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FROM: Carolina Power & Light Company Raleigh, N.C. 27602 Mr. E.E. Utley			DATE OF DOC 1-4-74	DATE REC'D 1-9-74	LTR X	MEMO	RPT	OTHER
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DESCRIPTION:

Ltr reporting an abnormal occurrence at the H.B. Robinson Unit #2.....concerning Main Steam Line Seismic Restraints...deflection of the Main steam line seismic restraint AP-1 has resulted in loosening of grouting around the anchor plate & misalignment of the restraint.

PLANT NAME: H.B. Robinson #2

ENCLOSURES:

ACKNOWLEDGED

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FOR ACTION/INFORMATION 1-11-74 JB

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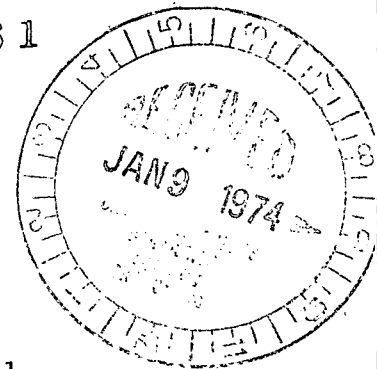
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Carolina Power & Light Company

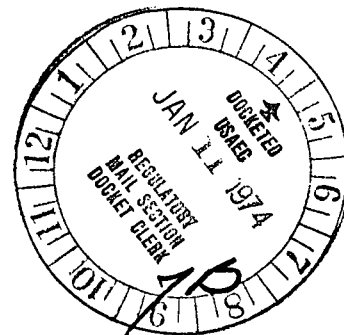
January 4, 1974



File: NG-3514

Serial: NG-74-11

Mr. John F. O'Leary, Director
Directorate of Licensing
Office of Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545



Dear Mr. O'Leary:

H. B. ROBINSON UNIT NO. 2
LICENSE DPR-23
MAIN STEAM LINE SEISMIC RESTRAINTS

In order to keep you informed of significant operating events, the following information is submitted concerning main steam line seismic restraints at Robinson Plant.

Identification of Event

Deflection of main steam line seismic restraint AP-1 resulting in loosening of a small amount of grouting around restraint anchor plate and misalignment of restraint. This restraint is on Main Steam Line "C" inside containment approximately midway between the penetration into containment and Steam Generator "C."

Conditions Prior to Event

In that the exact time of the occurrence cannot be definitely determined the plant conditions cannot be accurately identified. The first visible evidence of the problem was detected at 2100 Tuesday, December 4, when fragments of grouting were found on the containment floor. The source of this broken grouting was identified at 0833 Wednesday, December 5. A previous inspection at 0920 on Monday, December 3 did not reveal any broken grouting. Therefore, it is postulated that the deflection of the seismic restraint which caused the grouting to fall occurred sometime between 0920 Monday, December 3 and 2100 Tuesday, December 4. During that time period reactor power was varied from 25% to 100%. It is, however, most probable that the initiation of the movement of the restraint began much earlier and propagated over an indeterminate time period. The displaced grouting brought attention to the area.

Description of Event

At 2100, Tuesday, December 4, 1973, a routine containment inspection revealed some fragments of foreign material on the west side of the containment

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at the floor elevation of 251.5 feet. This material was tentatively identified as insulation. However, another inspection of the area was made at 0833 on Wednesday, December 5. This investigation revealed that the material was concrete grouting which had been dislodged from around the main steam seismic restraint, AP-1. With attention focused on this area it was apparent that the restraint was deflected from a normal plane with the polar crane wall to which it was attached. The outermost point of the restraint has moved in a northerly direction some 2-3 inches with a resultant displacement of grouting around its base. The restraint is attached to the wall by welding to an anchor plate which is in turn fastened to the polar crane wall via 24 one-half inch anchor studs embedded in the wall.

The main steam piping within containment was visually inspected on December 5, and no further abnormalities were found. There was no indication that the piping was damaged or that further deflection was imminent. It was decided that the condition did not jeopardize plant safety, and the plant was accordingly maintained at 100% power.

Designation of the Apparent Cause of Event

An Ebasco stress analysis engineer arrived on site on December 8 to further investigate the problem. It was determined that predicted thermal expansion of the piping retained in the subject restraint was about two inches in the direction that the restraint was deflected. After examining the restraint and all associated piping, it was tentatively postulated that the deflection was a result of a failure of the piping to slide freely within the restraint in its unrestrained direction. Therefore, the pipe shoe bound against the restraint during a thermal transient and deflected the restraint. Due to the fact that there was no other obvious damage in the associated piping, it is felt that the deflection was not the result of an impact load which would have caused more widespread damage. It is believed that the binding of the pipe within the restraint occurred over an extended period with the deflection and failure of grouting propagating with each thermal transient.

Analysis of Event

There were no personnel injuries as a result of the event. The problem was not the result of an operator error and does not jeopardize the continued safe operation of the plant.

Damage was confined to the concrete area around the restraint. All pipe hangers and whipping restraints are intact. The exact condition of the restraint anchor plate, anchor studs, and concrete cannot be determined because they are obscured by the restraint. Therefore the integrity of the restraint cannot be positively determined, and it is thus necessary to assume its failure to make a conservative analysis of the seismic characteristics of system.

January 4, 1974

Using the conservative assumption that the restraint is totally absent, Ebasco Corporation performed a computer analysis of the stresses on Steam Line "C" in the area of the restraint. The following data summarizes the results:

Pressure stress	4,353	psi
Estimated weight stress	3,671	psi
*Seismic stress of the design earthquake	<u>10,387</u>	psi
	18,411	psi

Pressure stress	4,353	psi
Estimated weight stress	3,671	psi
**Seismic stress of hypothetical earthquake	<u>20,774</u>	psi
	28,798	psi

*Estimated to occur once during plant life (0.1g)

**No loss of Function Earthquake (0.2g)

The results show that the total of pressure, weight, and seismic stresses for the design earthquake is 18,411 psi versus an allowable of 18,000 psi and 28,798 psi for the hypothetical earthquake versus an allowable of 27,000 psi.

Ebasco concluded that the very slight overstress is not severe enough to restrict operation. This conclusion is put into perspective when it is considered that the allowable stress for the design earthquake is a factor of three less than the tensile strength of the piping.

Corrective Action

The bending of the restraint was caused by the failure of the pipe shoe to slide on the mating restraint surface. Ebasco Services, Incorporated has been retained to investigate and propose a permanent correction for the failure of the restraint to function as it was designed to function. Carolina Power & Light Company plans to implement corrective action during the April, 1974 refueling outage.


Failure Data

There have been no past problems with seismic restraints.

JGH:DBW:mvp

cc: Messrs. N. B. Bessac
T. E. Bowman
B. J. Furr
B. Howell
D. V. Menscer
N. C. Moseley
D. B. Waters

Yours very truly,


E. E. Utley
Vice-President
Bulk Power Supply