UNITED STATES OF AMERICA
UNITED STATES NUCLEAR REGULATORY COMMISSION

before the

ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
PUBLIC SERVICE COMPANY NEW HAMPSHIRE, et al.	)	Docket Nos. 50-443 OL-1 50-444 OL-1
(Seabrook Station, Units 1 and 2)	)	(On-site Emergency Planning Issues)

AFFIDAVIT OF RANDY C. JAMISON

I, RANDY C. JAMISON, being on oath, depose and say as follows:

1. I am a Senior Engineer in the Seabrook Project Electrical Engineering Group at Yankee Atomic Electric Company (YAEC) in Framingham, Massachusetts. YAEC provides engineering, scientific and technical services to Seabrook Station. A statement of my professional qualifications is attached and marked "A".

2. A special test program was performed under my direction to determine the ability of ITT Surprenant RG-58 coaxial cable to carry current without degrading adjacent cables during low power testing. The test program used a current source to supply current through the coaxial cable while monitoring jacket temperature and observing the effect on adjacent cables. The testing was conducted in accordance with a procedure which I prepared and which was reviewed and approved in accordance with applicable YAEC procedures. The testing included Quality Assurance (QA) Department surveillance.

3. The test RG-58 coaxial cable was mounted in a bundle of qualified instrument cables to represent a cable located at the middle of a cable tray and to provide adjacent cables to monitor for physical degradation (see Figure 2 from the test procedure which is attached and marked "B"). Test cable jacket temperature was monitored at points inside and outside the cable bundle. The current was permitted to flow at least until the test cable jacket temperature stablized. The adjacent cables were not energized because it was assumed that there would be minimal heating contribution if the adjacent cables were carrying normal low level instrument signals. This was shown correct since even at the 1 amp test current, which is greater than normal signal levels, the heating was minimal (see ¶ 7).

4. As discussed in the Affidavit of Thomas W. Glowacky (hereinafter referred to as the Glowacky Affidavit) at ¶ 7, the maximum current available for the various RG-58 cable applications is 400 milliamps (400 x 10^{-3} amps) for the analyzed failure of the center conductor shorting to the shield (short to ground). This current is well within the equivalent 8-10 amps cable ampacity such that the RG-58 cable will not overheat and degrade adjacent cables (Glowacky Affadavit at ¶ 8). Although the maximum current available is 400 milliamps, a 1 amp test current was selected for conservatism to verify that no overheating would occur. To gain additional assurance that the RG-58 cable will not overheat and degrade adjacent cables at 400 milliamps, tests were also conducted at 10 amps, a very conservative ampacity value.

5. Two RG-58 coaxial cables were included in the test. A new (unaged) cable was included to represent low power (5%) testing during which thermal and radiation aging affects are not present. A new (unaged) LOCA tested

cable was also included to determine whether a LOCA would affect the ability of the RG-58 cable to carry the test currents without degrading adjacent cables during low power testing. To simulate a failure of the center conductor shorting to the shield analyzed in the Glowacky Affidavit, the shield and the center conductor were connected in series with the current flowing through both.

6. The results of the 1 amp test are as follows. The maximum test cable jacket temperature for the new cable was 77.9°F (in a 76.7°F ambient). The maximum test cable jacket temperature for the new LOCA tested cable was 81.6°F (in a 80.7°F ambient). Examination of the jacket temperature rise over ambient (1.2°F for the new cable and 0.9°F for the new LOCA tested cable) demonstrates that the LOCA test did not affect the current carrying capability of the RG-58 cable. There was no physical degradation observed on the adjacent cables. Furthermore, the test RG-58 cables themselves did not show any physical degradation of the jacket or center conductor insulation from carrying the 1 amp current.

7. The results from the 1 amp test are acceptable because the maximum 1.2°F RG-58 jacket temperature rise over ambient is insignificant and can not cause degradation of adjacent cables in any plant environment (normal or accident) during low power testing. It should be remembered that this temperature rise is itself conservative since the 400 milliamp maximum current which would flow if the RG-58 failed and shorted the center conductor to shield would cause even less heating than the test current of 1 amp.

8. The results of the 10 amp test are as follows. The maximum test cable jacket temperature for the new cable was 113.2°F (in a 81°F ambient). The maximum test cable jacket temperature for the new LOCA tested cable was 107.2°F (in a 74°F ambient). Examination of the jacket temperature

rise over ambient (32.2°F for the new cable and 33.2°F for the new LOCA tested cable) demonstrated that the LOCA test did not affect the current carrying capability of the RG-58 cable. There was no physical degradation observed on the adjacent cables. Furthermore, the test RG-58 cables themselves did not show any physical degradation of the jacket or center conductor insulation from carrying the 10 amp current.

9. The 10 amp test current does not represent an actual plant application current level. This test was conducted to obtain additional heat rise data. The results of the 10 amp test verifies that RG-58 cables carrying the maximum 400 milliamp current will not overheat and degrade adjacent cables because even at the 10 amp current (25 times the 400 milliamp maximum) the heat rise was not significant (33°F).

10. In conclusion, these tests demonstrate that an RG-58 coaxial cable carrying the 400 milliamp maximum current expected if the RG-58 cable failed by shorting center conductor to shield (test was actually at 1 amp), can <u>not</u> generate sufficient heat to cause degradation of adjacent cables during low power testing. The 10 amp test confirms that an RG-58 cable carrying the 400 mA current can not cause degradation of adjacent cables.

