July 1, 1969

Roger S. Boyd, Assistant Director for Reactor Projects, DRL

OYSTER CREEK MEETING, JUNE 21, 1969 - DOCKET NO. 50-219

A meeting was held on June 21, 1969 with representatives of Jersey Central et al and the General Electric Company. The purpose of the meeting was to discuss the various matters of concern on Oyster Creek with regard to current licensing matters as described in Amendment No. 53 dated June 13, 1969. In addition GE presented a briefing on the manner in which it applies piping codes in the design of its nuclear plants. This also included a discussion on design and inspection practices that were applied to the critical systems on the Oyster Creek plant. A list of attendees is attached.

John Barnard and S. Naymark were the principals for General Electric. The applicant's role was passive in the discussions. GE indicated that, although reference was made in its 1964 Oyster Creek functional and design specifications to employ the appropriate codes and applicable code cases, strict adherence to this direction was not required. The option to follow code cases in design appeared to be liberal because it was, in part, left to the discretion and judgment of the designer. Based on the discussions at the meeting, it was apparent that with regard to valves in the main process system, the designers did not employ code cases that required acceptable inspection practices and standards involving volumetric examinations. This action has been of current concern on the Oyster Creek plant.

Discussions on other aspects of the plant with regard to pipes, fittings and pumps resulted in an uncertain status as to what inspections and standards were actually employed on the Oyster Creek plant. On this general matter GE agreed to provide us with a listing of all critical process components along with an identification of inspection actions. This listing was provided informally and is attached to this memo. Other items discussed at the meeting included the ATAPCO/Metropolitan pipe and valve problem, modifications to the standby gas treatment system, and testing of the main steam line isolation valves. Additional information is attached to this memo. On these matters we indicated our concerns as follows:

A/43

OFFICE ▶					
SURNAME ▶					
DATE ▶					

1. ATAPCO/Metropolitan

Information given in Amendment No. 53 was not adequate to assure the quality of the suspect material. Additional tests and inspection may be necessary.

2. Modification to the Standby Gas Treatment System

Test results on building leakage following modifications will be necessary. Removal of the demisters in the filter train has not been adequately justified, especially with regard to effects of pipe or component leakage outside primary containment. These events could introduce moisture ladden fission products into the filter train and without the demisters, the effectiveness of the charcoal filters would be impaired.

3. Testing of Main Steam Line Isolation Valves

We indicated that the leakage from the south outboard valve was excessive to a condition that the calculated 2-hour thyroid dose at the site boundary was about at the 10 CFR 100 value with little conservatism in the analysis. GE indicated that the leakage had been reduced significantly (25 to 50 times less) by reworking the pilot of the valve. The data will be submitted for our information. In addition, we expressed concern that only the outboard valves were tested. Because of single failure effects, we require that acceptable performance be demonstrated by either the inboard or outboard valves. On this matter additional testing may be required.

Original signed by
Robert L. Tedesco

R. L. Tedesco, Chief
Reactor Project Branch 2, DRL

Attachments:
1. List of Attendees
2. Oyster Creek Inspection & Additional Information

cc w/o att. 2:
F. A. Morris S. Levine
F. Schroeder R. DeYoung
Branch Chiefs, RL R. Engelken, CO

Distribution:
Docket File V. Stello
DRL Reading w/o att. 2
RPB-2 Reading

OFFICE ▶	DRL:RP					
SURNAME ▶	RLTedesco/dj					
DATE ▶	7/1/69					

CRITICAL SYSTEMS - NDT PERFORMED

System	Tests Done
I Recirculation	
A. All Gate Valves	1. Shop hydro @ 2175 psig - exceeds ASME 1 reqts. 2. Radiograph 3. Liquid Penetrant
B. Piping & Fittings	1. Shop hydro on fittings @ 2050 psig - not req'd. by ASTM spec. 2. Field hydro @ 1 1/2 times design pressure 3. Radiograph welds 4. Liquid Penetrant Welds
C. Drain & Instrument Lines & Fittings 2" and less	1. Visual 2. Field hydro @ 1 1/2 times design pressure
II Main Steam	
A. All Main Steam Isolation Valves	1. Shop hydro @ 2450 psig 2. Radiograph 3. Liquid Penetrant 4. Magnetic Particle
B. Safety Valves	1. Shop hydro @ 1880 psig 2. Liquid Penetrant 3. Magnetic Particle

