



Carolina Power & Light Company
Harris Nuclear Plant
P.O. Box 165
New Hill NC 27562

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

SERIAL: HNP-99-069

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

Document Control Desk

SERIAL: HNP-99-069

Page 2

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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)

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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.