



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

Report Nos.: 50-400/80-23, 50-401/80-21, 50-402/80-21 and 50-403/80-21

Licensee: Carolina Power and Light Company
 411 Fayetteville Street
 Raleigh, NC 27602

Facility Name: Shearon Harris

Docket Nos.: 50-400, 50-401, 50-402 and 50-403

License Nos.: CPPR-158, CPPR-159, CPPR-160 and CPPR-161

Inspection at Shearon Harris site near Raleigh, North Carolina

Inspectors:	<u>J. Blake</u>	<u>11/5/80</u>
	J. Blake	Date Signed
	<u>J. Coley</u>	<u>11/7/80</u>
	J. Coley	Date Signed
	<u>W. Kleinsorge</u>	<u>11/7/80</u>
	W. Kleinsorge	Date Signed
	<u>L. Zajac</u>	<u>11/7/80</u>
	L. Zajac	Date Signed

Accompanying Personnel: A. R. Herdt

Approved by:	<u>A. R. Herdt</u>	<u>10-30-80</u>
	A. R. Herdt, Section Chief, RC&ES Branch	Date Signed

SUMMARY

Inspection on September 29 - October 3, 1980

Areas Inspected

This special, unannounced inspection involved 148 inspector-hours on site in the areas of In-depth QA inspection of performance in piping installation, welding and inspection; safety-related concrete; machinery installation; housekeeping and storage of materials; previously identified inspection findings; and licensee identified items.

Results

Of the 6 areas inspected, no items of noncompliance or deviations were identified in 5 areas; 3 items of noncompliance were found in one area - (Infraction - Magnetic particle examination program - Paragraph 6.c.(2)(b); Infraction - Weld rod control (two examples) - Paragraph 7.d.; Deficiency - QA document control - Paragraph 6.d).

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DETAILS

1. Persons Contacted

Licensee Employees

- *S. D. Smith, Vice President, Construction
- *P. W. Howe, Vice President, Technical Services
- *N. J. Chiangi, Manager, Engineering and Construction QA
- *R. M. Parsons, Site Manager
 - A. M. Lucas, Sr. Resident Engineer
- *G. L. Forehand, Principal QA Specialist
- *R. Hanford, Principal Engineer, Welding/Metallurgy
- *C. R. Osman, Project QA Specialist
- *G. M. Simpson, Principal Construction Specialist
- *T. J. French, Senior Engineer
- *C. S. Hinnant, Resident Engineer-Electrical
 - E. Betz, Sr. QA Specialist NDE

Other licensee employees contacted included construction craftsmen, inspectors, mechanics, security force members, and office personnel.

Other Organizations

- *W. D. Goodman, Daniels Construction Company, Project Manager

NRC Resident Inspector

- *G. F. Maxwell

*Attended exit interview.

2. Exit Interview

The inspection scope and findings were summarized on October 3, 1980, with those persons indicated in Paragraph 1 above. There was some discussion concerning the details of the infraction against the magnetic particle examination program; the unresolved item concerning the qualification of the liquid penetrant examiner and the areas of concern (Inspector Follow-up Items) concerning the examiner's test specimen identification and the placement of the back-scatter B on the RT film.

3. Licensee Action on Previous Inspection Findings

- a. (Closed) Infraction 400/80-13-01: "Welding in the Way of Rust". Carolina Power and Light Company's (CP&L) letter of response dated June 25, 1980 has been reviewed and determined to be acceptable by Region II. The inspectors held discussions with the Harris Site Manager and examined the corrective actions as stated in the letter of

response. The inspectors concluded that CP&L had determined the full extent of the subject noncompliance, performed the necessary survey and follow-up actions to correct the present conditions and developed the necessary corrective actions to preclude recurrence of similar circumstances. The corrective actions identified in the letter of response have been implemented.

- b. (Closed) Unresolved Item 400/80-13-04, 401, 402, 403/80-11-04: "Final Weld Peening". This item concerns the peening of final weld layers without regard for final surface inspection. The inspectors determined that no final weld peening had been accomplished. The licensee has revised all welding procedures that require post weld heat treat to prohibit peening. The inspectors have no further questions. This item is considered closed.
- c. (Open) Infraction 400/80-15-01: "Fabricator and Contractor Undercut". This item concerns contractor and fabricator weld deficiencies undetected by the contractor, fabricators or licensee's QC/QA program, that were subsequently identified by an NRC inspector. An additional example of a weld deficiency undetected by contractor, or licensee QC/QA program is discussed in RII:NE 400/80-18-04: "Containment Liner Weld Geometry". In view of the above, this item will remain open until the licensee can provide adequate assurances through objective evidence, that the QC/QA monitoring program is capable of identifying such deficiencies, with consistency.
- d. (Open) Infraction 400/80-15-02, 401, 402, 403/80-13-02: "Failure to Follow Reinforcing Steel Storage Procedure". This item concerns the licensee's failure to store reinforcing steel in Level D conditions. The inspectors noted no change in reinforcing steel storage conditions, therefore this item remains open.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or deviations. New unresolved items identified during this inspection are discussed in Paragraphs 5.c., 6.c.(2)(c), and 6.c.(3)(b).

