



Commonwealth Edison
Quad-Cities Generating Station
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NJK-75-107

February 28, 1975



Mr. John F. O'Leary, Director
Directorate of Licensing Regulation
Nuclear Regulatory Commission
Washington, D. C. 20545

Reference: Quad-Cities Nuclear Power Station
Docket No. 50-265, DPR-30
Appendix A, Sections 1.0.A.4, 6.6.B.1.a

Dear Mr. O'Leary:

Enclosed please find Abnormal Occurrence Report No. 50-265/75-8 for Quad-Cities Nuclear Power Station. This occurrence was previously reported to Region III, Directorate of Regulatory Operations by telephone on February 18, 1975, and to you and Region III, Directorate of Regulatory Operations by telecopy on February 19, 1975.

This report is submitted to you in accordance with the requirements of Technical Specification 6.6.B.1.a.

Very truly yours,

COMMONWEALTH EDISON COMPANY
QUAD-CITIES NUCLEAR POWER STATION

N. J. Kalivianakis
Station Superintendent

NJK/MPF/jeh

cc: Region III, Directorate of Regulatory Operations
J. S. Abel

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REPORT NUMBER: AC-50-265/75-8

REPORT DATE: February 28, 1975

OCCURRENCE DATE: February 18, 1975

IDENTIFICATION OF OCCURRENCE:

Jet pump components were discovered missing during a jet pump inspection.

CONDITIONS PRIOR TO OCCURRENCE:

The Unit Two reactor fuel assemblies had been removed and inserted into the fuel storage pool to facilitate out-of-core sipping operations and recirculation piping repairs during the refueling outage.

DESCRIPTION OF OCCURRENCE:

With the core void of fuel during refueling operations, a scheduled jet pump inspection was performed. This inspection was carried out with the aid of an underwater television camera and video tape unit. The details of the inspection are listed below. The various jet pump components and their physical locations are illustrated on Figures 1 and 2.

- (1) Beam bolt assemblies were observed for movement while applying 300 ft-lbs of torque to the beam bolt in both the clockwise and counter-clockwise directions.
- (2) Beam bolt keepers were inspected with respect to the following:
 - (a) Position
 - (b) Evidence of movement
 - (c) Condition of the four tack welds
- (3) The hold-down beams were inspected with respect to the following:
 - (a) Position
 - (b) Check of beam pocket fits
 - (c) Evidence of movement
- (4) The lock plates were inspected with respect to the following:
 - (a) Condition of the four flat head screws and their respective tack welds.
 - (b) Evidence of movement

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- (5) The beam bolt retainers were inspected to determine the condition of the 1/2" cap screw and its tack weld.
- (6) The restrainer gate wedges were inspected with respect to the following:
 - (a) Position
 - (b) Engagement with the restrainer and belly band of the jet pump.
 - (c) Evidence of movement
- (7) The restrainer stops (adjusting screws) were inspected with respect to the following:
 - (a) Tightness with the belly band of the jet pump.
 - (b) Evidence of movement
 - (c) Condition of the adjusting screw tack weld.
- (8) The restrainer gates were inspected with respect to the following:
 - (a) Condition of the two clamp bolts.
 - (b) Condition and tightness of the two clamp bolt nuts.
 - (c) Condition of the two tack welds of each clamp bolt keeper.

Upon completion of the above inspections on all twenty jet pumps, the following discrepancies were noted:

- (1) The beam bolt retainer clips and 1/2" cap screws were found to be missing on jet pumps 7 and 8.
- (2) The restrainer adjusting screw on the shroud side of jet pump 18 was found to be missing.
- (3) Restrainer gate keepers on jet pumps 1, 8, 12, 15, and 18 were found to have their welds in place, but not fused to the restrainer gate.

