YANKEE ATOMIC ELECTRIC COMPANY

Telephone 617 872-8100

1671 Worcester Road, Framingham, Massachusetts 01701

B.4.1.1
FYR 81-7

January 5, 1981

United States Nuclear Regulatory Commission
Officer of Inspection and Enforcement
Region I
631 Park Avenue
King of Prussia, PA 19406

Attention: Mr. Boyce H. Grier, Director

References:
(a) License No. DPR-3 (Docket No. 50-29)
(b) USNRC Letter to YAEC dated October 24, 1980, I&E Information Notice No. 80-37
(c) USNRC Letter to YAEC dated November 21, 1980 I&E Bulletin No. 80-24
(d) YAEC Letter to USNRC dated December 15, 1980 (WYR 80-136)

Subject: I&E Bulletin No. 80-24, "Prevention of Damage Due to Water Leakage Inside Containment (October 17, 1980 Indian Point 2 Event)"

Dear Sir:

As requested in References (b) and (c), we have reviewed our facility in relation to the incident at Indian Point Unit 2 described in the References. Attachment A to this letter contains the information requested in Reference (c). In addition, recent discussions with the site resident USNRC Inspector have indicated that the USNRC desires additional information not specifically addressed in Reference (c). We have included some additional information as we understand the NRC's concern and to the degree that this information is available.

The following information is submitted in response to your request for estimates of manpower expended in the review, preparation of reports and corrective actions required by this bulletin:

Manpower Requirements	Hours
Bulletin Research and Response	45
Corrective Actions	None Required

We trust you will find this information satisfactory. However, should you have any further questions, please contact us.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY

L. H. Heider
Vice President

COMMONWEALTH OF MASSACHUSETTS)
)ss
COUNTY OF WORCESTER)

Then personally appeared before me, L. H. Heider, who, being duly sworn, did state that he is a Vice President of Yankee Atomic Electric Company, that he is duly authorized to execute and file the foregoing request in the name and on the behalf of Yankee Atomic Electric Company, and that the statements therein are true to the best of his knowledge and belief.

Robert H. Groce Notary Public
My Commission Expires September 14, 1984

ROBERT H. GROCE
NOTARY PUBLIC
MASSACHUSETTS

Response to USNRC Bulletin 80-24
Yankee Atomic Electric Company

Background Information

The events at the Indian Point Unit 2 Plant as they pertain to the Yankee Rowe Plant can be divided into two concerns. The first concern is the non-detection of the flooding of the reactor vessel pit from any source and thus wetting the reactor vessel at operating temperature. The second concern is the leakage of open or closed systems inside containment and the detection of this leakage.

The Yankee Rowe Reactor vessel is supported and surrounded by the neutron shield tank within the shield tank cavity (see Sketch A for details). The neutron shield tank and cavity are in turn supported and surrounded by the biological shield. The containment itself surrounds this biological shield. The reactor vessel pit and the neutron shield tank are not the lowest points in containment. The lowest point in containment is below the biological shield on the vapor container skin. A gravity flow path exists from the reactor vessel pit to a ring header below the biological shield and to "tell tales" outside of containment. These "tell tales" are currently checked weekly to identify any leakage in the reactor vessel pit. A flow path also exists from the ring header to the vapor container drain tank, located outside the vapor container. The level alarm of this drain tank is set slightly above the normal tank level. This drain tank receives water from the containment only, and thus, an increase in water level would be attributed to the containment and would not be masked by other plant conditions. The vapor container drain tank level alarm indication is in the control room.

All auxiliary piping systems in use during power operation are located such that a leak in a system would not gravity drain to the reactor vessel pit. The only exception to this is the neutron shield tank which surrounds the reactor vessel pit. Level indication light for the neutron shield tank are provided in the control room. The neutron shield tank surge tank level is alarmed in the control room.

A leak in an auxiliary piping system in containment would drain from the brass drain boxes in the main coolant loop and pressurizer areas to the ring header below the biological shield. Other auxiliary systems outside of the biological shield would drain down the containment skin to the ring header area. The vapor container coolers, by their location, fall into this category.

A small leak in an auxiliary piping system could be detected by one or more of the following means:

Containment Radiation Levels
Vapor Containment Drain Tank
High Containment Humidity
Noise from the Containment Sound System
Containment Leak Inspections Performed Bi-Weekly

Item 1 Summary description of all "open" cooling water systems.

a. Mode of operation during routine reactor operation and in response to a LOCA:

Yankee Rowe has one "open" cooling water system present inside containment which provides cooling water to four air coolers used to cool containment air. The water supply to the coolers is manually regulated. During a LOCA the system is automatically isolated by a trip valve in the containment isolation system.