5. Independent Inspection Effort (Units 1, 2, 3 and 4)

a. Construction Progress

The inspectors conducted a general inspection of the power block construction site, the pipe fabrication shop, the pipe storage area, to observe construction progress and construction activities such as welding, nondestructive examination, material handling and control, housekeeping and storage.

b. Specific Work Activities

(1) Concrete Activities

The inspectors observed the placement of the final lift of concrete on concrete pour No. 1CB1W282015 on September 29, 1980. (This is an interior wall in the Unit 1 containment.) The inspectors observed the handling and placement techniques including amount of vertical free fall of the concrete, the horizontal distance between placements, and the use of vibration.

(2) Heat Exchanger Installation

The inspectors observed the grouting of several heat exchangers in the auxiliary building. Activities observed included preparation of the existing concrete and the application of the grout.

(3) Machinery Installation

The inspectors observed the alignment and leveling activities associated with the installation of a Terry turbine driven auxiliary feedwater pump in the auxiliary building.

The inspectors also observed the alignment and leveling operations involved with installation of the Unit 1 Polar crane rails.

During these observations the inspectors discussed the activities with the workers and foremen involved to determine their awareness of QA/QC requirements. In both cases the crews involved were very much aware of the requirements of the jobs at hand.

c. Chloride Control

During the general inspection of Paragraph 5.a. and also during other inspection activities during the week, the inspectors made the following observations:

- (1) The inspectors noted several cans of "Winbro Tapfree" thread cutting fluid containing 1, 1, 1, Trichloroethane. At the time of this inspection it could not be determined whether the above material was consistent with Paragraphs NB-4712, NC-4712 and ND-4712 of the ASME B&PV Code. In addition, it could not be determined whether the licensee's site procedures addressed the requirements of Paragraph NB-4713, NC-4713 and ND-4713 of the ASME B&PV Code and the requirements of Paragraph C4 of Regulatory Guide 1.37. The licensee indicated that they would look further into the matter.
- (2) The inspectors noted several cubicals in the power block (some containing safety-related equipment) permeated with the distinctive

stench of urine. This would have only been mentioned as a house-keeping and health concern except that in a number of areas in the power block the floor drain system is incomplete and during the rains on September 29, and 30, 1980. The inspector noted several areas where floor drains from one level were dumping water on installed equipment on the level below. One case in point was the stainless steel boron recycle tank in the auxiliary building.

The inspectors informed the licensee that the acceptability and/or control or the use of "Winbro Tapfree" cutting fluid would be an unresolved item identified as 50-400/80-23-06, and 50-401, 402, 403/80-21-06 "Chloride Control".

The licensee indicated that efforts would continue to be made to improve the sanitation in the work areas.

There were no items of noncompliance or deviations identified during this area of the inspection.

6. QA Inspection of Performance

This inspection was performed to determine whether site work is being performed in accordance with NRC requirements and SAR commitments, the QA/QC program is functioning in a manner to assure requirements and commitments are met, and that prompt and effective action is taken to achieve permanent corrective action on significant discrepancies.

The following areas were examined to verify the inspection objectives:

a. Field Drawings and Work Procedures

- (1) The inspectors reviewed the below listed documents to determine whether the most recent revisions of field drawings, construction specifications and work procedures are in agreement with the SAR and system drawings.

CAR-SH-M-30, Rev. 10A EBASCO Specification "General Power Piping"

CAR-1364-B070, Rev. 06 "CP&L Piping Line List"

CAR-2165-G-297, Rev. 3 "Flow Diagram - Service Water System"

CAR-2165-G-092, Rev. 6 "Service and Cooling Water Piping - Turbine Building"

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- (2) The inspectors reviewed the below listed documents to determine whether the design changes have been properly provided, reviewed, approved and processed.

Pipe Spool Fabrication/
Modification Record

<u>Turnover No.</u>	<u>Drawing Number</u>	<u>Revision</u>
4060	1-SW-34-3	1
4060	1-SW-33-4	0
4065	2-SW-33-2	0, 1 & 2
4065	2-SW-167-1	0
4065	2-SW-169-1	0
4065	2-SW-37-1	0, 1 & 2

- (3) The inspectors reviewed the below listed documents to determine whether work procedures adequately describe critical points and methods of installation as well as inspection and test hold points - to properly reflect design intent.

<u>Number</u>	<u>Title</u>
Site Specification 030, Rev. 5	"Field Fabrication and Erection of Power Piping"
Site Specification 031, Rev. 3	"Requirements for Field Welding of Category 1, 2, 3 and 4 or Code Class 1, 2 and 3 Piping Components and Systems at SHNPP Project"

b. Field Inspection

- (1) The inspectors made a detailed inspection, including physical measurements, of a portion of the service water system as indicated below to determine whether equipment or systems are installed/erected as described by field drawings and construction specifications.

