



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

'APR 28 1982

INVESTIGATION REPORT NO. 50-400/82-03 and 50-401/82-03

SUBJECT: Carolina Power and Light Company
Shearon Harris Nuclear Plant
Unit 1

Improper Welding Inspection Practices

DATES OF INVESTIGATION: December 11, 1981 - February 26, 1982

INVESTIGATOR:

J. Y. Vorse
J. Y. Vorse, Regional Investigator
Enforcement and Investigations Staff

04-19-82
Date Signed

REVIEWED BY:

Carl E. Alderson
Carl E. Alderson, Director
Enforcement and Investigations Staff

4-23-82
Date Signed

A. INTRODUCTION

On December 4, 1981, the NRC Resident Inspector assigned to Carolina Power and Light Company's Shearon Harris nuclear power plant, advised Region II that several personnel had complained to him that a welding inspector was not performing visual weld inspections properly. The personnel who complained had no first hand knowledge; however, the rumor among the welders and welding inspectors was that if a hanger was located in an inaccessible area, the individual would not inspect the weld but would sign it off as acceptable. One complainant identified a specific hanger which was rumored to have not been properly inspected by the welding inspector. This hanger was inspected by the Resident Inspector and all welds appeared to be acceptable. However, the adjacent hanger had one weld which appeared to be rejectable. The Resident Inspector later learned the hanger welds had been inspected and accepted by the welding inspector in question.

Based on the number of personnel who were complaining about the welding inspector's weld inspection practices and the potential impact on the welding inspection program, an investigation was initiated by Region II on December 11, 1981, under the authority provided by Section 161.c of the Atomic Energy Act of 1954, as amended.

B. SCOPE OF INVESTIGATION

A review of the information supplied by the Resident Inspector disclosed one allegation to be addressed during the investigation. This was:

A welding inspector was signing off welds on hangers and pipes as acceptable when he had not visually inspected them.

During the course of the investigation, the Investigator held discussions with numerous current licensee and licensee contractor employees. Formal interviews were conducted with 59 individuals who were considered by the Investigator to have potential knowledge of the alleged acts or practices. The investigation also included an inspection of randomly selected hangers and pipes which had been inspected by the particular welding inspector during the time frame the rumors began forming.

The investigation included a review of appropriate regulatory requirements, NRC records and licensee procedures and records including:

- 10 CFR 50, Appendix B
- Shearon Harris Quality Assurance Program
- Personnel Training and Qualification
- Visual Examination of Welds Procedure

This investigation was conducted by one investigator and two inspectors requiring a total of 42 man-hours of investigative and inspection activity on-site.

C. CONCLUSIONS

The allegation was substantiated in that the welding inspector had signed off weld inspections he had not personally performed; however, the welds had been inspected by inspector trainees who were working with the inspector. This results in two violations of NRC requirements:

1. Inspections were performed by uncertified welders; and
2. Inspection records do not reflect the correct identity of the individuals who performed the inspection.

DETAILS OF INVESTIGATION

CAROLINA POWER AND LIGHT

SHEARON HARRIS NUCLEAR PLANT

DECEMBER 14, 1981 - JANUARY 22, 1982

A. INDIVIDUALS CONTACTED

The following individuals were contacted during the course of the investigation.

Carolina Power and Light (CP&L)

G. A. DeBarres, QA Weld Inspector
K. A. Douglas, QA Weld Monitor
R. L. Faulkner, QA Weld Control and Surveillance
S. M. Freeman, QA Weld Inspector
A. B. Giles, QA Technician
J. C. McDonnell, QA Weld Inspector
A. Lucas, Senior Resident Engineer
E. W. Mercer, QA Weld Inspector
S. W. Montastle, QA Weld Inspector
R. M. Parsons, Site Manager
W. H. Pere, QA Weld Inspector
K. B. Stanley, QA Weld Inspector
R. B. Strickland, Mechanical Inspector
G. G. Tingen, QA Weld Inspector
T. Wait, QA Welding Supervisor

Daniels Construction Company

Crew P-21: Reactor Auxiliary Building (RAB)

R. V. McLeod, General Foreman
W. W. Burton, Pipe-Fitter Helper
R. J. Carr, Welding Foreman
J. F. Goodsell, Welder
B. W. Nguyen, Welder
K. M. Norton, Welder
J. A. Owens, Welder
G. S. Peck, Pipefitter
R. D. Symank, Welder
M. D. Warlick, Welder

