TERA

DISTRIBUTION:

NRC PDR	RDenise
Local PDR	RHartfield
Docket File	ELD
LWR #3 File	IE (3)
DVassallo	WRussell
DRoss	
SVarga	bcc:
FWilliams	JBuchanan, NSIC
OParr	TAbernathy, TIC
ADromerick	ACRS (16)
MRushbrook (w/extra copies)	
RMattson	
SHanauer	
JKnight	
RTedesco	
RDeYoung	
VMoore	
MErnst	

OCT 16 1979

Docket No: 50-339

Mr. W. L. Proffitt
Senior Vice President - Power Operations
Virginia Electric & Power Company
P. O. Box 26666
Richmond Virginia 23261

Dear Mr. Proffitt:

SUBJECT: ENVIRONMENTAL QUALIFICATION OF REACTOR COOLANT TEMPERATURE DETECTORS AND CONTAINMENT PRESSURE TRANSMITTERS

The environmental qualification for certain Westinghouse-supplied instrumentation is described in WCAP-9157 "Environmental Qualification of Safety-Related Class IE Process Instrumentation." Your application for a license to operate the North Anna Plant references WCAP-9157 as a basis for the acceptance of the environmental qualification of this instrumentation. The regulatory staff has found that additional information is needed to complete its review of WCAP-9157. Westinghouse Electric Corporation has agreed to provice the requested information in a timely manner except for three areas: (1) the qualified life of resistance temperature detectors (RTDs) to be used to measure the temperature of reactor coolant; (2) qualification of field connections for these temperature detectors; (3) qualification of remote bellows sensing pressure transmitters to be used to measure pressure of the containment atmosphere. Acceptable information for these three areas must be provided for our review and approval prior to the issuance of a license to operate your plant. Since resolution of these matters may not be completed with Westinghouse within the remaining licensing review schedule estimated for your plant, we will recuire that resolution of the staff's concerns stated below be completed on your application.

The Westinghouse evaluation of the qualified life of the resistance temperature detectors (Section 2.2 of WCAP-9157) is unacceptable because the assumed post-accident fission product source term is too small and the assumed post-accident operating time is too short. Guidelines for calculating acceptable qualified life in a radiation environment follow.

A. The total integrated exposure to be simulated in qualification tests should be the sum of the calculated integrated exposure during normal plant operation and the calculated integrated exposure during post-accident plant operation.

B. The fission product source term for calculating exposure during post-accident operation should correspond to loss-of-coolant-accident (LOCA) conditions with a release of 100% of the noble gases, 50% of the iodines, and 1% of the remaining fission products generated in the equilibrium core.

OFFICE ➔						
SURNAME ➔						
DATE ➔						

NRC FORM 318 (9-76) NRCM 0240 ★ U.S. GOVERNMENT PRINTING OFFICE: 1976 - 256 - 769

C. Post-accident exposure for RTDs should be based on the higher of two exposures calculated by assuming (1) an instantaneous release of fission products from the fuel to the containment atmosphere, and (2) an instantaneous release from the fuel to the reactor coolant without subsequent release to the containment.

D. Post-accident operation time for the narrow-range resistance temperature detectors should be the sum of the longest time required for reactor trip in any anticipated operational occurrence or design basis accident plus a margin of one hour for uncertainties in predicting the time.

E. Post-accident operation time for the wide-range resistance temperature detectors should consider the environmental conditions for an interval of 100 days following the accident, unless a shorter time can be justified. (Since the post-accident operation time used in qualification tests described in WCAP-9157 is less than 100 days, you should provide justification to show that extending the test to 100 days would not significantly affect instrument performance or accuracy for this period).

WCAP-9157 does not include qualification of electrical connections used in the installation of resistance temperature detectors because these field connections are not made by Westinghouse. Justification for your conclusion that field connections will perform acceptably in the post-accident environment is needed.

