

U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS
REGION I

RO Inspection Report No.: 50-219/73-12

Docket No.: 50-219

Licensee: Jersey Central Power & Light Company

License No.: DPR-16

Oyster Creek

Priority: _____

Category: C

Location: Forked River, New Jersey

Type of Licensee: 1930 MWT, BWR

Type of Inspection: Special, Unannounced

Dates of Inspection: August 3 & 6, 1973

Dates of Previous Inspection: June 26-29, 1973

Reporting Inspector: *D. L. Capiton for*
F. S. Cantrell, Reactor Inspector

9/11/73
DATE

D. L. Capiton for
E. Greenman, Reactor Inspector

9/11/73
DATE

Accompanying Inspectors: None

DATE

DATE

Other Accompanying Personnel: None

DATE

Reviewed By: *D. L. Capiton*
D. L. Capiton, Senior Reactor Inspector

9/11/73
DATE

SUMMARY OF FINDINGS

Enforcement Action

Paragraph 6.6.2 of the Technical Specification requires "Notification shall be made within 24 hours by telephone and telegraph to the Director of the Regional Regulatory Operations Office --- followed by a written report within 10 days to the Director of Licensing --- in the event of the abnormal occurrences as defined in Section 1.15 ---" Section 1.15 defines an abnormal occurrence as:

"D. Failure of one or more components of an engineered safety feature or plant protection system that causes or threatens to cause the feature or system to be incapable of performing its intended function."

Contrary to the above requirements, the Directorate of Regulatory Operations was not notified until July 26, 1973 that 88 of 132 shock suppressors were found defective during the 1973 refueling outage (April 15 - June 5, 1973), and that 8 of the repaired shock suppressors had failed again when examined on July 22, 1973.

A written report of these failed shock suppressors was not submitted to Licensing until August 6, 1973. (A preliminary copy of the "Summary Report on Snubber Repair Activities during Spring 1973 Refueling Outage" was supplied to RO:I on July 27, 1973).

Licensee Action on Previously Identified Enforcement Items

Not inspected

Design Changes

None

Unusual Occurrences

During the 1973 refueling outage, 88 of 132 shock suppressors on main steam lines and auxiliary cooling lines were found defective. Eight of the repaired shock suppressors were found defective again after six and one half weeks of reactor operation.

Other Significant Findings

A. Current Findings

A check of AEC documents and correspondence in the Ocean County Library (Local Public Document Room for Oyster Creek and Forked River No. 1) showed that the library was receiving copies of correspondence and commission documents relating to the Oyster Creek and the Forked River facilities.

B. Status of Previously Reported Unresolved Items

Not Inspected

Management Interview

The following persons were present during the exit interview on August 6, 1973.

Mr. J. T. Carroll
Mr. E. G. Greenman
Mr. F. S. Cantrell

The following items were discussed:

1. The inspector stated that the General Office Review Board (GORB) should review the available data on the shock suppressors in a special meeting, and evaluate the significance of additional failures of shock suppressors on safe reactor operations. The GORB should either approve the course of action stated in the August 6, 1973 report to Licensing or recommend an alternate program.

A licensee's representative stated that the available information would be supplied to all of the members of the GORB, that the GORB secretary would poll the members to see if a special meeting should be held, and would act accordingly. He stated that a regular meeting of the GORB was scheduled August 14, 1973.

2. The inspector stated that the failure to report the problems found with the shock suppressor was considered to be a serious violation of the reporting section of the Technical Specifications (Paragraph 6.6.2). He stated that this applied to both the initial observations

during the refueling outage (April 15 - June 5, 1973) and the subsequent findings on July 22, 1973.

3. The inspector stated that the statement in the JCPL August 6, 1973 letter to Licensing that "Notification of this event, as required by the Technical Specification (TS) Paragraph 6.6.2.a, was made to AEC Region I, Directorate of Regulatory Operations (RO), ---" was not technically correct.

The licensee's representative stated that this statement was intended to mean that RO was notified by telephone as required by the T.S., not that the notification was timely.

4. The licensee's representative confirmed the inspector's understanding that the shock suppressors would be reinspected during any reactor shutdown that occurs subsequent to August 24, 1973, but not later than September 8, 1973, and that Region I will be promptly notified of the results of the inspection.

