

May 31, 1983

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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In the Matter of)	
)	
CAROLINA POWER & LIGHT COMPANY)	Docket Nos. 50-400 OL
AND NORTH CAROLINA EASTERN)	50-401 OL
MUNICIPAL POWER AGENCY)	
)	
(Shearon Harris Nuclear Power)	
Plant, Units 1 and 2))	

APPLICANTS' RESPONSE TO INTERVENOR
EDDLEMAN PROPOSED CONTENTION 161
(DS-416 CIRCUIT BREAKERS)

By a pleading dated May 7, 1983, as supplemented on May 14, 1983, Intervenor Wells Eddleman has supplemented his petition to intervene by proposing a new Contention 161 which alleges as follows:

Applicants have not demonstrated that the Harris nuclear reactors can be safely shut down when shutdown is required, because of defects and possible malfunction of Westinghouse DS-416 circuit breakers used in the safety related shutdown systems at Harris.

For the reasons set forth below, Applicants Carolina Power & Light Company and North Carolina Eastern Municipal Power Agency submit that Contention 161 must be rejected for failure to state sufficient basis for the allegations made.^{1/} Alternatively, the Board should defer its ruling on Contention 161, to allow Mr. Eddleman a period of time (thirty days) within which to review the proposed design change to the DS-416 reactor trip switchgear undervoltage attachments, and thereafter to amend, modify or withdraw his proposed Contention 161.

1/ Applicants are not addressing Mr. Eddleman's arguments for good cause for a late filed contention and do not here challenge the timeliness of the proposed contention.

DS03

BACKGROUND

On March 31, 1983, Westinghouse Electric Corporation ("Westinghouse") informed the NRC of the potential for intermittent malfunction of reactor trip switchgear that employs the DS-416 undervoltage (UV) trip device. Pending further investigations, operating plants utilizing the identified undervoltage trip device were advised that control room operators should actuate the manual reactor trip switch at the Main Control Board when a demand for an automatic undervoltage trip is observed. See letter from E. P. Rahe, Manager, Westinghouse Nuclear Safety Department, to R. C. DeYoung, Director, Division of NRC Inspection and Enforcement, dated March 31, 1983 (Attachment A).

On April 12, 1983, Westinghouse informed the Harris Project Staff at Carolina Power & Light Company ("CP&L") of the identified problem. See letter from R. L. Whitney, Westinghouse, to L. I. Loflin, CP&L, dated April 12, 1983 (Attachment B). On April 20, 1983, Westinghouse reported the problem with the undervoltage attachments to the DS-416 reactor trip switchgear to the NRC, pursuant to 10 C.F.R. Part 21 (for operating plants) and pursuant to 10 C.F.R. § 50.55(e) (for plants under construction). This report to the NRC was confirmed in correspondence with CP&L on April 21, 1983. See letter from R. L. Whitney to L. I. Loflin dated April 21, 1983. (Attachment C). In Westinghouse's April 21, 1983 letter, a design discrepancy was described in the undervoltage attachment to the DS-416 reactor trip switchgear. The groove in the shaft receiving the retaining ring was not increased in width to be consistent

with an earlier retaining ring design change. The new retaining ring is wider than the original design and does not properly seat in the existing grooves. Westinghouse committed to replace the undervoltage attachments on DS-416 reactor trip switchgear supplied by Westinghouse. The new attachments have modified (widened) grooves to accommodate the new retaining rings. Furthermore, Westinghouse is developing and will implement a procedure for installation of the new attachments on DS-416 reactor trip switchgear in the Harris plant, which will ensure proper alignment and interface of the attachment with the breaker trip shaft.

On May 26, 1983, Applicants submitted to the NRC an interim report on the identified problem with the undervoltage attachments to the DS-416 reactor trip switchgear pursuant to 10 C.F.R. § 50.55(e) and 10 C.F.R. Part 21 (Attachment D). This report commits to implement the design change to correct the identified design deficiency. Applicants are also considering the implementation of another design change, currently undergoing industry review, which would provide redundant actuation of an undervoltage trip signal by activation of both the undervoltage attachment and the shunt coil attachment on the DS-416 reactor trip switchgear.