Crew P-35 (RAB)

W. T. Bohan, Foreman
D. L. Cauble, Welder
R. W. George, Pipe-Fitter
W. J. Jenkins, Welder
T. R. Merideth, Welder
M. D. Tatham, Welder
J. C. Woznick, Welder

Crew P-17 (RAB)

D. E. Bradford, Pipe-Fitter
C. A. Brigman, Foreman
R. L. Grant, Pipe-Fitter
T. M. Lazafame, Pipe-Fitter
W. H. Martin, Welder
J. E. Newsome, Welder
J. B. Starnes, Pipe-Fitter Helper
L. L. Whitehead, Pipe-Fitter
S. J. Whitlock, Fitter

Crew P-14 (Waste Process)

R. A. Gardner, Foreman
W. C. Lynch, Welder
T. Smith, Welder
W. B. Surber, Welder

Crew P-20 (Waste Process)

J. A. Brincheck, Welding Supervisor
K. T. Davis, Pipe-Fitter Helper
J. D. Foster, Pipe-Fitter
D. P. Freeman, Welder
C. F. Green, Jr., Welder
J. W. Kilgore, Pipe-Fitter Helper
J. F. Lynch, Pipe-Fitter
D. C. Martin, Welder
D. M. Shargots, Welder
R. R. Stone, Pipe-Fitter
N. C. Sulton, Welder
G. G. Wilbon, Welder

Daniels Technical Services, Ltd.

D. A. Sands, QA Welding Inspector
B. L. Holcombe, QA Welding Engineer

Nuclear Regulatory Commission (NRC)

G. F. Maxwell, Resident Inspector

B. ALLEGATION

Occasionally, a welding inspector, Individual A, did not visually inspect welds on seismic hangers and piping. However, he signed documentation showing that he had.

C. BACKGROUND

The Resident Inspector at Shearon Harris nuclear site expressed concerns about certain workers approaching him and complaining about a welding inspector, Individual A. Several workers stated they were hearing other workers saying that Individual A was not looking at some welds he was signing off as acceptable. One individual stated to the Resident Inspector that if a weld was located in a difficult to access location, Individual A would not acquire the appropriate scaffolding to allow him to have access to the weld to be inspected. The Resident Inspector was further informed that he could find an unacceptable weld on seismic category 1 pipe hanger numbered A-3-236-1-CC-H-469. The Resident Inspector looked at the welds on that hanger and found no rejectable welds. However, on an adjacent hanger, No. A-3-236-1-CC-H-342 the Resident Inspector found what was, in his opinion, a rejectable weld. It was later determined by the resident inspector that this weld had been inspected by Individual A. Three additional hangers were looked at by the Resident Inspector and no rejectable welds were noted.

D. INTERVIEWS OF WELDING INSPECTORS

Eight weld inspectors including a supervisor, as well as four other personnel involved in the QA weld inspection program were interviewed by the Investigator. One individual stated he had heard rumors that Individual A "inspected from the floor". Two individuals stated they heard rumors that Individual A sometimes shined his flashlight on hangers from the floor but did not go up and visually check the welds. Five individuals stated they were aware that Individual A had a very bad case of arthritis during the summer months of 1981 and were surprised when they saw him up on the scaffolding. Two welding inspectors, Individuals B and C, stated they inspected welds before they (the inspectors) were certified. Individuals B and C provided the Investigator with signed statements which contained the following information in essence:

Individual B started work as a welding inspector trainee beginning sometime in September 1980. Initially, he was under the direct supervision and received on-the-job-training from Individual A. Individual A showed him what to look for

regarding acceptability and when to reject a weld. After about 2 months, Individual B began inspecting welds by himself, particularly in areas which were relatively inaccessible and high up. Individual A remained on the floor signing off the weld inspection documentation and provided Individual B with a sticker showing the weld had been inspected. Individual B placed the stickers on the hangers on which he had inspected welds. Individual B estimated that he had inspected welds by himself on approximately 50-75 hangers most of which were on the 90ft. and 236ft. elevations in the Reactor Auxiliary Building. Although he inspected the welds prior to being certified in January 1980, Individual B had no misgivings about those welds he accepted. In fact, he believes he was on the conservative side and inspected all welds in accordance with AWS D1.1-75 Standards.

