

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

Report No. 99900510/80-01

Program No. 51200

Company: United Engineers & Constructors, Inc.
30 South 17th Street
Philadelphia, Pennsylvania 19101

Inspection Conducted: May 5-9, 1980

Inspectors: *D. G. Anderson* 6/2/80
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Date

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Program Evaluation Section
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Date

Summary

Inspection on May 5-9, 1980 (99900510/80-01)

Areas Inspected: Implementation of 10 CFR 50, Appendix B, and 10 CFR Part 21 criteria in the areas of followup on previous inspection findings, design inspection, design interfaces, and design process management. The inspection involved ninety-six (96) hours on site by three (3) USNRC inspectors.

Results: In the four(4) areas inspected, five (5) deviations were identified in three (3) of the areas. There were no deviations in the other area and no unresolved items identified in any of the areas inspected.

Deviations: Previous Inspection Findings: Procedures for implementation of the reporting requirements of 10 CFR 50.55(e) did not exist. (See Notice of Deviation, Item A.) Design Interfaces: Contrary to procedure, issued drawings were not properly identified as safety related, were not certified, or were not marked void or destroyed when superseded. (See Notice of Deviation, Item B.) Contrary to procedure, specifications were not issued with purchase orders, were not Project Level design reviewed, were not submitted to the checker after internal review and revision, or were not noted "For Construction." (See Notice of Deviation, Item C.) Design Process Management: Contrary to procedural requirements, outdated drawings were not physically separated from current drawings in a stick file, and System Descriptions did not reference codes and standards. (See Notice of Deviation, Item D.) Contrary to PSAR commitment, IEEE standard 382 was not invoked in a procurement document. (See Notice of Deviation, Item E).

DETAILS SECTION I

(Prepared by D. G. Anderson)

A. Persons Contacted

- G. R. Carl, Piping Engineer
- A. J. Friedman, Licensing Engineer
- *R. H. Leonard, Assistant Quality Assurance Manager
- M. P. McKenna, Manager, Pipe Support Group
- L. S. Nascimento, Assistant Structural Project Engineering Manager
- J. J. Parisano, Supervising Piping Discipline Engineer
- D. H. Rhoads, Project Engineering Manager
- E. Skolnick, Supervising Engineer
- *W. S. Stevens, Senior Attorney Corporate Legal Department
- J. E. Tompkins, Nuclear/Mechanical Engineer
- *G. Valentyeni, Assistant Project Engineering Manager
- *R. J. Vurpillat, Member, Part 21 Committee

*Indicates those present at the exit meeting.

B. Followup on Previous Inspection Findings

(Closed) Deviation (Report No. 79-02): Contrary to Chapter 17.1.3 Design Control, of the WPPSS-PSAR, a specification for the Borated Water Storage Tank (BWST) and the Demineralized Water Storage Tank (DWST) contained seismic response spectra which had been superseded. The inspector reviewed the corrective action and action to prevent recurrence as identified in the UE&C letter of response dated July 12, 1979. See further information correcting this item below.

C. Errors Concerning Amplified Response Spectra

The purpose of this part of the inspection was to followup on a deviation identified in Inspection 79-02 and to review UE&C activities related to two (2) 10 CFR 50.55(e) events which were reported to the NRC on the WPPSS and Seabrook projects. The inspector verified by record review, direct observation and discussions with UE&C personnel the following information related to these items:

1. Objectives

- a. Safety significance of the reported item.

- b. Determination of how the item was identified.
- c. Generic Applicability of the item to other systems, components, or to other vendors, suppliers, or domestic plants.
- d. Verification that the cause of the safety concern or reported item has been properly identified.
- e. Verification that the identification, review, and evaluation of the item was conducted under the requirements and procedures of the UE&C quality assurance program.
- f. Determination of the status of corrective action and preventive action to assure that this item has been satisfactorily resolved.
- g. Determination of notification of affected utilities or customers.
- h. Determination of the accuracy and timeliness of reporting to the NRC.

2. Method of Accomplishment

The preceding objectives were accomplished by an examination of:

- a. Corporate Procedure: Reporting of Defects and Non-Compliances to the NRC, 9/18/79.

GEDP-0046, Response to Potential Significant Deficiencies as Defined in 10 CFR 50 Paragraph 50.55(e), 5/9/80.

WPPSS Procedure PP-35, Processing of NRC Inspection and Enforcement Bulletins and Circulars, 11/17/76.

Administrative Procedure No. 36, Control of Seismic Design (DRAFT).

GEDP-0012, Development and Use of Amplified Response Spectra for Seismic Design of Structures and Systems, 2/20/75.