RESPONSE TO CONTENTION 161

Mr. Eddleman offers as basis for Contention 161 a report in INSIDE NRC of Westinghouse's April 20, 1983 report to the NRC. But Contention 161 is far too sweeping an allegation to be supported by the identification of a design problem with the undervoltage attachment to the reactor trip switchgear. There is

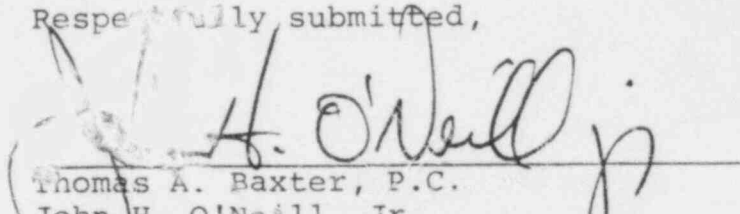
no basis for the assertion that "Applicants have not demonstrated that the Harris nuclear reactors can be safely shut down when shutdown is required, because of defects and possible malfunction of Westinghouse DS-416 circuit breakers used in the safety-related shutdown systems at Harris." (emphasis supplied). The identified problem was only with an automatic trip of the circuit breaker when an undervoltage signal was received. The immediate corrective action recommended by Westinghouse for operating plants was to instruct reactor operators to initiate a manual shutdown (which would involve a trip of the DS-416 circuit breaker). There has been no identified problem with the shutdown capability of nuclear reactors using the DS-416 reactor trip switchgear (i.e. with the circuit breaker actually tripping), and the INSIDE NRC article cited by Mr. Eddleman as basis certainly does not support such an allegation. This, of course, is an extremely important distinction. Thus, while Mr. Eddleman has admittedly pointed to an identified design problem, his contention goes much too far and must be rejected for lack of any basis.

Applicants appreciate that Mr. Eddleman did not have the correspondence attached to this pleading and adequate technical information with which to assess the import of the deficiency identified in the trade press article. Applicants are willing to stipulate that they will not raise timeliness as an objection to a revised contention filed by Mr. Eddleman within thirty days, if he so chooses, based on the information contained in this Response.

Under the circumstances, Applicants would not object to the Board's deferring a ruling on Contention 161, until such time as Mr. Eddleman has had an opportunity to review Applicants' Response hereto, similar to the procedure adopted by the Board for control room design contentions. Under such a procedure, Mr. Eddleman would have thirty days within which to amend, modify or withdraw Contention 161. Applicants and the NRC Staff would have fifteen and twenty days, respectively, to reply.

Counsel to Applicants discussed this Response to proposed Contention 161 with Mr. Eddleman by telephone on May 31, 1983. Mr. Eddleman authorized counsel to represent to the Board that if the Board does not decide that Contention 161 is admissible as written, he has no objection to adoption of the procedure outlined by Applicants, which would allow him thirty days within which to review Applicants' technical response and to amend, modify or withdraw Contention 161, as he chooses, after such review.

Respectfully submitted,



Thomas A. Baxter, P.C.
John H. O'Neill, Jr.
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1800 M Street, N.W.
Washington, D.C. 20036
(202) 822-1090

Richard E. Jones
Samantha Francis Flynn
CAROLINA POWER & LIGHT COMPANY
P.O. Box 1551
Raleigh, North Carolina 27602
Counsel for Applicants

Dated: May 31, 1983

May 31, 1983

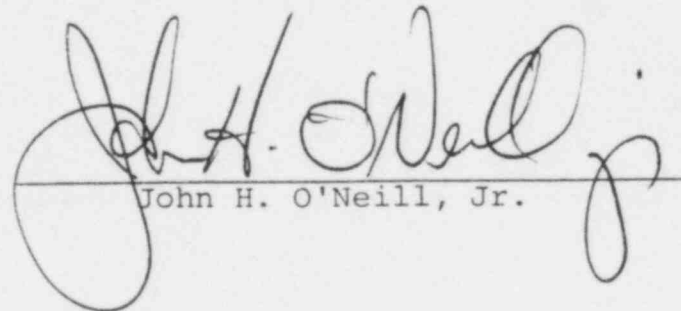
UNITED STATES OF AMERICA
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(Shearon Harris Nuclear Power)
Plant, Units 1 and 2))

CERTIFICATE OF SERVICE

I hereby certify that copies of "Applicants' Response to Intervenor Eddleman Proposed Contention 161 (DS-416 Circuit Breakers)," dated May 31, 1983 are being served to all those on the attached Service List by deposit in the U.S. Mail, first class, postage prepaid, this 31st day of May, 1983.