FW-277	FW-281	2-SW-169
FW-281	FW-311	2-SW-33
FW-1068	FW-1072	1-SW-334

- (2) The inspectors reviewed the below listed "Pipe Spool Fabrication/Modification Records" to determine whether such modifications were properly approved and controlled and whether appropriate procedures were followed:

<u>Turnover No.</u>	<u>Drawing No.</u>	<u>Revision</u>
4065	2-SW-169-1	0
4065	2-SW-33-2	2

- (3) The inspectors interviewed craftsmen and foremen associated with safety-related piping fabrication and installation to determine

whether their level of knowledge is adequate to provide the required quality of workmanship.

c. Quality Control

(1) QC Inspection Reports

The inspectors reviewed nondestructive examination reports for the below listed welded joints to determine adequacy; whether deficiencies submitted by QC inspectors received proper corrective action where applicable; and if work and work controls were adequate.

<u>Weld No.</u>	<u>Drawing No.</u>
FW-1069	1-SW-334
FW-1070	1-SW-334
FW-281	2-SW-169
FW-279	2-SW-169
FW-311	2-SW-33
SWFAB-4	2-SW-33-2
SWFAB-9	2-SW-169-5
SWFAB-10	2-SW-169-4
SWFAB-13	2-SW-169-2
SWFAB-9	1-SW-334-4
SWFAB-11	1-SW-334-2

<u>Joint Numbers</u>	<u>Inspection</u>	<u>ASME Class</u>
SSW8-165SB2-FW-280	MT	3
C-1-221-1-CT-12-FW-52A	MT	2
C-1-221-1-CT-12-FW-52	MT	2
2-CT-127SB1-FW-47	PT	2
1-CT-11/2165-G-116-FW-37A	MT	2
1-CT-11/116&118-FW-37	MT	2
2-CT-12-35A-1-FW-32	PT	2
1-CT-11/2165-G-116-FW-31	PT	1
2-CT-4-595A-1 Weld No. 39	PT	2
C1-221-1-SI-1-FW-1A	MT	2
3CC-20-254-SN-1-FW-524	MT	3
A2-236-1-CC-137-FW-389	MT	3
A2-236-1-CC-137-FW-388	MT	3
C1-221-1-SI-2-FW-13A	MT	2
C1-221-1-SI-2-FW-13	MT	2
C1-221-1-SI-1-FW-1	MT	2

(2) Quality Control Inspection

(a) Liquid Penetrant Examination

The inspectors observed liquid penetrant examination of 12-inch diameter pipe weld, 2SF149-FW407 of the spent fuel

system, to determine if the examination was performed per code requirements and licensee's written procedures. The applicable code for nondestructive examinations is ASME Boiler and Pressure Vessel Code, Section V, 1974 Edition with addenda thru winter 1976.

No items of noncompliance or deviations were noted.

(b) Magnetic Particle Examination

The inspectors observed magnetic particle examination (MT) of four production pipe welds, identified below, and one training test specimen, to determine whether the MT was performed in accordance with code requirements and licensee's written procedures. The applicable code is the same as indicated above.

<u>Weld Identification</u>	<u>Pipe Size & Mat'l</u>	<u>System</u>
2SW166-SW-1	8" Carbon Steel	Service Water
2SW167-SW-1	8" Carbon Steel	Service Water
2SW167-FW-264	8" Carbon Steel	Service Water
2SW168-SW-1	8" Carbon Steel	Service Water

The following discrepancies were noted during observations of these examinations:

- 1 The test surface was not always observed during application of the MT powder, in that illumination was not directed upon the test surface, on several occasions, until excess MT powder was being removed.
- 2 The removal of excess MT powder was done vigorously using a syringe.

It should be noted that the syringe creates high air pressure unless squeezed gently. The air pressure from the syringe when squeezed rigorously was checked in the calibration lab on an air pressure gage and also on an oil manometer. In each case, the pressure exceeded that recommended in the "Standard Method for Dry Powder Magnetic Particle Inspection" SE-109 which is invoked by Article 7, "Magnetic Particle Examination" of the ASME Code, Section V.

Paragraph 5 of SE-109 states in part, "The powder shall be applied by lightly dusting a small quantity over the surface and then removing the excess with a gentle air stream. The air stream shall be so controlled that it does not disturb or remove lightly held powder patterns. In order to recognize the broad, fuzzy, lightly held powder patterns produced by subsurface discontinuities, it is essential to observe carefully the formation of indications while the powder is being applied, and also while the excess is being removed. Adequate lighting

shall be provided for easy observation of the indications."

In view of the above observations, the inspectors requested the same team of examiners to perform a MT test on a training test specimen in the NDE lab. Essentially the same discrepancies were noted during this test. The only difference was that the office lighting offered more illumination than that in the production area, but was still bordering on being inadequate. The examiners apparently felt it was inadequate as they used a flashlight, but again did not always shine the light on the test surface during application of the MT powder.

