



UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

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JAN 13 1968

MEMORANDUM FOR CHAIRMAN SEABORG
COMMISSIONER RAMEY
COMMISSIONER TAPE
COMMISSIONER JOHNSON

SUBJECT: JERSEY CENTRAL POWER AND LIGHT COMPANY OYSTER CREEK PLANT

My November 8 and November 24, 1967 memoranda to you discussed the cracks found in the stub tubes of the Oyster Creek reactor pressure vessel. Since that time we have received an interim report on the problem from Jersey Central Power and Light Company. Final decisions on the methods and extent of repair are expected in a week or two, and shortly after that we expect a final report from Jersey Central for our review. This information will be reviewed by both the Regulatory Staff and the ACRS before the repair work proceeds far enough along to be significant.

Informal discussions with Mr. Lou Roddis of General Public Utilities (which includes Jersey Central) on January 12 brought out additional information on the status of the stub tube investigation.

1. A more careful dye penetrant check of the shop welds joining the stub tubes to the pressure vessel (90 of 137 tubes checked as of January 9) revealed that the cracks found on the high side joints generally are larger than initially assumed. There are six cracks over 15 inches and three over 23 inches, for example. This means that the cracks originally thought to be 8 inches long really are 23 inches long. It was confirmed, however, that the cracks are "very shallow".
2. Initially, no cracks were found at the low side joint between the stub tubes and the vessel. However, the results of this latest dye penetrant inspection have indicated that there are 10 cracks at the toe between the clad and the weld. These cracks appear not to be in the stub tubes as is the case with the high side cracks.

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3. Ten of the 69 instrument thimble welds have been checked. Of these, nine were cracked. These are inconel field welds. The instrument thimbles are in the same vicinity as the stub tubes. This is the first information we have on instrument thimble weld cracks.
4. Many of the field welds which join the stub tubes to the control rod guide tubes exhibited porosity and lack of fusion. Jersey Central and General Electric have decided to remove all of these field welds and recontour the welds. The machine to do this is expected to be delivered to the site in about two weeks.

We will continue to inform you of significant developments.

Harold L. Price
 Director of Regulation

cc: Secretary (2)
 General Manager (2)
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J. P. O'Reilly, Chief, Reactor Inspection
& Enforcement Branch, Division of Compliance, H2

January 24, 1968

N. C. Moseley, Senior Reactor Inspector
Region I, Division of Compliance

INQUIRY MEMORANDUM

JERSEY CENTRAL POWER & LIGHT COMPANY, 219/68-A
NEW INFORMATION ON CONTROL ROD DRIVE HOUSING STUB TUBE
CRACKS AND IN-CORE INSTRUMENTATION THIMBLE FIELD WELD
DEFECTS; DEFECTIVE WELLS, REACTOR PRESSURE VESSEL INTERNALS

The following information relating to the indicated subject areas was obtained by phone communication with senior GE site representatives at JC - Mr. D. K. Willett, Test and Startup Manager, and Mr. G. Lees, Responsible Engineer - Pressure Vessel Repairs, - on January 22 and 23, 1968. The inquiry regarding the stub tubes and the in-core instrumentation thimbles was prompted by information obtained informally by representatives of DRL during the January ACRS meeting. The inquiry regarding the reactor pressure vessel internals was the result of similar conditions which have been detected at the Niagara Mohawk Power Corporation facility, Docket No. 50-220*.

A. Control Rod Drive Housing Stub Tube Cracks and In-Core Instrumentation Thimble Field Weld Defects

The cracks in the stub tubes are more extensive than was originally reported. The pertinent information follows:

1. At least seven stub tubes had crack "chains" (not continuous cracks) that went completely around the tube.

*Memorandum, N. C. Moseley to J. P. O'Reilly, Niagara Mohawk Power Corporation, Docket No. 50-220, "Defective Welds, Control Rod Drive Hydraulic System Penetrations and Reactor Pressure Vessel Internals", dated January 23, 1968.

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2. At least an additional 16 had crack "chains" that exceeded 15" in length.
3. The lengths of the cracks in many other tubes were in excess of the figures originally reported.
4. A crack depth of as much as $\frac{1}{4}$ " was noted.
5. The cracks were described as being of the same kind and cause as previously reported.
6. All of the cracks have been ground out except:
 - a. The two stub tubes left completely untouched.
 - b. An additional five tubes left with only the original grinding done.
7. The conditions described above were defined as not being new cracking but rather the result of a more sensitive application of the dye penetrant technique.
8. Some weld addition will be required in repair.
9. The new status of the stub tube cracks has been known to GE for at least several weeks.

