



Carolina Power & Light Company

JUL 13 1984

SERIAL: NLS-84-281

Mr. James P. O'Reilly, Regional Administrator
United States Nuclear Regulatory Commission
Suite 2900
101 Marietta Street, NW
Atlanta, GA 30303

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-325 & 50-324/LICENSE NOS. DPR-71 & DPR-62
RESPONSE TO IE BULLETIN 84-02

Dear Mr. O'Reilly

Carolina Power & Light Company (CP&L) has reviewed your letter of March 12, 1984, transmitting IE Bulletin 84-02, Failures of GE Type HFA Relays in Use in Class 1E Safety Systems. Enclosed please find CP&L's responses to the concerns raised in IE Bulletin 84-02.

Should you have any questions concerning this submittal, please contact Mr. Sherwood R. Zimmerman at (919) 836-6242.

Yours very truly,

A. B. Cutter - Vice President
Nuclear Engineering & Licensing

MAT/ccc (274MAT)

Enclosure

cc: Mr. D. O. Myers (NRC-BSEP)
Mr. J. P. O'Reilly (NRC-RII)
Mr. M. Grotenhuis (NRC)
NRC Document Control Desk

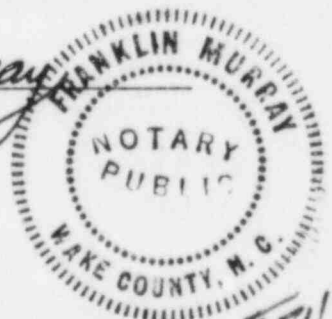
A. B. Cutter, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.

Notary (Seal)

My commission expires: OCT 04 1986

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ENCLOSURE TO NLS-84-281
BRUNSWICK STEAM ELECTRIC PLANT
RESPONSE TO IE BULLETIN 84-02

Action 1.a

Develop plans and schedules for replacing (1) nylon or Lexan coil spool-type HFA relays used in normally energized safety-related applications and (2) nylon coil spool-type HFA relays used in normally de-energized safety-related applications. The replacement relays and any replacements made in the future should meet the requirements of the applicable IEEE standards. The replacement program for energized and de-energized relays should be performed on a "best efforts" basis during plant outages of sufficient duration. The entire replacement program should be completed within two years from the date of this bulletin.

The replacement schedule should consider the following recommended priority:

Nylon or Lexan normally energized in the reactor trip system
Nylon or Lexan normally energized in other safety-related applications
Nylon normally de-energized in the reactor trip system
Nylon normally de-energized in other safety-related applications

Response

A review has been made of relays (not limited to HFA relays - see Additional Information section) used in the primary safety-related systems at Brunswick. Due to time restraints, not all safety-related systems could be reviewed prior to responding to this bulletin. The systems surveyed include: NSSS, Core Spray, HPCI, RCIC, RHR, RPS, CRD, NSSS Logic, Reactor Ventilation Radiation Monitor, CAD, SGT, Diesel Generators' Engineered Safeguards Logic, 4160V Emergency Switchgear, and Main Steam Leak Detection. These systems were chosen because they represent the primary safety-related systems and because they contain the majority of HFA relays used in safety-related systems at Brunswick. A review of the remaining safety-related systems at Brunswick is continuing. Of the identified HFA relays being used in safety-related systems, approximately 40% are normally energized. This is because most safety-related systems at Brunswick (HPCI, RHR, CS, RCIC, etc.) employ energize-to-function DC logics (i.e., normally de-energized DC relays). Of the normally energized HFA relays identified (both AC and DC), approximately 60% have already been upgraded to the Century Series Tefzel coil spool-type HFA relays by means of a replacement coil kit. This upgrade effort was primarily focused on the Reactor Trip System (RTS). For the purposes of this review, the RTS was defined as consisting of the Reactor Protection System (RPS) plus Primary Containment Isolation System (PCIS) inputs into the RPS logic. Certain prerequisite actions are being taken in preparing a replacement schedule for the remaining normally energized Lexan coil relays used in safety-related systems at Brunswick. These actions include the engineering necessary to generate procurement specifications, determine clearances, review Technical Specification requirements, prepare implementing document packages, and specify periodic testing needed to return the various safety channels to service. This work must then be integrated with all other scheduled work to avoid mutual interference. Therefore, the replacement

