Exhibit 2

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT

PLANT OPERATING MANUAL

VOLUME 3

PART 4

PROCEDURE TYPE: EMERGENCY OPERATING PROCEDURE (EOP)
END PATH PROCEDURE (EPP)

NUMBER: EOP-EPP-010

TITLE: TRANSFER TO COLD LEG RECIRCULATION

REVISION 11

CONTINUOUS USE
Continuous Use of Procedure Required. Read Each Step Before Performing.

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Instructions	Response Not Obtained
NOTE: The following steps will separate the CCW system into two independent headers and isolate the non-essential header. (Isolation of the non-essential header ensures the design CCW flow rate through the RHR heat exchangers.)	
8. Verify CCW Alignment To The RHR Heat Exchangers:	
a. Verify both CCW pumps - RUNNING	a. GO TO Step 9.
b. Verify the following valves - OPEN 1CC-147 1CC-167	
c. Verify CCW flow to the RHR heat exchanger(s).	c. WHEN CCW flow to the RHR HX(s) verified, THEN do Step 8d. Observe NOTE prior to Step 11 AND continue with Step 11.
d. Shut train A CCW non-essential supply AND return valves: 1CC-99 1CC-128	
e. Shut train B CCW non-essential supply AND return valves: 1CC-113 1CC-127	
f. Observe NOTE prior to Step 11 AND GO TO Step 11.	

FOLDOUT

- LOSS OF EMERGENCY COOLANT RECIRCULATION

  IF emergency coolant recirculation can NOT be established OR is subsequently lost, THEN GO TO EPP-012, "LOSS OF EMERGENCY COOLANT RECIRCULATION," Step 1.

- LOSS OF RECIRCULATION SUMP

  IF recirculation sump level (LI-7160A SA (LI-7160B SB)) drops rapidly to less than 43%, THEN stop all pumps taking suction on the affected sump.

- LOSS OF SUCTION

  IF RWST level decreases to 3% (Empty alarm), THEN secure all pumps taking suction only from the RWST.

Instructions	Response Not Obtained
9. Verify CCW Alignment To RHR Heat Exchanger A:	
a. Verify train A CCW pump - RUNNING	a. GO TO Step 10.
b. Verify CCW valve from RHR HX B - SHUT 1CC-167	
c. Verify CCW valve from RHR HX A - OPEN: 1CC-147	
d. Verify CCW flow to RHR HX A.	d. WHEN CCW flow to RHR HX A verified, THEN do Step 9e. Observe NOTE Prior to Step 11 and continue with Step 11.
e. Shut train A CCW non-essential supply AND return valves: 1CC-99 1CC-128	
f. Observe NOTE prior to Step 11 AND GO TO Step 11.	

FOLDOUT

- LOSS OF EMERGENCY COOLANT RECIRCULATION

  IF emergency coolant recirculation can NOT be established OR is subsequently lost, THEN GO TO EPP-012, "LOSS OF EMERGENCY COOLANT RECIRCULATION," Step 1.

- LOSS OF RECIRCULATION SUMP

  IF recirculation sump level (LI-7160A SA (LI-7160B SB)) drops rapidly to less than 43%, THEN stop all pumps taking suction on the affected sump.

- LOSS OF SUCTION

  IF RWST level decreases to 3% (Empty alarm), THEN secure all pumps taking suction only from the RWST.

Instructions	Response Not Obtained
10. Verify CCW Flow To RHR Heat Exchanger B:	
a. Verify train B CCW pump - RUNNING	a. Continue attempts to restore CCW. Observe NOTE prior to Step 11 AND continue with Step 11.
b. Verify CCW valve from RHR HX A - SHUT 1CC-147	
c. Verify CCW valve from RHR HX B - OPEN: 1CC-167	
d. Verify CCW flow to RHR HX B.	d. WHEN CCW flow to RHR HX B verified, THEN do Step 10e. Observe NOTE prior to Step 11 AND continue with Step 11.
e. Shut train B CCW non-essential supply AND return valves: 1CC-113 1CC-127	

FOLDOUT

- AFW SUPPLY SWITCHOVER CRITERIA

  IF CST level decreases to less than 10%, THEN switch the AFW water supply to the ESW system using OP-137, "AUXILIARY FEEDWATER SYSTEM", Section 8.1.

- LOSS OF EMERGENCY COOLANT RECIRCULATION

  IF emergency coolant recirculation can NOT be established OR is subsequently lost, THEN GO TO EPP-012, "LOSS OF EMERGENCY COOLANT RECIRCULATION," Step 1.

- LOSS OF RECIRCULATION SUMP

  IF recirculation sump level (LI-7160A SA (LI-7160B SB)) drops rapidly to less than 43%, THEN stop all pumps taking suction on the affected sump.

- LOSS OF SUCTION

  IF RWST level decreases to 3% (Empty alarm), THEN secure all pumps taking suction only from the RWST.

Instructions	Response Not Obtained
NOTE: Additional foldout item, "AFW SUPPLY SWITCHOVER CRITERIA", applies.	
11. Implement Function Restoration Procedures As Required.	
12. Align CNMT Spray For Recirculation:	
a. Any CNMT spray pump - RUNNING	a. GO TO Step 13.
b. Verify CNMT sump to CNMT spray suction valves - OPEN 1CT-105 1CT-102	
c. Verify RWST to CNMT spray pump suction valves - SHUT 1CT-26 1CT-71	

FOLDOUT

- AFW SUPPLY SWITCHOVER CRITERIA

  IF CST level decreases to less than 10%, THEN switch the AFW water supply to the ESW system using OP-137, "AUXILIARY FEEDWATER SYSTEM", Section 8.1.

- LOSS OF EMERGENCY COOLANT RECIRCULATION

  IF emergency coolant recirculation can NOT be established OR is subsequently lost, THEN GO TO EPP-012, "LOSS OF EMERGENCY COOLANT RECIRCULATION," Step 1.

- LOSS OF RECIRCULATION SUMP

  IF recirculation sump level (LI-7160A SA (LI-7160B SB)) drops rapidly to less than 43%, THEN stop all pumps taking suction on the affected sump.

- LOSS OF SUCTION

  IF RWST level decreases to 3% (Empty alarm), THEN secure all pumps taking suction only from the RWST.

Instructions	Response Not Obtained
13. Consult Plant Operations Staff To Perform The Following: o Restore CCW to the spent fuel pool cooling system using OP-145, "COMPONENT COOLING WATER", Section 8.11. o Sample AND evaluate sump pH. o Evaluate locally placing both CSIP auxiliary oil pump control switches in AUTO. o Evaluate defeating the automatic start of the CSIPs from the emergency safeguards sequencers. (Defeating the CSIP automatic start can be accomplished by de-energizing control power to the sequencers or lifting the associated leads to the respective CSIP control circuits.)	
14. Check Time Since LOCA Initiation - LESS THAN 6.5 HOURS	GO TO EPP-011, "TRANSFER BETWEEN COLD LEG AND HOT LEG RECIRCULATION", Step 1. WHEN EPP-011, "TRANSFER BETWEEN COLD LEG AND HOT LEG RECIRCULATION" completed, THEN RETURN TO procedure and step in effect.
15. Within 6.5 HOURS Of LOCA Initiation, Complete SI Alignment For Hot Leg Recirculation Using EPP-011, "TRANSFER BETWEEN COLD LEG AND HOT LEG RECIRCULATION".	

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT

PLANT OPERATING MANUAL

VOLUME 3

PART 2

PROCEDURE TYPE: Operating Procedure

NUMBER: OP-145

TITLE: Component Cooling Water

8.11 Restoring CCW to Spent Fuel Pool Heat Exchanger after Initiation of Cold Leg Recirculation

8.11.1 Initial Conditions

NOTE: The Spent Fuel pool temperature is predicted to increase to 137 °F in approximately 5 hours and 34 minutes after CCW is isolated to the Spent Fuel Pool Heat Exchanger assuming an initial temperature of 112 °F and maximum normal heat loads subsequent to a LOCA. Actual conditions may lead to slower heat up rates.

1. Time since CCW was isolated to the Spent Fuel Pool Heat Exchanger has been greater than 5 hours and 34 minutes.

2. Spent Fuel Pool temperature is approaching 137 °F.

3. Communications have been established between the operators doing the valve manipulations and the Main Control Room.

8.11.2 Procedural Steps

NOTE: The following steps will restore CCW to the Spent Fuel Pool Heat Exchanger while maintaining at least 5600 gpm to the RHR Heat Exchanger. These steps must be completed prior to the temperature of the Spent Fuel Pool water reaching 150 °F.

1. Verify the following valves are shut:

   a. 1CC-207, CCW TO RCPS.

   b. 1CC-208, CCW TO RCPS.

   c. 1CC-176, CCW TO EXCESS LTDN & RCDT HEAT EXCHANGERS.

   d. 1CC-202, CCW FM EXCESS LTDN & RCDT HEAT EXCHANGERS.

   e. 1CC-304, CCW TO GROSS FAILED FUEL DETECTOR.

   f. 1CC-305, CCW TO GROSS FAILED FUEL DETECTOR.

   g. 1CC-114, CCW TO SAMPLE HEAT EXCHANGERS.

   h. 1CC-115, CCW TO SAMPLE HEAT EXCHANGERS.

2. Locally shut the following manual valves:

   a. 1CC-315, CCW Supply Isolation Valve to Seal Water HX.

   b. 1CC-328, CCW Supply Isolation Vlv to Letdown HX.

   c. 1CC-343, CCW Supply Isolation Valve to BRS Vent Condenser.

   d. 1CC-354, CCW Supply Isolation Vlv to BRS Distillate Cooler.

   e. 1CC-357, CCW Supply Isolation Vlv to BRS Recycle Evaporator Condenser.

   f. 1CC-383, Fuel Pool HX 1&4A CCW Outlet 2nd Isol Vlv.

   g. 1CC-411, Fuel Pool HX 1&4B CCW Outlet 2nd Isolation.

8.11.2 Procedural Steps (continued)

3. Open 1CC-128 (1CC-127), CCW Nonessential Return to Header A(B).

4. Open 1CC-99 (1CC-113), CCW Hx A(B) to Nonessential Supply.

5. Verify that the SFP cooling train which is to be placed in service is aligned to the B Spent Fuel Pool per OP-116.

6. Restore CCW to the Spent Fuel Pool Heat Exchanger that is aligned to the B Spent Fuel Pool. The following steps are written for aligning the A Train CCW to the A Train SFP HX, the B Train is shown in parentheses.

   a. Unlock and shut 1CC-382 (1CC-398), Fuel Pool HX 1&4A (1&4B) CCW Outlet Isolation Valve.

   b. Verify open 1CC-374 (1CC-384), CCW Supply Isol Vlv to Fuel Pool HX 1&4A (1&4B).

   c. Open 1CC-383 (1CC-411),.Fuel Pool HX 1&4A (1&4B) CCW Outlet 2nd Isol Vlv.

   d. While monitoring CCW flow to the RHR HX on FI-688A1 (FI-689A1), slowly throttle open 1CC-382 (1CC-398) to establish flow to the SFP HX while maintaining between 5600 to 5800 gpm flow to the RHR HX.

7. Monitor Spent Fuel Pool temperature to maintain less than 150°F. Throttle open 1CC-382 (1CC-398), Fuel Pool HX 1&4A (1&4B) CCW Outlet Isolation Valve as necessary while ensuring FI-688A1(FI-689A1) remains above 5600 gpm.

