



Jersey Central Power & Light Company  
Madison Avenue at Punch Bowl Road  
Morristown, New Jersey 07960  
(201) 455-8200

December 21, 1979

Mr. Thomas V. Wambach  
Systematic Evaluation Program Manager  
Division of Operating Reactors  
United States Nuclear Regulatory Commission  
7920 Norfolk Avenue  
Bethesda, Maryland 20555

Subject: Oyster Creek Nuclear Generating Station  
Docket No. 50-219  
SEP Topic 111-6  
Seismic Design Considerations

Dear Mr. Wambach:

The purpose of this letter is to forward additional seismic design documentation requested by the U.S. NRC's Seismic Review Team (SRT) and to advise you of the status of Jersey Central Power & Light Company's (JCP&L) actions in several areas discussed during the July 17 and 18, 1979 seismic review meeting at Oyster Creek.

The status of our responses to requests for Oyster Creek seismic design information is summarized in Attachment A.

If there are any additional questions regarding the information provided, please call Jim Knubel, Supervisor-Nuclear Safety & Licensing Section, (201) 455-8753.

Very truly yours,

*Ivan R. Finfrock, Jr.*  
Ivan R. Finfrock, Jr.  
Vice President

Attachments

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ATTACHMENT A

OYSTER CREEK NUCLEAR GENERATING STATION

SEP TOPIC III-6

SEISMIC DESIGN CONSIDERATIONS

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December, 1979

A. Information Requested by NRC Letter dated September 4, 1979

Attachment 6 to NRC (T.V. Wambach) letter dated September 4, 1979 to JCP&L requested the following information. The status of JCP&L's response to each request is also given.

1. Item A-1

Information requested: "Shear areas of original reactor building and turbine building models".

Response: This information was transmitted to the NRC (T.V. Wambach) by JCP&L (Y. Nagai) letter dated November 27, 1979.

2. Item A-2

Information requested: "Structural drawings (including foundation details) in sufficient detail to permit verification analyses of the following buildings:

- Reactor building
- Turbine building
- Office building (portion founded on reactor building)
- Ventilation stack

Response: These drawings were transmitted directly to Lawrence Livermore Laboratory at the request of the NRC by Burns and Roe in August, 1979. Additional structural drawings were transmitted by JCP&L letter dated November 27, 1979.

3. Item A-3

Information requested: "Reinforcement details of block wall in containment spray corner room (near stairway)".

Response: Reinforcement details for the block walls are shown in Burns and Roe drawings 4505-4 and 4514-3, attached.

4. Item A-4

Information requested: "Confirmation of soils design information; shear wave velocity or shear moduli, poissons ratio, bearing capacity".

Response: This information was transmitted to the NRC (T.V. Wambach) by MPR letter dated September 14, 1979.

5. Item B-1

Information requested: "Emergency condenser - original Forster Wheeler computations including arrangement drawings showing support and anchorage details".

Response: Available desin drawings and calculations were transmitted as Enclosure 2 to JCP&L (T. Tipton) letter dated August 24, 1979, to the NRC (T. Wambach).

6. Item B-2

Information requested: "Reactor pressure vessel stress report - Combustion Engineering".

Response: The Oyster Creek reactor vessel stress report, including drawings, were transmitted as Enclosure 5 to JCP&L (T. Tipton) letter dated August 24, to the NRC (T.V. Wambach).

7. Item B-3

Information requested: "Reactor vessel supports - Burns and Roe computations (1965)".

Response: Enclosure 6 to JCP&L's letter of August 24, 1979 included design calculations for the vessel ring girder and horizontal stabilizer supports. Additional vessel support drawings and calculations are forwarded herewith in Enclosure 1.

8. Item B-4

Information requested: "Stabilizer - analytical techniques used to evaluate the stabilizer and overall RPV support system".