Individual C began his on-the-job-training with Individual A in October 1981 for pipe hanger welding inspection. Individual C estimates that he spent 3 weeks, 40 hours per week with Individual A and, although he could not recall how many hangers they inspected, he estimates he alone inspected about 75% of the welds. That is, those welds which were difficult to get to because of the need to climb scaffolds or physically difficult to get to. When he rejected welds the first several times, Individual A climbed the scaffold, looked at the welds and agreed they were rejectable. Thereafter, Individual C rejected and accepted welds without Individual A looking at them. Individual A always signed the weld inspection forms (Weld Data Report (WDR QA 34 and traveler)) as well as the weld inspection sticker. Individual C estimates that he inspected welds on about 100 hangers by himself before he was certified. In all of these situations, Individual A signed the documentation. Like Individual B, Individual C had no reservations about the welds he had accepted. He also inspected the welds according to AWS D1.1-75 standards.

E. INTERVIEWS OF CRAFT PERSONNEL

Forty-two Craft personnel comprised of welding foremen, welders, pipe-fitters, and pipe-fitter helpers were interviewed by the Investigator. Twenty-seven individuals had no knowledge of Individual A and could provide no pertinent information. Three individuals stated they heard rumors that Individual A would inspect from the floor and shine his flashlight on the welds. Five individuals stated they observed Individual A performing inspections on welds which were high up and difficult to get to. One welder,

Individual D stated that Individual A accepted welds without looking at them. A signed statement was provided to the Investigator by Individual D which contained the following information in essence:

Sometime in the late spring or early summer, Individual D was assigned to assist Individual A in locating and providing access for inspection of welds on piping. This transpired on a Saturday with no one else in the general area. The pipes were located in the waste process area, elevation 236. Individual A remained on the floor and Individual D climbed the scaffolds and ladders, placing stickers on pipes signifying the welds had been inspected. Individual A signed off the paperwork. Individual D estimates that this activity took place on approximately 100 welds, all non-safety Category 6 and 7. Individual D expressed concerns to co-workers and opined that this was the source of all the subsequent talk going around the plant about Individual A not inspecting the welds. Individual D thought Individuals E and F may have knowledge about similar occurrences.

Individual E was interviewed and stated he had no first hand knowledge about improper welding inspection. Individual E only acknowledged hearing rumors that Individual A had welders put stickers on pipes for him. Individual F was interviewed by the Investigator and he provided a signed statement containing the following information in essence:

Individual F, a pipefitter helper, estimates he assisted Individual A in locating welds approximately 500 times. Most of the welds were easily accessible and were looked at by Individual A. On one occasion, however, in September 1981, Individual A glanced at two category 7 (non-safety related) welds which were located approximately 20 ft. above him. These were off the "MY column" and "column 2" of the East-West Hallway of the waste process area. Individual A signed the inspection sheet and handed the carbon copy to Individual F for the craft records. He also gave Individual F two filled out stickers instructing him to place them by the welds. However, Individual F did not do so because there was no scaffolding or ladder available, so he took the stickers home. Individual F was later requested by the Resident Inspector to provide him with the stickers. Only one was still available and this was given to the Resident Inspector by Individual F. This same sticker was later provided to the Investigator. The sticker bears the initials of Individual A.

Based on the information provided by Individual D regarding Individual A's not inspecting welds on a Saturday when no others were in the indicated area, a foreman, Individual G was asked to provide the names of craft personnel who assisted Individual A on Saturdays. Individual G provided those names to the Investigator. They were: Individuals H, I, J, K, L and M. These personnel were interviewed. Individuals H, I, J and M stated they observed Individual A inspect welds from scaffolds and ladders on Saturdays and he always appeared to be inspecting carefully. Individual K stated he observed Individual A inspect the welds although he seemed reluctant to go high. Individual L stated he assisted Individual A with approximately 100 weld inspections. On one occasion, Individual A shined his flashlight from a distance and accepted one weld. This, according to Individual L, was on code 6 and 7 non-safety related piping, located high off the floor.