8. Document component manipulations per OMM-001.

Exhibit 3

SYSTEM# 5165, 5175, 5185
CALC. TYPE EACSYS

CAROLINA POWER & LIGHT COMPANY

CALCULATION NO. E-6000

FOR

AUXILIARY SYSTEM LOAD STUDY

FOR

SHEARON HARRIS NUCLEAR POWER PLANT

NUCLEAR ENGINEERING DEPARTMENT

QUALITY CLASS: ■ A ☐ B ☐ C ☐ D ☐ E

Rev. No.	RESPONSIBLE ENGINEER DATE	■ DESIGN VERIFIED BY ☐ ENGINEERING REVIEW BY DATE	APPROVED BY RESPONSIBLE SUPERVISOR DATE
0-5	See original Cover Sheets (following pages)		
6	Robert R. Larsen	RAMESH H. Mehta	Bharat B. Ajmani
	4/13/99	4/16/99	4/19/99
REASON FOR CHANGE: See Revision Summary			
REASON FOR CHANGE:			
REASON FOR CHANGE:			

REVISION SUMMARY

Rev. #	Revision Summary
0-5	See original cover sheet.
6	Incorporated Spent Fuel Pool C & D Activation Project (ESR 95-00425). The specific changes are as follows: Added a 150 hp motor each to buses 1&4A33-SA and 1&4B33-SB. Added the motor's heater loads to PP1&4A33-SA and PP1&4B33-SB. Revised the feeder cable length for 1&4A33-SA and 1&4B33-SB. Also revised the limiting loading value for these busses. Added a 60 hp motor each to busses 1-4A1021 and 1-4B1021. Added the motor's heater load to PP1-4A10221 and PP1-4B10212. Added a 40 hp motor to Bus 1-4B1021. Added new LCP loads to PP1-4A10221, PP1-4A111 and PP1-4B111. Also corrected the existing SFP Cooling Pump and Purification Pump motors to show load required during shutdown/refueling. Also incorporated the outstanding changes listed on page iii. The specific changes associated with the safety related busses are as follows: Bus 1A-SA – revise the bhp for the ESW pump motor. Bus 1A21-SA – revised bhp values for Fan S-2 and S-4, also revised LP-118 and LP-134 loading. Revised the starting of MOVs 3CZB3, 3CZB11 and 3CZB9 to start in any load block. Bus 1A36-SA – revised steady state minimum voltage requirement. Revised the starting of MOVs 3CZB5, 3CZB7, 3CZB1, 3CZB13, 3CZB17, 3CZB25 & R2 to start in any load block. Revised EHC-72 to be on in any load block. Bus 1A35-SA – revised bhp of MOV 2CSL523-SA-1, revised the starting of P1A-SA to start in any load bock. Bus 1&4A33-SA – revised LP-502 loading, revised the starting of E-12 to start in any load block. Bus 1A32-SA – revised the starting of E-88 to start in any load block. Bus 1A31-SA – revised the starting of Fan S-68, Pumps 2MS-P18 and 2MS-P20 to start in any load block. PP1A211-SA reduced load. Bus 1B-SB – revised bhp for ESW pump motor. Bus 1B21-SB – revised bhp values for Fan S-2 and S-4, also revised LP-119 and LP-534 loading. Revised the starting of MOVs 3CZB10, 3CZB12 & 3CZB4 to start in any load block. Bus 1B36-SB – revised steady state minimum voltage requirements. Bus 1B35-SB – revised bhp of MOV 2CSL522-SB-1, revised the starting of Boric Acid Transfer Pump 1B to start in any load block. Bus 1&4B33-SB – revised the starting of E-13 to start in any load block. Bus 1B31-SB – revised the starting of 2MS-P19 to start in any load block. Bus 1B32-SB – revised the starting of E-88 to start in any load block. Bus 1B36-SB – revised the starting of MOVs 3CZB14, 3CZB18, 3CZB2, 3CZB20, 3CZB22, 3CZB24, 3CZB26, 3CZB6, 3CZB8 & R2 to start in any load block. Revised EHC-72 to be on in any load block. PP1B211-SB reduced load. The BOP buses load changes associated with the ESRs listed on page iii, were incorporated into the AFLSC, BFLSC, Q1 Load List, Q2 Load List, AOVERSUT & BOVERSUT databases. The full load runs and LOCA runs were not revised since the new load changes are enveloped by the existing future load margin/POLDF data. Incorporated changes due to Calculation E-6003, Rev. 3. This revision changed the methodology used for performing the LOCA/LOOP & LOOP (EDG) Load/Voltage Study, LOCA Voltage Study (including DGVR reset analysis), and Degraded-Grid Voltage Relay Dropout Setting Study. The methodology used for

	determining the transformer and cable losses for the diesel loading was also revised. This revision also revised the POLDF data and ESW Pump hp values utilized for the LOCA runs. The following outstanding ESRs were incorporated: ESR 94-00013, Rev.0, ESR 94-00067, Rev.0*, ESR 94-00171, Draft Rev.0*, ESR 94-00543, Rev.1, ESR 94-00151, Rev.0, ESR 95-00085, Rev.0*, ESR 95-00153, Rev.0*, ESR 95-00215, Rev.1*, ESR 95-00311, Rev.0, ESR 95-00410, Rev.0, ESR 95-00425, Rev.0*, ESR 95-00427, Rev.8,9,10, ESR 95-00431, Rev.0*, ESR 95-00565, Rev.0, ESR 95-00908, Rev.0, ESR 95-00939, Rev.0*, ESR 95-00993, Rev.0, ESR 95-00995, Rev.0*,4, ESR 95-00997, Rev.0*, ESR 95-01001, Rev.0*, ESR 95-01031, Rev.0, ESR 96-00025, Rev.2,3, ESR 96-00116, Rev.0, ESR 96-00163, Rev.3, ESR 96-00216, Rev.0, ESR 96-00226, Rev.0, ESR 96-00315, Rev.0, ESR 96-00320, Rev.0, ESR 96-00511, Rev.0, ESR 97-00183, Rev.2, ESR 97-00237, Rev.1&2, ESR 97-00248, Rev.0, ESR 97-00368, Rev.0,2, ESR 97-00559, Rev.0, ESR 98-00006, Rev.0*,2*, ESR 98-00058, Rev.0, PCR-5767, Rev.0 *** Indicates that the ESR has not been field implemented. These ESRs should be reviewed during the next revision of this calculation to verify that they were not cancelled, revised, etc.**

Computed by: Robert R. Larsen	Date: 4/13/99	CAROLINA POWER & LIGHT COMPANY	Calculation ID: E-6000	
Checked by: Raul H. Kelly	Date: 4/16/99	CALCULATION SHEET	Pg. 1 of 6	Rev. 6
TAR/PID No.: N/A			File: N/A	
Project Title:				
Calculation Title: Auxiliary System Load Study				
Status: Prelim. ☐ Final ☒ Void ☐				

1.0 PURPOSE

1.1 E-6000 serves in the following capacities:

- Performs load list analyses to tabulate maximum expected bus loadings during various plant conditions
- Performs voltage drop analyses under full load conditions
- Performs overvoltage analyses under shutdown conditions
- Performs voltage drop analyses during load sequencing via offsite power and via standby diesel generators
- Analyzes auxiliary system degraded voltage performance to support undervoltage relay settings per Branch Technical Position PSB-1
- Performs short circuit analyses to determine available fault currents in order to assure that installed equipment ratings are not exceeded

2.0 LIST OF REFERENCES

2.1 Calculation E-6001 Rev.2, "Load Factor Study"

2.2 AUXSYS 4078 User's Manual for Electrical Auxiliary System Design Rev. 2, 12/89

2.3 Calculation E-6003 Rev. 3, "Minimum and Maximum Operating Voltages Required for Class 1E Buses"

2.4 Design Basis Document #202 Rev. 4, "Plant Electrical Systems, Off Site Power Systems, Generator, Exciter, Isolated Phase Bus Duct, Generator & Exciter Mechanical Support Systems"

2.5 Calculation 17-EP Rev. 2, "Diesel Generator Load Sequence Voltage Profile"

3.0 CALCULATION

This study is an analysis of the Harris Nuclear Plant (HNP) electrical auxiliary system under various loading conditions. Computer databases are developed utilizing load input from electrical calculation E-6001 for use with Ebasco software programs ESMS4128 and AUXSYS4078. Synopses of these databases are located in Tab D of this calculation. Configuration of the HNP electrical distribution system is modeled in accordance with sketch SK-H0183-E-3100 shown in Tab W. Computer analyses are then performed to calculate load lists, bus voltages, and short circuit currents based on the E-6000 databases.

3.1 Load List Analyses

The loading of the auxiliary system under various plant scenarios is tabulated via a load list on a per train basis. In order to quantify loading under various plant conditions (full load, shutdown, start-up, Loss-of-Coolant Accident (LOCA) and LOCA/Loss-of-Offsite Power (LOCA/LOOP), a Train-A and Train-B load list is generated based upon electrical calculation E-6001 and E-6000 Tab L. These load lists are located in a separate binder and are further described in Tab Q. Results of the load list analyses are summarized in Tab B. Details concerning total plant load magnitudes given to the Transmission Planning group are located in Tab R.

3.2 Undervoltage Analyses under Full-load Conditions

Bounding analyses are performed to envelop minimum expected voltages throughout the plant distribution system during both winter and summer full-load conditions with plant loads fed via either the Unit Auxiliary Transformers (UATs) or Start-Up Transformers (SUTs). Details concerning the databases set-up to bound these conditions are located in Tab D. When analyzing the Train-A distribution system, all redundant loads are assumed operating from applicable Train-A buses. Under minimum possible voltage conditions as discussed with Transmission Planning, the effect on bus voltages with all expected loads running and with various 6.9kV and 480V large motors starting is investigated. This process is repeated for Train-B with redundant loads assumed operating from Train-B buses. Results of the full-load voltage analyses are located in Tab B.

3.3 Overvoltage Analyses During Shutdown Conditions

Existing transformer tap settings are verified to provide satisfactory bus voltage levels within maximum allowable voltage criteria under minimum load conditions. For the overvoltage analyses, the plant is modeled at minimum load during shutdown conditions while connected to the 230kV switchyard via the start-up transformers. The switchyard is set at its maximum expected voltage per discussions with Transmission Planning (see Tab M). A summary of the results of the overvoltage analyses is located in Tab B.

3.4 LOCA/LOOP & LOOP (EDG) Load / Voltage Study

Analyses are performed to determine EDG terminal voltage and worst-case EDG loading during both LOCA/LOOP sequencing and LOOP sequencing. To determine worst-case EDG loading, the LOCA/LOOP and LOOP scenarios have been combined into one conservative, enveloping scenario called LOCA/LOOP-LOOP. EDG terminal voltage during sequencing is obtained from data collected during the 18 month surveillance test. Tab L, Appendix C provides a copy of the EDG terminal voltage data collected during OST testing. Tab D, Section 3.4 describes the computer database used in the EDG loading analysis. Tab L provides details of the load model and methodology. Results are summarized in Tab B, Section 3.4.

3.5 LOCA Voltage Study (Offsite Power Available)

Analyses are performed to calculate minimum available voltages throughout the emergency power system during and after LOCA load sequencing with the auxiliary electrical distribution system supplied from offsite power. A detailed study of emergency power system loads is conducted in Tab L to determine worst case loading during a LOCA. The loading on associated BOP buses is modeled with "lump" motor loads as detailed in Tab E.

With the 230kV switchyard set at its minimum expected voltage, LOCA voltage analyses are performed to calculate minimum expected emergency power system voltages during motor starting and at the end of each load block. Additionally, a detailed study is provided to demonstrate the ability to "reset" the degraded grid voltage relay (DGVR) during LOCA sequencing. Tab D, Sections 3.6 & 3.7 provide details of the databases used. Results of the LOCA voltage studies are shown in Tab B, Section 3.5.

3.6 Degraded-Grid Voltage Relay Dropout Setting Study

Analyses are performed to calculate minimum available voltages throughout the emergency power system during switchyard degraded voltage conditions. Loads fed from emergency power system buses are modeled in a steady-state operating condition in accordance with the LOCA sequencing study in Tab L. Operation of motor operated valves is enveloped by modeling the largest motor operated valve on each MCC as running. The loading on associated BOP buses is modeled with "lump" motor loads as detailed in Tab E.

To verify adequacy of the degraded grid voltage relay (DGVR) dropout setting, the switchyard voltage is incrementally reduced until the voltage at the 6.9kV emergency bus reaches the lowest allowed "as-left" DGVR dropout setting with tolerance. The resultant emergency power system voltages are then compared with their steady-state criteria voltage (as determined in Calculation E-6003). Tab B, Section 3.6 contains a summary of the voltages present throughout the emergency power system at the DGVR dropout setting.

3.7 Plant Operating Load Demand Factors

In the normal full-load, LOCA, and degraded-grid voltage analyses, plant operating load demand factors (POLDFs) are utilized for various non-safety related buses. By using these factors, more realistic normal full-load voltages are calculated. Also, for LOCA and degraded-grid voltage analyses, the factors enable the use of lump motor loads to simplify databases while still accounting for the impact of non-safety related loads on the Class-1E portion of the distribution system. POLDFs are developed for the non-safety related buses shown below.

Train-A Buses	Train-B Buses
1D1	1E1
1D2	1E2
1D3	1E3
1-4AA	1-4AB

Table 1: Non-Safety Related Buses Modeled per POLDF Data

Tabs D and E of this calculation contain further details concerning the use of POLDF data for the above buses in voltage analyses.

3.8 Short Circuit Analysis

In order to determine worst-case short circuit currents available throughout the auxiliary system, the following analyses are performed on a per train basis:

1) Analysis with maximum motor contribution and a high prefault voltage of 1.0 pu.

   Maximum motor contribution is modeled by running all Class-1E motors shown as starting or running in load block #9 of the LOCA sequencing study described in Tab L as well as Non-class 1E motors specified as running during winter or summer full-load conditions per calculation E-6001. Also, the effects of the main generator, security diesel generator, and emergency diesel generators are included in the analysis. The Train-A and Train-B full-load short circuit databases are utilized for generation of these analyses with maximum motor contribution and a 1.0 pu high prefault voltage.

2) Analysis with minimum motor contribution and a maximum prefault voltage.

   Minimum motor contribution is modeled by running all motors specified as normally operating during shutdown conditions as noted in calculation E-6001. Also, in order to envelop motor testing and other intermittent motor operation during shutdown, the largest motor other than those already noted as normally running during shutdown conditions is modeled as running in the study. The Train-A and Train-B shutdown databases are utilized for generation of these short circuit analyses. Maximum prefault voltages are applied to the system as described in section 3.3 of Tab B.

A comparison of the results from the above analyses is conducted in Tab B. Worst-case available short circuit currents are identified for comparison with installed equipment capabilities. Maximum acceptable short circuit currents are based upon installed bus ratings and circuit breaker interrupting capabilities.

4.0 CONCLUSIONS

Overall, the electrical auxiliary system meets design requirements for proper operation of equipment via both onsite (emergency diesel generators) and offsite (230kV switchyard) power sources. Acceptable switchyard voltages have been discussed and agreed-upon between HNP and Transmission Planning personnel (see Tab M). Details regarding the results of the various analyses are located in Tab B.