schedule will be submitted to the NRC by February 15, 1985. This replacement program will be performed on a best effort basis, commensurate with other required regulatory work, beginning with the next scheduled outages of sufficient duration on each plant. These outages have been determined to be the next refueling outages which are the Reload 4 outage for Brunswick-1 (presently scheduled to begin in March of 1985) and the Reload 6 outage for Brunswick-2 (presently scheduled to begin in April of 1986). This replacement program will be incorporated into the Brunswick long term schedule.

The coil replacement procedure used at Brunswick to upgrade the HFA relays was written prior to issuance of Supplement 4 to SIL 44, "HFA Relay Magnetic Coil Assembly Replacement and Relay Adjustments." As such, contact wipe and gap adjustment checks and coil pickup voltage adjustment checks suggested by General Electric were not performed on these upgraded relays. This procedure is currently being revised to incorporate the recommended adjustment checks. A review of HFA relays that have had coil changeout without the recommended adjustment checks is in progress to determine if the lack of completing these checks could create a safety concern. This review consists of a contact by contact analysis of upgraded HFA relays to determine the safety significance of any single contact opening as a result of "relay contact chatter" (resulting from a postulated seismic event) on the plant for affected equipment required during operation at power or while shutdown. Preliminary results of this review have not identified any safety concerns. We anticipate finalizing this review prior to July 31, 1984. If at any time during the course of this review CP&L identifies a relay which requires adjustment or replacement, it will be adjusted or replaced during the next outage of sufficient duration contingent on the availability of qualified replacement parts and/or relays. Additionally, safety-related HFA relays that have had coil changeout without adjustment checks and for which no safety concerns are identified will be inspected and adjusted as necessary or replaced as part of our relay replacement program.

In the response to IEB 75-02, dated March 16, 1976, it was determined that no nylon bobbin HFA relays are in use at Brunswick. Therefore, since nylon bobbin HFA relays are not used, replacement of the normally de-energized safety-related HFA relays at Brunswick is not required.

CP&L believes that the service life and reliability of the replacement relays and upgraded relays utilizing coil kits in the HFA upgrade program are acceptable for the expected environmental and seismic conditions at their installed locations at Brunswick based on the following:

- a) Service Life - Brunswick's normal surveillance via PT's (as required by the Technical Specifications) is sufficient to ensure adequate performance for relays located in mild environments. Any HFA relays that may be located in "harsh environment" areas will be covered under the Environmental Qualification program at Brunswick as required by 10 CFR 50.49.
- b) Seismic - CP&L has established that the upgrade of the original relays with Century Series replacements or the use of coil conversion kits does not reduce the seismic withstand capability from that of the original relay.

Action 1.b

During the period before relay replacement, develop and implement surveillance plans that include:

- (1) Monthly functional tests of all reactor trip system normally energized relays that verify relay contacts change state when the relay coil is de-energized;
- (2) Visual inspections of all safety-related normally energized relays as soon as practical upon receipt of this bulletin. Thereafter, similar inspections should be accomplished in conjunction with the monthly functional test. These visual inspections should verify that relay coils are not deteriorating (e.g., inspection of bobbins for visual cracks or melting), and should confirm cleanliness of the relay pole pieces.

Response

A large majority of the normally energized safety-related HFA relays in the reactor trip system have been upgraded to Century Series via coil kits. The normally energized safety related HFA relays in the reactor trip system are being functionally tested under existing Periodic Test Procedures (PTs). In the few instances where the existing PT's functional testing frequency is less often than on a monthly basis and the affected relay coil has not been upgraded to Century Series, the PTs are being revised to require monthly functional testing (in cases where this testing can be accomplished during power operation).