Randy C. Jamison

Randy C. Jamison

STATE OF NEW HAMPSHIRE

Rockingham, ss. July 22, 1988

The above-subscribed Randy C. Jamison appeared before me and made oath that he had read the foregoing affidavit and that the statements set forth therein are true to the best of his knowledge.

Before me,

Beverly E. Silloway

Beverly E. Silloway, Notary Public
My Commission Expires: March 6, 1990

"A"

RANDY C. JAMISON

SENIOR ENGINEER

EDUCATION

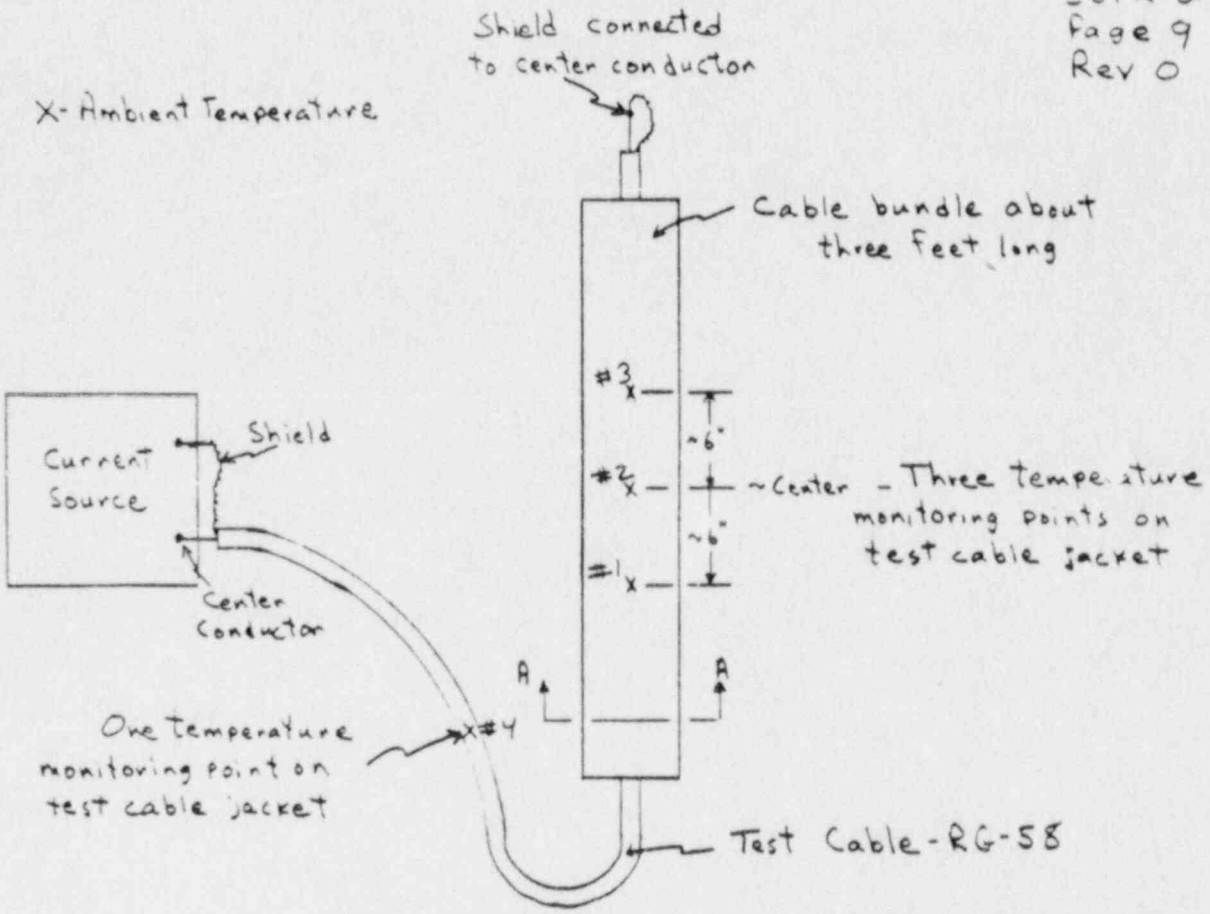
BS Electrical Engineering, Pennsylvania State University, 1977
MS Electrical Engineering, Pennsylvania State University, 1978

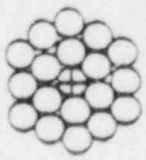
Mr. Jamison was employed by McGraw Edison Company, Power Systems Division, from 1977 to 1980. He was responsible for providing technical support to six Sales Engineers who sold electrical transmission and distribution equipment to electrical utilities.

In 1980, Mr. Jamison joined Yankee Atomic Electric Company as an Engineer in the Electrical Engineering Group. In this position, he was responsible for performing engineering studies, design changes and technical evaluations of the electrical systems for Yankee Plant, Vermont Yankee, Maine Yankee and Seabrook Station.

In his present position as Senior Engineer, he is responsible for performing various activities within the Electrical Engineering discipline for Seabrook Station. These activities include preparation of design changes, calculations, technical evaluations and licensing support.

Mr. Jamison is a member of the Institute of Electrical and Electronics Engineers (IEEE). He is a Registered Professional Engineer in the State of New Hampshire. He is a member of the Nuclear Power Engineering Committee's (NPEC), Subcommittee 6.5, Working Group on Independence Criteria (responsibility for IEEE Std. 384).





Section A-A

⊕ - Test RG-58 Coxial Cable Target

○ - Adjacent cables - Inner layer 2-RG-59 coaxial cables, 2-TSP cables and 2-RG-58 coaxial cables (if space permits). Outer layer - any combination of RG-59, TSP and RG-58 cables.

Figure 2

Test No 2 Equipment Setup