CP&L

Carolina Power & Light Company

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SHEARON HARRIS NUCLEAR PROJECT
P.O. Box 165
New Hill, North Carolina 27562

December 6, 1985

File Number: SHF/10-13510
Letter Number: HO-850475 (O) NRC-402

Dr. J. Nelson Grace
United States Nuclear Regulatory Commission
Region II
101 Marietta Street, Northwest (Suite 2900)
Atlanta, Georgia 30323

CAROLINA POWER & LIGHT COMPANY
SHEARON HARRIS NUCLEAR POWER PLANT 50-400
1986 - 900,00 KW - Unit 1
EMERGENCY SERVICE WATER PUMP
MATERIAL FAILURE, ITEM 219

Dear Dr. Grace:

Attached is an interim report on the subject item, which was deemed reportable per the provisions of 10CFR50.55(e) on November 8, 1985. CP&L is pursuing this matter, and it is currently projected that corrective action and submission of the final report will be accomplished by March 1, 1986.

Thank you for your consideration in this matter.

Yours very truly,

J. L. Willis
Plant General Manager
Shearon Harris Nuclear Power Plant

DLT/cwj

Attachment

cc: Messrs. G. Maxwell (NRC-SHNPP)
J. M. Taylor (NRC)

CAROLINA POWER & LIGHT COMPANY
SHEARON HARRIS NUCLEAR POWER PLANT

UNIT NO. 1

INTERIM REPORT

EMERGENCY SERVICE WATER PUMP MATERIAL FAILURE

ITEM 219

DECEMBER 3, 1985

REPORTABLE UNDER 10CFR50.55 (e)

IE27
1/1

SUBJECT

10CFR50.55(e) Reportable Item, Shearon Harris Nuclear Power Plant Unit 1, Emergency Service Water Pump Material Failure.

ITEM

Emergency Service Water Pumps 1A and 1B for SHNPP Unit 1.

SUPPLIED BY

Hayward-Tyler, Inc.

NATURE OF DEFICIENCY:

Loss of pump discharge pressure and flow occurred during operation of the 1A ESW pump. Subsequent inspection revealed the pump shaft was sheared at the pump upper bearing. Bearing and shaft sleeve were destroyed. Inspection of 1B ESW pump also has indicated deterioration.

DATE PROBLEM IDENTIFIED

September 5, 1985

DATE PROBLEM REPORTED

On November 8, 1985, CP&L (Mr. K. V. Hate) notified the NRC (Mr. P. Frederickson) that the item was reportable under the provisions of 10CFR50.55(e).

SCOPE OF PROBLEM

Visual inspection and detailed metallurgical examination indicate the shaft failure of 1A pump was due to extreme overheating. The flow slots in the bearing were plugged due to the damage to the bearing. No further conclusions could be drawn from the damaged parts.

Two general areas were investigated, these areas were (1) the design and installation of the pump bearing and (2) the seal and bearing water injection system required during ESW pump starting and operation. With regard to the bearing design, the bearing to shaft sleeve design clearances are specified to be 0.008" to 0.012". These clearances appear to be adequate based on similar vertical pump/bearing design. However the clearances found during repair of the pump did not meet these values.

The bearing housing was found to be slightly "hour-glass" shaped. The deviation from the nominal diameter was noted to be 30 mils and caused interference fit between the bearing and shaft. The housing was honed and bearing clearances verified. This problem was not noted in previous pump installation records.

The Seal Bearing Lube System design and operation was also investigated. Due to a lack of permanent design for the Seal Water System, a temporary design was installed providing Seal Water. This temporary system was operated for over a year with no apparent deficiencies. A temporary system was in service when the pump failed.

After the A pump was repaired and proper bearing clearances verified on reassembly, testing was done to develop a correlation between injection supply pressure and flow to the seal. The testing was representative of the temporary design. The flow rates obtained (5-8 gpm) were adequate to cool the bearing assuming proper bearing clearances. However, this data cannot be correlated with the situation that existed prior to the failure.

It is impossible to determine if the failure was a direct result of either the bearing installation or the seal injection flow provided. CP&L will complete additional testing on the pumps to verify proper performance/operation and will inspect one of the pumps prior to fuel load.

SAFETY IMPLICATIONS

Loss of the ESW pumps would prevent heat removal from other safety systems.

REASON DEFICIENCY IS REPORTABLE

The failure required extensive repair to establish system adequacy.

CORRECTIVE ACTION

ESW pump 1A was disassembled, components inspected and repaired and/or replaced as necessary. Pump 1B is currently being repaired.

PREVENTIVE MEASURES

The permanent seal water system has been installed.

FINAL REPORT

The final report on this matter will be issued upon completion of testing of both ESW pumps required by I.E. Bulletin No. 83-05. It is currently projected that the final report will be issued by March 1, 1986.