DESIGNATION OF APPARENT CAUSE OF OCCURRENCE:

Equipment Failure-

The apparent cause of the missing retainer clips, the 1/2" cap screws, and the adjusting screw is attributed to equipment failures caused by installation deficiencies. Based on the parts being inadequately installed, the vibrational forces present during normal operation could cause these components to become dislodged from their normal positions.

During the jet pump repairs to Unit 2 during 1972, the beam bolts and keepers were the primary components repaired. The repairs necessary to Unit 1 during its past refueling outage in 1974 revealed that further defective installation existed. It is felt that these present components were originally installed in a deficient manner and that the possibility of their failure was not known at the time of the original Unit 2 repairs. The discovery of their failure at this time is consistent with the deficiencies noted during the Unit 1 outage in 1974.

ANALYSIS OF OCCURRENCE:

The jet pumps are designed to withstand the combined loadings from differential pressure and temperature, dead weight, fluid movement, seismic acceleration, and vibration without failure or loss of integrity. The missing jet pump components did not lead to jet pump failure or loss of integrity. Particularly, there were no failures of any jet pump hold-down components. There were thus no unsafe conditions existing during previous periods of reactor power operation.

Jet pump component failures and missing or loose parts have been previously analyzed in the following documents:

- (1) Quad-Cities Station, Unit 2, Special Report No. 2, "Jet Pump Operability".
- (2) NEDO-10174, May 1970, G. J. Scatena, "Consequences of a Postulated Flow Blockage Incident in a Boiling Water Reactor".
- (3) Quad-Cities Station, Unit 1, Abnormal Occurrence Report letters of April 25, 1974, May 30, 1974, and July 12, 1974.

The health and safety of the public were not adversely affected by this occurrence.

CORRECTIVE ACTION:

The missing beam bolt retainer clips and 1/2" cap screws of jet pumps 7 and 8 will not be replaced. These pieces are important only during the initial construction of the jet pump beam assembly or during their removal. After installation of the beam bolt, the function of these pieces is completed.

A replacement stop (adjusting) screw has been installed and tack welded to its holding clamp on jet pump 18. As an alternative to removal of the jet pump throat, the welding tool used to tack weld the stop screw was modified to perform its intended function.

Although it has been postulated that the restrainer gate keeper on jet pump 18 was loosened during the repair of the stop screw, the tack welds of all jet pump restrainer gates were reinspected as a precautionary measure. As a result of the faulty tack welds discovered on the jet pump restrainer gate keepers of jet pumps 1, 8, 12, 15, and 18, the restrainer gate bolts were retorqued, and new tack welds were placed and verified. A similar inspection of the twenty jet pump beam bolt keepers was performed with satisfactory results.

