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U. S. ATOMIC ENERGY COMMISSION
REGION I
DIVISION OF COMPLIANCE

April 15, 1966

CO REPORT NO. 219/66-1

Title: JERSEY CENTRAL POWER & LIGHT COMPANY
LICENSE NO. CPPR-15
Dates of Visit: March 22 and 23, 1966

By : J. P. O'Reilly for R. T. Carlson, Reactor Inspector

SUMMARY

The status of construction activities is discussed in the report. Overall construction is estimated to be 38% complete, based on money expended.

The installation, overload and initial leak rate tests of the dry well and torroidal chamber were completed satisfactorily.

A problem with an expansion joint located in one of the vent headers that joins the dry well and torroidal chamber, that resulted in both the replacement of the joint and a repetition of the overload test on the dry well, is discussed in the report.

Adequate quality control measures appear to be in effect for reinforced concrete.

A 400' meteorclogical tower has been installed and data are being accumulated.

A fatality, the first at this site, resulted from injuries received by a construction worker in a fall.

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DETAILS

I. Scope of Visit

Mr. R. T. Carlson, Reactor Inspector, Region I, Division of Compliance, visited the construction site of the Jersey Central Power & Light Company's reactor facility at Oyster Creek, New Jersey, on March 22 and 23, 1966. The visit included the following:

A. A review of the construction organization.

B. A review of the status of the containment system.

C. A review of the quality control measures in effect for reinforced concrete.

D. A review of the status of construction and the timetable of significant events.

E. A tour of the construction site.

The principal persons contacted were as follows:

Jersey Central Power & Light Company (Jersey Central)

Mr. Ivan Finfrock, Nuclear Project Engineer
Mr. Norman M. Nelson, Plant Maintenance Supervisor, Designee

General Electric Company (GE)

Mr. Willard C. Royce, Resident Manager
Mr. Abel B. Dunning, Construction Engineer, Mechanical
Mr. Glen C. Brockmeir, Construction Engineer, Civil

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II. Results of Visit

A. Organization

1. Jersey Central

Jersey Central currently has two people at the site on a full-time basis - Mr. Nelson, the designated Plant Maintenance Supervisor, and Mr. Fred Kossatz, the designated Plant Mechanical Maintenance Foreman under Mr. Nelson. Both are present for on-the-job training relating to plant construction and operation.

Mr. Finfrock, the Nuclear Project Engineer, operates out of the Company Office in Morristown, New Jersey, and spends much of his time at the site, 3 to 4 days per week. His principal concern at this time relates to site meteorology.

Both Messrs. Nelson and Finfrock report to Mr. Donald Rees, the Project Engineer, who is located in the Company Office in Morristown.

2. General Electric

GE, the prime contractor for the Oyster Creek Project, currently has six people at the site. These personnel are: Mr. Royce; Messrs. Dunning and Brockmeir - the men most actively engaged in following day-to-day construction; Mr. Stibers, Office Engineer; Mr. Ryan, Site Auditor; and a clerical worker. According to Mr. Royce, the staff will be increased to eight in the near future.

Mr. Royce reports to Mr. R. A. Huggins, Project Engineer, Atomic Power Equipment Department (APED), San Jose, California.

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Results of Visit (continued)

3. Burns and Roe, Inc. (B&R)

B&R is the Architect-Engineer and the direct Supervisor of Construction for this project. The senior site representative for B&R is Mr. Giles Willis, who reports to Mr. David Kregg, the Project Manager. The principal channel of communication between GE and B&R is through Messrs. Huggins and Kregg.

4. Other Principal Contractors

Other principal contractors associated with this project, and their responsibilities, are listed below:

Contractor	Responsibility
American Bridge	Structural steel on Turbine Building, and on bridge crane
American Dewatering Corp.	Site dewatering
Chicago Bridge & Iron Co.	Containment system
Eastern Transit Mix Co.	Concrete
Hatzel & Buehler, Inc.	Miscellaneous electrical work
McBride Plumbing Co.	Miscellaneous piping
Poirier & McLane Corp.	Superstructure

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Results of Visit (continued)

Contractor	Responsibility
United Roofing & Waterproofing	Concrete waterproofing
U. S. Testing Laboratory	Construction related testing
White Construction Co.	Reactor Building
Worthington Corp.	Turbine condensers

B. Construction Status

Overall construction was estimated by Mr. Dunning to be 38% complete, based on expenditures, as of March 1, 1966. A picture reflecting the construction status as of early February is shown in Figure 1 of this report. The reported status of the major subdivisions of the facility, as of March 1, 1966, is provided below:

Subdivision	Percent Complete
Containment system	100%
Reactor Building, structural portion	35%
Turbine Building, structural portion	80%
Intake and discharge structures, structural portions	98%
Intake and discharge canals, excavation	5%
Waste Disposal Building, excavation	90%

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Results of Visit (continued)

Construction activities at the site are estimated by GE to be 2 to 3 months behind schedule. The principal delay being the result of labor jurisdictional disputes. Mr. Royce told the inspector that this was not a current cause for delay; however, it was still a sensitive subject area and could result in further delays in the future.

