



Carolina Power & Light Company

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MAY 11 1993

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Vice President
Nuclear Services Department

SERIAL: NLS-93-107
10 CFR 50.90
TSC 92TSB01

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 & 50-324/LICENSE NOS. DPR-71 & DPR-62

NUMAC STEAM LEAK DETECTION INSTRUMENTATION UPGRADE TECHNICAL SPECIFICATION
AMENDMENT REQUEST - INFORMATION REGARDING EMI/RFI MAPPING
(NRC TAC NOS. M84686 AND M84687)

Gentlemen:

The purpose of this letter is to provide the NRC with information concerning planned electro-magnetic and radio-frequency interference (EMI/RFI) mapping to be conducted at the Brunswick Steam Electric Plant, Unit Nos. 1 and 2, in support of modifications that will install NUMAC digital steam leak detection instrumentation.

Carolina Power & Light Company (CP&L) submitted a Technical Specification amendment request regarding the NUMAC instrumentation replacement on September 14, 1992. The NRC requested additional information for this amendment request by letter dated November 25, 1992. By letters dated January 25, 1993, and February 8, 1993, CP&L responded to that request for additional information. As a part of the February 8 response, the Company stated that in-plant EMI/RFI mapping was not considered necessary to support installation of the General Electric NUMAC Leak Detection instrumentation at the Brunswick Plant. During subsequent conversations with the NRC staff, CP&L was advised that the position indicated in our February 8 submittal regarding EMI/RFI mapping was unacceptable. As a result, the Company is amending its response of February 8, 1993 to provide an overview of the test methodology to be utilized in conducting EMI/RFI mapping to support the planned NUMAC instrumentation installation. The amended response is included in Enclosure 1 of this letter. Enclosure 1 also provides information regarding vendor susceptibility testing to be conducted in support of the NUMAC installation.

In order to support the installation of the NUMAC Leak Detection modification during the current Unit 1 refuel outage, CP&L requests that the NRC issue the amendment for Unit 1 no later than July 15, 1993, with an implementation date to be no later than 90 days from the date of issuance of the amendment.

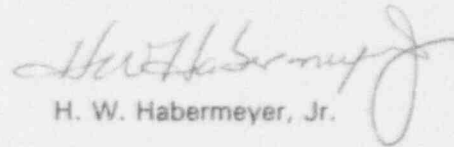
Carolina Power & Light Company is providing, in accordance with 10 CFR 50.91(b), Mr. Dayne H. Brown of the State of North Carolina with a copy of this letter.

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Please refer any questions regarding this submittal to Mr. D. C. McCarthy at (919) 546-6901.

Yours very truly,


H. W. Habermeyer, Jr.

KAH/kah (nls93107.wpf)

Enclosure

H. W. Habermeyer, Jr., having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief, and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.

Eleanor C. Chappell
Notary (Seal)

My commission expires: 2/6/96

cc: Mr. Dayne H. Brown
Mr. S. D. Ebner
Mr. P. D. Milano
Mr. R. L. Prevatte



ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 NRC DOCKET NOS. 50-325 & 50-324 OPERATING LICENSE NOS. DPR-71 & DPR-62 NUMAC INSTRUMENTATION (NRC TAC NOS. M84686 AND M84687)

EMI/RFI MAPPING

In-Plant Mapping - Plant Conditions:

The purpose of in-plant EMI/RFI mapping is to produce data that will characterize the EMI/RFI consequences of plant steady-state operations and "local-effect" transients in the area the NUMAC instrumentation is to be installed.

Plant operational mode (shutdown, startup, power operation) during testing is not considered to be a critical test parameter. For the steady-state EMI/RFI measurements, the test procedure will require a significant percentage of plant equipment and systems to be energized or operational in order to ensure that a representative steady-state noise background exists at the intended NUMAC area of installation, on power busses, and throughout the cable raceway system. For the "local-effect" transient testing, the test procedure will specify that a sampling of the potentially significant emitters be in operation or cycled, to represent the worst-case, while measurements are being taken. Candidates for "local-effect" transient testing include relays, motorized cycle timers, power supplies, and high amperage cabling. Radios will be operated in areas in which their use is permitted by plant procedures.

Current plans are to obtain the majority of the steady-state data on Unit 2 during either startup or power operations. To minimize the possibility of adverse effects on the operating unit, the "local-effect" transient testing will be performed on Unit 1, which is shutdown for a refueling outage. Based on the configuration similarity between units, test data obtained on either Brunswick unit is applicable to both units. This assumption has been previously discussed with the NRC staff.

In-Plant Mapping - Test Methods:

The in-plant test procedure is being developed on the following basis:

- 1) The physical environment in the vicinities of the intended equipment installation location and of the associated power and signal cable raceways will be examined. Potential EMI/RFI emitters will be identified.
- 2) Based on the identified sources of potential interference, appropriate test points will be determined. The test procedure will specify the plant conditions under which to perform measurements in the target device area. The procedure will also require that a representative sampling of the major emitters be in operation or be cycled while the test measurements are being taken. At each test point, tests will be defined to measure field strengths in orientations that will represent the worst-case emissions level. In general, the tests would be performed in accordance with MIL-STD-462 test methodology. The following minimum subtests are to be specified in the procedure:

- CE01: Conducted emissions testing in the frequency domain on power and signal leads, between 30 Hz and 15 kHz, in common and differential modes;
- CE03: Conducted emissions testing in the frequency domain on power and signal leads, between 15 kHz and 50 MHz, in common and differential modes;
- CE07: Conducted emissions testing in the time domain on power leads in common and differential modes;
- RE01: Radiated emissions magnetic field testing in the frequency domain between 30 Hz and 50 kHz;
- RE02: Radiated Emissions electric field testing in the frequency domain between 14 kHz and 1 GHz;
- Radiated Emissions, DC magnetic field strength, per MIL-STD-1399; and
- Radiated Emissions, Electric Field, Hand-held Radio Profile.

The referenced tests utilize non-intrusive measuring techniques. The conducted emissions measurements are performed with instrumentation such as current probes, frequency analyzers, oscilloscopes, and signal transient recorders. The current probes are wrapped around the cables under test. Voltage monitoring requires physical connection of test leads to the subject circuits, with high impedance and ungrounded connections; however, the measurements are accomplished without the need to lift any wiring terminations. Radiated emissions are measured in free air spaces using radio antennas and frequency analyzers.

CP&L plans to utilize the same test consultant that has performed similar testing at Turkey Point and Zion for other recent digital system upgrades. The test methodology and data presentation formats would be similar to that used at Turkey Point and Zion. CP&L also plans to use a data presentation format compatible with that planned by EPRI for use with their upcoming generic plant testing.

Vendor Susceptibility Testing:

Carolina Power & Light Company's February 8 letter, Enclosure 1, Paragraph III, discussed the current status of the vendor's susceptibility qualification testing and analyses. As indicated in that reference, the vendor has agreed to expand their NUMAC qualification program. The additional testing will be more specifically applicable to the Brunswick NUMAC Leak Detection application and cover a broader frequency range than previous tests. CP&L is working with the vendor to improve the completion date of the Leak Detection monitor-specific testing. Test results are expected to be available by late summer, 1993.

Margin Determination:

The results of the in-plant testing will be compared to the vendor's susceptibility qualification test results to establish the magnitude of the resultant margin. These results will be forwarded to the NRC for review.