System	Tests Done
C. Relief Valves	1. Shop hydro @ 5400 psig 2. Radiograph 3. Liquid Penetrant 4. Magnetic Particle 5. Ultrasonic Tests
D. Piping from Reactor to Turbine Main Stop Valves	1. Radiographed all girth welds on pipe 2 1/2" and larger 2. Liquid Penetrant Welds 2 1/2" and larger 3. Magnetic Particle Welds 2 1/2" and larger 4. On less than 2 1/2" visual and random Liquid Penetrant 5. Hydro @ 1 1/2 times design pressure
III Standby Liquid Control Poison System	
A. Injection Valve 1"	1. Shop hydro @ 7500 psig 2. Too small for radiograph
B. Valves 2 1/2" (all 150 psi system rating)	1. Radiograph 2. Visual 3. Hydro @ 1 1/2 times design pressure or greater
1 1/2" and less (forgings)	1. Visual 2. Hydro @ 1 1/2 times design pressure or greater

System	Tests Done
C. Piping 2 1/2"	1. Radiograph welds 2. Liquid Penetrant 3. Hydro @ 1 1/2 times design pressure
1 1/2" and smaller	1. Visual 2. Liquid Penetrant 3. Hydro @ 1 1/2 times design pressure

IV CRD Hydraulic

System	Tests Done
A. Valves - 3" (Isolation valves and those inside containment vessel)	1. Radiograph 2. Magnetic Particles 3. Hydro @ 1 1/2 times design pressure
2 - 3" (Outside containment vessel)	1. Magnetic Particle 2. Hydro @ 1 1/2 times design pressure
B. Valves - Forgings (2" and smaller)	1. Magnetic Particle 2. Hydro @ 1 1/2 times design pressure
C. Piping - 3" between 1st isolation valve and reactor	1. Radiographed welds 2. Liquid Penetrant welds 3. Hydro @ 1 1/2 times design pressure
3" between 1st isolation valve away from reactor to control valve	1. Liquid Penetrant welds 2. Hydro @ 1 1/2 times design pressure
Remainder of piping 2" and smaller	1. Liquid Penetrant welds 2. Hydro @ 1 1/2 times design pressure

System			Tests Done
V Core Spray			
A. Valves		A-1. All valves 2" and greater between reactor through isolation stop and check valves through outboard block valve that could see reactor pressure (V 20-12 and V 20-18)	1. Radiograph 2. Surface Penetrant 3. Hydro @ 1 1/2 times design pressure
		A-2. Valves between pumps and above block valves (see only pump discharge pressure)	1. Random radiograph 2. Surface Penetrant 3. Hydro @ 1 1/2 times design pressure
		A-3. Valves between torus and pump	1. Radiograph 2. Surface Penetrant 3. Hydro @ 1 1/2 times design pressure
B. Piping		B-1. Section described in A.1	1. Radiographed welds 2. Liquid Penetrant welds 3. Hydro @ 1 1/2 times design pressure 4. UT 90%
		B-2. Section described in A.2	1. Radiographed welds 2. Random liquid Penetrant of welds 3. Visual all welds 4. Hydro @ 1 1/2 times design pressure
		B-3. Piping from torus to isolation valve	1. Radiographed welds 2. Random surface penetrant of welds 3. Visual all welds 4. Hydro @ 1 1/2 times design pressure

System	Tests Done
VI Containment Spray	
A. Valves	1. Visual 2. Random magnetic particle 3. Hydro @ 1 1/2 times design pressure
B. Piping	1. Visual 2. Random radiography of welds 3. Random liquid penetrant of welds 4. Hydro @ 1 1/2 times design pressure
VII Isolation Condenser System	
A. Valves	1. Shop hydro @ 2000 psig 2. Radiograph 3. Liquid Penetrant 4. Field hydro @ 1.5 times design pressure
B. Piping & Fittings	1. Radiograph of welds 2. Liquid Penetrant of welds 3. Hydro @ 1.5 times design pressure 4. Random UT
C. Drain & Instrument Lines - 2" and less (no valve castings)	1. Visual 2. Hydro @ 1.5 times design pressure

System	Tests Done
VIII Shutdown Cooling	
A. Valves	1. Radiograph 2. Magnetic Particle 3. Hydro @ 1.5 times design pressure
B. Piping	1. Radiograph welds 2. Magnetic Particle and/or Liquid Penetrant welds 3. Hydro @ 1.5 times design pressure
C. Drain & Instrument Lines approximately 1" and less	1. Visual 2. Hydro @ 1.5 times design pressure
IX Cleanup Demineralizer	
A. Valves - through 2nd isolation valve	1. Radiograph 2. Liquid Penetrant and/or magnetic particle 3. Hydro @ 1 1/2 times design pressure
- Beyond 2nd isolation valve	1. Visual 2. Hydro @ 1 1/2 times design pressure
B. Piping - through 2nd isolation valve	1. Radiograph welds 2. Liquid Penetrant welds 3. Hydro @ 1.5 times design pressure
- Beyond 2nd isolation valve	1. Visual 2. Hydro @ 1.5 times design pressure