Table 6: ***Train-A LOCA/LOOP and LOOP Loading***

LOAD BLOCK	STARTING				RUNNING			
	kVA	kW	kVAR	PF	kVA	kW[1]	kVAR	PF
1	6987.1	2075.4	6671.8	0.30	1305.8	1190.5	536.5	0.91
2	6115.2	2640.3	5515.8	0.43	1976.3	1788.2	841.4	0.90
3	9419.2	3667.4	8675.9	0.39	3083.2	2761.4	1371.4	0.90
4	9542.2	4390.4	8472.2	0.46	3728.4	3364.2	1607.1	0.90
5	8574.8	4555.6	7264.6	0.53	4366.1	3930.4	1901.2	0.90
6	6777.9	4527.2	5044.2	0.67	4703.6	4246.0	2023.8	0.90
7	6086.9	4497.8	4101.2	0.74	4676.0	4221.3	2011.4	0.90
8	9842.2	5524.8	8145.3	0.56	5408.9	4887.8	2316.4	0.90
9	7994.5	6317.9	4898.6	0.79	6582.8	6030.6	2639.2	0.92

Table 7: ***Train-B LOCA/LOOP and LOOP Loading***

LOAD BLOCK	STARTING				RUNNING			
	kVA	kW	kVAR	PF	kVA	kW[1]	kVAR	PF
1	7002.3	2043.9	6697.4	0.29	1286.5	1161.7	552.8	0.90
2	6051.2	2628.2	5450.7	0.43	1960.1	1762.0	858.6	0.90
3	9410.2	3641.4	8677.1	0.39	3067.3	2735.0	1388.5	0.89
4	9514.8	4366.4	8453.8	0.46	3711.5	3337.3	1624.2	0.90
5	8561.7	4537.0	7260.7	0.53	4354.7	3908.3	1920.6	0.90
6	6717.0	4463.0	5020.0	0.66	4653.6	4183.6	2038.0	0.90
7	6009.9	4429.0	4062.4	0.74	4620.0	4153.9	2022.3	0.90
8	9786.3	5460.4	8121.3	0.56	5353.1	4820.8	2327.2	0.90
9	7915.9	6245.5	4863.6	0.79	6515.5	5957.0	2639.3	0.91

NOTES FOR TABLES 6 & 7

1. Running kW load data is used in FSAR TABLES 8.3.1-2a and 8.3.1-2b. Revisions to this data may require an FSAR revision. See Section 4.2.4. Cable & transformer losses of 40kW must be added to the load block 9 "running load" in order to determine final EDG steady-state loading after sequencing.

Exhibit 4

HOLTEC INTERNATIONAL

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STUDY / SCOPING REPORT

for the

FUEL STORAGE PROJECT IN POOLS C AND D

of

HARRIS NUCLEAR PLANT

for

CP&L

Holtec Report No: HI-971703

Holtec Project No: 70324

Report Category: A

Report Class: Safety Related

COMPANY PRIVATE

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Executive Summary

This report presents a feasibility and scoping study of the racking project for pools C and D of the Harris Nuclear Plant. The project will provide increased storage capacity to accommodate spent fuel from Harris, Robinson, and Brunswick plants. Since the fuel discharge rates of the plants contain a number of unquantifiable variables, maximum flexibility in storage configurations is sought. This flexibility requires a development of various rack layouts to accommodate a range in the number of storage locations for both PWR and BWR assemblies. This report evaluates the criticality, thermal-hydraulic, and structural aspects of the PWR and BWR storage racks proposed by Holtec International.

The report has been similarly arranged to the format of the licensing amendment application report expected by the NRC and used successfully for numerous previous re-racking projects. Chapters 1 through 3 provide general descriptions of the project and rack hardware. Chapter 4 includes criticality evaluations extracted from other plants with similar rack designs and fuel types. Chapter 5 develops an overall pool heat load and discusses other pertinent thermal hydraulic issues and associated analysis techniques. Chapter 6 discusses rack dynamic analysis methodology and the results from preliminary rack stability evaluations. Chapter 7 presents the pool structure evaluation methodology.

The final licensing amendment application report will, of course, be much more extensive and will cover the results of all analyses required to be performed for licensing of the new storage racks.

All information in the final report will be prepared in unison with the ongoing CP&L project to complete the spent fuel pool cooling and cleanup system for pools C and D, which was abandoned during construction. The pool heat load and thermal hydraulic

methods discussed herein provide a starting point for design input development.

The conclusion which may be developed from this scoping report and supporting documentation is that the proposed rack designs are suitable for the intended application at Harris Nuclear Plant. The racks will perform in an acceptable manner under all postulated conditions and provide for maximum flexibility and storage capacity increases on an as needed basis.

4.7.1 are pertinent to the higher-reactivity unborated case.

4.7.2 Dropped Fuel Assembly

For a drop on top of the rack, the fuel assembly will come to rest horizontally on top of the rack with a minimum separation distance from the fuel in the rack of more than 12 inches, including an estimated allowance for deformation under seismic or accident conditions. At this separation distance, the effect on reactivity is insignificant (<0.0001 δk). Furthermore, soluble boron in the pool water would substantially reduce the reactivity and assure that the true reactivity is always less than the limiting value for any probable dropped fuel accident. Consequently, fuel assembly drop accident will not result in a significant increase in reactivity due to the separation distance.

4.7.3 Lateral Rack Movement

Lateral motion of the rack modules under seismic conditions could potentially alter the spacing between rack modules. Region 2 storage cells do not use a flux-trap and the reactivity is therefore insensitive to the spacing between modules. The spacing between modules is sufficiently large to preclude adverse interaction even with the maximum seismically-induced reduction in spacing. Furthermore, soluble poison would assure that a reactivity less than the design limitation is maintained under all accident or abnormal conditions.

4.7.4 Abnormal Location of a PWR Fuel Assembly

The abnormal location of a fresh unirradiated fuel assembly of 5.0 w/o enrichment could, in the absence of soluble poison, result in exceeding the design reactivity limitation (k_∞ of 0.95). This could occur if a fresh fuel assembly of the highest permissible enrichment were to be either positioned outside and adjacent to a storage

rack module or inadvertently loaded into a storage cell. The largest reactivity increase results if a fresh unburned assembly (5.0 w/o enrichment) were to be accidentally installed in a cell with the surrounding cells filled with fuel of the highest permissible reactivity. Calculations for this condition resulted in a maximum reactivity of 0.990, including uncertainties. Soluble boron in the spent fuel pool water, for which credit is permitted under these accident conditions, would assure that the reactivity is maintained substantially less than the design limitation. It is estimated that a soluble poison concentration of 400 ppm boron would be sufficient to maintain a k_∞ less than 0.95 (including uncertainties) under the maximum postulated accident condition.

4.7.5 Abnormal Location of a BWR Fuel Assembly

This accident is not a postulated event, since the worst case reactivity is considered for BWR fuel assemblies.

4.7.6 Eccentric Fuel Assembly Positioning

The fuel assembly is normally located in the center of the storage rack cell with bottom fittings and spacers that mechanically restrict lateral movement of the fuel assemblies. Nevertheless, calculations with the fuel assembly moved into the corner of the storage rack cell (four-assembly cluster at closest approach), resulted in a small negative reactivity effect. Thus, the nominal case, with the fuel assembly positioned in the center of the storage cell, yields the higher reactivity.

4.7.7 BWR Fuel Zirconium Channel Distortion

Consequences of bulging of the zirconium fuel channel are treated as a mechanical deviation in Section 4.6.2.6. Bowing of the zirconium channel (including fuel rods) results in a local negative reactivity effect analogous to that

Exhibit 5

CP&L

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SERIAL: HNP-99-069

APR 30 1999

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION
REGARDING THE ALTERNATIVE PLAN FOR SPENT FUEL POOL
COOLING AND CLEANUP SYSTEM PIPING

Dear Sir or Madam:

By letter dated March 24, 1999, the NRC requested additional information regarding the Harris Nuclear Plant (HNP) license amendment request to place spent fuel pools 'C' and 'D' in service. Enclosure 8 of the HNP license amendment request (ref. SERIAL: HNP-98-188, dated December 23, 1998) provided a detailed description of the proposed alternatives to demonstrate compliance with ASME B&PV Code requirements for spent fuel pool cooling and cleanup system piping in accordance with 10 CFR 50.55a(a)(3)(i). The NRC has determined that additional information is required to complete the review of the proposed alternative piping plan. Enclosed is the HNP response to the NRC request for additional information. The enclosed information is provided as a supplement to our December 23, 1998 submittal and does not change our initial determination that the proposed license amendment represents a no significant hazards consideration.

Please refer any questions regarding the enclosed information to Mr. Steven Edwards at (919) 362-2498.

Sincerely,

Donna B. Alexander

Donna B. Alexander
Manager, Regulatory Affairs
Harris Nuclear Plant

KWS/kws

Enclosures

c:

Mr. J. B. Brady, NRC Senior Resident Inspector (w/ Enclosure 1)
Mr. Mel Fry, N.C. DEHNR (w/ Enclosure 1)
Mr. R. J. Laufer, NRC Project Manager (w/ all Enclosures)
Mr. L. A. Reyes, NRC Regional Administrator (w/ Enclosure 1)

bc: (w/o enclosures)

Mr. K. B. Altman
Mr. G. E. Attarian
Mr. R. H. Bazemore
Mr. S. R. Carr
Mr. J. R. Caves
Mr. H. K. Chernoff (RNP)
Mr. B. H. Clark
Mr. W. F. Conway
Mr. G. W. Davis
Mr. W. J. Dorman (BNP)
Mr. R. S. Edwards
Mr. R. J. Field
Mr. K. N. Harris
Ms. L. N. Hartz
Mr. W J. Hindman
Mr. C. S. Hinnant
Mr. W. D. Johnson
Mr. G. J. Kline
Ms. W. C. Langston (PE&RAS File)
Mr. R. D. Martin
Mr. T. C. Morton
Mr. J. H. O'Neill, Jr.
Mr. J. M. Taylor
Nuclear Records
Harris Licensing File
Files: H-X-0511
H-X-0642

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION REGARDING THE ALTERNATIVE PLAN FOR SPENT FUEL POOL COOLING AND CLEANUP SYSTEM PIPING

I. Existing Piping System

A. Detailed description of the proposed change:

Requested Item I.A.1

Provide isometric drawings (isometrics) showing all piping and piping systems within the scope of the proposed alternatives; i.e., for fuel pool cooling and cleanup system (FPCCS) and component cooling water system (CCWS) piping. Provide Isometric drawings to be used for continuance of design and construction without an N-Stamp.

Response to Requested Item I.A.1

Copies of the original construction isometrics are provided in Enclosure 2 and have been marked up to show:

- installed piping (in scope of the Alternative Plan)
- embedded piping
- class boundaries, including safety vs. non-safety related
- location and identification of field welds

In addition, please note that these isometrics include the following information:

- material requirements for piping and fittings
- pipe spool numbers (traceable to vendor data packages)
- location of hanger attachment lug welds

These markups were based upon detailed field walk downs of the current system configuration. Documented verification of these details will be provided by the system turnover / certification process used to implement this activity (ref. responses to RAI items II.2 & 3). Piping outside of Code boundaries is identified on these isometrics only for the purpose of depicting continuity.

Requested Item I.A.2

Provide weld matrixes that list all the welds (each weld should be uniquely identified and traceable to I.A.1 above) within the scope of the alternatives.

Response to Requested Item I.A.2

A matrix is provided in Enclosure 3 for each of the field welds in the scope of the Code related piping discussed in I.A.1. For clarity, in-scope field welds are defined herein as that set of field welds which meet all of the following criteria:

(1) is installed in the ASME Section III Class 3 boundaries of the Component Cooling Water or Spent Fuel Pool Cooling Systems
(2) was installed during original plant construction,
(3) Code required field installation records are no longer available
(4) is consistent with the design of the system as it will be completed
(5) is in the "large-bore" piping on the main system flow path. Instrument lines, vents and drains, branch connections to other systems, etc., are not included.

Requested Item I.A.3

(i) In the matrixes or isometrics, identify the piping material (ASME / ASTM Specification), weld material (ASME / ASTM Specification), the existence of all required material documentation, and any specific missing documentation. (ii) Identify each missing document for each weld. (iii) Identify the method(s) used for reconciliation of each type of missing document. (e.g., missing Certified Material Test Report reconstructed with complete chemical analysis run on shavings taken from the material). (iv) For the sampling and testing methods used for reconciliation, identify references used for guidance. (i.e., NRC DG-1070, ASME, or EPRI). Explain any differences between the sampling / testing methods and the selected referenced guidance. (v) For chemical analysis, identify sample size and chemical analysis (mean and standard deviation for each element) for each analyzing technique.

Response to Requested Item I.A.3

(i) The weld matrix (Enclosure 3) includes a listing of weld material based on a review of applicable Weld Procedure Specifications (WPS) and Weld Data Reports (WDR) for comparable piping. Note that piping material requirements are included in the isometrics provided in response to requested item I.A.1. All Code piping in the scope of the Alternative Plan has been supplied by an NPT Stamp holder and vendor documentation for this material is on hand. This accounts for material certification for all of the piping within the scope of the Alternative Plan and the large majority of the welds in that piping. The outstanding material certification issue to be addressed herein is that associated with welding materials for a relatively small group of field installed welds on the large bore (12" and up) Code piping. During construction,

filler metal traceability was accomplished by recording the material heat number on the WDR. The WDR was incorporated into the piping installation package, and typically became the only source of this information to be forwarded to document control. Since the WDRs for these field welds are not on hand, the traceability of filler metal cannot be established.