The qualification test of the remote bellows sensing pressure transmitter resulted in an anomalous pressure spike above the test chamber pressure (Section 6-6 of WCAP-9157). The test results are unacceptable to the staff because the indicated pressure does not meet the acceptance criteria for instrument accuracy and anomalous indications, such as the pressure spike, are contrary to the requirements of Section 4 of IEEE-279-1971, "IEEE Criteria for Protection Systems for Nuclear Power Generating Stations." It is concluded in WCAP-9157 that this pressure spike is attributable to the smallness of the test chamber and that the spike would not occur in the large containment. The discussion in WCAP-9157 of the cause of the pressure spike in the test and the assurance of its absence in the plant is inadequate. Additional tests or analyses are needed to demonstrate that this pressure transmitter is acceptable.

Please amend your application to provide the following additional information.

1. Results of calculations using the guidelines in this letter to determine acceptable qualified life of resistance temperature detectors to be used to measure reactor coolant temperature.

2. Results of tests or analyses to demonstrate acceptable environmental qualification of field connections for resistance temperature detectors to be used to measure reactor coolant temperature.

OFFICE ▶						
SURNAME ▶						
DATE ▶						

3. Results of tests or analyses, in addition to those in WCAP-9157, to demonstrate acceptable environmental qualification of pressure transmitters to be used to measure containment pressure.

This information is needed by October 25 in order to meet our schedule for review and approval of your application for an operating license. If you cannot meet this date, please inform us within two weeks from the date of receipt of this letter of a date you will submit the requested information. If you desire clarification of the technical information requested in this letter please call Tom Dunning on (301) 492-7383.

Sincerely,
Original signed by
A. W. Dromerick

Olan D. Parr, Chief
Light Water Reactors Branch No. 3
Division of Project Management

cc:
See next page

OFFICE	DPM:LWR #3	DSS	DPM:LWR #3			
SURNAME	AWDromerick:mec	RSatterfield	ODParr			
DATE	10/17/79	10/17/79	10/17/79			

Mr. W. L. Proffitt

cc: Mr. Anthony Gambaradella
Office of the Attorney General
11 South 12th Street - Room 308
Richmond, Virginia 23219

Richard M. Foster, Esq.
211 Stribling Avenue
Charlottesville, Virginia 22903

Michael W. Maupin, Esq.
Hunton, Williams, Gay & Gibson
P. O. Box 1535
Richmond, Virginia 23212

Mrs. June Allen
412 Owens Drive
Huntsville, Alabama 35801

Mr. James Torson
501 Leroy
Socorro, New Mexico 87801

Mrs. Margaret Dietrich
Route 2, Box 568
Gordonsville, Virginia 22942

William H. Rodgers, Jr., Esq.
Georgetown University Law Center
600 New Jersey Avenue, N.W.
Washington, D. C. 20001

Mr. Peter S. Hepp
Executive Vice President
Sun Shipping & Dry Dock Company
P. O. Box 540
Chester, Pennsylvania 19013

Mr. R. B. Briggs
Associate Director
110 Evans Lane
Oak Ridge, Tennessee 37830

Clarence T. Kipps, Jr., Esq.
1700 Pennsylvania Avenue, N.W.
Washington, D. C. 20006

Carroll J. Savage, Esq.
1700 Pennsylvania Avenue, N.W.
Washington, D. C. 20006

Mr. James C. Dunstan
State Corporation Commission
Commonwealth of Virginia
Blandon Building
Richmond, Virginia 23209

Alan S. Rosenthal, Esq.
Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Michael C. Farrar, Esq.
Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dr. John H. Buck
Atomic Safety and Licensing Appeal Board
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. Michael S. Kidd
U.S. Nuclear Regulatory Commission
P. O. Box 128
Spotsylvania, Virginia 22553

Dr. Paul W. Purdom
Department of Civil Engineering
Drexel University
Philadelphia, Pennsylvania 19104

Mr. W. L. Proffitt

cc: Dr. Lawrence R. Quarles
Apartment No. 51
Kendal-at-Longwood
Kennett Square, Pennsylvania 19348

Mr. Irwin B. Kroot
Citizens Energy Forum
P. O. Box 138
McLean, Virginia 22101

James B. Dougherty, Esq.
Potomac Alliance
1416 S Street, N.W.
Washington, D. C. 20009