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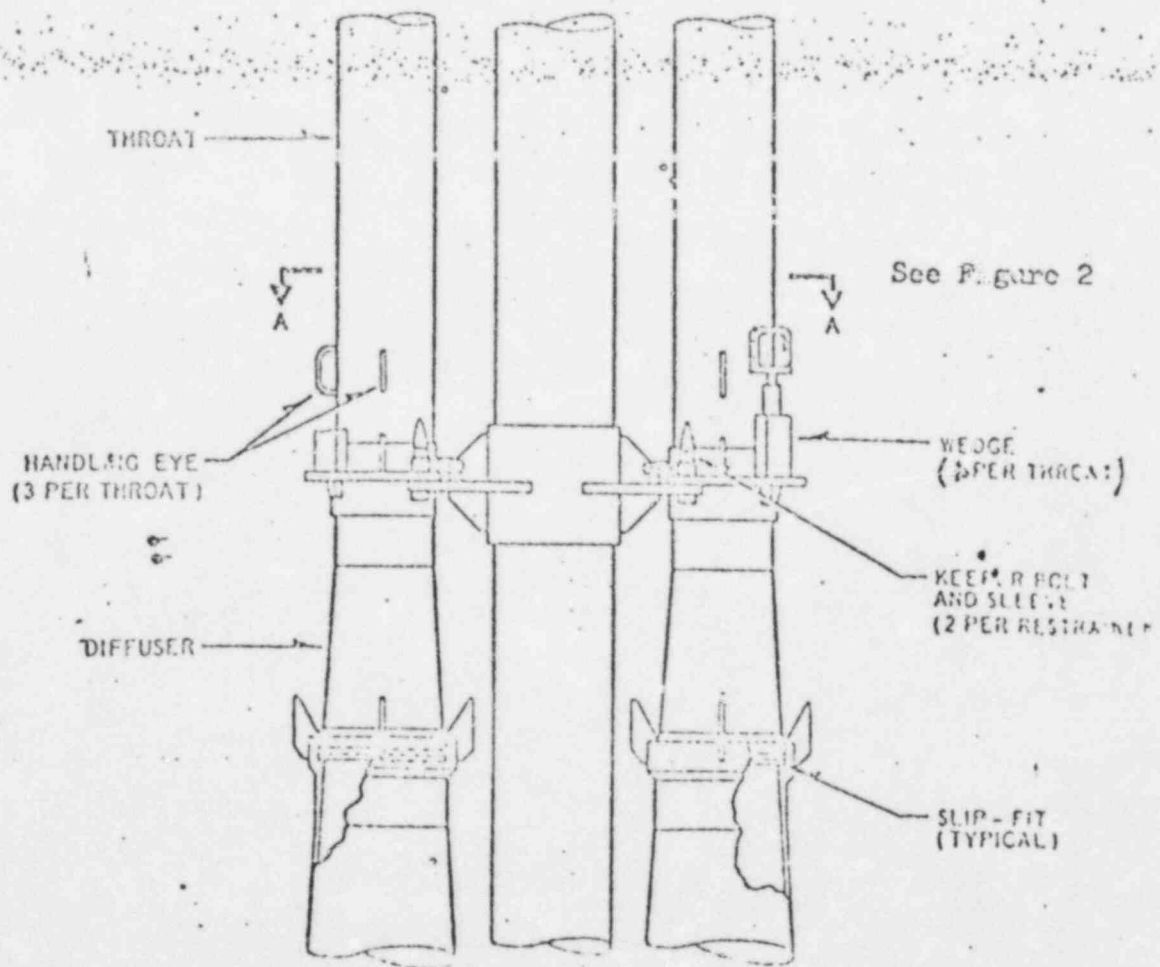
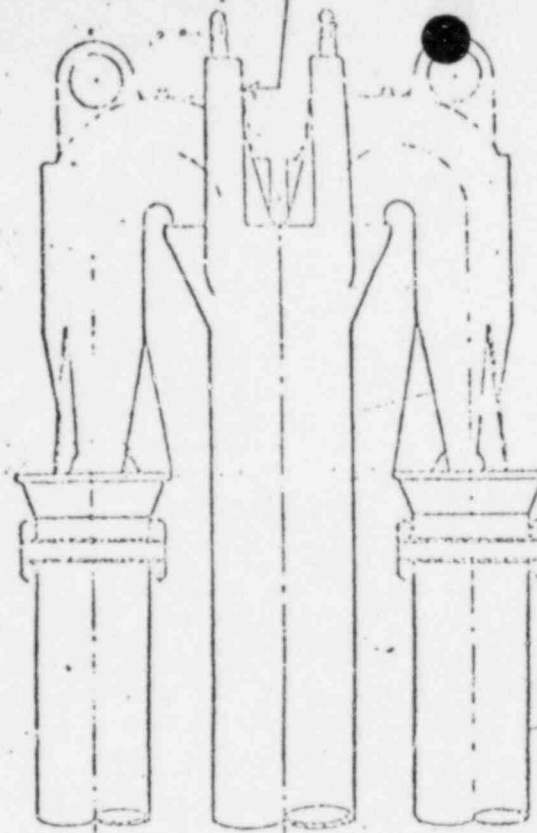
A list of objects, known to date, which are loose or missing in the unit 2 reactor vessel is attached. Further search for loose or missing parts is being conducted and an attempt will be made to retrieve all these objects before returning the unit to operation. Details of the searches for these parts will be reported in the future.