(ii) The WDR was used to provide the installation record for field welds. Generally, these reports are no longer on hand for the subject welds.

(iii) The WDR contained information pertaining to weld attributes, including identification of the items being welded, specification of the WPS to be used, welder identification, filler metal material identification, NDE requirements, and signature documentation (including that of the ANI) that all required attributes were satisfactorily performed and verified as complete. Reconciliation of missing information is presented in the weld matrix discussed in response to requested item I.B.4.

(iv) The sample size chosen for verifying filler metal composition of accessible (i.e., non-embedded) field welds is 100%. All of the accessible field welds (including welds for hanger lugs) in the large bore stainless steel Spent Fuel Pool Cooling System piping subject to the Alternative Plan have been evaluated for material composition using a Metorex X-Met Alloy Analyzer. Additionally, three of these stainless steel welds have been subject to laboratory analysis of chip samples to verify chemical composition. All three of the large bore carbon steel field welds in the CCW System subject to the Alternative Plan will be evaluated by laboratory analysis of chip samples since the alloy analyzer does not lend itself to reliable evaluation of this material. The use of these specific methods for determination of base metal is provided in the Corporate Welding Manual, Procedure NW-16. Chemical analysis was and will continue to be performed by a reputable and recognized laboratory (NSL Analytical Services, Inc of Cleveland, Ohio for completed analyses) to traceable standards. Since some blending of filler metal and base metal may have occurred with the field welds in question, the results of the filler metal analysis is being evaluated by CP&L's Materials Services Section - Metallurgy Unit (See Enclosure 4 for analysis of SFP field welds).

(v) Relative to physical sample size, Corporate Welding Manual Procedure NW-16 calls for the removal of about 5 grams of material for this type of analysis. The precise weight of the sample taken was not recorded, but was sufficient to facilitate the testing for which results are provided herein. Relative to the number of welds subject to chemical analysis, three of the field welds in the stainless steel Spent Fuel Pool Cooling piping were subject to composition analysis by both the alloy analyzer and chemical analysis of chip samples. Note that the purpose of subjecting these three welds to chemical analysis was not to provide inference to the entire population, but rather to demonstrate consistency with the alloy analyzer. Since the alloy analyzer does not lend itself to reliable composition analysis with carbon steels, all three CCW field welds will also be subject to laboratory analysis for material composition. The accuracy of the chemical analysis method for each element is listed in the laboratory

test report. The laboratory analysis report from the three stainless steel samples already completed is included in Enclosure 4.

Requested Item 1.A.4

In the matrixes or on the isometrics, identify inaccessible non-embedded welds and embedded welds (all other welds should be accessible).

Response to Requested Item I.A.4

The isometrics are marked up to show which field welds are embedded and thereby inaccessible (Enclosure 2). All field welds which are not embedded are externally accessible.

Requested Item I.A.5

On the isometrics, indicate the specific location of each weld listed in I.A.2 and identify the boundaries of the systems that are considered safety related. Identify all non-safety related items that appear on the isometrics.

Response to Requested Item I.A.5

The isometrics are marked up accordingly (Enclosure 2).

Requested Item I.A.6

(i) Identify in the matrixes, or on the isometrics, the welds that will be or have been inspected or re-inspected that have Code documentation, welds that have been inspected that do not have Code documentation, and welds that will be or have been inspected or re-inspected not to Code. (ii) For the welds that will be or have been inspected or re-inspected but not to Code, describe the inspection technique, acceptance criteria, and documentation. (iii) Identify the edition and addenda of ASME Code that will be or has been used for the above inspections and re-inspections.

Response to Requested Item I.A.6

(i) Code documentation for welds performed by the piping vendor are included in the vendor data packages. As noted in the Alternative Plan (Enclosure 8 to HNP-98-188, dated 12/23/98), this accounts for approximately 160 of the roughly 200 welds in the large bore Spent Fuel Pool Cooling piping. Based on available evidence, all of the 40 piping field welds and the 12 hanger attachment pad welds were inspected to Code requirements, but generally do not have the Code required documentation available.

Documentation which is on hand for these field welds is listed on the matrix prepared in response to requested item I.A.2. (Enclosure 3).

(ii & iii) The accessible field welds within the scope of the Alternative Plan have been re-inspected using original surface examination criteria from ASME Section III, 1974 - winter 1976 Addenda, ND-5000. A portion of the inaccessible (embedded) field welds will be subjected to internal inspections using a high resolution, remotely operated video camera mounted on a pipe crawler. Details of these camera inspections, including inspection technique and acceptance criteria, are provided in response to requested items III.3 & III.4.

Requested Item I.A.7

Identify any non safety related items installed during the original construction which will be upgraded to safety related status by this amendment; e.g., will any of the non-safety-related ANSI B31.1 piping (Enclosure 8, page 7 of the submittal) be upgraded?

Response to Requested Item I.A.7

No such items installed during original construction will be upgraded for use in a Code application in support of this activity. No B31.1 piping will be upgraded for use in a Code or safety-related application. The turnover of piping and equipment within the scope of this activity will include a review of all Code items and documentation by the ANI to ensure that each item has the appropriate certification.

Requested Item I.A.8

Identify any commercial grade items requiring dedication installed during the original construction. For these items, is documentation of the dedication program available for review? Are the dedication packages for items available for review?

Response to Requested Item I.A.8

No commercial grade items were installed during the original construction which will now be used inside Code boundaries. The turnover of piping and equipment within the scope of this activity will include a review of all Code items and documentation by the ANI to ensure that each item has the appropriate certification.

Requested Item I.A.9

Identify any commercial grade items requiring dedication that will be used to complete construction.

Response to Requested Item I.A.9

No commercial grade items will be dedicated for use in a Code application by this activity. The turnover of piping and equipment within the scope of this activity will include a review of all Code items and documentation by the ANI to ensure that each item has the appropriate certification.

Requested Item I.A.10

(i) Was the piping system constructed in accordance with a 10CFR50 Appendix B Program? (ii) Is the construction Appendix B program documentation available for review? (iii) If construction was performed under a different program, identify the program. Is this program documentation available for review?

Response to Requested Item I.A.10

(i) The overall quality assurance program used by Carolina Power & Light Company for the design and construction of the Harris Nuclear Power Plant is described in the Shearon Harris PSAR. PSAR Section 1.8 states that "The Carolina Power & Light Company Quality Assurance Program for the engineering and construction of the Shearon Harris Nuclear Power Plant (SHNPP), which includes the quality assurance programs for both Ebasco and Westinghouse by reference, is structured with regard to safety-related equipment in accordance with the eighteen criteria of Appendix B to 10CFR50. In addition, the subject Program is structured in accordance with ANSI N45.2 and thereby Regulatory Guide 1.28 . . . ". The PSAR further states that the "Shearon Harris Nuclear Power Plant Quality Assurance Plan" was replaced by the "CP&L Corporate Quality Assurance Program" on April 1, 1974, and provides a cross reference on how the subject plan met the criteria of 10 CFR50 Appendix B.

(ii & iii) Certain aspects of Shearon Harris Nuclear Power Plant construction were subject to QA requirements beyond those outlined in the CP&L Corporate QA Manual. Since CP&L was not only the Owner, but also the constructor, installer, and a fabricator for Code items in the Shearon Harris Nuclear Power Plant, a separate QA Program was developed, reviewed, approved and implemented specifically to obtain the required ASME N, NA, and NPT Certificates of Authorization. ASME Code Section III, Subsection NA-4133.2 requires that an applicant for a Certificate of Authorization develop a QA program and implementing procedure specific to the proposed scope of work, and that "the applicant shall request the Society to review this procedure and Program prior to the issuance of a Certificate of Authorization." For construction of SHNPP, CP&L met this requirement by the formalization of its "ASME Quality Assurance Manual", intended to meet the criteria in Section III, Subsection NA-4100 of the

Code. All Code work by CP&L during the Construction of the Shearon Harris Nuclear Power Plant was performed to the requirements of this QA program manual. A copy of the ASME Quality Assurance Manual is provided in Enclosure 5.

Requested Item I.A.11

(i) Are the work control procedures and hold point sign-off documents from the original construction available for review? (ii) If these documents are required by Code, what documents are missing?

Response to Requested Item I.A.11

(i) Work control procedures and hold point sign-off documents from the construction era are available for review.

(ii) With the exception of the aforementioned WDRs and associated weld process control issues (including NDE) discussed in response to item I.B.4, CP&L has not identified any missing documents requiring consideration under the Alternative Plan.

Requested Item I.A.12

(i) Provide a list of qualified weld procedure specifications (WPS) used, and their procedure qualification records (PQRs). (ii) For welds missing welder identification, how will weld integrity be established.

Response to Requested Item I.A.12

(i) The welding procedures available for welding during the original construction of the piping in question were identified based on a review of available WPS in the welding manual at that time. A copy of these WPS and their PQRs are provided in Enclosure 6.

(ii) CP&L has located welder identification markings at each accessible field weld in the scope of the Alternative Plan. These Code required welder symbols can be traced back to the welder responsible for each such weld, and from there, qualification records on file can be used to establish that each welder was appropriately qualified.

These markings are not accessible on embedded welds. However, alternate QC records have been located which identify the welders for three of these fifteen welds, and numerous programmatic and procedural assurances existed to ensure that welds were made using qualified welders and weld procedures. For embedded welds, internal camera inspections (as described in response to RAI Items III.2, 3 & 4) will be used to augment programmatic and procedural assurances relative to the quality of these welds.

In addition, since the Spent Fuel Pool Cooling piping nozzles exit into the pools below the water level, the portions of the Spent Fuel Pool Cooling System piping attached to the spent fuel pools (including the embedded piping) are flooded as well. Beyond internal camera inspections, water chemistry in these legs of piping will be analyzed to ensure that Microbiologically Induced Corrosion or other corrosion mechanisms have not resulted in degradation of the integrity of field welds or piping.

B. Applicable Regulations for Welds and Piping Systems Within the Scope of the Proposed Alternatives

Requested Item I.B.1

1. Identify the edition and addenda of Code and any Code cases that were used for original construction of the welds and piping systems. If not the same for all the welds, identify the Code requirements for each weld or group of welds.

Response to Requested Item I.B.1

Piping was installed to ASME Section III, 1974 Edition, Winter 1976 Addenda. The PSAR and current FSAR provide the CP&L position on conformance to the requirements of Reg. Guides 1.84 and 1.85 relative to use of Code cases. A review of the N-5 Code Data Report associated with turnover of Unit 1 SFP piping identifies two Code cases used at some point in its construction; it is reasonable to assume that these same Code cases may have been used on the corresponding Unit 2 piping and equipment. These Code cases are:

N-240	"Hydrostatic Testing of Open Ended Piping, Section III, Division 1"
N-275	"Repair of Welds, Section III, Division 1"

Likewise, a review of the Unit 1 CCW N-5 Code Data Report shows these Code cases in association with its construction:

N-275	"Repair of Welds, Section III, Division 1"
N-224	"Use of ASTM A500 Gr. B and ASTM A501 Structural Tubing for Section III, Class 2, 3 and MC"
N-224-1	"Use of ASTM A500 Gr. B and ASTM A501 Structural Tubing for Section III, Class 2, 3 and MC"
N-282	"Nameplates for Valves, Section III, Division 1, Class 1, 2 and 3 Construction"
N-127	"Alternative Rules for Examination of Welds in Piping, Section III, Class 1 and 2 Construction"

Requested Item I.B.2

Identify the edition and addenda of Code and code cases that will be used to complete construction of the piping systems. Identify any exceptions to Code requirements and justifications for these exceptions.

Response to Requested Item I.B.2

Construction will be completed to ASME Section III, 1974 Ed, Winter 1976 Addenda. Code Case N-240 will be used to exempt formal requirements for hydro testing of the embedded piping connected to the atmospheric spent fuel pools due to the lack of accessibility. The need to invoke other specific Code cases has not been identified. Use of any such Code case would be consistent with CP&L's position regarding conformance with Reg. Guides 1.84 and 1.85. Relative to exceptions to Code requirements, CP&L does not take any such exceptions beyond those specifically identified and addressed by this Alternative Plan.

Requested Item I.B.3

Identify the edition and addenda of Code and code cases that were or will be used for repair and replacement of welds and piping.

Response to Requested Item I.B.3

No repair or replacement activities have been performed on the Code piping subject to the Alternative Plan. Future repair and replacement activities (after completion of construction and turnover) will be governed by the site Section XI Repair and Replacement program.

Requested Item I.B.4

Provide a matrix (See I.A.2) that identifies the specific paragraph in Code that is applicable to missing weld documents. Identify documentation deficiencies for each weld. Identify any exceptions to Code requirements. Provide alternatives and justifications for these exceptions.

Response to Requested Item I.B.4

A matrix has been provided in Enclosure 7 for Code requirements pertaining to missing weld documents. Additional information relative to specific welds is provided in Enclosure 3. Alternatives and justifications are identified in Enclosure 2 and discussed elsewhere in the Alternative Plan and this RAI response.

Requested Item I.B.5

Identify the ASME requirements, including administrative requirements, that were completed prior to stoppage of the original construction of the piping systems. Is documentation of these completed requirements available for review? What ASME data reports were filed and what were their filing dates?

