

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8011070413 DOC. DATE: 80/11/03 NOTARIZED: NO DOCKET #
 FACIL: 50-400 Shearon Harris Nuclear Power Plant, Unit 1, Carolina 05000400
 50-401 Shearon Harris Nuclear Power Plant, Unit 2, Carolina 05000401
 50-402 Shearon Harris Nuclear Power Plant, Unit 3, Carolina 05000402
 50-403 Shearon Harris Nuclear Power Plant, Unit 4, Carolina 05000403

AUTH. NAME AUTHOR AFFILIATION
 CHIANGI, N.J. Carolina Power & Light Co.
 RECIPIENT NAME RECIPIENT AFFILIATION
 O'REILLY, J.P. Region 2, Atlanta, Office of the Director

MA/1

SUBJECT: Interim deficiency rept re 800903 discovery of unclear & incorrect weld symbols on Bergen-Patterson seismic Class 1 pipe hanger drawings. Caused by design drawings reaching field w/o corrections. Corrections will be made by 810501.

DISTRIBUTION CODE: B019S COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
 TITLE: Construction Deficiency Report (10CFR50.55E)

NOTES:

| | RECIPIENT | | COPIES | | RECIPIENT | | COPIES | |
|-----------|--------------------|--|--------|------|-------------------|--|--------|------|
| | ID CODE/NAME | | LTR | ENCL | ID CODE/NAME | | LTR | ENCL |
| ACTION: | A/D LICENSNG 04 | | 1 | 1 | YOUNGBLOOD, B 05 | | 1 | 1 |
| | RUSHBROOK, M. 06 | | 1 | 1 | WILSON, JERRY 07 | | 1 | 1 |
| INTERNAL: | AD/RCI/IE 17 | | 1 | 1 | AEOD 18 | | 1 | 1 |
| | ASLBP/J, HARD | | 1 | 1 | D/DIR HUM FAC15 | | 1 | 1 |
| | EDO & STAFF 19 | | 1 | 1 | EQUIP QUAL BR11 | | 1 | 1 |
| | HYD/GEO BR 22 | | 1 | 1 | I&E 09 | | 1 | 1 |
| | LIC QUAL BR 12 | | 1 | 1 | MPA 20 | | 1 | 1 |
| | NRC PDR 02 | | 1 | 1 | OELD 21 | | 1 | 1 |
| | PROC/TST REV 13 | | 1 | 1 | QA BR 14 | | 1 | 1 |
| | <u>REG FILE</u> 01 | | 1 | 1 | RUTHERFORD, W, IE | | 1 | 1 |
| | STANDRDS DEV 21 | | 1 | 1 | | | | |
| EXTERNAL: | ACRS 16 | | 16 | 16 | LPDR 03 | | 1 | 1 |
| | NSIC 08 | | 1 | 1 | | | | |

NOV 10 1980





Carolina Power & Light Company

Raleigh, N. C. 27602

File: SH N-2/18
Item 48

COPY

RECEIVED DISTRIBUTION
SERVICES UNIT
1980 NOV 6 PM 2 46
US NRC
DISTRIBUTION SERVICES
BRANCH

November 3, 1980

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

SHEARON HARRIS NUCLEAR POWER PLANT
UNITS 1, 2, 3 AND 4
DOCKET NOS. 50-400, 50-401, 50-402 AND 50-403
WELD SYMBOL ERRORS AND MISAPPLICATION
OF WELD ON BERGEN-PATTERSON
PIPE HANGERS

Dear Mr. O'Reilly:

In accordance with 10CFR50.55(e), the Region II office (Mr. R. McFarland) was officially notified of the subject deficiency as being "potentially reportable" on September 8, 1980. On October 7, 1980, the Region II office (Mr. J. K. Rausch) was officially notified that the subject deficiency was considered reportable under the provisions of 10CFR50.55(e). The intent of this letter is to inform you that due to the extensive nature of the problem, all investigation/corrective action on the subject deficiency has not yet been completed. Attached is an interim report which describes the problem and corrective action taken to date. It is expected that all corrective action will be completed by May 1, 1981, at which time the final 10CFR50.55(e) report will be submitted.

If you have any questions regarding this matter, please do not hesitate to contact me.

NJC/mt (970121)
Attachment

cc: Mr. V. Stello (2) W/A
Mr. G. Maxwell W/A

Yours very truly,
Original Signed By
N. J. Chiangi

N. J. Chiangi - Manager
Engineering & Construction
Quality Assurance

B019
S 1/1

8011070413

S

23 9 13 9 11 13 13

230713 11

CAROLINA POWER & LIGHT COMPANY
SHEARON HARRIS NUCLEAR POWER PLANT
UNIT NO. 1

WELD SYMBOL ERRORS AND
MISAPPLICATION OF WELD ON
BERGEN-PATTERSON PIPE HANGERS

INTERIM REPORT
OCTOBER 28, 1980

PREPARED BY:
CAROLINA POWER & LIGHT COMPANY

INTRODUCTION

Seismic Class I Bergen-Patterson pipe hangers are detailed on design drawings which specify location, geometry, and joint welding requirements. Welding processes, filler metal, etc. are described in procedure MP-08 - "General Welding Procedure for Structural Steel (Seismic and Non-Seismic) and Hangers"; and weld inspection requirements are specified in Site Specification No. 034 - "Nondestructive Examination, Visual Inspection, and Testing Requirements for Code Class 1, 2, 3, Balance-of-Plant Piping Systems, Seismic and Non-Seismic Structures for Permanent Plant Construction".

Work Procedure WP-110 - "Installation of Safety Related or Seismic Class I Pipe Hangers" provides instruction to the craft regarding the installation of the pipe hangers.