F. INTERVIEW OF INDIVIDUAL A (WELDING INSPECTOR)

Individual A was interviewed at Shearon Harris on December 17, 1981 and he provided a signed statement containing the following information in substance:

Regarding signing off welds that he did not actually look at, but which were inspected by trainees, Individual A explained that he was always within close proximity to them. When questioned by the Investigator as to whether or not he remained at floor level while the trainee inspected welds high on the scaffolds, Individual A declined to state where his exact physical location was except that he was in the "immediate vicinity". Individual A explained that sometime around April 1981, EBASCO began sending revisions requiring reinspection of some pipe hangers. Subsequently, for about a 3 month period, Individual A went out and looked at the respective hangers. No welds had to be inspected but he did have to verify the hanger was physically present. Therefore, Individual A would often shine his flashlight on the hanger while standing on the floor to ensure the hanger was present and in its proper location. He would then sign off the revised drawing and give to whoever was assisting him, a sticker indicating the date the hanger was "inspected" to the latest revision. The assistant would then place the sticker somewhere on the hanger. Individual A believes this may have been misconstrued by others in the vicinity that he was signing off welds without actually looking at them. In fact, none of the welds on the hanger required any inspection. Individual A estimates that he inspected approximately 100 hangers in this manner. Individual A denied having not inspected welds on pipes or hangers, but signing them off as acceptable.

G. WELD INSPECTIONS BY NRC

Based on the statements, made by several individuals, that Individual A signed off pipe welds without inspecting them, the Region II Engineering Inspection Branch was requested to conduct an inspection of randomly sampled welds on hangers and pipes. It was further requested that they draw samples from:

Areas which were relatively difficult to access;

Welds which were inspected on Saturdays; and

Welds which were inspected during the April-September 1981 time frame.

The results of the reinspection of welds conducted by NRC inspectors are documented in NRC Inspection Report Nos. 50-400/82-01 and 50-400/82-06. A summary of that inspection is included herewith as Enclosure 1. Two violations were identified by the inspectors and they are discussed in the referenced inspection report.

H. REVIEW OF LICENSEE PROCEDURES

The problem of uncertified individuals performing inspections and the inspection reports for those inspections being signed off by a certified inspector was discussed with the CP&L Site Manager and Senior Resident Engineer. They stated that such actions were permissible in accordance with licensee procedure CQA-1, "Personnel Training and Qualification".

A review of that procedure disclosed that Paragraph 7.1 contains the following:

"Emphasis will be on firsthand experience gained through actual performance of processes, tests examinations, and inspections. As the inspector in training develops proficiency, he may be allowed to perform certain functions with minimal supervision; however, he will not be permitted to "sign-off" hold points in verification of quality requirements for work activities."

In response to the Investigator's comments regarding the inspection records being signed by an inspector who had not actually inspected the weld, the licensee's site management representatives stated that the certified inspector was accepting responsibility for the welds, therefore the inspector would only permit the trainees to accomplish the inspection when he believed they were qualified.

The licensee's procedure and implementation of the procedure is inconsistent with the requirements of ANSI N45.2.6-1973 which the licensee committed to follow in that the trainees had not been certified to perform the inspections in question; that is, no "certificate of qualification" meeting the requirements of Section 2.2.4 of the Standard had been completed for the individuals.

The licensee's procedure is also inconsistent with Criterion 17 of Appendix B to 10 CFR 50, which requires that inspection records identify the inspector who performed the inspection. An inspector cannot "accept responsibility" for an inspection that he did not personally perform.

I. FINDINGS

The allegation was substantiated in that the welding inspector signed inspection records indicating that he had inspected welds and found them acceptable when, in fact, he had not personally inspected the welds. This action results in two violations of NRC requirements. These are:

1. The inspection records did not identify the individuals (B and C) who had actually performed the inspections as required by 10 CFR 50, Appendix B, Criterion XVII and Section 1.8.5.17 of the PSAR; and
2. The inspections were performed by individuals (B and C) who were not certified to perform the inspections in accordance with ANSI N45.2.6-1973 as required by 10 CFR 50, Appendix B, Criterion II and Section 1.4.9(1.58) of the PSAR.

These violations appear to be the direct result of inadequacies in licensee procedure CQA-1 (Rev. 4), "Personnel Training and Qualification" or the licensee's interpretation of that procedure as discussed in Paragraph H above.