Response to Requested Item I.B.5

None of the piping or equipment in question had completed the system certification process and received an N-Stamp. Generally, requirements which were met are consistent with the status of construction at the time work was halted. For instance, embedded piping had been installed, inspected and tested prior to pouring concrete, but accessible piping immediately adjacent was still under construction. The availability of records for the construction varies. Generally, records generated by site construction during the installation of the subject piping is not on hand. However, records generated as a result of QC oversight (NCRs, DDRs, audits, etc) are on hand and retrievable. Notably, hydro test records are also generally available for that portion of construction that proceeded to the extent of hydro testing, including embedded Spent Fuel Pool Cooling System piping. Hydro test documentation, including verification of weld documentation, is available for all but 2 of the 15 embedded field welds. The remaining 2 are included in the liner leak test boundary and would have been procedurally required to be verified as complete, but were not specifically included in the leak test as inspection items. (See Enclosure 3 for identification of records available, and Enclosure 8 for the hydro test records specifically discussed herein.) No partial data reports were filed on the subject piping systems. Manufacturer's Code data reports from NPT suppliers are available in document control for the subject piping, as are warehouse receipt inspection records. These records will be subject to review by the ANI as part of the system turnover process.

Requested Item I.B.6

Identify ASME survey inspections conducted prior to stoppage of the original construction of the piping systems. Provide documentation for representative internal / external audits conducted during the peak construction periods for the welds in question (1978 - 1979), particularly in the areas of work control, welding, material traceability and records.

Response to Requested Item I.B.6

There are no documented ASME survey inspections on hand specific to the construction of the piping systems in question. There were, of course, ASME surveys associated with CP&L obtaining and maintaining its N, NA and NPT Certificates of Authorization. This was originally accomplished by an interim letter of authorization in July, 1978 allowing CP&L to commence Code work. A follow up survey on the effectiveness of the program

was conducted in July of the following year, with additional audits occurring in 1982 and 1985, in accordance with Code requirements.

Information pertaining to audits and inspections performed by parties other than the ASME is provided in response to requested item I.B.7, below. Also, note that the majority of construction for the welds in question occurred during the '81 - '83 time frame, as attested to by QC records and other documents associated with this construction.

Requested Item I.B.7

Identify third party inspections conducted prior to stoppage of the original construction of the piping systems. Provide a representative sample of documentation for these inspections.

Response to Requested Item I.B.7

A number of ANI inspections specifically associated with the construction of the Unit 2 & 3 SFP Cooling piping are documented in the form of QA surveillance records, hydro test records and other types of records which would have been subject to ANI review. Generally, the ANI inspection records which cannot be retrieved are those associated with WDRs and pipe spool packages. Records for which ANI inspections / reviews are documented are identified in Enclosure 3.

In addition, Corporate QA / QC, which operated independently of the site construction program, provided both quality inspections of work activities and audits on construction activities. Records for which QC inspections are documented are identified in Enclosure 3, and representative samples of QA audits of the construction program are provided in Enclosure 9. Finally, the NRC performed regular inspections of construction activities, with follow-up activities being initiated as needed for issues identified and tracked to satisfactory closure.

Requested Item I.B.8

With regard to piping system components / services performed by others, provide documented validations of these vendors services. Provide the documentation of the audits of the supplier of prefabricated piping.

Response to Requested Item I.B.8

A review has been conducted which identifies that Code data reports are on hand for pipe spools and components inside Code boundaries. The turnover process for completion and activation of this portion of the plant will include a review of these documents by the ANI. CP&L intends to replace any piping or equipment provided by an outside supplier for which appropriate Code records cannot be located. Audit records of the supplier of

prefabricated piping and a representative sample of a piping vendor data package are included in Enclosure 10.

II. Completion of Piping System (General)

Requested Item II.1

(i) Identify the differences between HNP's proposed construction program to complete the SFP C and D and the original construction program under HNP's N certificate. (ii) How will these differences be reconciled?

Response to Requested Item II.1

(i) CP&L proposes to complete construction per the design requirements of the original construction Code. CP&L is requesting that exception be allowed under 10CFR50.55a.(a)(3)(i) to certain QA requirements generally found in Section III, Subsection NA and associated with having certificates of authorization for construction and installation of Code items, and to requirements regarding N-Stamping of the completed systems.

(ii) CP&L proposes to reconcile the differences between the original program and the program to be used for completion by providing comparable assurances, tests, inspections and reviews as needed to assure an acceptable level of quality and safety in accordance with 10CFR50.55a.(a)(3)(i). It is CP&L's intention to complete construction using the current Corporate Appendix B QA Program, augmented by supplemental QA requirements to ensure that the intent of Code requirements are adequately addressed. (See response to requested items III.14, 15 & 16).

Requested Item II.2

Will data packages be prepared?

Response to Requested Item II.2

Yes. CP&L is implementing a turnover plan which closely emulates that associated with the N-Stamping process, including preparation of Section III style data packages and third party (ANI) review.

Requested Item II.3

What third party verification is planned?

Response to Requested Item II.3

The Hartford Steam Boiler Insurance and Inspection Co. has been in discussions with CP&L throughout the development of the Alternative Plan. The role that Hartford will play in the certification / turnover process is very similar to that which would be followed in an N-stamping process. It is intended that the ANI will review work packages, participate in field inspections, participate in resolution of field discrepancies and non-conformances, and conduct a final review and certification process much like that done for the preparation of an N-5 data report for each affected system within Code boundaries. Details of this process are contained in a set of "Supplemental QA Requirements" developed for this activity (See response to III.14). A copy of the generic data report to be used for installation of Code items is provided in Enclosure 11.

III. Specific Comments on Submitted Information

Requested Item III.1

(i) What was the basis for selecting the four externally accessible field welds for internal examination? (ii) Identify these welds in the matrix provided in response to I.A.2 above.

Response to Requested Item III.1

(i) Field welds were generally used to join long sections of prefabricated piping, and so were (are) not typically accessible for internal examination with the naked eye. The four field welds in question join the strainer nozzles to the piping, and were identified by a field walk down as being those field welds which could be accessed without specialized pipe crawling / camera equipment. One of these welds is only a few feet away from an open pipe end, lending itself well to visual examination with the assistance of an examination mirror. The other three field welds were subject to a more limited inspection by inserting a boroscope through nearby pressure taps. Note that a more detailed internal examination of these welds will be performed and formally documented when the strainers are disassembled, using the same internal inspection criteria as developed for the remote camera inspection discussed in III.2, 3, 4 & 5 below.

(ii) These welds are identified on the matrix (Enclosure 2) as 2SF-37-FW-441, 2SF-36-FW-449, 2-SF- 36-FW-450 & 2-SF-38-FW-451 .

Requested Item III.2

With reference to the "substantial portion of the embedded piping and field welds", identify these welds in the matrix provided in response I.A.2

Response to Requested Item III.2

These welds have been identified on Enclosure 3 as requested.

Requested Item III.3

Provide a summary of the inspection procedure used for remote inspection of embedded welds.

Response to Requested Item III.3

The procedure will use a pipe crawler mounted camera to perform a detailed inspection of the interior surfaces of embedded field welds. The procedure will include demonstration of camera resolution capability to at least 1/32" wire, and performance demonstration of inspector's ability to discern and disposition flaws of the nature which might be expected to be encountered. The inspection procedure will be developed and approved by a Level III inspector under the Corporate NDE Program. Inspections will be performed by an appropriately qualified Level II inspector.

Requested Item III.4

With reference to the remote inspection of the embedded welds, identify the critical characteristics that will be verified and the acceptance criteria to be used.

Response to Requested Item III.4

The inspection will specifically include examination of field welds for the following:

No cracks
No lack of Fusion (LOF)
No lack of Penetration (LOP)
No oxidation ("Sugaring")
No undercut greater than 1/32 inch
No reinforcement ("Push Through") greater than 1/16 inch
No Concavity ("Suck Back") greater than 1/32 inch
No porosity greater than 1/16 inch
No inclusions

Generalized inspections will be performed on the piping interior for indications of arc strikes, foreign material, high / low, mishandling indications, etc,. Any such indications shall be noted and characterized during the inspection and evaluated by Engineering if necessary.

In addition, since the Spent Fuel Pool Cooling piping nozzles exit into the pools below the water level, the portions of the Spent Fuel Pool Cooling System piping attached to the spent fuel pools (including the embedded piping) are flooded as well. The inspection procedure will also include criteria and instructions to conclusively ascertain if

Microbiologically Induced Corrosion or other corrosion mechanisms have resulted in degradation of this piping.

Data Recording - The following information will be recorded for each inspection:

1. The inspection will be recorded on videotape in a manner which will facilitate future review and evaluation.

2. Indication location (circumferential, side of weld, etc.), length, and depth (where applicable) shall be documented and recorded on tape.

References - The following references were used to establish this criteria:

ASME Section III, ND-4424 Winter 76 Addenda
ANSI B31.1 Paragraph 136.4.2, 1980 Edition
Corporate Welding Manual NGGM-PM-0003, NW-02, NW-06

Requested Item III.5

Provide results of remote inspection with any identified discrepancies

Response to Requested Item III.5

Camera inspections are currently planned for late May or early June of 1999. Results will be provided upon completion of this activity.

Requested Item III.6

Provide a completed weld data report, representative of those that were discarded. Identify the critical characteristics and explain how, in lieu of records, each will be validated.

Response to Requested Item III.6

A sample WDR is provided in Enclosure 12. Note that this is a WDR for one of the 15 embedded field welds, extracted from a DDR (Deficiency Disposition Report) in which a QA inspector questioned the identity of the adjacent pipe spool. Code required attributes recorded on the WDR are identified and reconciled in Enclosure 6.

Requested Item III.7

With reference to the procurement specification (SS-021, Purchasing Welding Materials for Permanent Plant Construction), did other specifications for other filler materials exist?

What assurances are provided that these other filler materials were not used for the embedded piping.

Response to Requested Item III.7

SS-021 is the site spec for procurement of filler material used in the SHNPP Construction Program and referenced in the Work Procedures which implemented this program. SS-021 is the specification for filler material specifically invoked by Code work procedures; no substitutes were identified or allowed. Research has not identified any other specification for this purpose in association with construction of SHNPP. Being a fairly new plant, CP&L still employs many of the weld engineers and craft personnel associated with the original construction effort. Numerous interviews of these personnel consistently provide the same conclusion; that filler material purchased by CP&L for use in Code work in construction of SHNPP was procured to this specification.

Requested Item III.8

Provide any updates / supplements to the Alternative Plan as they become available.

Response to Requested Item III.8

These will be provided as requested.

Requested Item III.9

With reference to the "large percentage of embedded field welds" that will be inspected, identify these welds on the matrix provided. Provide technical justification for not inspecting the remaining welds.

Response to Requested Item III.9

The matrix has been marked up as requested. The "large percentage of embedded field welds" referred to are those which CP&L has a high level of confidence can be accessed with available pipe crawling equipment based on a walk down with the vendor for pipe crawler / camera services. The enclosed weld matrix (Enclosure 3) specifically identifies the base scope of field welds which are targeted for inspection. Currently, 6 of the 15 embedded field welds are included, which notably includes both of the field welds for which hydro test records are not available.

Assurance of quality for any embedded field welds which are not subject to remote camera inspection is provided by conformance to the requirements of QA Program(s) and implementation procedures which existed at the time of construction along with the body of evidence which directly support adherence to those requirements. This evidence includes: uniform application of QA requirements for the entire site construction

program, (including the completed and licensed Unit 1 facility), surveys, inspections, and audits verifying the effectiveness of QA program requirements, construction records which are on hand that attest to quality of construction, and re-performance of Code required inspections on accessible field welds in these same lines with no rejectable indications identified.

Requested Item III.10

(i) Explain what is meant by the statement that internal examination of the embedded welds provides a measure of quality assurance beyond Code requirements. (ii) What additional physical or material attributes will be verified?

Response to Requested Item III.10

(i) This statement is simply intended to identify that many of these welds would have been inaccessible for routine internal inspection at the time of construction (due to distance from an open pipe end), and since no Code requirements existed to do so, would not have been subject to an internal visual examination. Given this, internal camera inspections represent an activity above and beyond that which would have been required under the original construction program.

(ii) See response to requested items III.3 & 4.

Requested Item III.11

The submittal refers to opinions by Bechtel and Hartford concerning the benefits in accordance with an N certificate program. Are these opinions documented and available for review?

Response to Requested Item III.11

Hartford's endorsement of the Alternative Plan is provided in Enclosure 13. Note that this letter is authored by Dr. Richard E. Feigel, Vice President of Hartford Steam Boiler Inspection and Insurance Co. and Chairman of the ASME Council on Codes and Standards. Bechtel's endorsement of this plan is implicit in that they, as the design A/E, have fully reviewed and incorporated the Alternative Plan into the design change packages for this activity.

Requested Item III.12

Provide a copy of the site ASME Section III QA program used during original construction.

Response to Requested Item III.12

A copy of the ASME Section III QA Program manual is provided in Enclosure 5.

Requested Item III.13

(i) Provide a copy of the Corporate QA program that will be used to complete construction. (ii) (Provide a list of implementing quality control procedures for welder qualification, weld procedures, inspections, documentation, etc).