The field welds mating the in-core instrumentation thimbles to the reactor vessel are defective. This is contrary to previous reports. The pertinent information follows:

1. Ten of the subject welds were dye penetrant checked at the time of the original go-round of checks (subsequent to quality control checks during weld application).

2. All 10 gave indications of weld defects. The defects were described as including porosity and lack of bond between the weld and the thimble. No permanent record was made of these results.
3. All 10 were subsequently ground per an approved procedure (GE and CE approved) which calls for grinding down along the thimble to a maximum depth of $\frac{1}{4}$ " (below projected vessel clad line) and out radially to a maximum $\frac{1}{4}$ ". Nine of the 10 still have indications, lack of bond, following grinding.
4. GE field personnel are currently in the process of dye penetrant checking the remaining positions using the more sensitive technique. Sixteen have been completed to date. At least 13, and possibly all 16, gave indications similar to those found in the original 10. All have been ground per the described procedure.
5. Of the total 26 positions examined, 23 still have indications of lack of bond after grinding.
6. The program is to continue mapping and grinding to the specified shape and dimension ($\frac{1}{4}$ " down - $\frac{1}{4}$ " out). Any defects remaining following grinding will be left as is and the ground out area will be refilled with weld metal. As previously noted, this procedure has been agreed to by GE and CE.
7. GE, Mr. Willett, characterizes this field weld problem as being similar to that with the control rod drive housing field welds - poor workmanship and poor quality control.

During the discussions with Messrs. Willett and Lees, our inspector pointed out that the above described facts constituted new information as far as the Commission was concerned and that the first indication of any new developments was first learned of informally at the ACRS meeting January 12, 1968. Both Messrs. Willett and Lees were reminded that on January 11, 1968, during a meeting at the site between them and our inspector - called by the inspector specifically for the purpose of getting "updated" on the status of the pressure vessel problems, no mention was made of these new facts. Both Messrs. Willett and Lees were told that this situation, poor communications, did not reflect favorably on GE. Mr. Willett responded by saying that there was no purposeful intention to withhold any information. Mr. Lees stated that the information was old as far as he was concerned (reported to site about mid-December) and that he had assumed that it was already known to the AEC. Both persons indicated that attempts will be made to improve communications in the future.

B. Defective Welds, Reactor Pressure Vessel Internals

Defective welds have been detected in some of the reactor pressure vessel internals. The effected equipment was prefabricated by the P. F. Avery Company in their shops in Billerica, Massachusetts. This vendor also did similar work for BNPC where similar problems have been experienced. (See referenced memorandum). The equipment known to be effected at JC was identified as follows:

1. Steam Dryer

A number of welds are said to require reworking. Information as to the specific condition was not available at this time. GE reported that it was not a strength problem but one of weld quality.

2. Steam Separator

At least one weld was said to require some reworking. Information as to the specific condition was not available at this time.

3. Liquid Poison Sparger To Shroud-Mounted Support Clips Welds

Specified welds not made. (Similar condition noted at NMPC).

It is our understanding that both the shroud and the core spray system were checked and found to be free of defects.

Mr. Willett told our inspector that the possibility of problems with the pressure vessel internals was first brought to their attention by the GE representative at NMPC. He stated that as a result, a representative from the GE Quality Control Group in San Jose was summoned for a review of the situation. GE informs us that Avery people will perform any necessary repair work at JC.

It was also determined at the time of these communications that both JC and GE were aware of the control rod drive hydraulic system penetration problems at NMPC. (See referenced memorandum). The subject equipment was said to have been supplied by the same vendor as in the case of NMPC. It is our understanding that the equipment was inspected at JC, subsequent to learning of the conditions at NMPC, and that no defects were detected.

Our inspector discussed each of the above subjects with Mr. T. J. McCluskey, Plant Superintendent. Special emphasis was placed on the problem of poor communications discussed in paragraph A. His response to the latter implied that this was probably a case where GE wanted to assemble all of the facts prior to presenting the story. Our inspector told Mr. McCluskey that this philosophy did not apply here because of its special significance. Mr. McCluskey indicated that he would take the inspector's comments into consideration.

These problem areas will be reviewed further at the time of the DRL-CO-JC-GE meeting at the site, January 26, 1968. These subjects will also be discussed in more detail in future inspection reports for this facility.