FAILURE DATA:

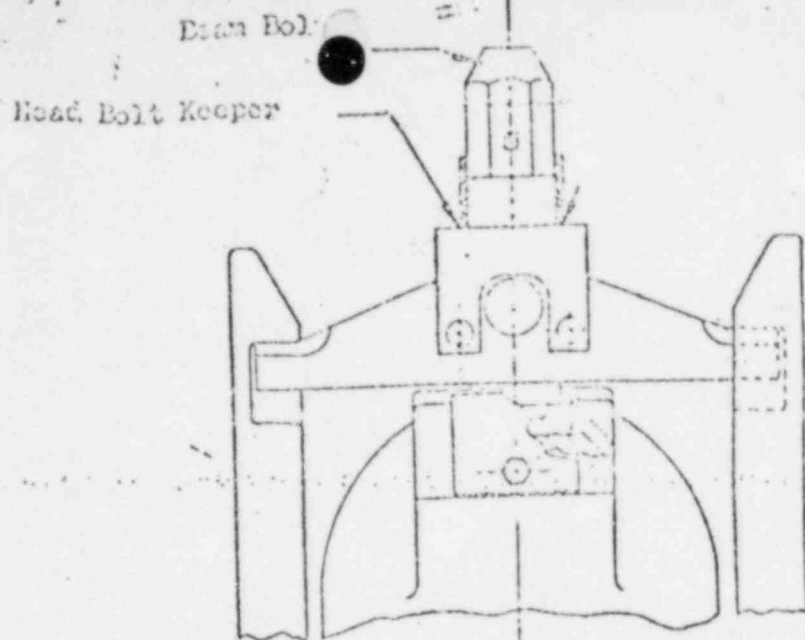
The problems discovered on this inspection of Unit 2 are similar but were less severe than those discovered following a jet pump failure of Unit 2 in August 1972. At that time, a jet pump assembly had become dislodged from its normal position and rotated in the vessel. Extensive inspections and repairs were performed on all Unit 2 jet pumps and they have since operated satisfactorily.

An extensive inspection of all Unit 1 jet pumps during its first refueling outage in April, 1974, revealed a large number of jet pump discrepancies. These included beam bolt torque test failures, sheared restrainer gate bolts and keepers, missing and cracked restrainer gate bolt keeper tack welds, a missing restrainer gate wedge and indications of wear in the vicinity of the wedge indicating possible vertical movement of the wedge prior to the inspections.

All of the jet pump problems which have occurred at Quad-Cities Station have been attributed to faulty craft installation and workmanship during the initial construction of both units.