Response to Requested Item III.13

(i) A copy of the current Corporate QA Program Manual is provided in Enclosure 14. Note that this program manual is used with FSAR Section 17 to define the overall corporate QA program.
(ii) All welding will be accomplished in accordance with the Corporate Welding Manual, which conforms to the requirements of Section IX with regard to welder qualification, weld procedures and process control. NDE will be performed in accordance with the Corporate NDE Manual. The site Mechanical Modification Procedures (MMPs) are those procedures which will primarily be used to control work control processes. The list of MMPs most applicable to this activity and the index from the Corporate Welding and NDE Manuals are provided in Enclosure 15.

Requested Item III.14

Provide a copy of the supplemental quality assurance requirements developed to augment the Corporate QA Program, which was based on a review of the approved Construction QA Program at the time of construction versus the existing Corporate QA Program.

Response to Requested Item III.14

Supplemental QA Requirements are provided in Enclosure 16.

Requested Item III.15

Provide documentation of the referenced comparison of approved ASME Section III Construction QA Program Manual with the effective Corporate 10CFR50 Appendix B QA Program.

Response to Requested Item III.15

Documentation of the referenced comparison is provided in Enclosure 17.

Requested Item III.16

Provide documentation of the supplemental quality assurance requirements that have been developed specifically for the purpose of addressing differences between ASME Section III quality assurance requirements and the Corporate 10CFR50 Appendix B QA Program.

Response to Requested Item III.16

The ASME Section III QA Manual discussed in response to requested items III.14 and III.15 above is the document which was reviewed by the ASME and singularly credited for assuring compliance with Section III requirements in order to authorize CP&L to perform N, NA and NPT stamp activities. The overall corporate QA program may have shared procedures, facilities, etc. with this program, but was not directly relied upon to assure compliance with Section III during the construction effort. Given this, the Supplemental QA Requirements provided in response to requested item III.14 and the QA manual comparison provided in response to item requested item III.15 provide the documentation requested in this item as well.

Matrix of Construction Records Pertaining to Units 2 & 3 Spent Fuel Pool Cooling System

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-SF-1-FW-1	Embedded	No, but assured by piping installation, hydro and concrete pour procedure requirements	No, but review of "Weld Documentation " contained in Hydro test record	■ SFA 5.9/5.4 ■ No ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements	No, but assured by weld doc review in hydro records; program and procedural requirements	No, but assured by weld documentation review in hydro records, program and procedural requirements.	Yes (ref. DDR 1347)	Hydro -QC & ANI (ref. DDR 1347)
2-SF-1-FW-2	Embedded	No, but assured by piping installation, hydro and concrete pour procedure requirements	No, but review of "Weld Documentation " contained in Hydro test record	■ SFA 5.9/5.4 ■ No ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements	No, but assured by weld doc review in hydro records; program and procedural requirements	No, but assured by weld documentation review in hydro records, program and procedural requirements.	Yes (ref. DDR 1347)	Hydro -QC & ANI (ref. DDR 1347)
2-SF-1-FW-3	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes B61, G97	Yes, by re-inspection.	No	
2-SF-1-FW-4	Embedded	Yes, on one side (ref. DDR-1347). Also assured by piping installation, hydro and concrete pour procedure requirements	No, but review of "Weld Documentation " contained in Hydro test record	■ SFA 5.9/5.4 ■ No ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements	No, but assured by weld doc review in hydro records; program and procedural requirements	No, but assured by weld documentation review in hydro records, program and procedural requirements.	Yes (ref. DDR 1347)	Hydro -QC & ANI (ref. DDR 1347)

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-SF-1-FW-5	Embedded	Yes, WDR on hand (ref. DDR-1347) Also assured by piping installation, hydro and concrete pour procedure requirements	Yes, WDR on hand (ref. DDR-1347)	■ SFA 5.9/5.4 ■ Yes, WDR on hand in DDR-1347 ■ Not required	Yes, in weld documentation (ref. DDR-1347)	Yes, attested to in weld documentation.	Yes (ref. DDR 1347)	Hydro -QC & ANI (ref. DDR 1347) weld documentation - QC & ANI (ref. DDR 1347) DDR-1347 - QC & ANI
2-SF-1-FW-6	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D41	Yes, by re-inspection.	No	
2-SF-8-FW-65	Embedded	Yes, on one side by DDR-1387. Also assured by piping installation, concrete pour procedure requirements	No	■ SFA 5.9/5.4 ■ No ■ Assured by site specification SS-021, procedural requirements	No, but assured by weld program and procedural requirements	No, but assured by program and procedural requirements. Will be subject to internal camera inspection	No	liner leak test - QC
2-SF-8-FW-66	Embedded	Yes, on one side by DDR-1387 Also assured by piping installation, concrete pour procedure requirements	No	■ SFA 5.9/5.4 ■ No ■ Assured by site specification SS-021, procedural requirements	No, but assured by weld program and procedural requirements	No, but assured by program and procedural requirements. Will be subject to internal camera inspection	No	liner leak test - QC

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-SF-70-FW-325	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes B7, D41	Yes by re-inspection	No, will be hydro-tested by Mod	
2-SF-72-FW-326	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes E21	Yes by re-inspection	No, will be hydro-tested by Mod	
2-SF-72-FW-327	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes E21, C97	Yes by re-inspection	No, will be hydro-tested by Mod	
2-SF-69-FW-328	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes B61	Yes by re-inspection	No, will be hydro-tested by Mod	
2-SF-69-FW-329	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes B61	Yes by re-inspection	No, will be hydro-tested by Mod	

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-SF-71-FW-329	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer, chemical analysis	Yes B7	Yes by re-inspection	No, will be hydro tested by Mod	
2-SF-30-FW-381	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes E21, C97	Yes by re-inspection	No	
2-SF-148-FW-382	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes E21	Yes, by re-inspection.	No	
2-SF-149-FW-408	Embedded	Yes (ref. DDR-829). Also assured by piping installation, hydro and concrete pour procedure requirements	No, but have repair WDR on hand, also weld documentation review signoff in North New Fuel Pool Hydro Record,	■ SFA 5.9/5.4 ■ Partial, WDR on hand for repair weld. ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements.	B61 (NCR W-207) Also repair WDR on hand (DDR 829)	Yes, (full LP in DDR 829). Will be subject to internal camera inspection	Yes, see North New Fuel Pool Hydro Test Record.	Hydro -QC & ANI Repair weld documentation - QC & ANI NDE rpt. - QC & ANI (ref. DDR-829) DDR-829 - QC & ANI

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-SF-150-FW-412	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes E21	Yes, by re-inspection.	No	
2-SF-14-FW-424	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes B61	Yes by re-inspection	No, will be hydro tested by Mod	
2-SF-31-FW-426	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes E21, C97	Yes by re-inspection	No	
2-SF-35-FW-440	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes E21	Yes by re-inspection	No	NDE rpt. - QC & ANI (ref. NCR WP-016)
2-SF-37-FW-441	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes E59, F60, E25, B47	Yes, by re-inspection. Will also be subject to direct internal examination when adjacent strainer is disassembled.	No, will be hydro tested by Mod	
2-SF-16-FW-447	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes B61	Yes by re-inspection	No, will be hydro tested by Mod	DDR-895 - QC & ANI

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-SF-36-FW-448 * See Note	Yes *	*	*	*	*	*	*	*
2-SF-36-FW-449	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D41, B47	Yes, by re-inspection. Will also be subject to direct internal examination when adjacent strainer is disassembled.	No, will be hydro tested by Mod	
2-SF-36-FW-450	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer & chemical analysis	Yes B47	Yes, by re-inspection. Will also be subject to direct internal examination when adjacent strainer is disassembled.	No, will be hydro tested by Mod	
2-SF-38-FW-451	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer & chemical analysis	Yes G1, B7	Yes, by re-inspection. Will also be subject to direct internal examination when adjacent strainer is disassembled.	No, will be hydro tested by Mod	
2-SF-67-FW-452	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes E21	Yes, by re-inspection.	No	
2-SF-68-FW-454	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes C97, D87	Yes, by re-inspection.	No	

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-SF-143-FW-512	Embedded	Assured by piping installation, hydro and concrete pour procedure requirements	No, but WDR review signoff in North New Fuel Pool Hydro Record,	■ SFA 5.9/5.4 ■ No ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements	No, but assured by weld doc review in hydro records, program and procedural requirements	No, but assured by weld documentation review in hydro records, program and procedural requirements.	Yes, see North New Fuel Pool Hydro Test Record.	Hydro -QC & ANI
2-SF-143-FW-513	Embedded	Assured by piping installation, hydro and concrete pour procedure requirements	No, but WDR review signoff in North New Fuel Pool Hydro Record,	■ SFA 5.9/5.4 ■ No ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements	No, but assured by weld doc review in hydro records, program and procedural requirements	No, but assured by weld documentation review in hydro records, program and procedural requirements.	Yes, see North New Fuel Pool Hydro Test Record.	Hydro -QC & ANI
2-SF-143-FW-514	Embedded	Yes, ref. DDR-888 Also assured by piping installation, hydro and concrete pour procedure requirements	No, but WDR review signoff in North New Fuel Pool Hydro Record,	■ SFA 5.9/5.4 ■ No ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements	No, but assured by weld doc review in hydro records, program and procedural requirements	No, but assured by weld documentation review in hydro records, program and procedural requirements Will be subject to internal camera inspection	Yes, see North New Fuel Pool Hydro Test Record.	Hydro -QC & ANI DDR-888

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-SF-144-FW-515	Embedded	Assured by piping installation, hydro and concrete pour procedure requirements	No, but WDR review signoff in North New Fuel Pool Hydro Record,	■ SFA 5.9/5.4 ■ No ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements	No, but assured by weld doc review in hydro records, program and procedural requirements	No, but assured by weld documentation review in hydro records, program and procedural requirements. Will be subject to internal camera inspection	Yes, see North New Fuel Pool Hydro Test Record.	Hydro -QC & ANI
2-SF-144-FW-516	Embedded	Yes, on one side, ref. DDR-869. Also assured by piping installation, hydro and concrete pour procedure requirements	No, but WDR review signoff in North New Fuel Pool Hydro Record,	■ SFA 5.9/5.4 ■ No ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements	No, but assured by weld doc review in hydro records, program and procedural requirements	No, but assured by weld documentation review in hydro records, program and procedural requirements. Will be subject to internal camera inspection	Yes, see North New Fuel Pool Hydro Test Record.	Hydro -QC & ANI DDR-921 - QC & ANI
2-SF-144-FW-517	Embedded	Yes - ref DDR-869. Also assured by piping installation, hydro and concrete pour procedure requirements	No, but WDR review signoff in North New Fuel Pool Hydro Record.	■ SFA 5.9/5.4 ■ No ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements	No, but assured by weld doc review in hydro records, program and procedural requirements	Yes, partial UT & LP performed under DDR-869. Also, assured by weld documentation review in hydro records, program and procedural requirements. Will be subject to internal camera inspection	Yes, see North New Fuel Pool Hydro Test Record. Also ref. DDR-869.	Hydro -QC & ANI Repair weld documentation - QC & ANI (ref. DDR-869) DDR-869 - QC & ANI

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-SF-159-FW-518	Embedded	Also assured by piping installation, hydro and concrete pour procedure requirements	No, but WDR review signoff in North New Fuel Pool Hydro Record	■ SFA 5.9/5.4 ■ No ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements	No, but assured by weld doc review in hydro records, program and procedural requirements	No, but assured by weld documentation review in hydro records, program and procedural requirements	Yes, see North New Fuel Pool Hydro Test Record.	Hydro -QC & ANI
2-SF-159-FW-519	Embedded	Yes, on one side (ref. NCR-85-1318, Also assured by piping installation, hydro and concrete pour procedure requirements	No, but WDR review signoff in North New Fuel Pool Hydro Record	■ SFA 5.9/5.4 ■ No ■ Assured by weld doc review in hydro records, site specification SS-021, procedural requirements	Yes, C-20 (see NCR W-103)	No, but assured by weld documentation review in hydro records, program and procedural requirements	Yes, see North New Fuel Pool Hydro Test Record.	Hydro -QC & ANI NCR W-103 - QC
2-SF-71-FW-331 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D75, E50, D69	Yes by re-inspection	N/A (Hanger attachment weld)	
2-SF-71-FW-332 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes E50, D69	Yes by re-inspection	N/A (Hanger attachment weld)	

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-SF-71-FW-333 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D69	Yes by re-inspection	N/A (Hanger attachment weld)	
2-SF-71-FW-334 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D75, E50, D69	Yes by re-inspection	N/A (Hanger attachment weld)	
2-SF-71-FW-335 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D69	Yes by re-inspection	N/A (Hanger attachment weld)	
2-SF-71-FW-336 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D69	Yes by re-inspection	N/A (Hanger attachment weld)	
2-SF-71-FW-337 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes E50, D69	Yes by re-inspection	N/A (Hanger attachment weld)	

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-SF-71-FW-338 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D69	Yes by re-inspection	N/A (Hanger attachment weld)	
2-SF-71-FW-339 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D75, D69	Yes by re-inspection	N/A (Hanger attachment weld)	
2-SF-71-FW-340 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D75, E50, D69	Yes by re-inspection	N/A (Hanger attachment weld)	
2-SF-71-FW-341 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D75, E50, D69	Yes by re-inspection	N/A (Hanger attachment weld)	
2-SF-71-FW-342 (Hanger Attach. Weld)	Yes	Yes, by inspection	No	■ SFA 5.9/5.4 ■ No ■ by alloy analyzer	Yes D75, D69	Yes by re-inspection	N/A (Hanger attachment weld)	

Field Weld No.	Access?	Id of welded items ?	Weld documents available?	Specified Filler Material ID/ Documentation on hand/ Alt.Verification Method	Qual Record & Welder ID	NDE Records	Hydrotest Records	Inspections completed (ANI / QC)
2-CC-3-FW-207	Yes	No, but is accessible and will be visually verified.	No	■ SFA 5.18/5.1 ■ No ■ TBD by chemical analysis	Yes, K40	Yes by re-inspection	No, to be hydro tested by Mod	
2-CC-3-FW-208	Yes	No, but is accessible and will be visually verified	No	■ SFA 5.18/5.1 ■ No ■ TBD by chemical analysis	Yes, C11	Yes by re-inspection	No, to be hydro tested by Mod	
2-CC-3-FW-209	Yes	No, but is accessible and will be visually verified	No	■ SFA 5.18/5.1 ■ No ■ TBD by chemical analysis	Yes, B1	Yes by re-inspection	No, to be hydro tested by Mod	

Note * Field Weld 2-SF-FW-36-448 is a completed and stamped field weld, but will be cut out and replaced as it joins a section of piping which was affected by a pipe spool modification.

