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December 5, 1990
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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Gentlemen:

Subject: Oyster Creek Nuclear Generating Station (OCNGS)
Docket No. 50-219
License No. DPR-16
Oyster Creek Drywell Containment

References: (1) NRC Letter dated October 16, 1990 - Requested Clarifications.
(2) GPUN Letter dated November 26, 1990 - Drywell Inspection/Sampling Plan.

This letter, together with the Reference (2) submittal, completes the response to the Reference (1) request for clarifications on the drywell corrosion issue.

The attachments to this letter address Reference (1), Items ii to iv, which correspond to Reference (2), Items (2) to (4).

Attachment I to this letter provides the information requested by the NRC for Item (2). This attachment consists of GE/Teledyne Report TR-7377-1 "Justification for Use of Section III Subsection NE Guidance in Evaluating the Oyster Creek Drywell." This report provides the technical justification for using ASME Section III NE guidance for the evaluation of membrane stress intensities which are between 1.0Smc and 1.1Smc.

Attachment II to this letter provides the information requested by the NRC for Item (3). This attachment consists of GE Reports Index No. 9-1 and 9-2, "An ASME Section VIII Evaluation of the Oyster Creek Drywell Stress and Stability Analysis." This two part report covers the structural analysis of the Oyster Creek drywell through the 14R outage with the current sand-in-place configuration and the sandbed portion of the drywell conservatively assumed corroded to 0.700". This report confirms the adequacy of the Oyster Creek drywell shell utilizing ASME Section III guidance to demonstrate ASME Section VIII Code compliance.

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Attachment III to this letter provides the information requested by the NRC for Item (4). This attachment consists of a detailed summary of the actions GPUN has undertaken to identify and prevent water intrusion into the drywell gap and addresses the effects of leakage on structures and equipment other than the drywell.

In addition to providing the requested Reference (1) clarification documentation, GPUN is proceeding with the analysis, engineering and planning to support removal of sand from the drywell sandbed region. Since our meeting with you on September 19, 1990, corrosion testing studies have reinforced our conviction that this will be a key step in arresting corrosion in that region. The technical evaluation supporting sand removal is well underway and the structural calculations are expected to be completed in December. Assuming satisfactory results, we plan to submit this structural analysis to you by December 31, 1990.

If you have any questions on this submittal or the overall drywell corrosion program, please contact Mr. Michael Laggart, Manager, Corporate Nuclear Licensing at (201) 316-7968.

Very truly yours,

J. C. DeVine, Jr.
Vice President, Technical Functions

JCD/RZ/plp
Attachments

cc: Administrator Region I
NRC Resident Inspector
Mr. Alex Dromerick, Jr.

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LIST OF ATTACHMENTS

ATTACHMENT I	GE/Teledyne Report TR-7377-1, "Justification for use of Section III Subsection NE Guidance in Evaluating the Oyster Creek Drywell."
ATTACHMENT II	GE Reports Index No. 9-1 and 9-2, "An ASME Section VIII Evaluation of the Oyster Creek Drywell Stress and Stability Analysis."
ATTACHMENT III	GPUN Detailed Summary Addressing Water Intrusion and Leakage Effects.

ATTACHMENT III

GPUN Detailed Summary Addressing Water Intrusion
and Leakage Effects Related to the Oyster Creek Drywell

WATER INTRUSION

The following describes GPUN past actions to investigate, identify, and correct leak paths into the drywell gap, as well as our planned future actions to prevent and surveil potential leakage. The issues discussed below occurred from 1985 to date. Actions taken to address the impact of leakage on other structures and equipment are also described.

1. REFUELING CAVITY

a) Liner

The stainless steel liner was inspected both by visual and dye penetrant methods. A significant number of cracks were found as well as some through-wall damage, most probably caused by mechanical impact. As a result, an analysis was performed for determining the failure mechanism (i.e., IGSCC, fatigue, etc.) and it was determined that the cracking was mechanically induced and not IGSCC induced. The most probable cause was thermal fatigue. (A sample was removed from the liner and metallurgically examined.)

To prevent leakage through these cracks during refueling, we install an adhesive type stainless steel tape to bridge any large cracks observed, and subsequently, apply a strippable coating. Both the tape and the coating have been qualified by GPUN and vendor for use in the environment that they normally see. This method of repair is temporary (refueling only) and both the tape and coating are removed prior to the end of the outage. No leakage concerns exist at any other times since the cavity is dry.

b) Bellows

The bellows allow for expansion between the drywell and the refueling cavity and are made of stainless steel. They were repeatedly tested using helium (external) and air (internal) without any indication of leakage. Any leaks from the refueling bellows would wind up in the concrete trough, which has a leakage detection/collection system. No leakage has been observed for the last two refuelings.

c) Piping Drains

There are two drain lines from the cavity that allow for water removal from the cavity and trough. They have been pressure tested with no evidence of leakage.

d) Metal Trough

The metal trough is located between the drywell and the reactor building. It was tested visually and with helium without any positive leaks identified.

