U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report Nos. 50-373/84-11(DE); 50-374/84-15(DE)

Docket Nos. 50-373; 50-374 License Nos. NPF-11; NPF-18

Licensee: Commonwealth Edison Company
P. O. Box 767
Chicago, IL 60690

Facility Name: LaSalle County Station, Units 1 and 2

Inspection At: Technical Center, Maywood, IL

Inspection Conducted: April 4, 1984

Inspector: D R Cilimberg 5/7/84
R. Cilimberg Date

Approved By: D H Danielson 5/7/84
D. H. Danielson, Chief Date
Materials and Processes Section

Inspection Summary

Inspection on April 4, 1984 (Reports No. 50-373/84-11(DE); 50-374/84-15(DE))
Areas Inspected: Metallurgical examination of cracks in flywheels from two diesel engines. The inspection involved a total of 8 inspector-hours on site by one NRC inspector.
Results: No items of noncompliance or deviations were identified.

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

*N. Mares, Metallurgical Engineer
*T. Spry, Welding Engineer

The inspector also contacted and interviewed other licensee and contractor employees.

*Denotes those present at the exit interview.

2. Cracks in Flywheels of Cummins Diesel Engines for Two Fire Pumps

This inspection was initiated to review the ongoing (CECo) evaluation of cracks in the subject flywheels.

Discussions with CECo personnel combined with a document review and observation of disassembled flywheels revealed the following:

Site maintenance personnel discovered cracks in the flywheel of a Cummins engine (Serial No. 10491124) used to power a fire pump. The discovery of these cracks prompted an inspection of the flywheel of the Cummins engine (Serial No. 1049118) on a second fire pump which also exhibited cracks.

Both flywheels were sent to the CECo metallurgical laboratory for evaluation as to the cause of cracking.

Preliminary observations suggest that stress concentration points were machined into the face of the flywheels at bolt holes during the manufacture of the fire pumps. Subsequent operation of the pumps resulted in cracks being initiated at the bolt holes due to high frequency cyclic stresses. Cyclic stresses were caused by the combination of an imoroperly mounted engine and the forces applied by a vertical 25 foot pump shaft connected to the horizontal engine with a horizontal shaft and universal joint.

The flywheel on the engine with Serial No. 10491124 exhibited fracture through bolt holes and adjoining metal continuously in a full circle. The flywheel continued to operate because the broken center section jambed at fracture surfaces to maintain rotation.

The flywheel on the engine with Serial No. 1049118 exhibited cracks which had propagated from one bolt hole through three other bolt holes but fracture had not occurred.

The metallurgical evaluation of the flywheels will be completed on May 31, 1984, and a report issued to substantiate the reasons for the cracks and recommend corrective action.

New flywheels have been installed on three fire pumps with two operating and one spare. The magnitude of the operating stresses have been greatly reduced by modification of the equipment foundations to alleviate vibration. A liquid penetrant examination is being performed on the flywheels every three months to determine if cracks are being initiated.

The inspector concludes that the action to date relative to cracked flywheels is acceptable. This item (373/84-11-01, 374/84-15-01) will remain open until the metallurgical report is available for review.

No items of noncompliance or deviations were identified.

3. Exit Interview

The inspector met with representatives (denoted in Paragraph 1) at the conclusion of the inspection. The inspector summarized the scope and findings of the inspection.