Yankee Rowe also uses an "open" water system inside containment for a fire hose station and other hose stations for decontamination of walls and floors. These lines are used during refueling shutdowns and maintenance outages and are valved out or blank flanged during normal operation.

Yankee Rowe utilizes a steam heating system inside of containment, consisting of four tube type heaters. The steam supply is manually regulated. During a LOCA the system is automatically isolated by a trip valve in the containment isolation system.

b. Source of water and typical chemical content of water:

The containment cooler water is supplied by the service water system which is taken from and returned to Sherman Pond. The typical chemical content of the water is as follows: Ph 5.8; conductivity 35 umhos; sodium 2.1 ppm; chloride 2.1 ppm; calcium 1.8 ppm; magnesium 0.6 ppm.

The steam for the heaters is supplied from the auxiliary and heating steam system, which uses demineralized water as a water supply.

c. Materials used in piping and coolers:

The supply and return piping is carbon steel and the cooler and heater tubing is copper.

d. Experience with system leakage and (e) history and type of repairs to coolers and piping systems:

One of the four coolers developed a minor leak which was repaired with Furminite epoxy and a clamp. The cooler was subsequently replaced in kind and no further problems encountered.

f. Provisions for isolating portions of the system inside containment in the event of leakage including vulnerability of those isolation provision to single failure:

Each cooler has an inlet and outlet isolation valve. In the event that the individual isolation valves fail to isolate the cooler the entire system can be isolated.

g. Provisions for testing isolation valves in accordance with Appendix J to 10 CFR 50.

The outlet trip valve is tested in accordance with Appendix J and the Technical Specifications.

h. Instrumentation and procedures in place to detect leakage:

The Yankee Rowe containment is a sphere surrounding the biological shield which houses the reactor vessel. The containment air coolers are located outside the biological shield and any leakage from the coolers would go below the biological shield and drain into the vapor container drain tank (see Sketch A) which has local and remote level indication with an alarm in the Control Room. The alarm is set slightly above the indicated level to give the operators prompt warning of any leakage inside containment. Water which drains below the biological shield has no path to reach the reactor vessel cavity.

i. Provisions to detect radioactive contamination in service water discharge from containment:

No provisions are necessary to detect radioactive contamination in service water discharge from the containment since the water supplies only air coolers and any leakage would be into the containment. The coolers are isolated in the event of a LOCA.

Item 2 Actions to be taken:

a. Verify existence or provide redundant means of detecting and promptly alerting control room operators of a significant accumulation of water in containment (including the reactor vessel pit if present).

A redundant means of detecting and alerting control room operators of a significant accumulation of water in containment will be installed by January 1, 1982, as identified in our response to TMI Item II.F.1 in Reference (d). Our present system promptly alerts the control room operators to small amounts of leakage inside containment.

b. Verify existence or provide positive means for control room operators to determine flow from containment sump(s) used to collect and remove water from containment.

Flow from the vapor container drain tank is determined by decreasing tank level. Manual valve manipulations are required to drain the tank to the radioactive waste disposal tanks.

c. Verify or establish at least monthly surveillance procedures, with appropriate operating limitations, to assure plant operators have at least two methods of determining water level in each location where water may accumulate. The surveillance procedures shall assure that at least one method to remove water from each such location is available during power operation. In the event either the detection or removal systems become inoperable it is recommended that continued power operation be limited to seven days and added surveillance measures be instituted.

We have verified that surveillance procedures exist with appropriate operating limits to assure the level instrumentation for the vapor container drain tank is operating properly (as required by Technical Specifications) and that there is no accumulation of water in the containment. Procedures assure there is at least one method of removing accumulated water.

d. Review leakage detection systems and procedures and provide or verify ability to promptly detect water leakage in containment, and to isolate the leaking components or system. Periodic containment entry to inspect for leakage should be considered.

We have reviewed the leakage detection systems and procedures and have determined that we have the ability to promptly detect water leakage in containment and isolate the leaking component or system. Currently a containment inspection is performed twice monthly in modes 1 through 4 to verify system integrity.

e. Beginning within 10 days of the date of this bulletin, whenever the reactor is operating and until the measures described in (a) through (d) above are implemented, conduct interim surveillance measures. The measures shall include where practical (considering containment atmosphere and ALARA considerations) a periodic containment inspection or remote visual surveillance to check for water leakage. If containment entry is impractical during operation, perform a containment inspection for water leakage at the first plant shutdown for any reason subsequent to receipt of this bulletin.