A gasket at the drain line from the trough was replaced. However, no clear leakage path was identified from this source. This portion of the cavity is coated during refueling with strippable coating.

e) Concrete Trough

The concrete trough is located under the metal trough and is designed to collect any leakage from the bellow area and direct it to a drain. This area was inspected by removing the drain plate attachment to the metal trough and visually inspected, using remote video. An area where concrete was found to be chipped was repaired and the drainage capability restored. No further problems are known to exist.

f) Steps (Stainless Steel Liner)

These are the steps that receive the shield plugs and plugs from the fuel pool to the cavity and cavity to equipment pool gates. These steps were examined visually and by PT with no indications of cracking. These steps will also be periodically coated during refueling.

g) Skimmer

The skimmer system is designed to maintain water clarity in the cavity. It consists of ducts and piping connected to the liner with most of the ducting and piping encased in concrete. A pressure test was performed in the skimmer system and as a result, some skimmers are removed from service by plugging them prior to each refueling.

In conclusion, we believe that all potential water leakage pathways from the refueling cavity into the drywell gap have been thoroughly checked and the continuation of our current tape/strippable coating method during future refueling outages is adequate for prevention of leakage from this source.

2. EQUIPMENT POOL

a) Liner

The liner was inspected both visually and dye penetrant tested, with any PT indications vacuum box checked. No through wall leakage was found. Additionally, the equipment pool has a leak detection system under the welds in the plate which is routed to drains. Any leaks into the collection system would not reach the drywell. While the leak detection system indicated leakage, no liner leaks were found.

Preventively, the equipment pool will be taped using the SS tape and then coated with a strippable coating prior to the refueling outage, further reducing the probability of leakage.

b) Drain

The drain was checked for leaks via pressure test and found to be leak free.

c) Support Pad

Concerns with the pad to liner welds arose. As a result, the pad was removed and the liner weld area checked prior to replacing the pad. No leakage was identified.

In conclusion, no leaks have been found related to the equipment pool. Preventively, the equipment pool will be protectively coated similar to the refueling cavity. Drains from the leak detection system are monitored on a periodic basis to detect any changes.

3. FUEL POOL

The fuel pool has a leak detection system similar to the equipment pool. The leak detection is for all welded joints in the stainless steel liner. Minor leakage (dripping) has been noted over the years at infrequent intervals, even though the pool is continuously flooded. Leakage or condensation has been postulated as the source. Additionally, in 1985 while reracking the pool, a leak was found. As a result, vacuum testing was performed to find the leak and underwater divers were used to confirm the leak location and to repair the leak. No further problems were encountered. Ongoing monitoring of the leak detection ensures early leakage detection.

4. PIPING PENETRATIONS

Piping that is buried in concrete and whose leakage could become a leak path to the drywell gap was investigated. The piping penetrating the drywell was not investigated since it was either tested as part of 10 CFR 50 Appendix J or any significant leakage would be detected as part of operability/system operation.

Other piping such as the drains from the cavity and equipment pool are discussed above.

In conclusion, no leakage is expected from the buried piping or piping penetrating the drywell.

5. WALKDOWNS FOR VISUAL LEAKAGE

Walkdowns are periodically conducted to identify any leakage in the Reactor Building wall, under the two pools, and on the drywell wall. While minor staining can be seen, samples of water were obtained (sand bed, drywell wall, etc.) and analyzed without being conclusive as being reactor refueling water.

6. SAND BED DRAINS

In the sand bed region of the drywell, there are five sand bed drains equally spaced around the drywell. Some of these drains were known to drip/leak. When cathodic protection was installed, water was observed coming out of the CP holes. As a result, every effort to remove any water entrapped in the sand bed was initiated. The five drains were cleared using a "roto-rooter" approach and approximately 500 gallons of water were removed. Presently, the drains are not leaking and preventive maintenance to clear the drains periodically has been initiated. A routine walkdown to identify changes in leakage is in place.

In conclusion, while the sand was retaining water due to blockage of the drains, after clearing the drains, the sand bed area appears to be free of water.

As a result of the above described approach to identify and correct potential water source leak paths and our ongoing program for surveillance for water intrusions, as discussed in the presentations made to the NRC on September 19, 1990 and the NRC site visit and inspection on October 29-31, 1990, we believe we have a thorough program for managing leakage that could affect drywell integrity.