John H. O'Neill, Jr.

Dated: May 31, 1983

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Washington, D.C. 20555

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Staff Attorney
Public Staff - NCUC
P.O. Box 991
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Westinghouse
Electric Corporation

Water Reactor
Divisions

Box 355
Pittsburgh, Pennsylvania 15200

NS-EPR-2744

March 31, 1983

Mr. R. C. DeYoung, Director
Division of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Phillips Building
7920 Norfolk Avenue
Bethesda, MD 20014

Dear Mr. DeYoung:

This is to confirm the telephone conversation of March 31, 1983 between R. A. Wiesemann and R. B. Miller of my staff and Mr George Lanik of the NRC. In that conversation, I reported that Westinghouse had informed its operating utility customers of the potential for intermittent malfunction of reactor trip switchgear that employs the DS-416 undervoltage (UV) trip device. To minimize the potential on any reactor trip switchgear utilizing this device, Westinghouse has recommended inspections as discussion below.

Westinghouse recently has been advised by one utility that one of the two main reactor trip breakers at each plant did not trip during preplanned testing. At one plant, three malfunctions occurred out of a total of 116 cycles. At the other plant, only one malfunction occurred in over 400 cycles. The reliability of the DS-416 UV device is supported by functional factory tests, vendor qualification programs, and periodic surveillance testing at operating plants in which no malfunctions have been reported. Therefore, these malfunctions are considered to be random in nature.

The owner of the two plants involved, in close cooperation with Westinghouse, has removed the UV trip device from one of the reactor trip breakers that malfunctioned and returned it to Westinghouse for a detailed examination to determine, if possible, the reason for such malfunctions.

Based upon a review at the plant site and at Westinghouse, the following have been identified as the potential factors for the reported occurrences.

- a. Manufacturing variations permitted interference between the moving core and the roller bracket on one of the UV devices which appears to be related to the intermittent malfunctions. A further factor may have been lack of side-to-side clearance of the roller bracket.
- b. Lack of minimum gap between the UV trip reset lever and the breaker trip bar pin appears to be related to the malfunction of the second UV device.

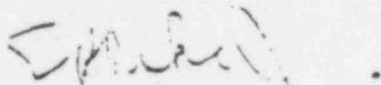
To determine if other DS-416 UV trip devices installed in the field are also susceptible to similar malfunctions, the dimensions identified in Figure 1 must be verified. Westinghouse is requesting that the utilities listed in Table 1 make these dimensional measurements and provide us with the results for our further evaluation of this potential unreviewed safety question.

Until the dimensions are verified, Westinghouse has further recommended that the control room operators actuate the manual reactor trip switch at the Main Control Board when a demand for an automatic reactor trip is observed. If the installed devices meet all the critical dimensions identified in Figure 1, the recommendation for manual reactor trip may be removed. However, if either the UV trip device or the trip bar is found to be out of tolerance with respect to the dimensions identified in Figure 1, Westinghouse recommends that replacement devices be installed.

Westinghouse operating utility customers are being informed that Westinghouse is reporting this to the NRC as a potential unreviewed safety question under 10CFR50.59 for operating plants. For plants under construction Westinghouse is requesting more information to determine if a significant deficiency exists.

