S-34
50-348/364-CIVP
2/19/92

Staff Exh. 34

DOCKETED
USNRC

'92 MAR 13 P12:11

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

TEST REPORT

WYLE LABORATORIES SCIENTIFIC SERVICES & SYSTEMS GROUP
WESTERN OPERATIONS, NORCO FACILITY

REPORT NO 58730
OUR JOB NO. ND 58730
CONTRACT ---
YOUR P. O. NO A01032-2

RAYCHEM CORPORATION
300 Constitution Drive
Menlo Park, California 94025

RECEIVED
NOV 20 1985
BECHTEL POWER CORP.
JOB NO. 15026

22 June 1982
DATE

ENVIRONMENTAL QUALIFICATION TEST REPORT
OF
RAYCHEM WEIS NUCLEAR ENVIRONMENTAL INTERFACE SEAL KITS
FOR
RAYCHEM CORPORATION
MENLO PARK, CALIFORNIA

VENDOR'S DOCUMENT REVIEW
1 ☐ Approved - Mfg. may proceed.
2 ☐ Approved - Submit final dwg. - Mfg. may proceed
3 ☐ Approved - except as noted - Make changes and submit final dwg. - Mfg. may proceed as approved.
4 ☐ Not Approved - Correct and resubmit.
5 ☐ Review not required - Mfg. may proceed.
Approval of this document does not relieve supplier from full compliance with contract or purchase order requirements.
By..... Date.....
BECHTEL

JOB NO. 9645	BECHTEL POWER CORPORATION 15740 SHADY GROVE ROAD GAITHERSBURG, MD 20877

GPD-33911 10/82

FOR MP&L-NP-2 APPROVAL

REGISTERED PROFESSIONAL ENGINEER
VLADIMIR M. GLOGOVAC
No. 22857
MECHANICAL
STATE OF CALIFORNIA

9645-E-062.3-QS-270-28-00

STATE OF CALIFORNIA }
COUNTY OF RIVERSIDE } ss.

Ray C. Myrick, being duly sworn, deposes and says: That the information contained in this report is the result of complete and carefully conducted tests and is to the best of his knowledge true and correct in all respects.

Ray C. Myrick

SUBSCRIBED and sworn to before me this 22nd day of June, 19 82

Catherine C Kelty
Notary Public in and for the County of Riverside, State of California

My commission expires ..., 19 83

OFFICIAL SEAL
CATHERINE C KELTY
NOTARY PUBLIC - CALIFORNIA
RIVERSIDE COUNTY

DYNAMICS

DEPARTMENT

DEPT. MGR. L. F. Gord

TEST ENGINEER P. Knoll

REGISTERED PROFESSIONAL ENGINEER Vladimir M. Glogovac

DCAS—QAR VERIFICATION

QUALITY ASSURANCE L. Housteau

NUCLEAR REGULATORY COMMISSION

Docket No. 50-348/364 Official Exh No. 34

In the matter of Alabama Power Company

Staff ✓ IDENTIFIED 12:18 p.m. 2/19/90

Applicant _____ RECEIVED 12:23 p.m. 2/19/90

Intervenor _____ REJECTED _____

Cont'g Off'r _____

Contractor _____ DATE 2/19/90

Other _____ Witness _____

Reporter L Estep

1.0 SUMMARY

Twelve Raychem NEIS (Nuclear Environmental Interface Seal) kit assemblies were subjected to an environmental qualification test program based on the guidelines of IEEE Standards 323-1974(1) and 383-1974(2) to determine their suitability for service within the containment of a nuclear power generating station. The test program was conducted by Raychem and by Wyle Laboratories, Norco, California during the period of February to April, 1982.

The test program consisted of the following:

1. Thermal aging - 0 and 120 hours at 175°C
2. Radiation exposure - 105 Mrads gamma
3. Electrical testing - Insulation resistance and voltage withstand
4. Helium leak rate measurements - 35 and 85 psid (pressure differential) at 25°C
5. 30 day simulated LOCA/MSLB (Loss Of Coolant Accident/Main Steam Line Break) environmental exposure with chemical spray
6. Helium leak rate measurements - 35 and 84 psid (pressure differential) at 25°C
7. Electrical testing - Insulation resistance and voltage withstand

The NEIS kits were installed on one half inch galvanized rigid steel conduit nipples, six inches long, through which either two or three insulated wires were installed.

The specimens were threaded into a test vessel flange which was bolted to the LOCA/MSLB test vessel. The NEIS kit assembly became part of the LOCA vessel pressure boundary.

The test results for the twelve test specimens are summarized below.

Six of the twelve test specimens demonstrated acceptable performance throughout the test program. Leak rates were less than 6×10^{-5} cc/sec of helium at 85 psi differential before and after the LOCA/MSLB exposure and there was no leakage indicated during the LOCA/MSLB exposure.

Two specimens showed no evidence of leakage during the environmental exposure but had significantly higher helium leak rates after the test (0.2 cc/sec at 20 psid).

One test specimen evidenced slight leakage during the LOCA/MSLB but was subsequently found to have a leak in the insulated wire. After repair of the wire, this specimen had a helium leak rate of 3.1×10^{-6} cc/sec at 85 psid. There were three remaining specimens that evidenced leakage during the LOCA/MSLB and had high post LOCA/MSLB helium leak rates. Post test investigation of these specimens revealed evidence of leakage during the LOCA/MSLB at the threaded flange connection.

All specimens exhibited extensive degradation of the zinc galvanizing on the pipe nipple, including the area under the NEIS kit seal.

2.0 TEST SPECIMENS

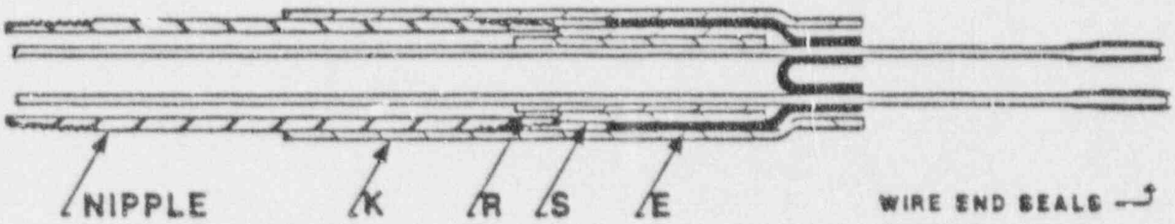
2.1 Materials

2.1.1 Kit components were all manufactured from Raychem's nuclear grade insulating material and sealant, and drawn from routine production inventory. All components conformed to applicable Raychem material and component specifications and were certified acceptable by Raychem Energy Division QA.

2.1.2 The galvanized pipe nipples were obtained from an electrical distributor as a standard commercial grade conduit nipple.

2.2 Construction

2.2.1 Each test specimen was comprised of a standard NEIS kit installed onto a 1/2-inch diameter, six-inch long galvanized rigid steel pipe nipple. The test specimen construction is shown in Figure 1.



	NEIS-2-50A	NEIS-3-50P
R - Inner Shim	WCSF-115-3U	WCSF-200-3U
S - Outer Shim	WCSF-300-2.3U	WCSF-300-2.3U
E - Conductor Sealing Breakout	602A212-52-12/144	403A112-52-10/144
K - Outer Sealing Sleeve	WCSF-500-6N	WCSF-500-6N
Wire (XLPE Insulation)	1/c#16 - 0.12" dia.	1/c#10 - 0.18" dia.
Conduit Nipple:	1/2" x 6" galvanized rigid steel	
	Nominal dimensions - 0.84" O.D., 0.63" I.D.	

FIGURE 1. Test Specimen Construction