WPPSS Procedure PP-25, Seismic Qualification of Purchased Components, 6/5/74.

WPPSS Procedure PP-17, Use of Analysis Request Form, 12/15/76.

Seabrook Administrative Procedure #22, Calculations, 8/13/79.

IE Information Notice No. 79-30, Reporting of Defects and Non-compliances, 10 CFR Part 21, 12/6/79.

- b. Specification 9779-243-18, Field Fabricated Tanks (Including BWST and DWST for WPPSS Units 1 and 4) 7/10/79.
 UEWL-79-5087, Contract Modification #26, 10/3/79.
 UNI-77-4036-7, Addendum No. 4 to Manufacturer's Stress Report for DWST, DMW-TK-1, September 1979.
 UNI-77-4036-6, Addendum No. 3 to Manufacturer's Stress Report for BWST, CSS-TK-1, September, 1979.
 UNI-77-4036-5, Addendum No. 5 to Manufacturer's Stress Report for DWST, DMW-TK-1, November 1979.
 Memorandum dated 12/20/79, WPPSS Nuclear Projects Nos. 1 and 4, Amplified Response Spectra Audits.
 Audit Report No. 8, Amplified Response Spectra, Contract 101, 2/29/80.
- c. Amplified Response Spectra for Seismic Category I Structures - Teabrook Station, Volume 1 and 2, February, 1980.

3. Findings

a. Non-Conservative Seismic Response Spectra (WPPSS)

This item was originally identified as a deviation during the NRC inspection conducted May 21-25, 1979 (IE Inspection Report No. 99900510/79-02). The following are details of this item.

In reviewing the technical content of Specification No. 243, Field Fabricated Tanks, the inspector noted that the response spectra contained in the figures on pages 20A-16, 17, and 18 of this specification were less conservative than those identified in Calculation No. SAG 3.5.1.1, Seismic Analysis Including Floor Response Spectra. Since the specification was for the procurement of storage tanks, including the BWST and DWST, and since these two tanks are the source of supply for the Safety Injection System and the Auxiliary Feedwater System respectively, the inspector followed up on this discrepancy to establish the state of fabrication. It appears that the material for both tanks has been purchased (Welk Brothers Metal Products) and shipped to the WPPSS site. It appears that the reason for this oversight is that these two tanks did not appear on the Seismic Category I listing and when the calculation was revised in April 1975, the revised seismic response spectra was not incorporated into the specification. UE&C has indicated that the BWST and DWST will

appear on the next edition of the Category I listing, that the change will be documented, that Specification No. 243 will be revised, and that the supplier will provide a reanalysis of the design of these tanks. During IE Inspection 99900510/80-01, the inspector reviewed UE&C corrective action and action to prevent recurrence as identified in the letter of response dated July 12, 1979. In particular, the corrected amplified response spectra (ARS) were transmitted to the vendor and the vendor in turn reanalyzed the BWST and DWST based upon the new ARS. UE&C then conducted an internal audit of the WPPSS specification list and determined that an additional twenty-four (24) specifications contained incorrect ARS. On November 6, 1979, the Seabrook project (independent of the ARS problems identified on WPPSS) reported the use of incorrect ARS in the design of components supported by the containment building annular steel frame. Since ARS errors have now been identified on two projects under contract to UE&C, the inspector has concern that projects already completed and in operation in which UE&C supplied ARS could now be operating to less conservative design criteria.

b. Error in the Seismic Design of the Containment Supports (Seabrook)

This item was reported as a 10 CFR 50.55(e) followup item in Inspection Report 99900510/79-04 (Details Section I, paragraph C.3.b.). Paragraph C.3.b.11 indicated that the item would remain open and further inspected during the next regular inspection. Since the item is related to the item in the previous paragraph, followup related to generic applicability will be the subject of future inspections.

Subsequent to this inspection, UE&C has reported the ARS errors for both WPPSS and Seabrook as a potential Part 21 items related to seismic design (5/9/80). WPPSS 1/4 also reported relative to Part 21 on 5/12/80. This problem has been identified as a followup item.

c. Design Criteria For Large Bore Hangers

This item was reported by WPPSS on January 4, 1980, under the requirements of 10 CFR 50.55(e) as a result of design review in conjunction with reponse to IE Bulletin 79-02, 79-07, and 79-14. Action on this item is only 20-25% Complete. Engineering review is expected to be completed by November 1, 1980, and all drawings are expected to be revised by November 15, 1980. This item resulted from the activities of a working designer not meeting the design criteria. UE&C is reviewing piping isometrics and pipe hanger design completely across the board from the reactor coolant system (RCS) and beyond. This item may be generic to the Seabrook project also, with a complete review scheduled to be completed by August 1, 1980. Corrective action on this item will be a reanalysis of the existing designs. A Standards Engineer has been appointed whose responsibility is to prepare detailed pipe design checklists which are being used on the piping reanalysis. Both large and small bore hangers are being reevaluated.