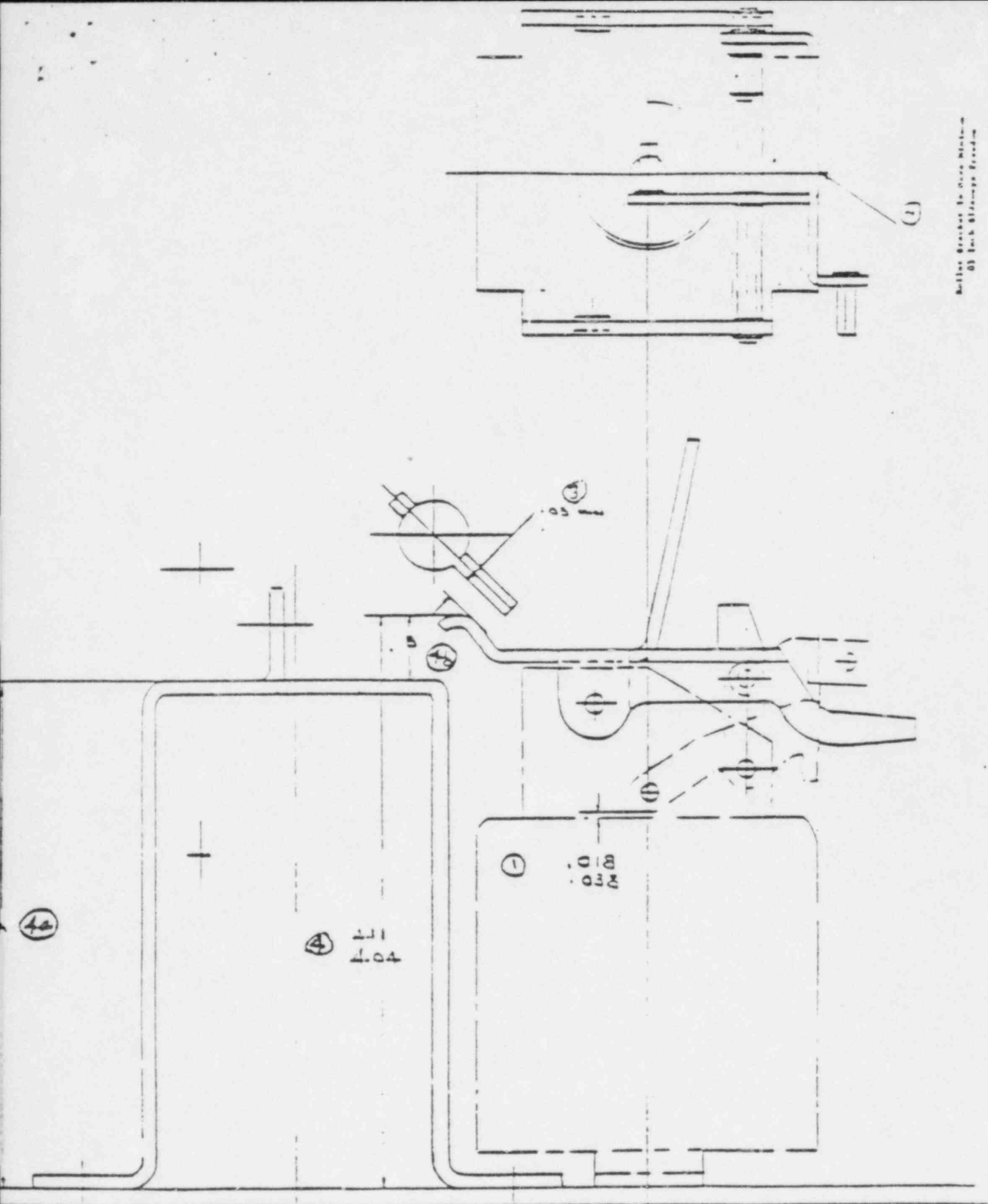
If you have any additional questions, please contact me or Clarence Draughon of my staff at (412) 374-5761.

Sincerely,



E. P. Rahe, Manager
Nuclear Safety Department

Milling Bracket to Have Minimum
.01 Inch Allowance Freedom



BREAKER 06005
S.V. 526 3055
SIDE VIEW

SEE SEPARATE PARTS LIST

Figure 1
Sheet 1 of 2

WESTINGHOUSE	WESTINGHOUSE ELECTRIC CORPORATION
BRIDGE PLANT	BRIDGE PLANT
ST. LOUIS, MO.	ST. LOUIS, MO.
DESIGNED BY	DESIGNED BY
DRAWN BY	DRAWN BY
CHECKED BY	CHECKED BY
DATE	DATE



50/386

Attachment B

Westinghouse
Electric Corporation

Water Reactor
Divisions

Nuclear Operations Division

Box 355
Pittsburgh Pennsylvania 15230

Mr. L. I. Loflin, Manager
Harris Project Engineering
Carolina Power & Light Company
P. O. Box 101
New Hill, NC 27562

April 12, 1983

Dear Mr. Loflin:

CAROLINA POWER & LIGHT COMPANY
SHEARON HARRIS NUCLEAR POWER PLANT
DS-416 Reactor Trip Breakers

Westinghouse was recently informed by a utility that one Model DS-416 main reactor trip breaker at each of two plants did not trip during preplanned testing of the undervoltage (UV) trip function.

