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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

Docket No. 50-395

AUG 12 1980

Mr. T. C. Nichols, Jr.
Vice President & Group Executive
Nuclear Operations
South Carolina Electric & Gas Company
P. O. Box 764
Columbia, South Carolina 29281

Dear Mr. Nichols:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION -
VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1

Enclosed are requests for additional information concerning qualification of electrical equipment. These requests are based on the review of the qualification information provided for five of the ten balance of plant electrical items which have been chosen for a detailed qualification review. Included are requests 031.74 thru 031.77.

Please provide your responses not later than September 12, 1980. If you cannot meet that schedule or require clarification of any of the requests, please contact the staff's assigned licensing project manager.

Sincerely,

A. Schwencer for

Robert L. Tedesco, Assistant Director
for Licensing
Division of Licensing

Enclosure:
As stated

cc w/enclosure:
See next page

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Mr. T. C. Nichols, Jr.
Vice President & Group Executive
Nuclear Operations
South Carolina Electric & Gas Company
P. O. Box 764
Columbia, South Carolina 29281

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cc: Mr. William A. Williams, Jr.
Vice President
South Carolina Public Service Authority
223 North Live Oak Drive
Moncks Corner, South Carolina 29461

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Resident Inspector/Summer NPS
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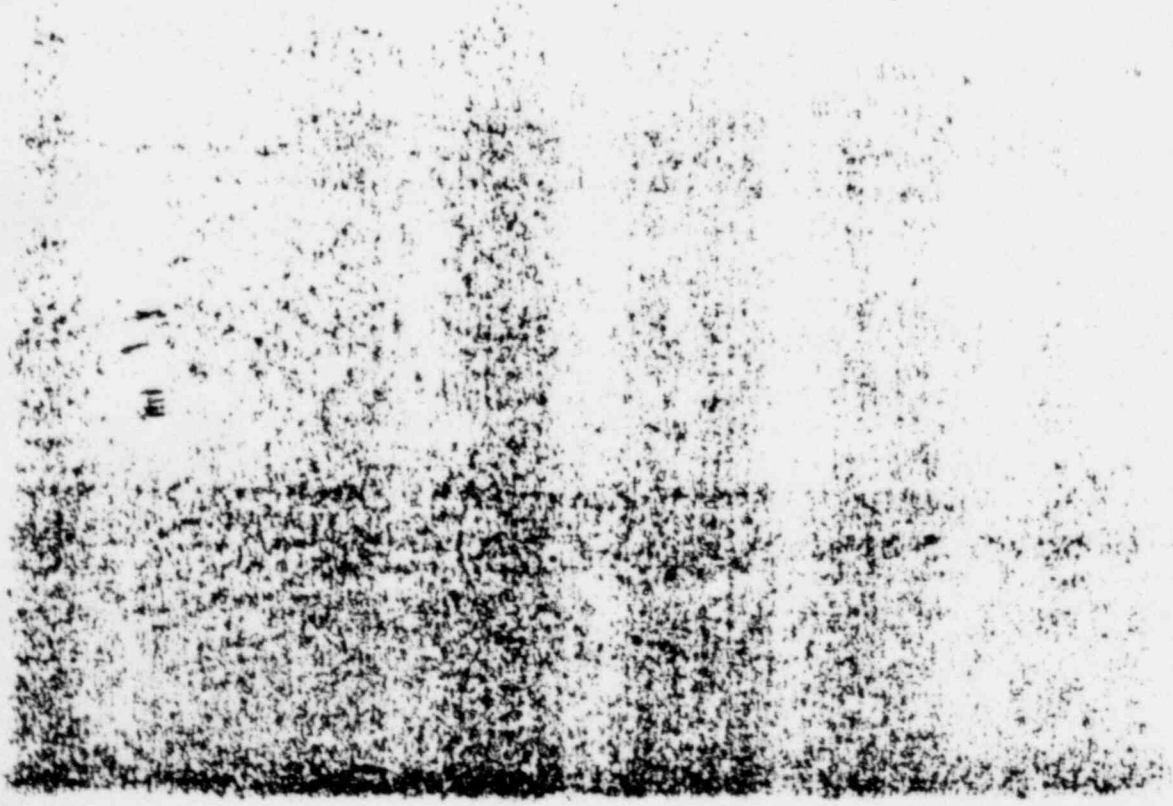
Irmo, South Carolina 29063



Enclosure

Summer Unit Number 1

50-395

SUPPLEMENTAL SECOND ROUND QUESTIONS

CONCERNING ENVIRONMENTAL QUALIFICATION

OF ELECTRICAL EQUIPMENT

031.74 Address the following items which relate to the environmental qualification plans which were provided for the component feed water pump and service water pump motors.