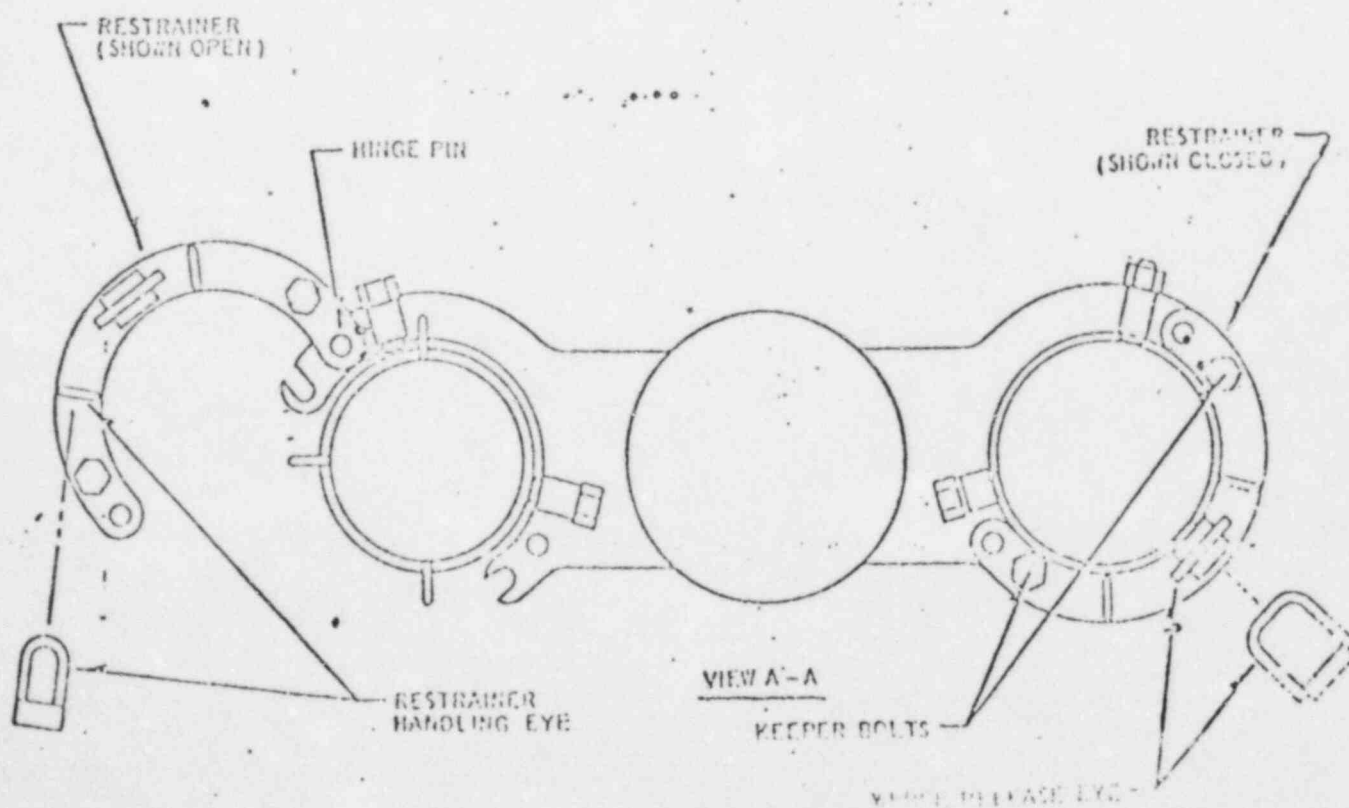


Jet Pump Figure 1



View B

Jet Pump Beam Details



JET PUMP RESTRAINER DETAILS

Figure 2

PART	ORIGINAL STATUS	DATE OF DISCOVERY	DATE OF RETRIEVAL	DISPOSITION
1. Lighting Support Bracket From Refuel Bridge	Missing	1/ 9/75	1/17/75	Hung in Unit 1 Fuel Pool
2. Neutron Dosimeter Tube	Missing	2/19/75		
3. Neutron Dosimeter	Missing	2/19/75		
4. JP 18 Adjusting Stop Screw	Missing	2/17/75		
5. JP 7 1/2" Cap Screw	Missing	2/17/75		
6. JP 7 Retainer Clip	Missing	2/17/75		
7. JP 8 1/2" Cap Screw	Missing	2/17/75		
8. JP 8 Retainer Clip	Missing	2/17/75		
9. 3 Pieces of Wire	Loose	2/17/75		
10. Piece of Angle Iron	Loose	2/17/75		
11. Open End Wrench	Loose	2/17/75		
12. 3 Pieces of Tape	Loose	2/15/75	2/17/75	Radwaste
13. 1 Piece of Wire	Loose	2/15/75	2/17/75	Radwaste
14. Rag	Loose	2/28/75		

LOOSE = Observed, but source unknown.

MISSING = Not in normal location and unaccounted for.

Do Files Yellow

Honorable Edward Mezvinsky

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