Based upon a review at the plant site and at Westinghouse, the following items have been identified as the factors potentially involved in the reported occurrences:

- a. Manufacturing variations permitted interference between the moving core and the roller bracket on one of the UV devices. A further factor may have been lack of side-to-side clearance of the roller bracket.
- b. Lack of minimum gap between the UV trip reset lever and the breaker trip bar pin appears to be related to the malfunction of the second UV device.

To determine if any DS-416 UV trip devices installed at Harris 1 and 2 are susceptible to similar malfunctions, the dimensions identified in the attached Figure 1 must be verified. Westinghouse is requesting that you make those dimensional measurements for each DS-416 reactor trip breaker and provide us with the results for our further evaluation. In addition, an estimate of the number of duty cycles experienced by each DS-416 reactor trip breaker and a report of failures experienced, if any, are also requested.

On March 30, 1983, the Westinghouse Water Reactor Divisions Safety Review Committee reviewed this specific DS-416 issue and determined that this item represents a potential unreviewed safety question under 10CFR50.59 for

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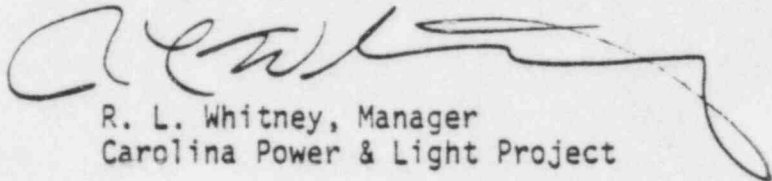
operating plants. Westinghouse is currently involved in dialogue with the Nuclear Regulatory Commission on the subject of breaker malfunction in the reactor protection system. Westinghouse, therefore, notified the NRC of this issue both orally and in writing on March 31, 1983. A copy of the Westinghouse letter to the NRC, NS-EPR-2744, is attached.

Your response is requested by April 29, 1983.

If you have any questions, please do not hesitate to contact the undersigned.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION



R. L. Whitney, Manager
Carolina Power & Light Project

RLW:bmf

Attachment

cc: [REDACTED]
R. K. Matzelle, Ebasco, 1L, 1A
D. J. Scanlon, Ebasco, 1L
J. L. Willis, CP&L Site, 1L, 1A
N. J. Chiangi, CP&L Site, 1L 1A
J. J. Sheppard, CP&L, 1L, 1A
L. H. Martin, CP&L, 1L, 1A
R. M. Parsons, CP&L Site, 1L, 1A
G. L. Forehand, CP&L Site, 1L, 1A
E. M. Harris, CP&L Site, 1L 1A
J. F. Halifax, W Raleigh, 1L
E. Four, W Sales (Hillside), 1L
C. L. McKenzie, CP&L, 1L 1A



DCM

Attachment C

Westinghouse
Electric CorporationWater Reactor
Divisions

Nuclear Service Division

Box 2728
Pittsburgh Pennsylvania 15230Mr. L. I. Loflin, Manager
Harris Project Engineering
Carolina Power & Light Company
P. O. Box 101
New Hill, NC 27562

April 21, 1983

Ref: CQL-7343

Dear Mr. Loflin:

CAROLINA POWER & LIGHT COMPANY
SHEARON HARRIS NUCLEAR POWER PLANT
DS-416 Reactor Trip Switchgear

This is to notify you that on April 20, 1983, Westinghouse advised the Nuclear Regulatory Commission of the potential for misoperation of DS-416 reactor trip switchgear undervoltage attachments. This was reported to the NRC under 10CFR21 for operating plants, and under 10CFR50.55(e) for plants under construction.