DETAILS

1. Persons Contacted

Mr. J. T. Carroll, Station Superintendent
Mr. D. L. Reeves, Operations Supervisor
Mr. E. I. Riggle, Maintenance Supervisor
Mr. W. Spoulos, Operating Foreman
Mr. A. H. Rone, Engineer

2. Hydraulic Shock Suppressor Failures

(JCPL Letter to Directorate of Licensing dated August 6, 1973)

During the April 15 through June 5, 1973 refueling outage all of the hydraulic shock suppressors in the drywell and those suppressors in the reactor building associated with safeguard equipment were inspected and rebuilt as necessary. Eighty-eight of one hundred thirty two suppressors required replacement of one or more seals and replacement of the hydraulic fluid to restore the suppressor to an operable condition.

The shock suppressors in the drywell were re-examined July 21-22, 1973 after the reactor had been operating six and one half weeks. The seals in eight suppressors were found to have deteriorated sufficiently to allow the suppressors to lose enough fluid to become inoperable.

Deterioration of one or more seals in each suppressor allowed the hydraulic fluid in the suppressor to leak out thus rendering the suppressor incapable of dampening movement of the connected pipe. These suppressors were installed to restrict a rapid movement of the pipe line such as could occur during an earthquake.

An investigation of the failure mechanism of the shock suppressors with the vendor of the shock suppressors and the manufacturers of the seals indicated that the seal material was being attacked by the hydraulic fluid. Two types of hydraulic fluid are used in the shock suppressors depending on the location where they are installed. A methyl phenyl silicone, which tests show has a greater resistance to radiation caused degradation, is used in the drywell and a dimethyl polysiloxane silicone is used in non radiation areas. The radiation resistant hydraulic fluid appears to react with the plasticizer used in the gum polyurethane seals causing a loss of

volume and seal effectiveness. Both molded polyurethane seals and gum polyurethane seals are used in each shock suppressor depending on the function of the seals.

The non radiation resistant fluid (dimethyl polysiloxane silicone) does not appear to seriously react with either type seal; however, after a period of exposure to radiation, the fluid has a tendency to "gel." One licensee representative believes this period is on the order of 8-10 years under operating condition. Another cause of seal degradation is extended exposure to temperatures above 150°F. (The seal manufacturer is reported to have stated that 150°F should be considered the maximum operating temperature; however, the supplier of the shock suppressor says that the suppressors are capable of operating at up to 200°F for extended periods without loss of function.

Based on the recommendation of the vendor of the shock suppressors and the availability of replacement seals, the shock suppressors were rebuilt with the same material that failed, and the same hydraulic fluid was installed, i.e., radiation resistant fluid in the drywell and non-radiation resistant fluid outside the drywell. The vendor of the shock suppressor recommended that the gum polyurethane seals be eventually replaced with molded polyurethane seals. (Molded polyurethane seals are not currently available in the number and shapes required). Even though the non-radiation resistant fluid degraded over an extended period in a radiation field (reported to be up to 10 years), the vendor of the shock suppressors specifically did not recommend the non-radiation resistant fluid for use in the drywell.

In discussion, the licensee's representative agreed that the drywell would be deinerted for a reinspection of the shock suppressors during any shutdown 5 to 7 weeks after July 21, 1973. If the shock suppressors have not been reinspected, a special shutdown will be scheduled September 8, 1973 for reinspection, and RO:I will be promptly notified of the findings.

In discussions concerning reporting the observed failures of the shock suppressors, the licensee's representative stated that he did not initially think of the safety significance of this type failure, or that other facilities would be subject to the same failures. At the time the plant was shutdown for refueling (6-8 weeks), his prime concern was to find out why the shock suppressors

failed and to get all of them repaired prior to scheduled startup. He stated that there had been some concern as to whether the suppressors had received proper storage prior to installation; however, he had been assured by the person responsible for installation that the suppressors had not been left out in the weather while awaiting installation. The licensee's representative stated that he originally planned to report the repair work in the semiannual report; however, it was subsequently decided that the findings should be submitted to the Commission in a separate technical report. This report was in preparation when additional failures were experienced July 22, 1973. It was not until that time that the failure was considered to be a generic problem, and the immediate reportability was not considered a requirement until July 20, 1973 when informed by Region I that the same problem had been experienced at other facilities. It was at that time when the suppressor failures experienced at Oyster Creek were first related to RO:I.

3. Local Public Document Room (PDR)

The inspector stopped in the Ocean County Library which is the local PDR for Oyster Creek and Forked River No. 1. A check showed that various documents and correspondence relating to the two facilities were being maintained. An envelope was opened by the inspector, and showed that the inspection reports were being transmitted to the PDR with the related correspondence between Regulatory Operations and the Licensee.