The above examples are indicative of noncompliance to 10 CFR 50, Appendix B, Criterion IX as implemented by PSAR, Section 1.8.5.9. This item is Infraction number 50-400/80-23-01; 401, 402, 403/ 80-21-01, "Failure of Magnetic Particle Examination of Comply with ASME Code Requirements".

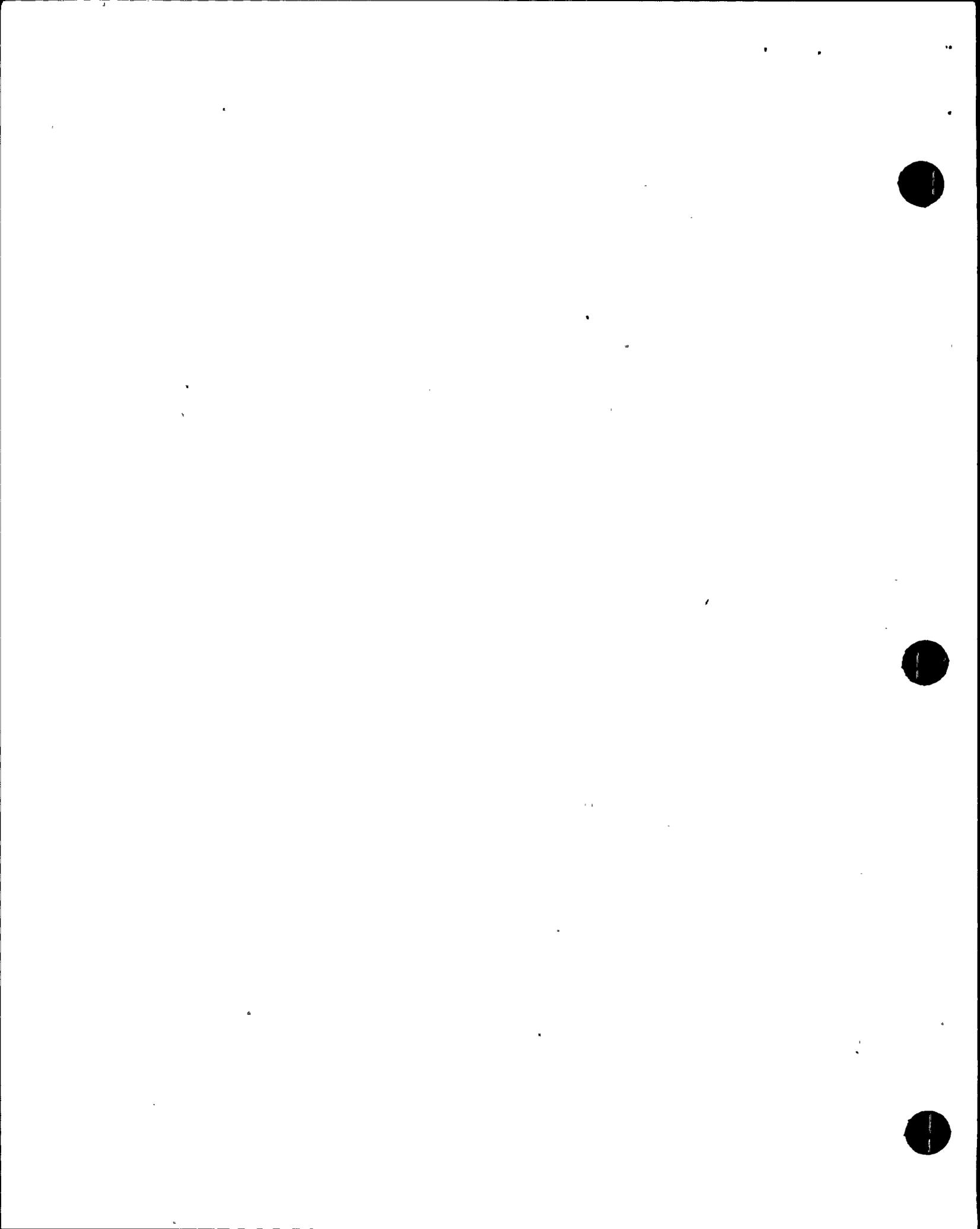
Within the areas examined, no items of noncompliance or deviations were noted except for the infraction noted above.

(c) Visual Examination

The inspectors observed visual examinations of five final pipe welds and two pipe joint fitups, identified below, to determine if the examinations were being performed in accordance with code requirements and licensee's written procedures. In addition, the inspectors personally visually examined several completed pipe welds and one pipe weld preparation, also identified below. The applicable Code is ASME Sections III and V, 1974 Editions with addenda thru winter 1976.