Enclosure 13 to Serial: HNP-99-069

Alternative Plan Letter of Endorsement from
The Hartford Steam Boiler Inspection and Insurance Co.

(1 Page)

Dr. Richard E. Feigel
Vice President

Post-it® Fax Note 7671	Date	# of pages ▶ 1
To BARRY BOBO	From GENE FEIGEL	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

The Hartford Steam Boiler
Inspection and Insurance Co.
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RECEIVED
MAR 8 1999.

March 8, 1999

Mr. Steve Edwards
Manager, SFP Activation Project
Carolina Power & Light Company
Harris Nuclear Plant
P.O. Box 165
New Hill NC 27562

Subject : 10CFR50.55a Alternative Plan
HH/99-001
HNP-98-188 a

Dear Mr. Edwards:

I have reviewed your letter to Mr. Bobo and the referenced attachments addressing various spent fuel pool piping systems. I have discussed the subject at length with Mr. Bobo, who is in responsible direct charge of Hartford Steam Boiler's (HSB) ASME Section III and XI inspection activities. Subject to detailed verification of completion of unfinished tasks and their compliance with commitments described, we believe that the plan proposed provides an acceptable alternative to code compliance in accordance with 10CFR50.55(a)(3). Our concurrence extends to both dispositioning issues related to the as-built condition of the systems and future activities under 'III. Alternative Plan for Continuance of Design and Construction.'

Our position is based principally on the following:

1. Site wide use of an integrated QA program at the site with evidence of adequacy provided by licensing of Unit 1.
2. Consistent reference by final acceptance documentation, e.g. hydrostatic test reports, of first tier inspection reports which establish review of records of welder qualification and similar code requirements.
3. Plan provisions to verify code compliance or establish technical equivalency. .e.g. deposited weld metal analysis.

Very truly yours,

Richard E. Feigel, Ph.D.
Vice President, Engineering

Cc: B. Bobo R. Howard

LOGGED

Supplemental Quality Assurance Requirements for the Design Change Packages Associated with Completion of the Units 2 & 3 Spent Fuel Pool Cooling System

SUPPLEMENTAL QA REQUIREMENTS

The following is a set of supplemental QA requirements developed for the implementation and turnover of Code items associated with the completion and activation of the Unit 2 & 3 Spent Fuel Pools at Harris Nuclear Plant. This document will be incorporated directly into the "Design Requirements" section of the design change packages for the pertinent modifications, and then by specific instructions in the appropriate sections (installation, testing, turnover, etc) as necessary to ensure that its requirements are implemented.

1.0 GENERAL

1.1 Scope

This document defines the set of QA requirements which will be used to govern the engineering, construction and startup of the Section III, Class 3 portions of the Spent Fuel Pool Facilities originally intended to service HNP Units 2 & 3. This portion of the plant was partially installed during original plant construction, but was suspended subsequent to cancellation of these units. The development of a supplement specific to this scope is necessitated by the following concerns:

- The original N-certificate associated with this program has long since been discontinued, and no partial turnover was conducted for the partially installed piping and equipment.
- The field construction documentation packages for partially installed piping have been discarded and are no longer available

As a result of the above, it is not possible to complete these systems in full compliance with Section III utilizing the previously installed piping and equipment. Since the N stamping process is the prescribed method for demonstrating quality assurance in construction activities, it is necessary to define a suitable alternate program which will ensure that the requisite level of quality exists upon completion and turnover. Generally, the corporate Nuclear Generation Group's Quality Assurance Manual is of suitable rigor to accomplish this. However, the program defined in the corporate QA manual was developed to comply with 10CFR50 Appendix B as it concerns operating plants, and was not intended to specifically conform to the requirements of Section III. For example, the corporate QA program outlines condition reporting requirements which govern field activities and meets the requirements of Appendix B in this regard. However, this program does not integrate involvement of the ANI in documenting adverse conditions, nor does it require the ANI to participate in the closeout of adverse condition reports. In addition, the current site procedures pertaining to field activities are generally oriented towards meeting the requirements of Section XI for inservice inspection, rather than Section III.

To address this issue, a set of QA requirements have been developed and are presented herein to supplement the corporate Appendix B QA Program. Generally, these requirements were the result of a review of the current corporate Appendix B Quality Assurance Program against the requirements of the approved ASME Section III QA

Manual utilized for construction of the Harris Nuclear Plant. These requirements are not intended to delete or revise any requirements in the corporate QA manual, but rather are to provide additional criteria in supplement of the existing program. These criteria will be implemented in one of the following manners:

Revision of site procedures: Since this supplement is not intended to contradict approved site procedures, this might be necessary to reconcile conflicts between the Supplemental QA Requirements and that of existing site procedures.

Incorporation through the work control process: When criteria are stipulated that are not already reflected in site procedures, it may be more suitable to add these through work planning and specific instructions in the work package. The requirements for additional involvement of the ANI would be an example of this.

Procedure revisions will be reflected by markups and inclusion on the Document Update Form (DUF), while work package implementation will be accomplished by specific instruction in the appropriate section of the modification package (implementation, testing, etc.).

1.2 Responsibilities

General - Programmatic responsibilities for implementation of the Corporate Appendix B program, including the site's Section XI Repair and Replacement Program, are as defined in the Corporate Quality Assurance Program Manual and supporting documents, including site procedures. The involvement of site organizations as pertains to the implementation of these supplemental requirements will be subject to their review and approval during the modification approval process.

AIA (ANI) - The Authorized Inspection Agency is responsible for providing the support necessary for implementation of the supplemental requirements described in this ESR. Acceptance of these requirements will be based upon NRC review and approval of the 10CFR50.55a Alternative Plan. Formal AIA endorsement of these supplemental requirements from a programmatic perspective will accomplished by review and approval of the modification packages which incorporate them.

Modification Engineer - The Modification Engineer for the affected ESR is responsible for implementing the requirements found herein in the most appropriate manner. This would include either revision of site procedures or through direct incorporation into the modification package, as described above.

Modification Responsible Engineer - This supplement pertains only to modification activities completing construction of the spent fuel cooling systems originally intended to service Units 2 & 3. As such, the ultimate responsibility for adherence for this rests with the RE for these modifications. Since this supplement will be incorporated into the

modification packages, the RE is responsible for ensuring that the modification package contains sufficient instructions and guidance to implement it as written.

2.0 DESIGN AND DOCUMENT CONTROL

2.1 Design Control

Design Control over the modification design is directed and coordinated by CP&L in accordance with corporate and site procedures governing the modification process and design activities by outside organizations. This process results in rigorous design review process (including independent design verification) by the A/E and detailed owner's reviews by CP&L engineering personnel.

This supplement pertains only to modification activities completing construction of the spent fuel cooling systems originally intended to service Units 2 & 3. Generally, it is intended that completion of this portion of the plant will be governed by the same revisions of the Code that were utilized for original design and construction. To that end, the applicable version of the Code associated with a particular aspect of construction, and the boundaries of that applicability shall be clearly defined as design inputs in the modification packages. Later versions of the Code may be used only with reconciliation of any differences between it and the Code that was utilized for original design and construction.

2.2 Design Specifications

2.2.1 Design specifications will be prepared for all Code stamped items, in accordance with corporate and site procedures, and will be subject to the following requirements:

- The specification shall clearly delineate Code classification and boundaries and the pertinent code revision associated with the item.
- The specification shall address Code requirements for data reports, including any that may pertain to transmittal to enforcement authorities.
- The specification shall fully conform to Section III design requirements.
- The design specification shall be certified to be correct, complete, and in compliance with the code by one or more Registered Professional Engineers competent in the applicable field of design of components and related nuclear power plant requirements. It is noted that some of site's existing design specifications date back to the construction era, but may have been revised since the plant began operation. In these instances, it is acceptable to use previous certified revisions of design specifications, so long as a reconciliation of any subsequent revisions is performed to assess design impact and integration into the current the Appendix B Program.

2.3 Design Control

2.3.1 Design control shall be as directed in the corporate QA program as implemented by corporate and site procedures.

2.3.2 Design of Code stamped items shall conform to the version of the Code which would have been utilized during original plant construction. Later versions can be utilized only with documented reconciliation. Design criteria of Section III, Subsection ND shall apply to all Class III piping, equipment and components.

2.3.3 Subsequent revision to the affected modification packages shall also be subject to the supplemental requirements defined herein through completion of construction and the turnover process.

2.3.4 This supplement is "frozen" as it is incorporated into the 10CFR50.55a Alternative Plan and approved by the NRC. Design changes and modification revision packages shall not delete or revise the content or applicability of these supplemental requirements, in whole or part, without NRC approval.

2.4 Applicability of existing site procedures

2.4.1 It is appropriate to use the site Section XI Repair and Replacement as a guide for integration of site procedures with the construction of Code related items. Generally, existing site procedures shall apply as if the Code portions of construction were being performed as a Section XI Repair and Replacement activity. However, where this supplement contradicts existing procedure or program requirements, the requirements in this supplement shall take precedent and the affected procedure or program be revised as appropriate.

2.4.2 Welding, including weld procedures, welder qualification, weld material control, use and control of welder ID symbols and preparation of Weld Data Reports, will be done using the Corporate Welding Manual as invoked and implemented through site procedures.

2.4.3 The ANI shall have the opportunity to review procedures, including those for welding and QC, which will be utilized for Code related construction activities during the review of work packages prior to field issuance. Likewise, any revisions to these procedures which is intended to be utilized in the work package subsequent to the initial ANI review shall also be identified to the ANI for his review prior to its use.

2.5 Document Control

2.5.1 Document Control will be as currently defined in the corporate Appendix B QA program for quality related activities and implemented through site procedures.

2.6 Identification of ASME code Documents

2.6.1 Purchase requisitions, purchase orders, procedures and other documents generated and / or used at the site for fabrication and installation of Code items shall be identified as "ASME Section III".

3.0 PROCUREMENT

3.1 General

3.1.1 The A/E may provide input into the procurement process, however, all procurement will be performed by CP&L under its existing Appendix B Quality Assurance Program and implemented by corporate and site procedures.

3.1.2 Procurement of all code stamped items will be accomplished using approved design specifications certified by a Registered Professional Engineer competent in nuclear power plant design.

3.2 Service Contracts

3.2.1 Service Contracts intended to obtain services associated with the engineering or construction of piping and equipment affected by this supplement shall be subject to all the rules and requirements of this supplement.

3.3 Code Stamped Items

3.3.1 It is intended to complete construction to the version of the Code to which the system was originally designed and specified, which governed construction of the existing portion of piping and equipment installed during initial plant construction. The applicable version of the code associated with a particular aspect of procurement or construction and the boundaries of that applicability shall be clearly defined in the modification package. Code stamped items shall be clearly identified as such in the modification BOM or the Equipment Commissioning List. Code stamped items shall be specified and procured so as to fully comply with Code requirements, including the use of qualified suppliers with appropriate Code certification, and shall be stamped in accordance with code requirements.

The BOM or the Equipment Commissioning List shall, as a minimum, contain the following information regarding Code stamped items:

Commercial information which sets forth items, quantities, terms, conditions, etc. as appropriate, as well as the approved Design Specification(s) which defines the engineering and quality requirements.

3.3.2 Any exceptions to the Design Specifications taken by the supplier with regard to a Code stamped item shall be reconciled by revision to the affected Design

Specification prior to proceeding with procurement. Any such revision to the Design Specifications would be prepared, reviewed and approved as set forth for the original specification.

3.4 Qualification of Suppliers

3.4.1 Qualification of Suppliers of materials and services shall be accomplished in accordance with the existing CP&L Appendix B Program in accordance with approved plant procedures. All suppliers must be verified as being on the approved supplier's list for the scope of supply and holding active certification from the ASME for any Code items being procured.

4.0 RECEIVING INSPECTION

4.1 Code stamped items

Inspection, examination and acceptance of Code items shall be accomplished in accordance with corporate and site procedures. Receipt activities shall be documented in the form of a Receipt Inspection Report (RIR). Items accepted shall be appropriately tagged / labeled.

Nonconformances noted during receipt inspection shall be reported via Condition Report (nonconformance) initiation, and the affected items placed on hold or rejected. When the vendor's data package is missing or deficient, the item will be placed on hold pending the delivery of the missing information or resolution of the deficiency.

