwater													
•Pumps	TB	4	4	4	2	4	4	2	4	4	4	4	4
•Flow Element	TB	2	2	4	4	2	4	4	2	2	4	4	4
•Level Elements	DW/RB	4	4	4	2	4	4	2	4	4	4	4	4
•Valves & Operators	TB	4	4	4	2	4	4	2	4	4	4	4	4
•MCC	TB	4	4	4	4	4	4	4	4	4	4	4	4
•Flow Control	CR	4	4	4	4	4	4	4	4	4	4	4	4
•FW Heating	TB	4	4	4	2	4	4	4	4	4	4	4	4
•Instrument Air	TB	4	4	4	2	4	4	4	4	4	4	4	4
•Control Inst. Trans.	TB	4	4	2	2	4	2	2	4	4	4	4	4
Turbine Pressure Controls													
•Bypass Valves	TB	4	4	4	2	4	4	2	4	4	4	4	4
•Pressure Sensors	TB	4	4	4	2	4	4	2	4	4	4	4	4
•Control Systems	CR	4	4	4	4	4	4	4	4	4	4	4	4

PILGRIM NUCLEAR POWER STATION 1
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PART II

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		Inside Small	Inside Large	Reactor Building	Turbine Building	Inside	Reactor Building	Turbine Building	Small	Large	Reactor Building	Reactor Building	Reactor Building
Suppression Pool													
•Level Monitoring	DW	2	2	4	4	2	4	4	2	2	4	4	4
Reactor Protection Sys.													
•Turbine SCRAM	TB	4	4	4	2	4	4	2	4	4	4	4	4
•MG Set	TB	4	4	4	4	4	4	4	4	4	4	4	4