<u>Weld Identification</u>	<u>Pipe Size & Mat'l.</u>	<u>System</u>	<u>Joint Status</u>
2SW167-SW-1	8" Carbon Steel	Service Water	Completed Weld
2SW168-SW-1	8" Carbon Steel	Service Water	Completed Weld
2SW167-FW-264	8" Carbon Steel	Service Water	Completed Weld
2SW167-FW-265	8" Carbon Steel	Service Water	Completed Weld
2SF149-FW-407	12" Stainless Steel	Spent Fuel	Completed Weld
2SW166-FW-270	8" Carbon Steel	Service Water	Joint Fitup
2SW166-FW-271	8" Carbon Steel	Service Water	Joint Fitup
1WC153-FW-337*	6" Carbon Steel	Coolant Water Waste Process	Completed Weld
1WC153-FW-338*	6" Carbon Steel	Coolant Water Waste Process	Completed Weld
1WL165-FW888*	2" Stainless Steel	Waste Liquid	Completed Weld
1WL164-FW883*	2" Stainless Steel	Waste Liquid	Completed Weld
2SW166-FW-270*	8" Carbon Steel	Service Water	Weld End Prep

*Joints visually examined by the inspectors.



The following discrepancies were noted:

- 1 The end of the internal counterbore on weld prep of pipe, to be welded as joint 2SW166-FW-270, had a sharp shoulder (approximately 90°). Figure ND-4233-1 of Section III specifies a 3-1 slope in this area.

This weld prep had already been accepted by the visual examiner, however, when this condition was pointed out to him, he stated that additional work had apparently been done on the weld prep after he had accepted it. The visual examiner had the end of the counterbore faired-in before the joint was fitup.

Prior to fairing-in, this condition was pointed out and discussed with the craftsman supervisor who considered the sharp shoulder to be acceptable.

This discrepancy apparently could be of a programmatic problem. The licensee agreed to review this program concerning weld end preparations and ensure code requirements are not being compromised. This is Unresolved Item Number 50-400/80-23-04 401, 402, 403/80-21-04 "Weld End Preparation Requirements."

- 2 Two 6-inch carbon steel joints (1WC153-FW-337 and FW-338) joining a valve-to-pipe, and two stainless steel joints (1WL165-FW888 and 1WL164-FW883) joining valves-to-pipe, contained sharp transitions between the weld and the valve. Figure 4233-1 of Section III specifies a 3-1 slope between thin and heavy wall material. Although the joints identified above are not code welds, it appears this condition may not be uncommon when welding thin walled material to thick walled components or fittings.

The licensee agreed to review his program and ensure the above described conditions are not being accepted on code welded joints. This will be Inspector Followup Item Number 50-400/80-23-07; 401, 402, 403/80-21-07 "Lack of a 3:1 Slope on Welded Joints."

Within the areas examined, no items of noncompliance or deviations were noted.

(d) Radiographic Examination

The inspectors reviewed radiographic films of the weld joints, listed below, to determine whether they met code requirements and licensee's written procedures. The applicable code is the same as that indicated above.



<u>Joint Nos.</u>	<u>System</u>
1-CT-5-2165-G-119-SW #1	Containment Spray
1-CT-3-2165-G-119-FW #156	Containment Spray
1-CT-9-2165-G-119-FW #199	Containment Spray
1-CT-8-2165-G-119-FW #188	Containment Spray
1-CT-4-2165-G-119-FW #168	Containment Spray
1-CT-8-2165-G-119-FW #190	Containment Spray

In addition, the inspectors reviewed spot radiographs of the welds listed below on the component cooling heat exchangers. Serial Nos. 19A5806-1 and 2, 19A5808-1 and 2, 19A5810-1 and 2 and 19A5812-1 and 2 which had been accepted by Westinghouse Electric Corporation and rejected by CP&L. The applicable code for this radiography is ASME Boiler & Pressure Vessel Code, Section III, 1971 Edition thru summer 1973 addenda and Section VIII (UW-52).

<u>Item</u>	<u>Radiographs</u>
19A5806-1-X616	Spot G-2, Spot G-3, Spot G-4 Seam L-2R1 2-3 Seam L-2R2 3-4
19A5806-2-X629	Spot G-2, Spot G-5, Spot G-6
19A5808-1-X641	Spot G-2, Spot G-4, Spot G-5, Spot G-8
19A5810-1-X653	Spot G-1, Spot G-2, Spot G-3, Spot G-4, Spot G-5, Spot G-6
19A5810-2-X670	Spot G-1, Spot G-5, Spot G-7, Spot G-8
19A5812-1-657	Spot G-1, Spot G-6, Spot G-7, Spot G-9
19A5812-1-X673	Seam L-2 and Seam L-1
19A5812-2-X669	Spot G-1, Spot G-2, Spot G-3, Spot G-4, Spot G-9

CP&L's original rejection of the radiographs and subsequent acceptance of the heat exchangers was documented in Deficiency and Disposition Report No. 374A which is discussed in Paragraph 6.d. herein.

During review of the dark room and associated equipment, it was noted that the lead letter "B", used to detect back scattering on a radiographic film, was positioned at the edge of the film cassette in many cases. In this location the lead letter "B" may not always be positioned behind the specimen being radiographed, e.g., 2-inch diameter and smaller pipe. This was confirmed when the inspectors observed a 2-inch welder qualification test specimen being radiographed. The pipe was placed in the center of the cassette such that the letter "B" would not have been under the pipe.