Weld types most often used in the installation of pipe hangers are the fillet weld and the flare-bevel weld. Occasionally, a full-penetration groove weld is used.

DESCRIPTION

On September 3, 1980, the Resident NRC Inspector identified a problem with unclear and incorrect weld symbols on Bergen-Patterson Seismic Class I pipe hanger drawings. Also, field inspection by the Resident NRC Inspector identified cases where the welds actually applied on the pipe hangers differed from that required by the design drawing; (i.e. over-welding, and over-sized fillets).

The problems identified above prompted an investigation of other pipe hanger drawings and reinspection of selected completed pipe hangers. Approximately 1,000 pipe hanger drawings whose installation was complete and 170 pipe hanger drawings which were in the process of installation were reviewed. Twenty hanger drawings were identified that had incorrect weld symbols. Seven hanger drawings were identified that had unclear weld symbols. Due to the recently identified problem of failing to weld full penetration welds when called for, the pipe hanger drawings which required full penetration welds were also identified. Ten such drawings were found. However, of these ten, seven were later declared to be shop welds rather than field welds. This was determined during a reinspection of these thirty-seven hangers by QA inspectors.

The QA inspectors reinspected the above thirty-seven pipe hangers plus an additional randomly selected seventy-seven pipe hangers in order to investigate the misapplication of weld. Results of their reinspection reveal: welds larger and smaller than required; fillet welds applied where full penetrations are required; no evidence of burn through on the back side of other full penetration welds thereby making them questionable; welding more sides and fewer sides than required.



100-100000

SAFETY IMPLICATIONS

Those hangers welded with smaller fillets and less sides welded than specified (under-welding) pose a potential safety concern. The fact that QA Inspectors had passed these welds as acceptable will require that other completed welds be reinspected. All hangers determined to have under-sized fillets and under-welding will have to be rewelded. Rewelding may be necessary in order to restore design margins. Those hangers welded on more sides than specified pose a potential safety concern. Some hangers require flexibility at specific joints in order to not transmit large moment loads. Flexibility is obtained by not welding on certain sides of the joint. Those hangers identified as having flexible joints will have to be reworked. This item is considered reportable due to design errors by Bergen-Patterson, failure to correctly translate design requirements by the field personnel, and failure of QA to translate design requirements to insure proper construction.

CORRECTIVE ACTION

The cause of the problem is three-fold. 1) Design documents that are incorrect or unclear are being provided by the vendor and, passing through all checking stages, are allowed to go to the field uncorrected. 2) Field personnel failed to weld the pipe hangers in accordance with the design drawings. 3) QA failed to insure that the proper welds were applied.

The welding unit is now reviewing hanger design drawings for missing, unclear, and incorrect weld symbols prior to issuance to the field. Those drawings with problems are returned to the mechanical unit who returns them to the vendor for correction by way of pipe hanger problem memos (PHPs).

Weld symbol identification training classes were conducted. Superintendents, general foremen, foremen, and welders of pipe and pipe hangers attended. Also, construction inspectors, QA inspectors, and mechanical unit personnel involved with pipe hangers attended the classes. In addition to instruction on weld symbol identification, emphasis was given on the importance of welding the pipe hanger exactly as the design drawing requires. In those instances where this is not possible, the hanger drawing is to be returned to the mechanical unit. We are confident this emphasis will decrease the problems found in the field with welding. If trend analysis indicate otherwise, we will take additional corrective action. Current trend following training is positive.

In addition to attending the classes referenced above, QA personnel also attended similar classes given within the QA organization. This was done in order that they may be better able to know when the proper welds have been applied.

Ebasco discussed the weld symbol problems with Bergen and Bergen agreed to revise procedures to assure that design drawings include proper weld symbols.

Bergen identified the problems to their personnel. All drawings being issued from Bergen's three design offices are now routed through the Hempstead office to provide more consistent review by Bergen engineering personnel.

FCR-H-258 has been conditionally approved by Ebasco to allow fillet welds to be 1/8 inch greater than design and to allow a 1/4 inch fillet reinforcement weld on bevel welds. The FCR also requested, but Ebasco did not approve, overwelding of a joint. This is due to certain joints requiring flexibility so as to not impart large moment loads to the embed plates. Ebasco provided us with a list of the hangers with this requirement. We will reinspect the hangers to assure compliance with the drawings. FCR-H-272 has been written requesting approval of over-welding for those hangers which do not have flexibility requirements.

Due to the underwelding and small fillet welds found in QA's reinspection of 114 pipe hangers. One hundred percent (100%) reinspection of pipe hangers previously completed will be necessary to verify the actual work. This reinspection began October 16, 1980. As of October 28, 1980, 78% (102 of 131) of the installed hangers inspected by QA have been found to be rejectable. A hanger will be rejected for the following reasons:

1. Drawing Problems

- a. Unclear symbols
- b. missing symbols
- c. incorrect symbols

2. Workmanship Problems

- | | |
|--|------------------|
| a. missing welder's symbols | g. slag |
| b. oversize welds (greater than 1/8") | h. porosity |
| c. undersized welds | i. undercut |
| d. weld type applied not the same as drawing | j. overlap |
| e. overweld | k. arc strikes |
| f. missing welds | l. weld splatter |

The problems identified by QA will be resolved. Drawing errors will be reported to Ebasco by pipe hanger memos (PHPs). Workmanship errors will be corrected by field rework or will be accepted to "use-as-is" by permanent waivers. Any rework done to any hanger will be reinspected for drawing compliance.

We expect that our corrective action of 100% hanger reinspection will be completed by March 1, 1981. Rework, reinspection of rework, and resolution of PHPs, PWs, and FCRs will be necessary before total completion of this effort can be claimed. With 78% rejection rate, much rework and evaluation will be necessary. Expected overall completion date is May 1, 1981.