- d. In this area of the inspection, no unresolved items were identified. The following deviation was identified as a result of this inspection (See Notice of Deviation, Item A).

During the review of the procedural commitments as implemented by UE&C, the inspector could not find a description of the mechanism by which UE&C identifies, evaluates, and reports items to their clients which are reportable under the requirements of 10 CFR 50.55(e). Prior to the conclusion of the inspection, UE&C generated a new procedure, GEDP-0046, Response to Potential Significant Deficiencies as defined in 10 CFR 50, Paragraph 50.55(e), which responds to this identified deviation. Since corrective action was completed prior to the end of the inspection, UE&C need only address action to prevent recurrence in their reponse to this item.

D. Design Inspection (Protection Against High Energy Line Ruptures in Fluid Systems Outside Containment)

1. Objectives

The objectives of this area of the inspection are to assure that ruptures in High Energy Lines (HEL) are evaluated and that UE&C has adequately documented information that supports their commitments to the applicable regulatory guides, branch technical positions, and safety analysis reports. The inspector selected HEL systems to determine:

- a. The essential systems that are proximate to any portion of the selected high energy line system.
- b. That the design analysis report combined with the composite drawing and stress isometric confirm that the integrity of the essential system would not be degraded in the event of a rupture at any location.

- c. That break point locations are in accordance with NRC guidelines and have been indicated on the drawings.
- d. That, for high energy line fluid systems located in containment penetration areas, the drawings and design basis provide confirmation that NRC criteria have been met.
- e. That, for those essential systems that are not protected by either the separation or protective enclosure design methods, the applicable drawings identify the break point locations and the physical design features to protect the essential systems.
- f. That the analysis for a postulated break assuming the loss of off-site power combined with a single active failure has been performed and documented.

2. Method of Accomplishment

The preceding objectives were accomplished by an examination of:

- a. Preliminary Safety Analysis Report, Seabrook Station, Volume III, Chapter 3.6, Protection Against Dynamic Effects Associated With The Postulated Rupture of Piping, and Final Safety Analysis Report (Preliminary), Chapter 3.6(B), Protection Against Dynamic Effects Associated With the Postulated Rupture of Piping (Submitted to Yankee Atomic Electric Co. for review on 8/29/79).
- b. DEDP 2601, Procedure for Piping Support and Restraint Methods and Responsibilities on Nuclear Projects, 6/3/76.
 DEDP 2602, Procedure for Design Location and Selection of Pipe Supports and Restraints for ASME III Piping, 12/16/76.
 DEDP 2604, Procedure for Pipe Rupture Design on Nuclear Projects.
 DEDP 2608, Procedure for Simplified Piping Analysis, 8/25/76.
 DEDP 2609, Procedure for Simplified Piping Analysis by IMAPS Computer Code, 2/8/78.
- c. Pipe Rupture Protection Procedures:
 Procedure for Calculating Elasto-Plastically Designed Pipe Whip Restraint Loads by Energy Balance Method, 3/23/79.
 Preliminary Procedure for Failure Modes and Effects Analysis (FMEA), 4/13/76.

Analysis of Pipe Whip and Concrete Wall Effects, 2/27/78.

Procedure for Evaluating Jet Impingement Loads from High Energy Piping Failures.

Procedure for Calculating Elastically Designed Pipe Whip Restraint Loads by Equivalent Static Analysis Method, 11/19/77.

d. Drawings:

- 9763-F-202074, Main Steam, 3/24/80.
- 9763-F-202079, Feedwater System, Piping and Instrument Diagram, 7/3/79.
- 9763-F-805211, Primary Auxiliary Building Piping Composite, Zone 32B Plan at El-6'0", 4/3/78.
- 9763-F-80522, Primary Auxiliary Building Piping Composite, Zone 32B Sections, 4/3/78.
- 9763-F-104058, Primary Auxiliary Building Pipe Whip Restraints, CS-324, 355, 374 Systems, 3/25/80.
- 9779-S-805040, Process and Instrumentation Diagram, Makeup and Purification System, 1/5/79.
- 9779-S-805041, Process and Instrumentation Diagrams, Makeup and Purification System, 12/29/78.

e. Piping Isometrics:

- 9779-F-807203, General Service Building Piping Isometric MUS System, 6/11/76.
- 9779-F-807209, General Service Building Piping Isometric MUS System, 3/17/76.