When conditions warrant, Conditional Release requests may be granted to permit progression of work involving a nonconforming item awaiting resolution. When this occurs, it will be processed and approved in accordance with existing site procedures. The ANI will be provided with the closure documentation for any conditional releases affecting Code stamped items or Code related construction.

5.0 STORAGE AND PROCESS CONTROL

5.1 Storage

Storage requirements for Code stamped items will be clearly identified in the Design Specification. Storage control through manufacture and shipment will be governed by the procurement process.

5.2 Equipment Commissioning Plan

5.2.1. General

This section prescribes the methodology which will be followed in commissioning previously installed equipment in support of completing and activating the C & D Spent Fuel Pools. The subject equipment was installed during the original site construction effort for Unit 2 & 3 fuel storage and handling activities, and was spared in place when these units were cancelled. This equipment was never incorporated into the operating unit nor has it been formally maintained under controlled storage conditions since that time. Note that the equipment in question (including Code related equipment) was procured to applicable design and quality assurance requirements, and this plan does not take exception to any of these requirements. Rather this plan prescribes a set of criteria which will ensure that the equipment in question will meet the applicable requirements of Appendix B and is capable of performing its intended function in the completed design.

5.2.2 Field Walkdown / Scope Development

Scope development is accomplished by performing a detailed field walkdown and comparing the modification design to the field condition. The entire list of previously installed equipment (both Code and non-Code related) which is anticipated to be used in the completed design will be compiled to comprise the scope of the Equipment Commissioning Plan. Note that this plan is not limited to mechanical equipment, and will include civil (pipe supports, penetrations), I&C (instrument racks, instrumentation, tubing) and electrical (cables, conduit, cable trays, equipment ground connections) as well. Each item in scope will be identified and individually dispositioned in the modification package.

5.2.3 Document Review / Retrieval

A document retrieval and review process will be included in the matrix of commissioning requirements to ensure that required quality assurance information is on hand. Generally, equipment commissioning matrix documentation requirements will be consistent with that of the original procurement effort. In particular, all Code documentation requirements (including Code data reports) must be satisfied for Code items. Records required for commissioning fall into one of two categories, which are discussed as follows:

(a) Procurement Documentation
This documentation pertains to the information which was originally used to procure the equipment in question and the vendor quality packages which were supplied with the item in response. These records are required to establish traceability and verify that required vendor quality assurance documentation and

quality releases are on file. Generally, this information is available in the Receipt Inspection Report (RIR) generated at the time the item was received. It is not acceptable to assume that the necessary information must have been received and is in order by virtue of its being installed in the field under control of the construction program, as it would have been possible to have issued the item to the field with a conditional release with outstanding quality related issues pending. All Code equipment must have traceability to the Code Data Report(s) for its construction.

(b) Field generated records
Construction records must be reviewed to ascertain to what extent the existing field condition was documented as being complete and satisfactory. Generally, this information exists in the equipment installation packages and has been maintained in document control for the major pieces of equipment in question. Once the equipment installation records have been retrieved, these must be compared against the field condition to verify that the installation as accepted has not been subsequently altered. Previous construction activities can be accepted for use in the modification implementation effort to the extent that required installation documentation exists and is verified to conform to the field condition.

In the event that records are found to be missing or deficient, an assessment is performed to determine what installation can be accepted by virtue of retest or re-inspection, or by use of alternate methods of verification. Alternately, the implications of the documentation deficiency can be evaluated to determine the potential impact to quality. Any such evaluation used to accept field conditions in the absence of required information must be formally documented and subject to design review as appropriate. Except as specifically provided in the 10CFR50.55a Alternative Plan for records of field installation of piping, this equipment commissioning plan is not intended to take exception to Code requirements pertaining to equipment installation or documentation requirements. Given this single exception, an evaluation of a deficiency is not allowed to stand in lieu of installation records which are deemed to be specifically required by Section III of the ASME B&PV Code.

5.2.4 Development of examinations, tests and acceptance criteria

The Equipment Commissioning Matrix shall specify any additional activities necessary to ensure the requisite level of quality assurance in light of the lack of formal controls on storage and handling since this equipment was initially installed. Development of these activities will include the following:

- Field verification of equipment identification against procurement documentation. In the case of Code related equipment, traceability will be established to the Code Data Report(s) and National Board Registration.
- Physical inspections, testing, etc., as required to verify that lack of controlled storage conditions and regular maintenance has not caused any condition affecting

quality. Commissioning criteria shall include consideration of corrosion, fouling, aging, radiation exposure, etc. For Code requirements, any degradation identified would be assessed in terms of Code requirements, with acceptability based on demonstrated compliance with those requirements.

- Physical inspections and considerations necessary to ensure that plant activities since construction have not resulted in any condition potentially adverse to quality (scavenging of parts, introduction of foreign material, damage from personnel and equipment traffic, etc). For Code equipment and piping, these criteria will specifically consider Code required attributes, with acceptability based on full Code compliance.

5.2.5 Repair of Deficiencies

Repair of any deficiencies shall be done in accordance with approved procedures. Since Code items in the scope of this equipment commissioning plan are supplied as completed Section III components from the vendor under that vendor's NPT Stamp Program, repairs to these items meet the definition of "Repairs" in ASME Section XI and shall be accomplished under the site's Section XI Repair and Replacement Program.

5.2.6 ANI Involvement

Code stamped equipment and related commissioning requirements will be specifically identified as such in the modification package in order to facilitate the system certification process. Provisions shall be made to ensure that any work packages generated to commission Code equipment are made available for ANI review subsequent to work completion.

5.2.7 Revising or Altering the Equipment Commissioning Plan

Generally, this equipment commissioning plan does not take exception to Code or quality requirements, but rather prescribes a dedication process which will ensure that all such requirements are met in light of the lack of storage control for the equipment it addresses. The sole exception is with regard to field installation records for Code related piping, which are no longer available and are the subject of a 10CFR50.55a Alternative Plan currently under review by the NRC. Acceptance of the field installation of this piping is contingent upon approval of this Alternative Plan by the NRC, and revising the Equipment Commissioning Plan with regard to piping acceptability may require prior notification of the NRC. Otherwise, this plan does not take exception from design or quality requirements (including ASME Code requirements), and authorization for its use and any revisions to it are provided under 10CFR50.59.

5.3 Process Control

Process control sheets are utilized to establish measures to ensure that processes, including welding and heat treating, are controlled in accordance with the Code and are accomplished by qualified personnel using qualified procedures. Generally, process control sheets for Code related construction activities will be as provided for under the site's procedures. Additional process control sheets are found in the Corporate Welding Manual and Corporate NDE Manual, as invoked and implemented by site and corporate procedures.

The ANI will review process control sheets for code related construction activities before they are issued to the field for construction. The ANI will have the opportunity to add any inspection hold points deemed necessary at this time. All process control sheets for Code related construction activities will be reviewed and accepted by the ANI subsequent to completion of field activities.

The hydrostatic test pressure used for pressure testing shall be required to meet Section III requirements, as opposed to those specified in Section XI. The process control sheets for hydrostatic testing shall reflect the more stringent test criteria.

Nonconforming field conditions will be controlled by site work process control and condition reporting procedures. The ANI will be notified of any condition reports initiated against code related construction activities, and will verify any such items are resolved prior to signing off the process control sheets for final acceptance.

Identification tags or markings shall be retained on each code item. When it is necessary to cut or transfer an item during code related construction, material identification shall be transferred to the affected piece prior to cutting. This activity shall be witnessed by QC and appropriately documented in the work package.

5.4 Modification Implementation Procedures

5.4.1 Modification procedures are being utilized for code construction (in the context of this ESR) will be those presently existing for use with the site's Section XI Repair and Replacement Program, subject to the supplemental requirements prescribed herein.

5.5 Start-up Procedures

5.5.1 Detailed start-up procedures will be developed and included in the affected modification package. Review of start-up procedures, including QC review, will be documented by review and signature approval as part of the modification approval process.

6.0 WELDING CONTROL

6.1 General

Welding activities associated with Code construction, including welding procedure qualification, weld materials procurement and control, welding equipment control, qualification of welders, weld process control and post weld heat treatment activities shall be controlled in accordance with the Corporate Welding Manual by the Plant Welding Engineer and the Plant Operating Manual. Welding may be performed by Contractors provided that the contractor is fully qualified to CP&L's welding program for the specific welding or welding related activity being performed.

Contractor's not qualified to and working under CP&L's Corporate Welding Program may only be used for Code welding activities for which they maintain their own program having the appropriate ASME certification. In this case, a service contract must be provided which authorizes the Contractor to invoke his program for the subject scope of work.

Work packages involving welding activities associated with Code construction will be reviewed by QC and the ANI prior to field issuance to ensure that appropriate hold points are included. Weld Data Reports shall be generated for any such welds per the Corporate Welding Program, and hold point inspections shall be accepted by QC and the ANI by signature and date on the WDR.

7.0 CONTROL OF EQUIPMENT, TOOLS, GAUGES AND INSTRUMENTS

7.1 General

Equipment, tools, gauges and instruments specified for calibration control shall be identified, stored, calibrated, and maintained in accordance with site procedures. Calibrations and adjustments shall be accomplished at prescribed intervals and against certified standards having known valid relationships to national standards. If no national standard exists, the equipment manufacturer's recommended standard shall be used. Recalibration shall be performed any time the accuracy of an instrument is suspect.

Traceability shall be maintained between the instrument and equipment or item being tested. The instrument identification number shall be recorded on the appropriate process control documentation. In the event an instrument is found to be out of calibration, a Condition Report must be initiated and an evaluation shall be performed to identify and disposition any suspect inspections, examinations, and test results.

8.0 INSPECTION, TESTS and NONDESTRUCTIVE EXAMINATION (NDE)

8.1 General

NDE activities associated with Code construction, including NDE procedures, qualification of personnel and control of inspection and test equipment shall be accomplished as provided in the Corporate NDE Manual. NDE procedures and acceptance criteria are provided in the Corporate NDE Manual for both original construction code and Section XI requirements. NDE shall be performed on all Code related construction activities in these modifications consistent with Section III requirements, and all such NDE shall utilize Section III acceptance criteria.

8.1.1 Process Control

Inspection, test and examination requirements shall be defined in the work packages and documented on appropriate process control sheets. These packages will be reviewed by the QC and ANI prior to field issuance. Work will not progress past established QC and ANI hold points until the hold point is accepted by signature and date by the QC inspector or ANI.

8.1.2 ANI Review and Approval of NDE Documentation

Records of inspections, tests and examinations containing QC and ANI hold points will not be considered completed until all such hold points are satisfied and the ANI has completed his inspection and signed and dated the process control sheets.

9.0 CODE DATA REPORT AND CERTIFICATION

9.1 General

The piping systems completed under these modifications will not be eligible for N stamping due to issues pertaining to the discontinuance of the original construction program and missing documentation. However, these systems will undergo a certification process similar to N stamping. Installation of Code piping, equipment and components will be documented on an ASME Section III data report "equivalent form". This form will be comparable to an NIS-2 form associated with Section XI repair / replacement activities, and PLP-605 can be used as a guideline for its completion. All work packages for installation of Code equipment shall be clearly identified as such, and provided to the ANI for review prior to field issuance and again upon completion of work activities. Completed and approved documentation pertaining to Code related construction, including field generated records and vendor data packages, shall be compiled in packages pending the review of the ANI for system turnover.

The ANI will review the documentation and certify completeness and conformance with the requirements of the corporate Appendix B Manual and these supplemental requirements prior to system turnover. Since these supplemental requirements will be implemented either by procedure revision or modification instruction, this certification will be accomplished by verifying that all Code related activities were conducted and documented in accordance with site procedures and the requirements of the modification package. The specific list of items reviewed to determine completeness and conformance will be provided as an attachment to this certification. Similar to the N-5, this listing will constitute the boundaries of the completed construction which would have normally been N-stamped.

The completed certification of the affected piping, equipment and components will be included in the modification documentation package as a permanent QA record.

10.0 NONCONFORMANCE AND CORRECTIVE ACTION

10.1 Nonconformance and corrective actions will be addressed within corporate and site procedures, including those associated with procurement, work control and condition reporting. Satisfactory resolution of any non-conformances or adverse conditions associated with code stamped items or code related construction activities will be verifiable by the ANI and all other responsible parties prior to turnover.

11.0 RECORDS CONTROL AND RETENTION

11.1 Records control and retention will be as directed by site work control and document control procedures, except as related to the ANI's role in certification as described herein.

12.0 AUTHORIZED NUCLEAR INSPECTOR

12.1 The services of an AIA shall be used as described herein. It is noted that a qualified ANI would be necessary for Section III construction activities, while an ANII is involved when performing repair and replacement activities under Section XI. Since elements of both are associated with this modification, dual qualification will be required for the AIA's site representative involved with this modification. Signoffs for this individual will reflect this dual qualification (ANI / ANII).

13.0 REVIEW, CONTROL AND REVISION OF SUPPLEMENTAL QA REQUIREMENTS

13.1 These supplemental requirements as incorporated into the modification design and approved therein will become part of a 10CFR50.55a Alternative Plan and therein subject to NRC review and acceptance. Since NRC acceptance for the alternative plan represents the authorization for these supplemental QA requirements, revision to these requirements can only be accomplished by submittal and review of the NRC as a revision to the Alternative Plan. Exceptions would be allowed only for revision to items which comply with all Code and Regulatory requirements and are provided for completeness and clarity (see Equipment Commissioning Plan), or administrative or clerical changes which do not affect technical requirements.