

**Omaha Public Power District**  
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402/536-4000

February 9, 1990  
LIC-90-0084

U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Mail Station P1-137  
Washington, DC 20555

References: 1. Docket No. 50-285  
2. Letter from OPPD (R. L. Andrews) to NRC (D. E. Sells) dated October 21, 1986 (LIC-86-0532)  
3. Letter from OPPD (R. L. Andrews) to NRC (H. R. Denton) dated April 1, 1985 (LIC-85-117)

SUBJECT: Gammametrics Cable Seal Repair

The purpose of this letter is to provide additional information regarding Environmental Qualification of Gammametrics neutron flux detectors at Fort Calhoun Station (FCS) and to revise Omaha Public Power District's (OPPD) conformance to Regulatory Guide (RG) 1.97 submittal (Reference 2).

In May 1988, Gammametrics issued a 10CFR21 notification to the NRC identifying potential leakage problems in the solder connections of neutron flux monitoring system detector/cable assemblies. During the 1988 refueling outage, Gammametrics personnel tested three of the four detector/cables systems installed at FCS. All three assemblies were found to be leaking thereby invalidating their qualification status. As a result, OPPD prepared a Safety Analysis for Operability (SAO) stating that environmentally qualified seal kits would be installed during the 1990 refueling outage.

Gammametrics completed environmental qualification testing of their new seal design recently and issued a report. Based on our review of this report, OPPD has concluded that the test does not meet the environmental qualification requirements of FCS. The seal kits, therefore, will not be installed as originally planned. The leaking cable assemblies will be repaired or replaced as necessary, in two of the four subject cable loops and will then be retested. Leaking in the replacement assemblies, if it should occur, will be repaired.

All four wide range neutron flux monitoring channels are required to be operable for low power operation ( $10^{-4}$  to 15%) and two channels are required to be operable during refueling operations. Only two of the detectors, per RG 1.97, are required to be environmentally qualified to 10CFR 50.49 requirements for post-accident monitoring operation. OPPD's RG 1.97 compliance submittal

*Acc'l Add: NRR/DET/EMEB 4r Encl  
NRR/DET/ESGB*

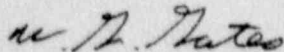
U. S. Nuclear Regulatory Commission  
LIC-90-0084  
Page 2

(Reference 3) took the position that the use of two completely independent channels meets the intent of Category I redundancy requirements. However, the submittal identified all four of the wide range neutron flux monitoring channels as being available to meet this requirement. Consistent with the above requirements only two of the four channels will be restored to fully qualified status prior to start up.

Attached are Section 5.1.1 and Table 1 of Reference 2 which have been revised to indicate the two detectors that will be environmentally qualified.

If you have any questions, please contact me.

Sincerely,



W. G. Gates  
Division Manager  
Nuclear Operations

WGG/pjc

c: LeBoeuf, Lamb, Leiby & MacRae  
R. D. Martin, NRC Regional Administrator, Region IV  
A. Bournia, NRC Project Manager  
P. H. Harrell, NRC Senior Resident Inspector

## 5.1 Type A Variables

### 5.1.1 Neutron Flux (CAT, 1)

The function specified above is performed by instrument loops N-002 and -004 made up of the excore detectors located in containment, amplifiers located in the Auxiliary Building and Wide Range Log Channel Drawers located in the control room. Two source range monitors (SRM's) and two wide range instrument monitors (IRM's) are provided for flux indication. All SRM and IRM detectors consist of dual fission chambers. The Excore detectors were replaced during the 1984 outage with fully qualified components. The detectors, amplifiers, and cable assemblies are qualified to Reg. Guide 1.89 and 1.100 and with the methodology described in NUREG-0588, CAT I. However, the balance of the equipment such as the Wide Range Log Channel Drawers, which provide signal processing and indication for neutron flux, have not been upgraded and are in compliance with the requirements applicable at the time of issuance of the construction permit. The District believes the above deviations from the requirements are justified as discussed in Section 2.3.3.A.1 of this report.

Summary Position - The District believes that the existing instrumentation loops for neutron flux measurement are adequate to perform the intended accident monitoring function. Thus, no modifications are proposed.

### 5.1.2 Reactor Coolant System Pressure (CAT, 1)

The function specified above is performed by pressurizer pressure instrument loops P-105/P-115 and by proposed loops P-120A and P120B (scheduled to be installed during the 1987 refueling outage). These loops are in compliance with the requirements of Reg. Guide 1.97 Rev. 2 except as noted herein:

This function is performed by P105/P115 pressure loops for the LOCA/MSLB bounded DBA events, and by P120A/P120B pressure loops for the ATWA bounded Design Basis Events (DBE).



TABLE 1  
COMPARISON OF FORT CALHOUN STATION UNIT NO. 1  
INSTRUMENTATION WITH REGULATORY GUIDE 1.97 REV. 2 REQUIREMENTS

TYPE "A" VARIABLES											
INSTRUMENT	CAT.	QA	RANGE	ENV. QUAL.	SEIS. QUAL.	REDUND.	POWER SUPPLY	RECORDING	DISPLAY LOCATION	COMMENTS	
I. REACTIVITY CONTROL											
1. Neutron Flux (NT-002, 004)	R.G. OPPD	1 1	-- USAR	10 <sup>-6</sup> %-100% 10 <sup>-8</sup> %-125%	CAT. 1 10CFR50.49	R.G. 1.100 IEEE-344-75**	REQUIRED YES	1E 1E	Required SPDS	One Channel Continuous CR, SPDS	In compliance with exceptions noted in Section 5.1.1
II. RCS INVENTORY/PRESSURE CONTROL											
1. Pressurizer Level (LT-101X/Y)	R.G. OPPD	1 1	-- USAR	0-100% 0-100%	CAT. 1 10CFR50.49	R.G. 1.100 IEEE-344-75+	REQUIRED YES	1E 1E	Required Recorded	One Channel Continuous CR, SPDS	In Compliance
2. RCS Pressure (PT-105, 115) (PT-120A, PT-120B)	R.G. OPPD	1 0737 1	-- 0737 0737	0-psig 0-2500 psig 1900-2900 psig	CAT. 1 10CFR50.49 10CFR50.49	R.G. 1.100 IEEE-344-75* IEEE-344-1975	REQUIRED YES YES	1E 1E 1E	Required Recorded SPDS	One Channel Continuous CR, SPDS CR, SPDS	See Section 5.1.2 See Section 6.1.4
3. Degrees of Sub-cooling (SPDS)	R.G. OPPD	1 0737	-- 0737	200°F to 35°F 618°F sub-cooled to 668°F super-heated	CAT. 1 10CFR50.49	R.G. 1.100 IEEE-344-75	REQUIRED YES	1E 1E	Required SPDS	One Channel Continuous CR, SPDS	In Compliance See Section 5.1.3

N/R - Not Required.

+ - The entire loop is not qualified to IEEE-344-1975, only portions, including the sensors are qualified.

\* - The transmitters located in the harsh environment were replaced per 10CFR50.49. The new transmitters are qualified per IEEE-344-1975 and 10CFR50.49. All other components of the loop are qualified per the seismic requirements which applied at the time the construction permit was issued. (Reference Appendix F of the USAR).

\*\* - The entire loop is not qualified to IEEE-344-1975, only the excore detectors and amplifiers are qualified. The balance of equipment is qualified to original seismic qualification.

-- - QA requirements for categories 1, 2, and 3 are shown in Section 2.3.3.A.5.

R.G.- Regulatory Guide 1.97, Rev. 2 requirements.