- f. WPPSS Pipe Break Stress Profiles-General Service Building, Stress Profile-Pipe Break Determination, 2/11/78.
- Table 29, Line 118-2-4.
 - Table 30, Line MUS-186-1-4.
 - Table 27, Line MUS-113-1-4.

- g. Safety Analysis Reviews (FMEA) PWR Pipe Whip Restraint Requirements. Pipe Break Analysis and Protection Effort-General Service Building, 8/15/79.

3. Findings

a. Seabrook Project

The inspector selected lines CS-374-1 and CS-374-2, which run from the charging pump (Safety Injection) through the Boron Injection Tank (BIT). This run of pipe is in the Chemical and

Volume Control System (CVCS) and is located on the Primary Auxiliary Building Arrangement Model in Section 32B between Columns 2-3 and Columns C-D at elevation 6'0". The inspector questioned the impact of this line on lines CS-358-3 and SI-272 and requested the Piping Engineer to reanalyze these lines for pipe whip. The results of the analysis indicated a jet force of 30.2 kip where 16.5 kip is necessary to form a hinge. This indicates that a hinge will form at the elbow on line CS-274-1 and the Piping Engineer suggested a need for a bumper at the elbow. The Piping Engineer indicated that a Work Request will be submitted to the Mechanical Analysis Group (MAG) for a reanalysis and confirmation of this conclusion. The inspector determined that no piping drawings for the Seabrook Project have as yet been released for fabrication.

b. WPPSS Project

The inspector reviewed the draft copy of the Final Safety Analysis Report, Washington Nuclear Project Units 1 and 4, Chapter 3.6, Protection Against Dynamic Effects Associated With the Postulated Rupture of Piping. This draft has been transmitted to WPPSS on April 10, 1980 for their review. It is of interest to note that tables accompanying Chapter 3.6 identify line numbers analyzed, piping isometrics with break locations, stress values for each location, positioning of restraints, and piping and instrumentation diagrams (P&ID). The inspector noted that approximately 400 lines were reported as having been analyzed in the FSAR. For his review, the inspector selected line MUS-118-2-4, which is a run of pipe from the discharge of the make-up pump to valve V465-B. The inspector had no questions related to this review.

- c. In this area of the inspection, no deviations or unresolved items were identified.

E. Exit Meeting

A meeting was conducted with management representatives at the conclusion of the inspection on May 9, 1980. In addition to those individuals indicated by an asterisk in the Details Sections of this report, the following were also in attendance:

- R. A. Curnane, Vice President, Project Support Operations
- H. G. Kreider, Manager, Power Engineering
- B. D. Redd, Project Engineering Manager
- G. E. Sarstem, Vice President, Power
- J. B. Silverwood, Manager, Reliability and Quality Assurance
- S. Timmaraju, Manager, Quality Engineering
- G. L. Visco, Supervisor, Project Administration

The inspectors summarized the scope and findings of this inspection for those present at the meeting. Management representatives present acknowledged the five (5) deviations identified during the inspection. Management of UE&C were not in complete agreement with the concerns of the inspector related to 10 CFR 21 reportability of the ARS errors and requested a possible meeting with IE/NRC management at a later date. Subsequent to the inspection, UE&C reported the item under the requirements of 10 CFR Part 21.

DETAILS SECTION II

(Prepared by D. F. Fox)

A. Persons Contacted

- G. M. Aggarwal, Supervising Discipline Engineer, Electrical
- D. O. Boyle, Assistant Engineering Manager, Seabrook Project
- A. W. Cole, Project Administrator, Seabrook Project
- *G. F. Cole, Project Manager, Seabrook Project
- H. E. Flora, Supervisor Discipline Engineer, Nuclear
- K. M. Kalawadia, Structural Engineer, Seabrook Project
- *R. H. Leonard, Assistant Quality Assurance Manager
- *B. C. Low, Quality Engineer, Seabrook Project
- R. P. Neustadt, Supervising Discipline Engineer, I&C
- *D. H. Rhoads, Engineering Manager, Seabrook Project

*Indicates attendance at the exit meeting.

B. Design Interfaces1. Objectives

The objectives of this area of the inspection for both internal and external interfaces were to determine that procedures have been established and implemented that:

- a. Require that design organizations identify, in writing, their interfaces for managing the flow of design information.
- b. Define and document the responsibilities of each organizational unit for the preparation, review, approval, distribution, and revision of documents involving design interfaces.
- c. Establish methods for systematically communicating needed design information, including changes thereto, across design interfaces as work progresses.
- d. Require documentation of information transmitted between organizations which identified the status of the design information or documents and incomplete items which require further evaluation, review or approval.
- e. Require that design information transmitted orally or by other informal means is promptly documented, and the documentation confirmed and controlled.