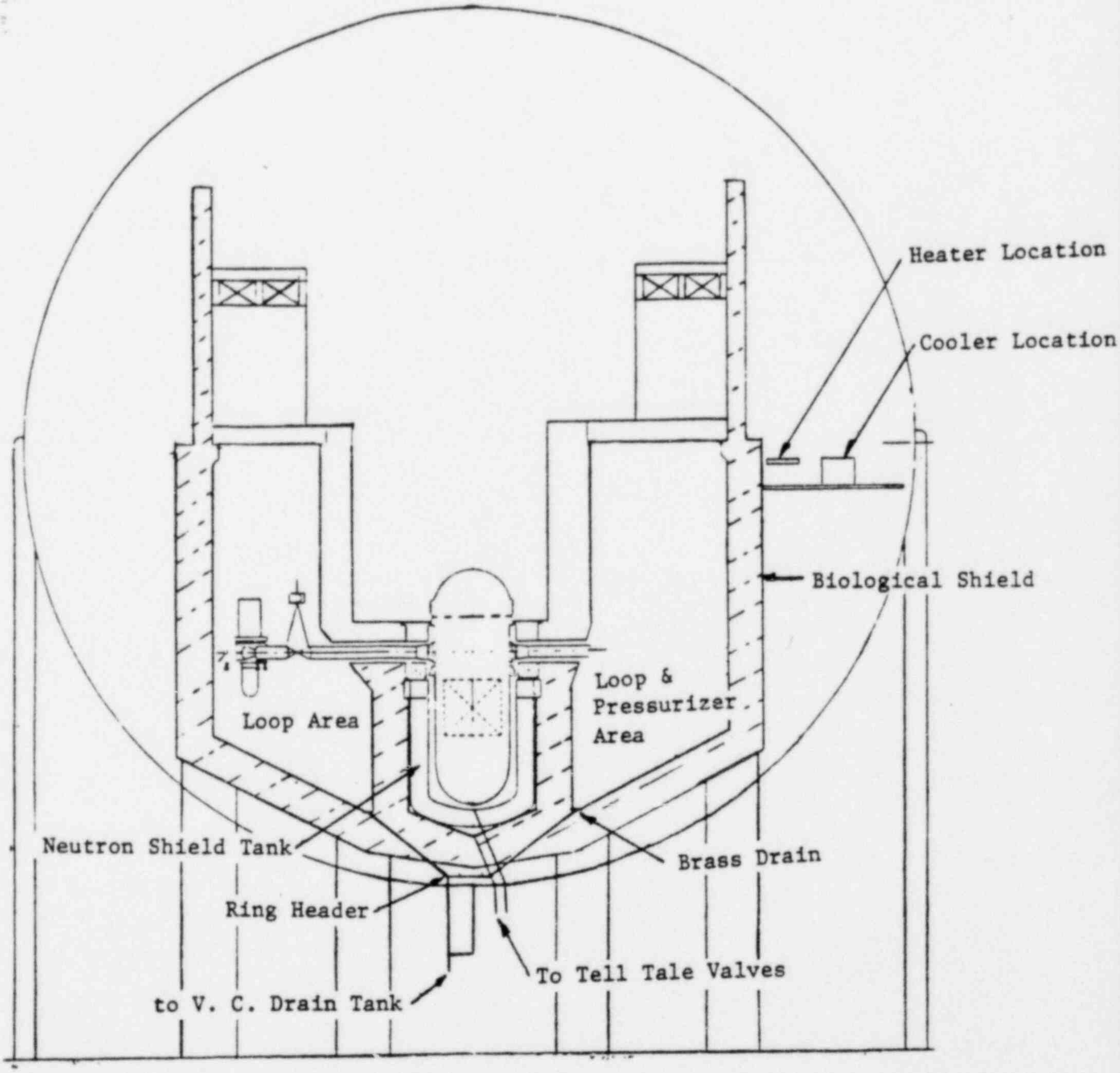
We curren\ty perform a periodic containment inspection twice monthly in modes 1 through 4.

f. Establish procedures to notify the NRC of any service water system leaks within containment via a special licensee event report (24 hours with written report in 14 days) as a degradation of a containment boundary.

We disagree that any service water system leak within containment is a degradation of a containment boundary, since the system is isolated in a LOCA condition and any leakage in the service water system would be into containment. However, we will establish procedures to notify the NRC of any significant service water system leaks within containment via a special licensee event report (24 hour with written report in 14 days). A significant leak would be considered any leak in excess of one gallon per minute.

<u>Item 3</u> For plants with closed cooling water systems inside containment. Provide a summary of experiences with cooling water system leakage into containment.

The component cooling system is the only closed auxiliary cooling system inside containment. This system provides cooling water inside containment for the main coolant pumps, neutron shield tank cooling coils, sample cooler and neutron shield tank fill line. Yankee Rowe has experienced only one leakage incident, which was corrected, in the neutron shield tank cooler coils (occurred in 1978). The leakage was approximated at one gallon per day. This leakage was contained within the neutron shield tank.



SKETCH A

Vapor Container Equipment and
Drain Locations