System	Tests Done
C. Drain & Instrument - High pressure 1" and less	1. Visual 2. Hydro @ 1.5 times design pressure
X Feedwater	
A. Valves	1. Radiographed 2. Surface Penetrant isolation check and control valves 3. Hydro @ 1 1/2 times design pressure
B. Piping	1. Radiograph welds 2. Magnetic particle welds 3. Liquid penetrant welds . 4. Hydro @ 1 1/2 times design pressure
C. Drain & Instrument 1" and less	1. Visual 2. Hydro @ 1 1/2 times design pressure
XI Reactor Building Closed Cooling Water (150 pound system)	
A. Valves	1. Visual 2. Hydro @ 1 1/2 times design pressure
B. Piping	1. Visual 2. Hydro @ 1 1/2 times design pressure 3. Liquid Penetrant or magnetic particle welds

Note: This is not a safeguards system

System	Tests Done

XII Turbine Building Closed Cooling Water (150 pound system)

A. Valves	1. Visual 2. Hydro @ 1 1/2 times design pressure
B. Piping	1. Visual 2. Random Liquid Penetrant of welds 3. Hydro @ 1 1/2 times design pressure

Note: This is not a safeguards system.

XIII Pressure Vessel Head Cooling (2" system)

A. Valves - 2" forgings	1. Visual 2. Hydro @ 1 1/2 times design pressure
B. Piping - 2"	1. Visual 2. Hydro @ 1 1/2 times design pressure

XIV Emergency Service Water (150 pound system)

A. Valves	1. Visual 2. Hydro @ 1 1/2 times design pressure
B. Piping & Fittings - flanged	1. Hydro @ 1 1/2 times design pressure 2. Used extra-strong piping for 8" and larger (1/2" wall)

VALVE QUESTIONS

The following clarifying statements have been prepared in answer to questions from the AEC Staff regarding the service requirements for certain specific valves in the Oyster Creek Plant.

I. Air System Valves

V-6-10 2" globe valve which serves as manual block valve on inlet to the pre-filter. This valve is normally open.

V-6-24 4" gate valve which serves as manual block valve in the air supply to the reactor building. This valve is normally open.

V-6-25 4" gate valve which serves as manual block valve in the air supply to the radwaste building.

Failure of any or all of valves V-6-10,24,25 is in the safe direction since loss of air leads to a reactor scram. The instrument air system at Oyster Creek is designed such that it is not required to provide for safe shutdown of the reactor or to preclude operation of post-accident cooling requirements. All equipment relating to these two basic functions are fail-safe in regard to their demand for air. In cases where air is momentarily required to provide a safety function, such air is made available through the presence of local accumulators located near the sensitive equipment. The fact that the air system is not in any sense a safeguard system is underlined by the fact that the main compressors feeding this system are not located on the emergency diesel service. In summary the plant contains no air system valves whose failure will preclude safe shutdown or operation of post-accident cooling equipment.

V-6-74
V-6-75
V-6-76
V-6-77

These valves are 1/2" maintenance valves in the instrument air system on each side of the pressure regulators which provide 30 psi instrument air to the hydraulic drive water supply system. These valves are normally open. Loss of instrument air in this system does not cause a safety problem since it will not lead to a failure of any hydraulic equipment and leads to a reactor scram.

V-6-175 1 1/2" gate valve which serves as a manual block valve in the 100 psi air supply to the scram valves. This valve is normally open. Loss of air caused by failure of this valve is not a safety problem since it leads to a reactor scram.

V-6-173 1/2" globe valve which serves as a bypass around the 5 to 10 psi pressure regulator valve in the air supply to the liquid poison storage tank. This air supply is used for agitating the liquid poison solution during the initial mixing operation. Subsequent solubility of the liquid poison is assured by temperature control and a Hi-Low Temperature Alarm on the poison tank. Failure of this valve would have no safeguard significance.

V-6-166 This valve has been replaced with a 2" valve and the original 1 1/2" globe valve is no longer installed in the air system. The 2" valve serves as a manual block valve in the air supply to the drywell.

II. Demineralized Water Valve

V-12-57 4" Butterfly valve serves as a shut-off valve in the demineralized water line. Failure of this valve would have no safety significance. There are no valves which could fail and cause the fuel pool to drain. In addition to the demineralized water system, both the condensate transfer system and the fire system are available to provide make-up water to the fuel pool.

III. Radioactive Waste System Valves

V-22-3
V-22-4 2" gate valves which serve as hose connection valves to drain header B which drains into the drywell equipment drain tank.

V-22-11 2" gate valve which serves as the main valve in drain header B.

V-22-12 2" gate valve which serves drain header A to drywell equipment drain tank.