A monthly visual inspection program for normally energized AC Lexan coil HFA relays used in safety-related systems was established (before issuance of this bulletin) in response to recommendations of early SILs. The visual inspection procedure consists of a flashlight inspection through the relay cover which specifically checks for: coil insulation material degradation; coil spool degradation (i.e., cracking or melting); and foreign material on the contacts or window (which could indicate insulation degradation). This program has proven effective in identifying deteriorating coil bobbins and/or insulation prior to relay failure. At this time, the visual inspection procedure is being revised to include the normally energized DC Lexan coil safety-related HFA relays resulting from the reviews (of the primary safety-related systems) associated with this response. CP&L anticipates that this revision will be completed by August 31, 1984. If additional normally energized AC or DC Lexan coil HFA relays are identified in safety-related systems as a result of the ongoing reviews associated with this bulletin they will be incorporated into the monthly visual inspection program.

The existing visual inspection procedure does not specifically include a relay pole piece cleanliness inspection. To perform this inspection partial disassembly of the relay is required. After re-assembly, per GE recommendations, contact wipe and gap adjustment and coil pick-up voltage checks must be performed. CP&L believes that relay disassembly and adjustment checks cannot be safely performed with the relay in service (i.e., clearances must be taken on fuses supplying power to the relay coil and contacts). This results in affected safety systems being out of service for the period of relay inspection during plant power operation. The degree of added assurance

of safety gained by performing the cleanliness inspection is outweighed by the degree of jeopardy placed on the plant by taking the affected safety system out of service. Given the above concerns and previous discussions, CP&L believes the visual inspection procedure currently in use is sufficient.

Action 1.c

Provide a basis for continuing operation for the period of time until the normally energized relays are replaced. This basis should include a discussion of those measures addressed in Items 1a and 1b and any other preventive and/or corrective measures taken or planned.

Response

As stated earlier, the majority of the normally energized, safety-related HFA relays in the RTS have already been upgraded to Century Series. The remaining relays of this category will receive monthly functional testing via existing PTs, revised PTs, or Special Tests (when possible during power operation of the plant). Monthly visual inspections are being performed on identified normally energized AC Lexan HFA relays in safety-related systems and are expected to begin in September of 1984 for identified normally energized DC Lexan HFA relays. Any Lexan type normally energized safety-related HFA relays which may be identified by the ongoing safety-related system review will be incorporated into the monthly visual inspection and relay replacement programs. CP&L believes the actions and surveillance measures already completed and/or planned are sufficient to ensure continued safe operation of Brunswick until the relay replacement program can be completed.

Actions 2 and 3

Not applicable to Brunswick.

Action 4

If your plant uses or plans to continue to use the nylon or Lexan-type HFA relay in systems other than those safety-related applications defined in this bulletin, then the appropriate administrative controls dealing with maintenance, storage, and handling of spare parts at your facility must be revised to ensure that the older and problematic HFA relay coils are not inadvertently used as a replacement part in safety-related applications in future maintenance efforts at your facility(ies).

Response

CP&L does not intend to purchase non-Century Series HFA relays for use in safety-related applications in the future with the exception of the 12HFA65 series relays which are not available in Century Series. (The 12HFA65 series relays do not experience the problems discussed in the bulletin because the coils are of different construction.) A purchase specification is being written to ensure this. At present there are no non-Century Series HFA relays or coils in "Q" stock at Brunswick. Administrative controls already exist to ensure that "non-Q" stock items are not used in safety-related applications.

Additional Information

CP&L is continuing its review of other types of relays (including those discussed in IE Notice 84-20) used in safety-related systems to determine if problems similar to those discussed in IE Bulletin 84-02 may exist. Appropriate corrective actions will be taken if such problems are discovered.

CP&L estimates that approximately 3500 to 4000 man-hours will be expended in completing the reviews associated with this response. Due to the uncertainties involved with the scope of the relay replacement program, CP&L is presently unable to estimate the man-hours necessary to fully implement the program. This information, if available, will be provided in future submittals concerning this bulletin.