1. The data presented to support the environmental qualification by analysis is not in an auditable form in that it is not presented as a step by step description as indicated in Section 5.4 of IEEE Standard 323-1971 and Paragraph 2.1 (3) (a) of NUREG 0588. In this regard, provide the step by step test description and the summary of the test results so that this information can be audited.

2. It is not apparent from an analysis of the test data, what is being provided as the qualified life of the Component Cooling Water Pump Motors. Provide the FAILURE criteria for these motors and state the qualified life anticipated. If the qualified life anticipated for these motors is less than 40 years, state the method and frequency of replacing these motors or components of the motors as well as the method and frequency of maintenance. This concern is addressed as a result of the suggestion in the Supplementing Documentation (Section F, page 5) that spare motor windings will be available for replacement after a design bases event.

3. It is not evident from the data supplied that Component Cooling Water Pump Motor was tested at MSLB or SSLB environmental conditions after operating for 40 years in a normal environment. The data supplied for review is not specific as to test ambient temperatures. The totally enclosed design and the cooling method used to exclude the harsh environment is noted but is not considered sufficient to justify the conclusion that the motor is qualified to operate for 40 years service life in a normal environment. Continue to operate while being exposed to MSLB or SSLB environment, and continue to operate in the post MSLB/SSLB environment for 6 months after this DBE. If the motor was not tested at MSLB/SSLB environmental conditions provide the justification that these DBE conditions will not affect the safety-related performance of these motors.

031.75 Provide responses to the following items which relate to the acceptance criteria and test results for the NAMCO limit switches (Refer to Tables 3.11-4b and 3.11-4d of the FSAR).

1. The acceptance criteria indicates that contact openings of less than 2 milliseconds during testing is acceptable however it is not apparent

from the test methods utilized and test data supplied that contact openings time was measured during testing and if it was measured, how that measurement was made. This is of special concern during seismic testing and plant induced vibration simulation testing. In this regard, provide these test results and clearly state how these measurements were made

2. Describe how the load current measurement (between closed contacts) was made during testing and state an acceptable variation of load current for this measurement. Also, state the failure criteria for this measurement.

3. Clearly state if the resistance between open contacts were taken during the tests and provide an acceptable value for this insulation resistance. Also, state the failure criteria for this item.

4. Clearly state if the switch was mechanically actuated during the tests, especially during LOCA testing and if so provide these test results (It is noted that the switch must be capable of proper operation before, during and after a design bases event). Also, state what IEEE Standard is being referred to in the qualification document dated November 21, 1977.

5. It appears from the information provided that the test reports have been submitted but have not been accepted. In this regard, provide a concise description of your review procedure for these reports and clearly state that based on this review all test reports for these limit switches are acceptable.

6. Table 3.11-4d of the FSAR documents the open contact resistance as remaining above 50 M ohms, yet the test data in the qualification document dated March 3, 1978 and LOCA test result reports this resistance as low as 50K ohms. In this regard, clarify this discrepancy and provide the failure criteria for this measurement (that is, the valve of this measurement which would prevent the switch from performing its safety-related function).

7. Increase in contact resistance of closed contacts was reported in seismic testings, however, no opening of contacts was observed. In this regard state if there was any increase in contact resistance of closed contacts during the LOCA testing and provide the test data or other information which supports the conclusion that these switches satisfy the acceptance criteria during seismic and LOCA testing.

8. No test data was supplied for closed contact resistance variation in the plant induced vibration simulation. Although the switch contacts did not open as reported in the test results, resistance variations may have occurred, and these values must be verified to be less than the acceptance criteria variations during the plant induced simulation. Accordingly, verify that these values were less than the acceptance criteria variation values.

