



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SEP 30 1988

Docket Nos. 50-445  
and 50-446

APPLICANT: Texas Utilities Electric Company (TU Electric)  
FACILITY: Comanche Peak Steam Electric Station (CPSES), Units 1 and 2  
SUBJECT: SUMMARY OF MEETING ON SEPTEMBER 21, 1988 - DISCUSSION OF  
CHEMICAL ENGINEERING BRANCH'S FSAR REVIEW FOR COMANCHE PEAK

NRC staff and representatives of TU Electric met on September 21, 1988 in Rockville, Maryland to discuss the Chemical Engineering Branch's ongoing review of changes to the Comanche Peak Final Safety Analysis Report (FSAR). The meeting notice and agenda are provided as Enclosures 1 and 2, respectively, to this summary. The list of attendees is provided as Enclosure 3.

The staff and applicant discussed the content of the various sections in the review materials binder collated for the Chemical Engineering Branch's (ECEB's) review of Comanche Peak FSAR changes from Amendment 55 through Amendment 73. This binder consists of previously docketed materials (FSAR sections and applicant letters) and other publically available materials (NUREG excerpts, regulatory guides, and industry standards). The table of contents of the ECEB review binder is provided as Enclosure 4. While discussing the content of the sections of this binder, Mr. Witt pointed out that materials corresponding to Safety Evaluation Report (SER) Sections 6.5.2 (Containment Spray System) and 9.3.4 (Chemical and Volume Control System) had been inadvertently left out of the review binder (these are SER sections for which ECEB has primary review responsibility.) It was agreed that these materials could be collected and added to the binder within the next 2 weeks. Mr. Witt also indicated 3 other SER sections for which ECEB has secondary review responsibility and which are not shown on the review responsibility matrix being used by the Comanche Peak Project Division (CPPD): 9.1.3 (Spent Fuel Pool Cooling and Cleanup System), 9.2.3 (Demineralized and Reactor Makeup Water System), and 9.5.4 (Emergency Diesel Engine Fuel Oil Storage and Transfer System). The review responsibility matrix was marked up by the staff to show corrected ECEB primary and secondary review responsibilities and is provided as Enclosure 5.

Using CPPD's action list for ECEB (Enclosure 6), current for FSAR Amendments 55 through 73 except for the updates to review responsibilities provided by Mr. Witt, the staff and applicant briefly discussed the action list items referred to ECEB by CPPD for review (indicated by a marginal note of ECEB's initials next to individual bullets). The applicant explained the pertinent portions of the FSAR Amendment description which were provided in a letter to the NRC (TXX-88467) dated June 1, 1988 as an FSAR review aid. Excerpts from this letter are contained in Section C of the ECEB review binder as indicated in Enclosure 4.

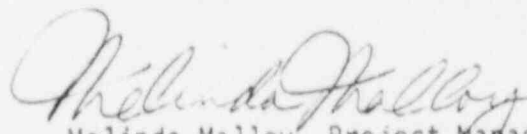
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During the course of these discussions, Mr. Witt requested that the applicant consider revising the FSAR to reflect its commitment to perform containment coatings surveillances and repairs throughout the life of the CPSES plant. This commitment, reflected in Supplement No. 9 to the Comanche Peak SER (SSER No. 9) is documented in a letter from W. G. Council (TU Electric) to V. S. Noonan (NRC) dated November 18, 1985 (TXX-4613). The applicant agreed to incorporate the surveillance and repair program in a future FSAR amendment.

In discussing action list item II.B.3 (Post-accident Sampling Procedures) appearing in Section 22 of the list, Mr. Witt indicated that the staff needs to review the plant-specific core damage procedures which are not included in his review binder. The applicant will submit the procedures, if not already docketed, so that the binder can be updated. Mr. Witt also pointed out that the third bullet on the action list for II.B.3 was closed in SSER No. 6 and should be removed from the list.

For review planning purposes, the applicant showed the staff a copy of the revisions in process for the text of FSAR Section 10.4.6 (Condensate Cleanup System) which will be part of Amendment 74, scheduled for submittal in October 1988.



Melinda Malloy, Project Manager  
Comanche Peak Project Division  
Office of Special Projects

Enclosures:

1. Meeting Notice
2. Agenda
3. List of Attendees
4. ECEB Binder Contents
5. ECEB Review Responsibilities Matrix
6. Action List for ECEB

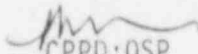
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SEP 30 1988

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Docket File

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AD:CPPD:OSP  
JHWilson  
09/29/88

SEP 30 1988

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SEP 30 1988

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- 2 - Comanche Peak Electric Station  
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ENCLOSURE 1

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

September 2, 1988



Locket Nos. 50-445  
and 50-446

MEMORANDUM FOR: Christopher I. Grimes, Director  
Comanche Peak Project Division  
Office of Special Projects

FROM: James H. Wilson, Assistant Director  
for Projects  
Comanche Peak Project Division  
Office of Special Projects

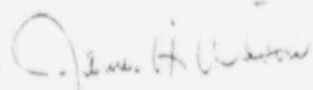
SUBJECT: FORTHCOMING MEETING WITH TU ELECTRIC