Westinghouse previously advised you of the potential for misoperation of these attachments based on reported malfunctions at one plant during testing. With the referenced letter Westinghouse requested information from you relative to dimensions of several clearances in the attachment to aid in our evaluation. The Westinghouse evaluation has concluded that deviations from the recommended clearances could increase the potential for misoperation of the attachment, thereby creating a condition wherein the reactor trip switchgear might not open on automatic demand from the reactor protection system.

After the earlier notification (CQL-7343), Westinghouse advised the operating plants on April 15, 1983, of an additional misoperation of another DS-416 undervoltage attachment. Investigation of this event revealed a missing retaining ring on one of the two undervoltage attachment pivot shafts (shown in Attachment 1). This allowed the pivot shaft to move laterally such that one end came out of its guide hole in the frame of the undervoltage attachment, and did not permit the attachment to operate on demand. A missing retaining ring was also identified at another plant. No misoperation of that attachment had been reported.

The Westinghouse evaluation of the retaining ring issue revealed a discrepancy in design. The groove in the shaft receiving the retaining ring was not increased in width to be consistent with an earlier (1972) retaining ring design change. The new retaining ring is wider than the original design, and

does not seat properly in the existing grooves. This discrepancy increases the potential for misoperation of the DS-416 undervoltage attachment, thereby creating a condition wherein the reactor trip switchgear might not open on automatic demand from the reactor protection system.

Corrective Actions

1. Westinghouse is committing to its utilities to replace the undervoltage attachments on DS-416 reactor trip switchgear supplied by Westinghouse for its Nuclear Steam Supply Systems.
2. The new attachments have modified (widened) grooves to accommodate the new retaining rings.
3. Manufacturing drawings have been revised and quality control procedures modified to assure that critical design dimensions are maintained during manufacture.
4. Furthermore, Westinghouse is developing and will implement a procedure for installation of the new attachments on DS-416 reactor trip switchgear in the Harris plant. This field installation procedure will provide for proper alignment and interface of the attachment with the breaker trip shaft.

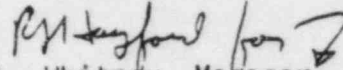
Until replacement undervoltage attachments can be fabricated, shipped, and properly installed at operating plants, Westinghouse has recommended the following be performed:

- a. Assure that control room operators are alerted to the potential for misoperation of the reactor trip switchgear due to possible malfunction of the undervoltage attachments.
- b. Re-emphasize to the control room operators the indications available to detect failure of the rods to insert into the core following a demand signal from the automatic protection system.
- c. Re-emphasize to the control room operators the manual reactor trip options available in the existing emergency operating procedures. These procedures contain diverse methods of tripping the reactor which do not rely on the undervoltage trip attachment.
- d. Visually verify after operation of the reactor trip switchgear that retaining rings are located on the grooved ends of the two undervoltage pivot shafts identified in Attachment 1. This will provide increased confidence that the shaft will not disengage, and that the attachment will be operable for the next trip demand. After installation of the replacement DS-416 undervoltage attachments, the requirement to visually verify the presence of retaining rings after operation of the reactor trip switchgear can be eliminated.

If you require additional information on this, please contact me.

Very truly yours,

WESTINGHOUSE ELECTRIC CORPORATION



R. L. Whitney, Manager
Carolina Power & Light Project

RLW:bmf

- cc: L. I. Loflin, CP&L Site, 2L
- R. K. Matzelle, Ebasco, 1L
- D. J. Scanlon, Ebasco, 1L
- J. L. Willis, CP&L Site, 1L
- N. J. Chiangi, CP&L Site, 1L
- J. J. Sheppard, CP&L, 1L
- L. H. Martin, CP&L, 1L
- R. M. Parsons, CP&L Site, 1L
- G. L. Forehand, CP&L Site, 1L
- ~~E. M. Harris, CP&L Site, 1L~~
- J. F. Halifax, W Raleigh, 1L
- E. Four, W Sales (Hillside), 1L
- C. L. McKenzie, CP&L, 1L



Carolina Power & Light Company

P. O. Box 101, New Hill, N. C. 27562
May 26, 1983

Mr. James P. O'Reilly
United States Nuclear Regulatory Commission
Region II
101 Marietta Street, Northwest (Suite 3100)
Atlanta, Georgia 30303

NRC-73

CAROLINA POWER & LIGHT COMPANY
SHEARON HARRIS NUCLEAR POWER PLANT
1986-90 - 900,000 KW - UNITS 1 & 2
MAIN REACTOR TRIP BREAKERS, SHOP ORDER 386, ITEM 130

Dear Mr. O'Reilly:

Attached is an interim report on the subject item which was deemed reportable per the provisions of 10CFR50.55(e) and 10CFR, Part 21, on April 27, 1983. CP&L is pursuing this matter, and it is currently projected that corrective action and submission of the final report will be accomplished by June 30, 1984.