After a discussion concerning the fact that the purpose of the letter "B" is compromised if it is not located behind the specimen being radiographed, the "B" was re-positioned for the radiography of the welder qualification specimen.

The licensee agreed to review procedures to ensure that the letter is located behind the specimen. This action will be reviewed in subsequent inspections and is identified as Inspector Follow-up Item No. 50-400/80-23-09, 40-401, 402, 403/80-21-09 "Placement of Lead Letter "B" on Film Cassette."

Within the areas examined, there were no items of noncompliance or deviations noted.

(3) Quality Control Inspectors

(a) Discussions with Nondestructive Examiners

1 The inspectors held discussions with three liquid penetrant examiners, four magnetic particle examiners, one NDE supervisor and one Level III examiner. The discussions centered on:

- a How they carry out procedural requirements.
- b Whether they had the necessary qualifications for the level of work being performed.
- c Whether they felt their findings received proper attention.

(b) Review of Qualification Records

The inspectors reviewed the qualification records for individuals qualified to perform visual, liquid penetrant, magnetic particle and radiographic examinations. The following discrepancies were noted:

1 A certified liquid penetrant examiner failed the color perception test in that the vision records for June 28, 1979, show 14 of 15 color plates were incorrectly read. Remarks on this vision record indicate the individual has a red/green color deficiency. The inspector considered that additional color testing should have been administered to ensure the individual is capable of distinguishing the colors pertinent to the NDE he is to perform. The Level III examiner stated that the test specimen given to the individual for the practical exam verified this ability to distinguish the appropriate colors as he is required to evaluate the test results.

The NRC inspectors requested that the four test specimens, given this individual, be penetrant tested in order to see the type of defects displayed by the test pieces. Of the four test pieces penetrant tested, two had no indications, one had a visual saw cut which also showed as a penetrant indication and the fourth test piece had two branch connection welds - one weld having four small indications the other having none.

In analyzing the above, the subject individual may not have demonstrated his capability to see penetrant indications, since the saw cut can be seen visually and would draw the individual's attention to this area and since the records do not indicate which branch connection weld was penetrant tested. Thus, the individual may not have penetrant tested any specimens with defects.

The licensee agreed to examine the action taken to ensure the subject individual is capable of distinguishing penetrant indications and also magnetic particle indications as it was noted that he is also qualified in magnetic particle. This is Unresolved Item Number 50-400/80-23-05; 50-401, 402, 403/80-21-05 "Verify color perception of liquid penetrant/magnetic particle examiner."

- 2 The Level III examiners have numerous test specimens for the practical examination in visual, liquid penetrant and magnetic particle qualifications, but there are no records on file which illustrate the test piece and describes the type and location of defects/indications or unacceptable conditions in these test specimens. Consequently, the Level III examiner must remember what defects existed, or assume the examiner candidate detected all existing defects/indications. Since several of the test specimens have no defects (as indicated above in 1) it appears the practical examination may not be adequate to verify an examiner candidate's ability to detect defects.

The licensee should review this program and ensure it meets the intent of code requirements. This will be Inspector Follow-up Item Number 50-400/80-23-08; 50-401, 402, 403/80-21-08 "Formal Records of Qualification Test Specimens."

(4) Quality Control Procedures

The inspectors reviewed CP&L's Nondestructive Examination Procedures listed below to determine whether the procedures meet code requirements, are adequate to properly control the work, and are

detailed to instruct the QC inspector on exactly what he should be looking for (especially acceptance criteria) when making inspections or observing test.

<u>Procedure No.</u>	<u>Title</u>
NDEP-101, Rev. 3	Radiographic Examination
NDEP-201, Rev. 2	Liquid Penetrant Examination
NDEP-301, Rev. 2	Magnetic Particle Examination
NDEP-402, Rev. 0	Ultrasonic Examination of Welds
NDEP-601, Rev. 2	Visual Examination of Welds
NDEP-10, Rev. 3	Training Qualification and Certification of Nondestructive Examination Personnel
NDEP-50, Rev. 0	Qualification of Nondestructive Examination Procedures.

Within the areas examined, no items of noncompliance or deviations were identified.

d. Nonconforming Items Reports (NCR)

The inspectors reviewed selected reports of construction discrepancies in the form of Deficiency and Disposition Reports (DDRs). Corrective action was examined to verify that:

- (1) The action taken corrected the items,
- (2) determined the cause of the deficiency,
- (3) considered the reportability to NRC, and
- (4) instituted effective action to prevent recurrence.

DDRs reviewed included the following:

DDR # 400	DDR # 371
DDR # 390	DDR # 370
DDR # 381	DDR # 359
DDR # 380	DDR # 355
DDR # 379	DDR # 354
DDR # 377	DDR # 352
*DDR # 374A	DDR # 373

*During review of DDR # 374A the inspectors noted the following problem:

Westinghouse Electric Corporation provided CP&L technical justification for acceptance of the welds and radiographs discussed in Paragraph 6.c.(2)(d). This justification included fracture analysis of a SA 285 Grade C steel heat exchanger to determine the possibility of failure due to a small flaw detected radiographically. The results of the analysis showed that the critical defect size for failure is in excess of 5.5 inches.