- f. Identify the external organizations providing criteria, designs, specifications, and technical direction.
- g. Identify the positions and titles of key personnel in the communications channel and their responsibilities for decision making, problem resolution, providing and reviewing information.

2. Method of Accomplishment

- a. Review of the following documents to determine if procedures have been established to control internal and external design interfaces:
 - (1) Sections 3.1, 3.2 and 17 of the PSAR for the PSNH (Public Service of New Hampshire) Seabrook Station to determine the original UE&C (United Engineers and Constructors) commitments relative to design interface control.
 - (2) Section III of the UE&C Quality Assurance Manual - Corporate Standards to determine the corporate QA commitments relative to design interface control.
 - (3) Sections QA-1, QA-3, QA-5 and QA-6 of the Seabrook Project Quality Assurance Procedures Manual to determine the Seabrook Project QA requirements relative to design interface control.
 - (4) The following General Engineering and Design Procedures contained in the Operations Manual - Power Engineering Department to determine if the UE&C commitments and QA requirements relative to design interface control were correctly translated into engineering procedures:
 - GEDP - 0005, Preparation, Documentation and Control of Calculations
 - GEDP - 0013, Preparation of Drawings
 - GEDP - 0014, Preparation of ASME Design Specifications.
 - GEDP - 0015, Preparation of Design Specifications
 - GEDP - 0022, Project Level Design Review and Design Verifications
 - GEDP - 0025, Management Level Design Review by Chief Discipline Engineers
 - GEDP - 0035, Engineering Design and Design Interface Control
 - (5) Sections 9 and 28 of the Seabrook Administrative Procedures Manual, Sections 12 and 14 of the General Administrative Procedures Manual and procedure PAP - 23 to determine project unique requirements for design document and interface control.

(6) Sections I, II, III and VII of the Seabrook Station Manual of Procedure to determine the requirements for control of external design interfaces.

b. Review of the following documents to determine if the objectives of Section II, B. 1 were accomplished.

(1) Twenty-four (24) design drawings

9763-F-101346	9763-F-310010	9763-F-805661
9763-F-101401	9763-F-310024	9763-F-805662
9763-F-101402	9763-F-310029	9763-F-805666
9763-F-101461	9763-F-801201	9763-M-503270
9763-F-101462	9763-F-801202	9763-M-503271
9763-F-101463	9763-F-801205	9763-M-503276
9763-F-101495	9763-F-805572	<u>W</u> -DWG-7246-D-79
9763-F-101496	9763-F-805573	
9763-F-101497		

(2) Ten (10) design specifications

9763-006-15-1	9763-006-172-1	9763-006-748-47
9763-006-15-2	9763-006-172-2	9763-006-1-1
9763-006-118-1	9763-006-246-1	
9763-006-143-1	9763-006-246-6	

(3) Four (4) Foreign Print Review Sheets and Labels

<u>W</u> -DS-677188	<u>W</u> -DWG-7246D79
<u>W</u> -DS-952243 (Sheet & Label)	

(4) System Description SD-20

(5) Project Change Notice 080491A

(6) The Request for Quotation, Supplier Quotation and Purchase Order Change Notice No. 14 for UE&C Purchase Order 5NH-7, 9763.006 - 246-1 (Refueling Water Storage Tank).

3. Findings

a. Deviations from Commitment

See Notice of Deviation, Items B.1 thru B.3 and Items C.1 thru C.4, and the additional comments below:

- (1) With respect to Item B.1, all thirty-four (34) superceded drawings contained in the Seabrook Structural Engineering Discipline Files were replaced with the current revision during the inspection. A UE&C audit of all other Seabrook Project drawing files performed during the inspection revealed no other superceded drawings.
- (2) With respect to Item B.2, Administrative Procedure AP-28 was revised during the inspection to only require certification of those drawings depicting ASME code items. All drawings depicting ASME code items that were examined during the inspection were properly certified.
- (3) With respect to Item B.3, Administrative Procedure AP-28 was revised during the inspection to permit drawings depicting nuclear safety-related items to be identified as "Nuclear Safety-Related."
- (4) With respect to Item C.1, Certified Design Specification 9763-006-246-1 was revised and issued during the inspection to reflect the changes in the technical work on (design changes) the Refueling Water Storage Tank.
- (5) With respect to Item C.2, procedure GEDP-0014 was revised during the inspection to delete the mandatory requirement that all specifications for ASME items be subjected to a formal Project Level Design Review and to impose the requirement that the Supervising Discipline Engineer review all final draft specifications and arrange for their design verification in accordance with GEDP-0022. or is current UE&C practice.
- (6) With respect to Item C.3, Administrative Procedure AP-28 was revised during the inspection to exempt marking Seabrook Project Design Specifications "For Construction" after the "Owners" comments are resolved in accordance with current UE&C practice.
- (7) With respect to Item C.4, procedure GEDP-0015 was revised during the inspection to provide for final review of the

final draft of Design Specifications by the independent design verifier prior to issue in accordance with current UE&C practice.

b. Unresolved Items or Follow Up Items

There were no unresolved items or follow up items identified in this area of the inspection.