C. Containment System

The installation, overload and initial leak rate tests of the containment system, the dry well and torroidal pressure suppression chamber, by CB&I have been completed. Significant aspects of these operations were reviewed by the inspector and are discussed in the following paragraphs:

1. General

The installation and testing of the system was completed several months behind schedule. Mr. Dunning told the inspector that a major contributing factor, in addition to the problem of labor jurisdictional disputes, was the upset in material delivery schedules caused by the then impending strike in the steel industry. Late deliveries of large quantities of material necessitated the hiring of additional welders, a shortage of which resulted in the acceptance of some welders that would not have been hired otherwise. As a result, the percentage of welds requiring repair increased from 0.5% to 50 - 75%. When asked by the inspector what assurance he had that all faulty welds were repaired, Mr. Dunning stated that this assurance was provided by the fact that all welds on the containment system were 100% X-rayed, and that the results were reviewed by qualified representatives of the following organizations: CB&I, B&R, The Hartford Steel Boiler Inspection and Insurance Company, and GE.

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Results of Visit (continued)

2. Expansion Joint Problem

The expansion joint in one of the ten vent lines that join the dry well to the torroidal chamber, the fourth going clockwise from the personnel airlock, was found to be distorted when a temporary protective cover was removed from the joint during the initial phase of post-installation testing*, i.e., a low pressure soap bubble test immediately preceding the pneumatic overload test on the dry well. The faulty joint was subsequently replaced.

According to Mr. Dunning, the distortion in the joint, the last to be installed, was the result of torsional and radial stresses imposed during installation when compensating for misalignment between the vent line and the torroidal chamber. He said that the distortion was inadvertently overlooked by construction supervision at the time of installation and that its discovery was delayed because of the presence of the protective cover. Mr. Dunning told the inspector that the original misalignment problem was corrected by proper mitering during replacement of the joint. He said that the remaining joints were subsequently inspected and found to be satisfactory.

The decision to replace the joint was made subsequent to the completion of the pneumatic overload and leak rate tests on both the dry well and the torroidal chamber. Post-replacement pressure testing included a repeat of the pneumatic overload test on the dry well, and the performance of hydro-pneumatic overload and leak rate tests on the torroidal chamber as originally planned.

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*Containment testing, including results, discussed further in paragraph II.C.3.

Results of Visit (continued)

Mr. Dunning told the inspector that a report of the expansion joint problem was being prepared by him and would be submitted to Jersey Central.

The inspector's review of the expansion joint problem indicated that the corrective measures taken were adequate and in accordance with good engineering practice.

3. Overload and Leak Rate Test Program

The inspector discussed with Mr. Dunning the scope and results of the overload and leak rate test programs. The sequence of significant tests conducted, as told to the inspector, was as follows:

a. Pneumatic overload test of dry well and vent system at 71.3 psig, 1.15 times the design pressure of 62 psig*.

b. Pneumatic leak rate test of dry well and vent system at design pressure.

c. Pneumatic overload test of torroidal chamber at 40.25 psig, 1.15 times the design pressure of 35 psig.

d. Pneumatic leak rate test of torroidal chamber at design pressure.

e. Repeat of the test described in paragraph 3.a. because of the replacement of the faulty expansion joint.

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* Witnessed performance and results discussed in CO REPORT NO. 219/65-3, paragraph II.A.

Results of Visit (continued)

f. Hydro-pneumatic overload test of torroidal chamber at 40.25 psig. The chamber contained 91,000 cubic feet of water to simulate operating conditions.

g. Hydro-pneumatic leak rate test of torroidal chamber at design pressure, with the same water present as described in paragraph 3.f.

The preliminary results of the leak rate tests were stated by Mr. Dunning to be as follows:

Test	Leak Rate, % Per Day
Dry well and vent system at 62 psig	0.064
Torroidal chamber at 35 psig, dry	0.078
Torroidal chamber at 35 psig, wet	~0.1 (computations incomplete)

According to Mr. Dunning, Jersey Central representatives were present throughout the significant phases of containment testing and will be provided with a report of the test results from CB&I, the group responsible for the performance of the tests, through GE.