A small flaw growing subcritically would penetrate through the thickness causing a leakage which would be detected long before this critical size would be reached. CP&L subsequently accepted the welds and radiographs in question.

The inspectors noted during the data review that portions of the Westinghouse technical justification were missing from the official records file. The missing copies were subsequently found and incorporated as part of the official records. Failure of CP&L to control official records is in noncompliance with 10 CFR 50, Appendix B, Criterion XVII, Quality Assurance Records. This is Deficiency Number 50-400/80-23-03; 401, 402, 403/80-21-03 "QA Documentation Control."

Within the areas examined, no items of noncompliance or deviations were identified except for the deficiency noted above.

e. Materials and Equipment

- (1) The inspectors examined/reviewed the items and certification documentation for the below listed components to determine if meaningful inspections were made to verify that material meets specifications and to what degree the licensee/contractor had inspected or verified performance by the vendor; item meets design and purchase order requirements; and the documentation is adequate; and the item meets design intent.

Component	Heat or Control No.	Unit
8" 90° Sch 100 Elbow	E1XZ	2
8" x 0.500" Pipe	L84062	2
8" x 0.500" Pipe	N93114	1 & 2
8" 90° Sch 100 Elbow	W4633	2
8" x 0.500 Pipe	L63647	2
8" x 0.500 Pipe	L 62089	2

- (2) Welding material purchasing and receiving records for the following materials were reviewed for conformance with applicable procedures and code requirements:

<u>Material Type</u>	<u>Size</u>	<u>Heat/Lot/Control No.</u>
7018	1/8"	421C9521
7018	3/32"	411H7461
7018	3/32"	421E5462

- (3) The inspectors reviewed the purchase documents and certification records for the liquid penetrant materials listed below to ensure they met the code requirements concerning total amounts of sulfur and halogens permitted.



<u>Material</u>	<u>Type</u>	<u>Batch No.</u>
Liquid Penetrant	SKL-S	78L097
Penetrant Cleaner	SKC-S	78C056
Developer	SKD-S	78B082

Within the areas examined, no items of noncompliance or deviations were noted.

f. Audits

The inspectors reviewed the results of corporate audits in the area of welding and NDE. The results reviewed were Audit Reports No. QAA/170-2 and QAA/170-3 and the exit meeting notes from Audit No. QAA/170-4, dated September 16, 1980. (At the time of this inspection QAA/170-4 Audit Report had not been issued.)

During the review of these audits and the reports of required corrective actions, there were no items of noncompliance or deviations noted.

g. Craft QC Training

The inspectors reviewed the outlines for the training courses which have been presented to the craft welding personnel. The outlines reviewed were as follows:

- (1) Welder Craft Training - This is an introductory lecture for new hire welders which introduces the welder to the QA/QC requirements of the welding at this site.
- (2) Weld Symbol Identification Training - This is a special course instituted recently to ensure that craft personnel involved with hanger installation were familiar with welding symbols used in the hanger fabrication drawings. This course was instituted after the NRC resident inspector identified some problems with improper weld symbols on some hanger sketches and additional problems with welder and foremen that did not know what the weld symbols meant and were guessing as to how much weld to apply in some cases. (This course was also given to office personnel in the Engineering and QA Units.)

During the inspections of work activities the inspectors questioned various welding personnel to determine their knowledge of the items covered in the training courses.

There were no items of noncompliance or deviations in this area of the inspection.



7. Safety-Related Piping (Unit 1)

The inspectors observed welding work activities for safety-related piping as described below to determine whether applicable code and procedure requirements were being met. The applicable code for safety-related piping is the ASME B&PV Code, 1974 Edition with addenda through winter 1976.

a. Welding

The below listed welds were examined in process to determine work conducted in accordance with traveler; welder identification and location; welding procedure; WPS assignment welding technique and sequence; material identity; weld geometry; fit-up; temporary attachments; gas purging; preheat; electrical characteristics; shielding gas; welding equipment condition; interpass temperature; interpass cleaning; process control systems; identity of welders; qualification of inspection personnel; and weld history records.

<u>Joint No.</u>	<u>Unit</u>	<u>Size</u>	<u>Stage of Fabrication</u>	<u>System</u>
MS-31-FW-286	1	34" x 2.000	Welding Out	Main Steam

With regard to the above inspection, the inspectors noted the following discrepancies:

- (1) A portable oven was unplugged and the welding rods within were cold. These rods were drawn for use on the subject joint. However, at the time of discovery, the rods had not quite been out of a heated atmosphere beyond the required maximum.
- (2) Welding rods (7018) lying on top of the work area for use on the subject joint were wet from rain dripping through the overhead shelter.

The accompanying site ANI and the welding inspector stopped any further welding and requested radiography of the partially filled joint. The radiographs did not show any unacceptable defects per the report of the ANI.