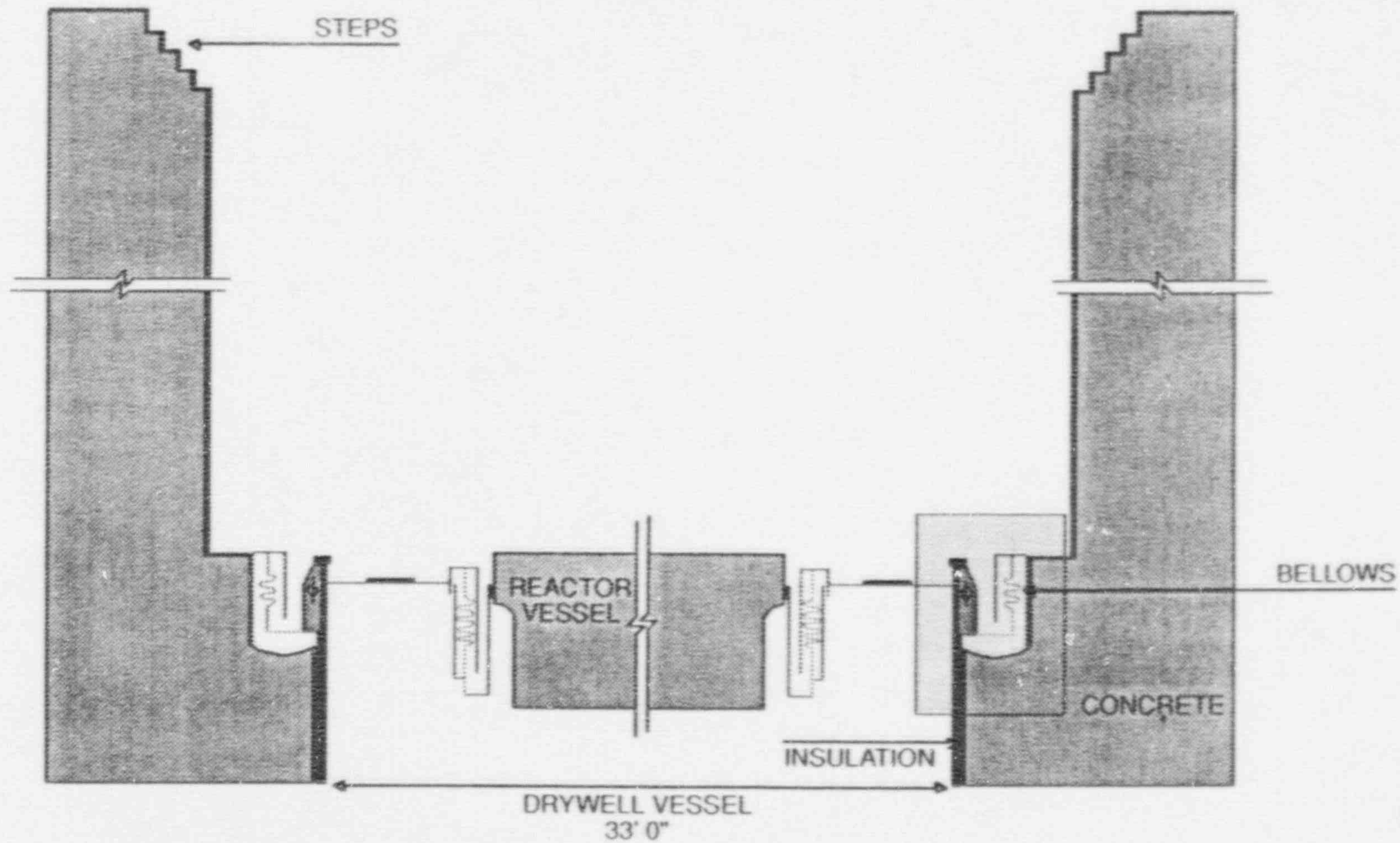
In addition to the efforts described above, actions have also been taken to address the potential impact of leakage on other structures and equipment. These actions are described below.

Cracks have been identified in the concrete walls and floor of the spent fuel pool and equipment pool. These cracks are routinely inspected and monitored for changes in size and condition. Numerous analyses have been performed which conclude that the identified cracking does not degrade the ability of the building to perform its intended function.

Inspections of these cracks indicate no evidence of leakage around or under the spent fuel pool. Evidence of leakage has been observed in both the floor and wall of the equipment pool and in the reactor cavity wall above elevation 95'-0". Based on visual inspections, this leakage has not affected any equipment. The water stains observed on the underside of the equipment pool contain no evidence which would indicate reinforcing bar corrosion. In addition, visual inspections indicate no general concrete degradation associated with these cracks.

Stains on the equipment pool and reactor cavity walls above elevation 95'-0" do indicate slight corrosion of the reinforcing bar. To determine the potential effect of this corrosion, a compositional analysis of a representative concrete core sample was performed in October, 1988. This analysis indicates that the diameter of a typical reinforcing bar could be expected to be reduced by 0.002 inch/year. The walls in question are reinforced with #8 and #11 reinforcing bar. Therefore, if the corrosion continues, the diameter of the reinforcing bar would be reduced by 8% and 6% respectively over a 40-year period. Since the corrosion is localized, this reduction has no impact on concrete integrity.

TOP OF REACTOR VESSEL



DRYWELL TO CAVITY SEAL