D. Reinforced Concrete - Quality Control Program

The inspector reviewed the quality control program for reinforced concrete. Included in the review were the following: An examination, on a selective basis, of pertinent

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Results of Visit (continued)

records including contracts and specifications, testing programs and results; a visual examination of construction field activities; and discussions with cognizant site personnel. It appears to the inspector, as a result of the review, that adequate measures are in effect to assure that the reinforced concrete will meet the minimum requirements of applicable American Society for Testing and Materials (ASTM) and American Concrete Institute (ACI) codes.

E. Site Meteorology

A 400' meteorological tower has been erected about 1500' southwest of the facility stack. Mr. Finfrock is overseeing this aspect of the Oyster Creek Project. According to Mr. Finfrock, the accumulation of data was started on February 14, 1966, and includes the following:

1. Wind velocity and direction at 75' and 400'.

2. Ambient temperature at 10'.

3. Thermal stability data as reflected by the differences between the temperature at 10' and at 75', 200' and 400'.

4. Rainfall.

Mr. Finfrock said that the tower installation was completed ten months behind schedule because of delays encountered in his dealings with State officals, FAA officials, and the contractor. He said that as a result, the submission to DRL of the desired one year's accumulation of data from the site will be made subsequent to the submission of the Final Safety Analysis Report (FSAR), tentatively scheduled for July 1966.

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Results of Visit (continued)

F. Miscellaneous

1. Expansion Gap, Dry Well - Biological Shield

The inspector reviewed a letter from Mr. Kregg to Mr. Huggins, dated October 26, 1965, in which a method of attaining the desired expansion gap between the dry well and its surrounding biological shield was discussed. The method discussed proposed the application to the exterior of the dry well, prior to the pouring of the biological shield, of a layer of an inelastic, compressible, asbestos-magnesite cement product. A layer of polyethylene sheeting would then be installed as a bond breaker at the concrete interface, and the concrete pours made. The letter stated that the material would compress about 0.150" during the pouring and curing of the concrete. Subsequently, the dry well would be filled with steam and heated to 280°F. The resultant pressures from the expansion of the dry well would be sufficient to compress the heated cement product an additional amount sufficient enough to attain the desired gap, 3/8".

This subject area will be reviewed further during future inspection visits.

2. Progress Reports

The inspector reviewed monthly progress reports from GE to Jersey Central for the period since September 1965. One item of interest noted, as extracted from the report for January 1966, is as follows:

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U. S. ATOMIC ENERGY COMMISSION
REGION I
DIVISION OF COMPLIANCE

December 6, 1966

CO REPORT NO. 219/66-5

Title: JERSEY CENTRAL POWER & LIGHT COMPANY
LICENSE NO. CPPR-15
Date of Visit: November 15, 1966
By : J. P. O'Reilly for J. R. Sears, Reactor Inspector

SUMMARY

The pouring of concrete in the reactor building around the dry well has progressed to the next-to-the-top floor level. The compressible material between the dry well and the concrete shield was observed.

Major mechanical equipment in the turbine building is in place.

The operating staff is now on-site.

DETAILS

I. Scope of Visit

A visit was made to the Jersey Central Power & Light Company reactor, under construction at Oyster Creek, New Jersey, by Mr. John R. Sears, Reactor Inspector, Region I, Division of Compliance, on November 15, 1966. The visit included a tour of the construction site and discussions with the following:

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Scope of Visit (continued)

Mr. Abe Dunning, Site Representative, General Electric (GE)
Mr. Tom McCluskey, Plant Superintendent, Jersey Central Power & Light Company (Jersey Central)
Mr. Ivan Finfrock, Project Engineer, Jersey Central
Mr. Donald Hettrick, Project Engineer, Jersey Central

II. Results of Visit

A. Tour

The inspector toured the construction site in company with GE and Jersey Central representatives. It was observed that major pieces of equipment had been installed in the turbine building, e.g., the turbine shell, the condenser, some tanks. The installation of some larger sized piping is in progress.

During the tour, a concrete floor slab was being poured for the next-to-the-top floor of the reactor building. The concrete biological shielding around the dry well had been poured to this level. The inspector observed that compressible material, which appeared to be similar to mineral asbestos insulation, had been applied to the sides of the dry well. This was covered by thin polyethylene sheets. Mr. Dunning stated that after all the concrete is placed around this material and has set, the atmosphere in the dry well will be raised to 280°F and 20 psig in order to compress the compressible covering. He stated that GE engineers have calculated that when the dry well atmosphere then returns to ambient conditions, the shrinkage should leave a one half inch gap between the dry well and the concrete. Mr. Dunning described the alternate methods being used at Niagara Mohawk and at Tarapur to allow for dry well expansion at MCA conditions, and said that simple economics of installation costs will determine which method will be used for future facilities.

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