Thank you for your consideration in this matter.

Yours very truly,

A handwritten signature in cursive script that reads 'R. M. Parsons'.

R. M. Parsons
Project General Manager
Shearon Harris Nuclear Power Plant

RMP/sh

Attachment

cc: Mr. G. Maxwell (NRC-SHNPP)
Mr. R. Prevatte (NRC-SHNPP)
Mr. V. Stello (NRC)

CAROLINA POWER & LIGHT COMPANY
SHEARON HARRIS NUCLEAR POWER PLANT

UNITS 1 AND 2

INTERIM REPORT

SHNPP MAIN REACTOR TRIP BREAKERS
ITEM 130

MAY 24, 1983

REPORTABLE UNDER 10CFR50.55(e)
REPORTABLE UNDER 10CFR21

SUBJECT: SHNPP Units 1 and 2 Main Reactor Trip Breakers, Westinghouse Model DS-416 purchased under NSSS contract with Westinghouse NY-435002, Shop Order 386.

ITEM: Misoperation of the undervoltage attachments.

SUPPLIED BY: Westinghouse Electric Corporation Switchgear Division.

NATURE OF DEFICIENCY: A design discrepancy exists concerning a retaining ring on the undervoltage attachment pivot shafts. Specifically, a design change increased the width of a retaining ring, while the groove in which the retaining ring seats, was not changed. This allows improper seating of the retaining ring. The result is that the retaining ring may detach itself from the pivot shaft with the potential for misoperation of the undervoltage attachment.

DATE PROBLEM OCCURRED: On April 12, 1983, Westinghouse informed CP&L (CQL-7343) of a potential problem concerning minimum gap clearances on the same item. On April 21, 1983, Westinghouse informed CP&L (CQL-7360) of a potential problem concerning a retaining ring design discrepancy on the undervoltage attachment.

DATE PROBLEM REPORTED: On April 18, 1983, CP&L (Mr. N. J. Chiangi) notified the NRC (Mr. C. Hehl) that this item was potentially reportable. On April 27, 1983, CP&L (Mr. N. J. Chiangi) notified the NRC (Mr. A. Hardin) that this item was reportable under 10CFR50.55(e) and 10CFR21.

SCOPE OF PROBLEM: This deficiency involves two Unit 1 and two Unit 2 Reactor Trip Breakers and two Unit 1 and two Unit 2 Reactor Trip Bypass Breakers.

SAFETY IMPLICATIONS: The potential for misoperation of the undervoltage attachment could create a condition wherein the reactor trip breakers might not open on automatic demand from the reactor protection system. This could prevent a safe shutdown of the reactor unless prompt operator action is taken to "manually" trip the reactor.

REASONS DEFICIENCY REPORTABLE: This item is reportable because the deficiency reported may affect the ability of safety related equipment to perform its intended function.

CORRECTIVE
ACTION:

1. Westinghouse has committed to replacing the undervoltage attachments which includes a replacement pivot shaft with wider grooves to accommodate the new retaining ring. Westinghouse is developing new procedures for the installation and proper alignment and interface of this attachment with the breaker trip shaft.

PREVENTATIVE
ACTION:

1. Westinghouse has revised manufacturing drawings and quality control procedures to assure that critical design dimensions are maintained during manufacture.
2. To prevent trip breaker failure as a result of any undervoltage attachment malfunction, CP&L is reviewing industry information as a precursor to initiating a design change for the automatic dual trip operation by activating both the undervoltage attachment and the shunt coil attachment on receipt of an automatic undervoltage signal from the reactor protection system.

FINAL
REPORT:

CP&L expects to complete the corrective action plan and submit a final report by June 30, 1984.