Response: The information requested is provided in Enclosure 1. Additional data on the support truss between the biological shield and reactor building is contained in Reference 18 of "Summary of Seismic Design Information, Oyster Creek Nuclear Generating Station" which was forwarded to the NRC (D.L. Ziemann) by JCP&L (I.R. Finfrock) letter dated July 9, 1979.

9. Item B-5

Information requested: "Heat exchangers - containment spray and shutdown (arrangement drawings including support and anchorage details or qualification data)".

Response: Design calculations for the containment spray heat exchangers were transmitted as Enclosure 7 to our August 24, 1979 letter. The shutdown cooling heat exchanger is shown in Southwestern Engineering Company drawing 77367. Foundation details for the shutdown cooling heat exchanger are shown on Burns and Roe drawing 4074-4. These drawings are attached.

10. Item B-6

Information requested: "Pumps - emergency service water and recirculation (arrangement drawings including support and anchorage details and/or qualification test data)".

Response: Information on the emergency service water pumps was provided as Enclosure 8 to our August 24, 1979 letter. Recirculation pump support drawings and other information were provided with our August 24, 1979 letter.

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11. Item B-7

Information requested: "Tanks - condensate storage and 7 day fuel oil (arrangement drawings including support and anchorage details and/or original seismic design computations)".

Response: Information on the condensate tank was provided as Enclosure 9 to our letter of August 24, 1979. Additional drawings of the condensate storage tank were transmitted by JCP&L letter dated November 27, 1979. Design calculations for the emergency diesel fuel oil storage tank are attached as Enclosure 2.

12. Item B-8

Information requested: "Diesel generator support - any original computations that evaluate the sliding stability of the diesel generator unit and the effect of relative displacement of attached lines or information that would permit such an evaluation".

Response: Calculations on the stability of the diesel generator and switchgear are attached as Enclosure 3.

13. Item B-9

Information requested: "Motor operated valves - effect of eccentric mass on 1" to 4" diameter lines".

Response: We have identified two applications of valves with operators in safety related piping systems less than 4" in size. These are the 2" motor-operated recirc bypass valves and approximately 1-1/2" air-operated valve in the CRD hydraulic system. We are obtaining specific weight and dimensional data on the heavier of these valves and will transmit analyses of the effect of the eccentric mass on piping stresses as soon as they are available.

14. Item B-10

Information requested: "Control rod drive hydraulic control units -

- a. computations addressing the lateral support of tubing
- b. anchorage criteria for the CRD modules including supporting computations and field verification that the modules are supported in accordance with the design criteria".

Response: Enclosure 4, attached, contains seismic qualification data for the CRD hydraulic control units and original seismic analyses for the attached 3/4- and 1-inch piping. Information on the anchorage (holddown) of the CRD control units is being obtained and is discussed in more detail in paragraph B.5, below.

15. Item B-11

Information requested: "M-G set in cable spreading room - arrangement drawings including support and anchorage details, weights and/or computations, qualification data".

Response: Available test data and drawings are presented in Enclosure 5.

16. Item B-12

Information requested: "Piping isometric drawings including support locations, support stiffnesses (or necessary drawings of supports to enable a determination of support stiffnesses), valve locations, valve masses and center of gravity and other pertinent details needed to independently verify and audit the seismic capability of the following piping systems:

- a. Isolation condenser piping - from containment penetration to the condenser
- b. 2" control rod drive return piping (50')

Response: MPR letter dated October 2, 1979, to the NRC (T.V. Wambach) transmitted available piping layout drawings, isometrics, support design drawings and piping specifications for four systems inside the containment: main steam, feedwater, isolation condenser and CRD hydraulic return. Additional information on isolation condenser and 2" CRD piping outside containment is given in Enclosure 10.

17. Item B-13

Information requested: "RK01 - 5 instrument racks - Blume analysis".

Response: Seismic analyses of instrument racks RK01 and RK05 were transmitted as Enclosure 4 of our August 24, 1979 letter. Additional information on the anchorage of these racks is being obtained and is discussed in Paragraph B.5 below.