9. It is not apparent from the information supplied or from the test results supplied what is being stated or anticipated as the installed life or qualified life of these switches. Accordingly, provide this information and if the installed life and/or qualified life is less than 40 years provide the method and frequency of replacements.

031.76 Regarding the triaxial cable revise or supplement the information as necessary so as to provide responses to the following items.

1. The engineering comments from Boston Insulated Wire (BIW) and Cable Company as well as the test data reports supplied are not legible. Accordingly, provide legible copies of all these test reports and other supporting information. Also, explicitly document that the cable to be used in the Summer Nuclear Unit is the same type of cable which was tested by BIW and Franklin Institute.

2. Table 3.11-5a(1) of the FSAR states that a "similar cable" was thermally aged and exposed to radiation, however it is not apparent from the BIW cable qualification data submitted that this data is applicable to the cable specified in that Table. Accordingly, verify that the test data provided is for the cable indicated in Table 3.11-5a(1) of the FSAR. Also, from the information provided it appears that the required test was a with-stand test voltage of 80 volts/Mil for 5 minutes. If the cable tested was a modified triaxial alternate (MIL-RG-11/U) the AC with-stand test voltage should have been 10 KVAC, not 5 KVAC as tested and the center conductor should be 18 AWG (.048") and not 20 AWG (.037") as given in the cable construction information (Note that this should produce an even higher with-stand test capability). In this regard, provide the test data, to include with-stand testing voltage data for conductor to inner shield insulation, and inner shield to outer shield insulation. Also, this test data should be from testing a cable which is essentially the same as that to be used in the Summer Nuclear Unit and it should have the same materials and construction including the jacket.

3. In BIW test reports #75B005-05 and 75C008 it is reported that the cable tested had a jacket of chlorosulforated polyethylene Bostrad 7 (CPSE) and an outside diameter (OD) of 0.46". The Franklin Institute test report was based on radiation testing on a 75 ohm coaxial cable with an outer jacket of neoprene rubber of unspecified OD. In the BIW test report #74G022B it is reported that the cable tested had a shield of flame tape composed of aluminum/polyester and outer jacket ethylene tetra fluoroethylene, ETFE (TEFZEL) of unspecified OD. It is not apparent that this data supports the conclusion that the cable identified as that to be used in the Summer Nuclear Station would have a qualified life of 40 years and be able to perform its safety-related function at the end of this time period. Accordingly, either provide the test data for a cable that has the same jacket material, overall

diameter, and has been thermally and radiation aged then tested for with-stand voltage after the specified bend test or justify the acceptability of the environmental qualification for the cable to be installed at the Summer Nuclear Unit on some other defined bases.

031.77 Address or provide supplemental information for the items below which relate to the qualification information provided for the Service Water Booster Pump Motors.

1. Provide the acceptance criteria, the test methods used, and the test results obtained that will verify the thermal endurance for the 40 year design life of these motors.

2. State the acceptance criteria, the test methods used, and the test results obtained that supports the conclusion that the insulation system utilized has been tested and has been qualified as a Class F (155°C) insulation system. (Refer to the Louis Allis Report dated October 12, 1976).

3. It is not apparent from the report supplied that the insulation system being submitted for Qualification was tested per IEEE Standard 117-1974 at 155°C for 27, 065 hours. Accordingly, provide the acceptance criteria, test methods used, and test results obtained from these tests. If the motorette procedure is utilized in the testing program, provide test results from at least 10 windings that will justify the conclusion that these windings will provide a specified life when tested or an estimated life from service experience. (Refer to the Appendix contained in IEEE Standard 117-1974).

4. It is not apparent, from the test results reviewed, that the motor or motorettes were tested under the normal service conditions of 90% relative humidity, weak acid fumes and abrasive dust atmospheric conditions, or the monthly cyclic test condition which produces cyclic thermal shock. Accordingly, provide the acceptance criteria, test methods used, and test results obtained that verify that these atmospheric and thermal shock conditions will have no or little effect on the insulation system or on the bearing and lubrication system utilized in this motor or in the ability of the complete motor to perform its safety-related function (the moisture test results should provide data that indicates that the test voltages have been applied for at least 10 minutes and the thermal cycling test results should provide data that indicates that there has been at least 8 thermal cycles).