The above discrepancies are indicative of poor welding controls.

b. Weld Heat Treatment

The inspectors reviewed the CP&L program for weld heat treatment for compliance with QA procedure and code requirements. The weld listed in Paragraph a. above was examined in process relative to weld joint preheating to determine; procedures available; procedures specify acceptable preheating method; procedures provide monitoring and recording requirements and procedure compliance.

c. Welder Qualification

The inspectors reviewed the CP&L program for qualification of welders and welding operators for compliance with QA procedures and ASME Code requirements.

The following welder qualification status records and "Records of Performance Qualification Test" were reviewed relative to the weld joint listed in Paragraph a. above.

<u>Welder Symbol</u>	<u>Unit</u>	<u>Organization</u>	<u>Application</u>
B-49	1	DCC	Safety-Related Piping
A-92	1	DCC	Safety-Related Piping

d. Welding Material Control

The inspectors reviewed the CP&L programs for control of welding materials to determine whether materials are being purchased, accepted, stored and handled in accordance with QA procedures and applicable code requirements. The following specific areas were examined:

Purchasing procedures, receiving, storing, distributing and handling procedures, Material identification, Inspection of welding material issuing stations

Welding material purchasing and receiving records for the following materials were reviewed for conformance with applicable procedures and code requirements:

<u>Process</u>	<u>Type</u>	<u>Size</u>	<u>Heat No.</u>	<u>Organization</u>
GTAW	70S6	3/32"	661C107	CP&L
GTAW	70S6	1/8"	661C107	CP&L
SMAW	7018	3/32"	421C8671	CP&L
SMAW - Shielded metal arc welding				
GTAW - Gas tungsten arc welding				

During a walk-through inspection of the auxiliary building October 2, 1980, the inspectors note that an electrode caddy filled with 7018 electrode had been left unattended and not plugged in, the electrodes were cold to the touch. When advised of the problem, the licensee's welding inspectors verified the problem and generated Nonconformance Report No. NCR W-123 citing a violation of site procedure MP-03, Rev. 9, Paragraph 3.12. This incident along with that described in Paragraph 7.a., above, were examples of a noncompliance against 10 CFR '50, Appendix B, Criterion V. This is Infraction Number 50-400/80-23-02; 50-401, 402, 403/80-21-02, "Weld Rod Control.

No other items of noncompliance or deviations were identified in this area of the inspection.

8. Licensee Identified Items (50.55(e))

a. New 50.55(e) Items

Prior to this inspection the licensee identified the following items as potentially reportable items.

- (1) Epoxy type coating was omitted on a vertical weld area 5-feet long and 8 inches wide on a seismic liner plate located in the containment building. Acceptability of the coating on the remainder of the plate is also questionable. EBASCO and CP&L are evaluating. This item will be evaluated during subsequent inspections. For the record, the above will be identified as License Identified Item 400/80-23-10, "Coating Deficiencies".
- (2) Deficiencies in field welds for 5 pipe hangers have been identified by CP&L. Deficient weld symbols identified on Bergen-Paterson drawings. Wrong welds were made on some field welds. This item will be evaluated during subsequent inspections. For the record the above will be identified as Licensee Identified Item 400/80-23-11; "Pipe Hanger Deficiencies".

9. Inspector Follow-up Items

- a. (Closed) 400, 401/79-20-02: "Studs Certified Material Test Reports". This item concerns vendor provided certificates of compliance for studs vice Certified Material Test Reports (CMTR) as required by Paragraph CC-2624 of the ASME B&PV Code. The licensee has requested and received stud base qualification reports from all their stud vendors, thus completing the documentation required by CC-2624. The inspectors reviewed the above documents and have no further questions. This item is considered closed.
- b. (Closed) 400, 401, 402, 403/80-03-02: "Welding Procedure Weave Width." The inspector reviewed the revisions which had been made to the licensee's welding procedures to provide better description of "weave-" and "stringer-Bead" welding techniques. This will help to ensure that welders and welding inspectors examine weld deposits using the same criteria.
- c. (Closed) 400/80-13-02, 401, 402, 403/80-11-02: "Interrupted Preheating". This item concerns procedural inadequacy in the area of weld preheat maintenance. The licensee revised CP&L Procedures MP-04 and MP-06 to reflect the requirements of Regulatory Guide 1.50. The inspectors have no further questions. This item is considered closed.
- d. (Closed) 400/80-13-03, 401, 402, 403/80-11-03: "Flux Storage". This item concerns procedural inadequacy in the area of submerged arc welding flux storage. The licensee has determined that no submerged arc welding is anticipated and therefore removed the flux storage requirements from their procedures. The inspectors have no further questions. This item is considered closed.

- e. (Closed) 400/80-18-04: "Containment Weld Geometry". This item concerns a notch condition between weld metal and base material the licensee rejected 21-feet of weld and made repairs to the rejected weld area. The inspectors reviewed records for the above and have no further questions. This item is considered closed.