DETAILS SECTION III

(Prepared by J. M. Johnson)

A. Persons Contacted

- M. P. Hamill, Supervising Engineer, Nuclear and Mechanical Services (WPPSS)
- J. Hill, Instrumentation and Control (I&C) Engineer (WPPSS)
- H. Katz, Licensing Engineer (Seabrook)
- *R. H. Leonard, Assistant QA Manager
- R. C. Lesnefsky, Project QA Engineer (WPPSS)
- *D. C. Low, Supervising Engineer, Seabrook Project Quality
- W. MacIntyre, QA Engineer (WPPSS)
- R. Mabry, Supervising Engineer, Mechanical (Seabrook)
- K. A. Parlee, Supervising Engineer, I&C (WPPSS)
- A. Ricci, Design Supervisor, I&C (WPPSS)
- S. Rubenstein, QA Engineer (Seabrook)
- G. Zozielorski, I&C Engineer (WPPSS)

*Denotes those present at exit interview.

B. Design Process Management1. Objective

The objective of this area of inspection was to examine the establishment and implementation of quality related procedures for the design process to verify that:

- a. The design process system is defined, implemented, and enforced in accordance with approved procedures, instructions, or other documentation for all groups performing safety related design activities.
- b. Design inputs are properly prescribed and used for translation into specifications, drawings, instructions, or procedures.
- c. Appropriate quality standards for items important to safety are identified, documented, and their selection reviewed and approved.
- d. Final design can be related to the design input with this traceability documented, including the steps performed from design input to final design.
- e. Design activities are documented in sufficient detail to permit design verification and auditing.

- f. The methods are prescribed for preparing design analyses, drawings, specifications, and other design documents so that they are planned, controlled, and correctly performed.

2. Method of Accomplishment

The preceding objectives were accomplished by an examination of the following:

- a. Preliminary Safety Analysis Report (PSAR) for WPPSS Nuclear Projects 3 and 5, Sections 17.2 (UE&C QA Program), 7.5 (Safety-Related Display Instrumentation), 7.1.1.2 (Safety-Related Systems supplied by UE&C), Tables 7.1-1, and 7.5-1 and Figure 7.9-1. This was examined to determine QA program commitments and certain specific design commitments.
- b. Preliminary Safety Analysis Report (PSAR) for Seabrook Station, Chapters 16 and 17, and Sections 3.9 (Mechanical Systems and Components), 3.1.2 (Conformance to AEC Division 1 Regulatory Guides) and Preliminary Draft Final Safety Analysis Report (FSAR) section concerning Regulatory guides, and Section 3.9, Mechanical Systems and Components, including chart (Radiation Level Integrated Doses). These were examined to determine QA program commitments and certain specific design commitments in the PSAR, plus proposed revisions in the FSAR.
- c. UE&C Quality Assurance Manual for WPPSS Nuclear Projects 1 and 4, procedure QA-3 (Design Control) was examined for procedural requirements for design.
- d. Project Procedures for WPPSS Nuclear Projects 1 and 4; procedures no. P.P. 5 (Specification Preparation), P.P. 14 (Project Level Design Review), P.P. 16 (Calculations), P. P. 18 (Project Change Requests), P.P. 21 (Drawing Practices and Approvals), and P.P. 28 (System Descriptions). Also examined were cancelled procedures P.P. 11 (Design Data Worksheet) and P.P. 12 (Unit Control Form). These were examined for detailed implementing procedure requirements in design areas.
- e. UE&C Drawings for WPPSS:
 - 1. 9779-S-503001, Revisions 0 and 1, and 2 (General Arrangement - Plant Control Room Complex Instrumentation) which reflects Figure 7.9-1 of the PSAR and provides additional detail;
 - 2. 9779-F-503018, Revisions 0 and 1, (General Arrangement - Safety-Related Controls and Instrumentation-Panel "Y");
 - 3. 9779-F-503024 and 9779-F-503025;

4. 9779-1-502081 (Control Diagram - Area Radiation Monitoring (ARM)), Revision 1;
5. 9779-F-502093 (Control Diagram - Containment Air Monitoring (CAM));
6. 9779-F-503013, Revision 0;
7. 9779-F-503015;
8. 9779-F-503021;
9. 9779-F-503020;
10. 9779-F-503022;
11. 9779-M-507003 (Plant Annunciator List - Computer Printout).