Failure of any of valves V-22-3,4,11, or 12 would not cause a loss of containment or isolation capability. Failure of one of these valves would cause leakage of liquid into the floor drain sump which would then be pumped to the radioactive waste tanks.

V-22-285
V-22-286 2" gate valves located between the drywell equipment drain tank and the drywell equipment drain tank pump. Failure of these valves would not cause loss of containment or an uncontrolled release of radioactive waste. Failure, at the most, would lead to a flow of liquid to the drywell sump, which would then be pumped to the radioactive waste system tanks.

V-22-189 2" check valve located in the discharge line from the drywell floor drain sump to the radioactive waste building. This valve is located outside of containment and separated from containment by automatically initiated isolation valves.

None of the valves questioned in the radioactive waste system provide isolation duty for the containment system and failure of these valves would not result in violation of the containment envelope. Other specific isolation valves are installed in the radioactive waste piping.

TEST OF THE STANDBY GAS TREATMENT SYSTEM

Measured Air Flow	Average Differential Pressure	Wind, Speed and Direction
2650 cubic feet per minute	Minus 0.34 inches of water	17± 3 miles per hour from the south-southwest

The door modifications were complete except for the lower sill seals. The sill was sealed with a temporary seal. A recheck is scheduled for June 22nd, following completion of the sill seals.

J.B. 6/21/69

MAIN STEAM ISOLATION VALVE TEST

The following test results were obtained on the south valve after inspection and repair of the pilot portion of the isolation valve.

INTER-VALVE AIR TEST

Test Pressure	Leakage	Conditions
35 psig	16-18 standard cubic feet per hour	Water seal on the inner valve
20 psig	Less than 1 cubic foot per hour	Water seal on the inner valve

The large difference in leakage between the two tests is due to the reverse leakage through the inner valve. The test pressure overrides the head of water in the steam line and acts to open the valve. The 35 psig test pressure tends to open the upstream valve to a greater amount than does the 20 psig pressure.

TECHNIQUE USED TO TEST MAIN STEAM ISOLATION VALVES

Two main steam isolation valves are located in series in each of two parallel steam lines. The valve bodies are set in the steam line so that pressure in the steam line assists in holding the valve disc closed. This arrangement is necessary so that the maximum leak tightness of the valve will be achieved during emergency situations.

Because of the arrangement of the valves, the only independent test method that can be applied to the main steam isolation valves is one that utilizes the application of air pressure between the two valves and in effect tests the downstream valve in the normal mode and tests the upstream valve in the reverse mode. The spring force that assists in closing the isolation valves is not sufficient to override the inter-valve test pressure acting on the disc of the upstream valve during the independent test operation. The physical arrangement of the piping permits a water leg to be created upstream of the first isolation valve. The use of a water leg assists in loading the isolation valve disc and tends to prevent the valve disc from opening under the force of the inter-valve pressure. While the water leg improves the test capability, the water leg pressure is insufficient to completely negate the error introduced by the inter-valve pressure. Successful tests have been achieved on the outboard valve by the inter-valve pressure technique. It has been assumed that the performance of the upstream valves is comparable to the performance of the downstream valves since the two valves are identical in design and should, therefore, have similar performance characteristics.

J.B. 6/22/69

MEMO ROUTE SLIP
Form AEC-93 (Rev. May 14, 1947) AECM 0240

See me about this.	For concurr.	For action.
Note and return.	For signature.	For information.

TO (Name and unit)	INITIALS / DATE	REMARKS
Docket file	INITIALS DATE	Please attach to memo from RLTedesco to RSBoyd, dated July 1, 1969 re: OYSTER CREEK MEETING, JUNE 21, 1969 - DOCKET NO. 50-219
TO (Name and unit)	INITIALS DATE	REMARKS
TO (Name and unit)	INITIALS DATE	REMARKS

FROM (Name and unit)	REMARKS
Delores Johnson	
PHONE NO. 7391 — DATE 7/1/69	

USE OTHER SIDE FOR ADDITIONAL REMARKS

GPO : 1968 O—294-619

JERSEY CENTRAL POWER & LIGHT COMPANY

JUNE 21, 1969 MEETING ATTENDANCE

Jersey Central

G. H. Ritter
G. F. Trowbridge

MPR

H. Mandil

General Electric

J. Barnard
S. Naymark
R. A. Huggins
D. Willett
J. E. Omer
W. S. Prier
W. Schultheiss
J. B. Graham

AEC - DR

H. L. Price
C. K. Beck
M. M. Mann

AEC - DRL

P. A. Morris
R. L. Tedesco
D. F. Knuth
A. W. Dromerick

AEC - CO

L. D. Low
R. Engelken