18. Item B-14

Information requested: "4160-480 transformer - arrangement drawings including weights, center of gravity and tie down details or qualification test data".

Response: Anchorage data for this and other electrical equipment is discussed in paragraph B.5, below.

19. Item B-15

Information requested: "Instrumentation test reports - GE".

Response: General Electric NID Standards and Qualification Engineering Qualification Report Memoranda No. 1, Rev. 1, dated January 26, 1971; Memorandum No. 2, dated September 1970 and Supplement to Memorandum No. 2 dated Marcy 1971 are presented in Enclosure 6. These qualification reports were prepared for the Dresden 2 nuclear station but are applicable in part to the equipment installed at Oyster Creek.



19. (continued)

An engineering evaluation of the applicability of these reports to the specific equipment installed at Oyster Creek is being made by General Electric and Jersey Central. The results of this evaluation will be transmitted to the NRC as soon as they are available.

20. Item B-16

Information requested: "Battery racks - computations supporting evaluation of new racks and qualification testing data for jars when available".

Response: Information on the battery racks was provided as Enclosure 3 to our August 24, 1979 letter.

21. Item B-17

Information requested: "Cable trays including lateral supports - original supporting criteria and/or later qualification testing data".

Response: As discussed during the July 17 and 18, 1979 meeting at Oyster Creek, tests on cable trays and supports were conducted by several utilities and an architect engineering firm. We expect these data to have applicability to Oyster Creek. We have recently obtained the data and will transmit them to you following our review.

22. Item B-18

Information requested: "Crane over service water pumps - provisions for assuring that crane will not overturn and damage the emergency service water pumps and/or supporting evaluations".

Response: An evaluation has been made of the stability of the bridge crane over the intake structure and emergency service water pumps. This evaluation is attached as Enclosure 7 and shows that the crane will not fall on the emergency service water pumps during an earthquake.

23. Item B-19

Information requested: "Emergency Service Water - Any additional existing information that can be provided to address the state of stress at entry points into the buildings or other discontinuity points".

Response: The piping referred to above is the buried portion of the emergency service water piping between the intake structure and the turbine building. Because of the various changes in analytical methods for buried piping since this piping was analyzed, we are in the process of re-analyzing the buried emergency service water piping. This analysis is being performed by URS/J.A. Blume and Associates and is expected to be complete within the next month. A copy will be forwarded for your information at that time.

B. Information Discussed During July 17 & 18, 1979 Meeting at Oyster Creek

During the July 17 and 18, 1979 seismic review meeting at Oyster Creek, a number of items not covered in your letter of September 4, 1979 were discussed. The status of these action items are as follows:

1. Intake structure analysis - Additional seismic analyses of the intake structure were submitted in Enclosure 1 to our August 24, 1978 letter to the NRC (T.V. Wambach).
2. Office building evaluation - An evaluation of the portion of the office building which contains the Station A and B batteries and cable tunnel is attached as Enclosure 8.
3. Drywell supports - The SRT requested information on the design of the lateral supports for the drywell. Chicago Bridge and Iron Company drawings 9-0971-36 and -37 are attached and show the drywell stabilizer assembly details.
4. Supports for isolated phase bus ducts - An analysis has been performed to determine whether the isolated phase bus duct supports are adequate to prevent the ducts from falling on or near the 4160 Volt switchgear during the design earthquake. This analysis is attached as Enclosure 9 and indicates that some additional bracing of these Class II duct supports is needed to upgrade them to Class I seismic requirements. We plan to add this bracing during the next refueling outage.
5. Equipment holddown and support - During the July 17 and 18, 1979 meeting at Oyster Creek, JCP&L representatives advised the NRC of actions completed or underway to evaluate and improve, where needed, the anchorage and support of selected equipment. This effort is still in progress. We will advise you of the results of our evaluations as soon as they are complete.