These drawings were examined for approvals, currency, cross-checked for consistency where applicable, and reviewed for conformance to procedural requirements of QA-3 and P.P.21.

- f. Drawing Task System (DTS), which is the status list for WPPSS drawings, was checked to assure indication of proper drawing revision for the majority of the above - listed drawings.
- g. System Description No. I-3, (Area Radiation Monitors (ARM) for WPPSS Nuclear Projects 1 and 4) was examined against applicable requirements and procedural requirements of QA-3 and P.P. 28.
- h. System Description No. I-19 (Containment Atmospheric Monitoring System (CAM) for WPPSS Nuclear Projects 1 and 4) was checked against procedural requirements of QA-3 and P.P. 28. Note that resolution of comments has not been completed.
- i. Specification No. 130 Q (Contract No. 9776-130Q) for Containment Atmospheric Monitors, including Division 15 Section 15Q (Technical Specification for Hydrogen Analyzers - CAM system - Class IE) was examined for scope of work, inclusion of environmental conditions, imposition of IEEE standards committed to in Table 17.1-1 of the PSAR, submittal requirements and QA requirements.
- j. Specification 121 (Contract No. 9776-121) including Section 15A (Plant Radiation Monitoring), and change order ED (12/5/79) which requires a test to verify operability of active valves, were examined for scope of work, inclusion of environmental conditions, etc.

- k. UE&C Calculation No. N-RAD-21 (Reactor Vessel Cavity Neutron Shielding) was reviewed for approval and computer code used (Morse-CG).
- l. UE&C Calculation Book No. N1, Run 5 (Post - LOCA Radiation Level in Containment) was checked for appropriate review and approvals.
- m. Vendor Kaman Sciences submittals for Contract 121 and their review by UE&C and approval status:
 - (1) Procedure No. KNP-18-14u(R) titled Seismic and Environmental Qualification Plan: Status - not approved;
 - (2) Procedure No. KNP-18-30, Revision B, titled Hydro Pressure Test (Liquid Samplers): Status - approved;
 - (3) Procedure KNP-20-2, Revision F: Status - approved as noted; Resubmittal as Revision I: Status - approved as noted; Resubmittal as Revision J: Status - approved.
 - (4) Drawings (foreign prints) 72300-01, 72301-01, 72302-01, 72303-01 (Note that these were unavailable in the discipline files, but available in Reproduction/microfilming department); Sketch JWE-8114-001, Revision 1 (Local Indicator and Control Panel); Drawing No. 901968, Revision A (ARM 1-19 and PRM 1 and 14 area monitors): Status - release as noted; Drawing No. 901977, Revision A (Outline Drawing AAM 7 and 8): Status - released as noted.
 - (5) Calculated Nozzle Loads (NCE), Revision A (for inlet and outlet valve configurations for gas and gas particulate monitors); Status: Not approved pending change to specification (i.e. "Specification must be revised to incorporate seismic conditions and requirements for valves - 7/26/79"). This change was verified to have been made on Purchase Order 9776-121, Change Order ED dated 12/4/79 which now requires that Seismic Category I valves shall be analyzed in accordance with the requirements of specification section 20A, and that active valves shall be qualified by testing to verify operability. (Additional details are provided in the changed pages).
- n. UE&C QA Manual for Seabrook (New England Power (NEP) 1 and 2), procedure QA-3 (Design Control) was reviewed for procedural requirements for design activities.
- o. UE&C Engineering Department Procedure No. GEDP-0022 (Project Level Design Review and Design Verification) was reviewed for implementation of QA-3 requirements.

- p. UE&C drawings for Seabrook:
- 9763-F202074, Revision 6 (P&ID)
 - 9763-F202075 (PI&D)
 - 9763-M-303660 (Logic Diagram)
- q. System Design Description (SDD) No. SD-3A.3. for Main and Auxiliary Steam System was examined for appropriate review and approvals, inclusion of required design data, currency, and to assure that it meets the requirements of QA-3 for Seabrook.
- r. Main Steam Isolation Valves (for Seabrook) technical specification 9763-006-248-25 (now void) was compared with specification 9763-006-248-65 which is the revised specification to go to the new vendor (Rockwell) who has been awarded this contract. It was noted that the specification is still in draft form, but does reflect certain valve changes. Such things as type of valve, size, capacity, actuator, closure time, imposition of Regulatory Guides and ANSI standards and seismic environmental conditions including radiation levels were examined and compared with SAR commitments (as applicable) and SDD requirements.
- s. Meeting notes, SBU 3508 dated March 19, 1980, of meeting between Rockwell and UE&C concerning modifications to the specification were examined.