ENCLOSURE 1

Followup on Regional Request

Certain pipe welds and a random sample of difficult access welds on seismic supports inspected by a certain welding inspector during a particular time frame were reviewed by inspectors from the Materials and Processes Section.

1. The following seismic Category I welds were re-examined by Region II inspectors during the week of January 19-22, 1982:

<u>COMPONENT ID/WELD NO.</u>	<u>SYSTEM</u>	<u>ITEM INSPECTED</u>
CS-H-1790	Chemical and Volume Control	Seismic Hanger
CX-H-1623	Chilled Water Return	Seismic Hanger
CC-H-469	Component Cooling	Seismic Hanger
BD-H-144	Blowdown	Seismic Hanger
BR-H-731	Boron Recycle	Seismic Hanger
CS-H-137	Chemical and Volume Control	Seismic Hanger
RM-H-366	Reactor Make-up Water	Seismic Hanger
SI-H-1018	Safety Injection	Seismic Hanger
SF-H-704	Spent Fuel Pool Cooling and Cleanup	Seismic Hanger
CC-H-800	Component Cooling	Seismic Hanger
CT-H-205	Containment Spray	Seismic Hanger
SW-H-2343	Service Water	Seismic Hanger
*CC-H-342	Component Cooling	Seismic Hanger

*NOTE: This hanger was alleged to be unacceptable.

In addition to the above welds, the inspectors also inspected the following welds on the laundry and hot shower tank #591-4B, that were alleged to be rejectable.

<u>ISOMETRIC</u>	<u>WELD JOINT</u>	<u>SYSTEM</u>
1-WL-1095	FW-3708	Waste Liquid
1-WL-1092	FW-3702	Waste Liquid
1-WL-1090	FW-3697	Waste Liquid

Discrepancies noted as a result of the NRC reinspection are as follows:

- a. The inside of the box frame windows for hanger CC-H-469 had not been welded. A review of the records for this hanger revealed that the weld inspector had mistakenly referenced a field change that would have deleted these welds if the hanger had been designed for a twelve inch pipe or smaller. Hanger CC-H-469, however, was designed for two 18-inch pipes.

- b. Field pipe welds FW-3708, FW-3702, and FW-3697, located on the top of the laundry and hot shower tank, had small arc strikes on the base metal adjacent to the field welds. Carolina Power and Light Company (CP&L) procedure NDEP-601 for visual examination of welds, paragraph 9.11, states that "weld and adjacent base metal shall be free of visible arc strikes, weld spatter and mishandling marks".
- c. In addition to the above pipe field welds, arc strikes and weld spatter were noted on vendor welds between the above field welds and the tank. The weld inspector had not reported this condition as required by paragraph 19.9 of CP&L's Quality Assurance Program for Radioactive Waste Management System.

The three examples noted above were reported as a violation of 10 CFR 50, Appendix B, Criterion V and was assigned number 50-400/82-01-03, Failure to Follow Procedures/Instructions for Visual Examination of Welds and Reporting of Discrepancies.

- d. As a result of the reinspections conducted during January, the Region II inspectors concluded that the samples taken were representative of the more difficult inspections the inspector in question had made on seismic supports. Although one item of noncompliance was found, the NRC inspectors concluded that this was an oversight by the welding inspector. When reading the instructions he apparently failed to see that the field change had size limitations. The NRC inspectors found inspection stickers with the individual in question's name on supports that were very high and difficult to reach.

This indicated that the weld inspector had made the inspections since all of the reinspected supports were examined during the period that the weld inspector was working alone. As for the reinspection of the three pipe welds that were examined by the inspector in question, two discrepancies were noted in this area and reported above. The Region II inspection concluded that a larger sample of pipe welds; particularly Non-ASME welds inspected by this individual would need to be reinspected on a subsequent inspection. An inspector follow-up item 400/82-01-05, Inspection of Pipe Welds was open to track this problem.

2. During the week of February 23-26, 1982 the Non-ASME welds listed below were re-examined by Region II. The safety significance of this non-ASME pipe is established by section 1.8 of the Harris FSAR, which commits to Regulatory Guide 1.143. The Guide identified the radioactive waste management systems as an activity important to safety and requires inspection in accordance with ANSI B31.1. CP&L procedure NDEP-601, Revision 0, conforms with the requirements of ANSI B31.1 and is the procedure used by CP&L for visual inspection of the Waste Processing System.