3. Findings

a. Deviations

In this area of the inspection, two deviations were identified (See Notice of Deviation, Items D. and E.).

- (1) Concerning Notice of Deviation Item D.1., the corrective action taken was that outdated drawings on this stick file were removed during the inspection, and two additional drawings were marked void and removed. The preventive action consisted of a memorandum to affected personnel from the Project QA Engineer which reiterated the requirements of Project Procedure 21 and requested all disciplines to ensure proper implementation.
- (2) Concerning Notice of Deviation Item D.2., it was noted that a PSAR Deviation No. 17.2-4 deletes the PSAR requirement of Section 17.2.2.2.c) "Design Control" for a "Unit Control Form" to provide assurance of the application of required design bases, and Codes and Standards, in specifications. PSAR Deviation No. 17.2-4 states that "other mechanisms of control are in use," but does not state what these are.

The UE&C QA Manual for WPPSS, Procedure QA-3, Section IV A.6 requires the generation and use of a Design Data Worksheet which enables the Engineer, during preparation of the specification and prior to the issuance of the System Design Description, "to verify that applicable requirements contained in the referenced Codes and Standards and AEC Criteria are being correctly translated into design." Project Procedure no. P.P.11 is referenced as giving detailed instructions on the use and significance of Design Data Worksheets. However, P.P.11 has been deleted, and no Design Data Worksheets were available for Area Radiation Monitors (ARM) or Containment Atmospheric Monitors (CAM) in the I&C Department. This may be a contributing cause to the fact that not all applicable requirements of Codes and Standards were translated into the System Descriptions for the CAM and ARM, and that the technical specification for the CAM system did not impose the applicable requirements of IEEE standard 382.

A clear consistent delineation of the mechanisms of control to assure application of Codes and Standards in WPPSS specifications appears lacking.

b. Unresolved Items

None

c. Follow-Up Items

- (1) During the course of the inspection, an error was noted in the DTS (Drawing Task Tracking System) for WPPSS in that it shows UE&C drawing number 9779-A-503001 to be currently at Revision 3, whereas Revision 3 has never been approved in house. Therefore, Revision 2 is the current level of this drawing, and responsible UE&C personnel committed to making this change in the next issue of DTS, which is issued monthly. No deviation was written because this appeared to be an isolated error. Further review will be made during a subsequent inspection to assure that the error has been corrected.
- (2) It was also noted that the new draft specification (9763-006-248-65) for Seabrook Main Steam Isolation Valves (MSIVs) shows the integrated gamma radiation dose as 1×10^6 , whereas the draft FSAR shows 1.3×10^7 for this location. The responsible UE&C engineer committed to revising the specification to reflect the higher values. No deviation was written because both documents are in draft form; however, a review will be made during a subsequent inspection to assure concordance

and correct designation of the integrated radiation dose by this specification as well as the imposition, if required, of IEEE 382 as committed to in Section 3.9 of the Seabrook PSAR (or inclusion of 9763-006-248-13 Specification for Actuators for valves for Seabrook, which includes IEEE 382 requirements).

- (3) It was also noted during the inspector's review of the meeting minutes of the award meeting for Purchase Order No. 9763-006-248-65 for the Main Steam Isolation Valves (MSIVs) for Seabrook that Rockwell, the new vendor, stated that their QA system is established around NCA 4134 of Section III of the ASME Code. Further, they stated that they meet the intent of 10 CFR 50, Appendix B and ANSI N 45.2, but not the detailed requirements nor all the N45.2 Daughter Standards. They indicated that they would generate a QA plan to supplement the manual, and also that their manual is submitted for information, not approval. The Rockwell QA manual has been submitted but not reviewed by UE&C. Further examination during a subsequent inspection will be made to assure that Rockwell's QA program (as supplemented) meets 10 CFR 50, Appendix B and ANSI N45.2 requirements, as well as applicable N45.2 daughter standards, including N45.2.11 committed to in the Seabrook PSAR (since Rockwell scope includes design of the MSIVs), and that the QA program is applied also to non-code parts essential to the functioning of the MSIVs.
- (4) It was also noted that System Design Description No. SDD-3 will need revision to show the new vendor of the MSIVs, the valve type, change in PSID from .5 PSI to 3.5 PSI, etc. Further review will be made during a subsequent inspection to assure implementation of the required changes in SDD-3.

d. Comments

It was noted that several of the systems examined have major redesigns pending.