Date & Time: Wednesday, September 21, 1988  
1:00 pm - 4:00 pm

Location: One White Flint North  
11555 Rockville Pike  
Rockville, MD 20555  
Room No. 78-15

Purpose: Discussion of Chemical Engineering Branch  
FSAR review for Comanche Peak

Participants:\* NRC TU Electric  
J. H. Wilson R. Walker  
D. Terao G. Bell, et al  
M. Malloy  
F. Witt

  
James H. Wilson, Assistant Director  
for Projects  
Comanche Peak Project Division  
Office of Special Projects

cc: See next page

\* Meetings between NRC technical staff and applicants for licenses are open for interested members of the public, petitioners, intervenors, or other parties to attend as observers pursuant to "Open Meetings and Statement of NRC Staff Policy," 43 Federal Register 28058, 6/28/78.

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9/21/88

AGENDA  
FOR  
CPSES UNITS 1 AND 2 FSAR REVIEW  
NRC - CHEMICAL ENGINEERING BRANCH

- INTRODUCTION: Don R. Woodlan  
Jim Wilson
  
- BRIEF DESCRIPTION OF SECTIONS: Manu Patel
  
- DETAIL FSAR CHANGE REQUEST: Manu Patel
  - Format of Table
  - Review Change Request (Bullets)  
with FSAR/SER Pages
  
- SUMMARY: Manu Patel  
Don Woodlan  
Jim Wilson
  
- REFERENCE:
  - CPSES FSAR Review Package
  - CPSES FSAR/SER Comparison
  - CPSES FSAR/SER Changes (Bullets)
  
- NRC/TU ELECTRIC CONTACTS:  
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TU ELECTRIC:
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  - Manu C. Patel (214) 812-8298

MEETING WITH TU ELECTRIC ON CHEMICAL ENGINEERING  
BRANCH FSAR REVIEW

September 21, 1988

Name

Affiliation

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NRC/CPD

Don Woodlan

TU Electric (214-812-8225)

Manu Patel

TU Electric (214-812-8298)

FRANK WITT

NRC/NRR/ECEB (301-492-0523)

Jim Wilson

NRC/CPD

ENCLOSURE 4

Table of Contents from the  
Chemical Engineering Branch  
Review Binder



## CHEMICAL ENGINEERING BRANCH (CECB)

## A. FSAR SECTIONS:

1. 6.1N and 6.1B:
  - a. FSAR 1A(N) R.G. 1.36 1A(N)-21 - 1A(N)-22
  - b. FSAR 1A(N) R.G. 1.54 1A(N)-31
  - c. FSAR 1A(B) R.G. 1.36 1A(B)-15
  - d. FSAR 1A(B) R.G. 1.54 1A(B)-23 - 1A(B) -24
  - e. FSAR 6.1N 6.1N-1 - 6.1N-5
  - f. FSAR Table 6.1N-1, sht 1&2
  - g. FSAR 6.1B 6.1B-1 - 6.1B-15
  - h. FSAR Table 6.1B-1 thru 6.1B-4
  - i. Q&R 281.1 281-1 - 281-2
  - j. Q&R 312.15 312-17
  - k. Q&P 312.16 312-18
  
2. 9.3.2 and II.B.3:
  - a. FSAR Section 9.3.2 (ALL)
  - b. FSAR Table 9.3-4, shts. 1 thru 3
  - c. FSAR Figure 9.3-4, shts. 1 thru 5
  - d. FSAR 1A(B) R.G. 1.21 1A(B)-9
  - e. FSAR Section II.B.3 IIB-12 thru 29 | 1
  - f. FSAR Table II.B.3-1
  - g. FSAR Figure II.B.3-1
  - h. FSAR Figure II.B.3-2 | 1
  - i. FSAR Figure 9.4-6 | 1
  
3. 10.4.6:
  - a. FSAR Section 10.4.6 (ALL)
  - b. FSAR Table 10.4-4, shts. 1 thru 11
  - c. FSAR Figure 10.4-7, shts. 1 and 2
  - d. FSAR Figure 1.2-23
  - e. FSAR Section 1A(B) R.G. 1.56 1A(B)-24 - 1A(B)-25 | 1
  
4. 10.4.8:
  - a. FSAR Section 10.4.8 (ALL)
  - b. FSAR Table 10.4-6, shts. 1 thru 8
  - c. FSAR Table 10.4-7
  - d. FSAR Figure 10.4-10, shts. 1 and 2
  - e. FSAR Figure 1.2-31
  - f. FSAR Figure 1.2-33
  - g. FSAR Figure 10.3-1, shts. 1 thru 5 | 1
  
5. 12.3.1:
  - a. FSAR Section 12.3.1 12.3-35
  - b. Q&R 331.2 331.11

## CHEMICAL ENGINEERING BRANCH (ECEB)

## B. SER/SSER SECTIONS:

- |    |                            |                |   |
|----|----------------------------|----------------|---|
| 1. | 6.1N and 6.1B:             |                |   |
|    | a. SER 6.1.2               | 6-1 - 6.2      |   |
|    | b. SSER #9, Appendix L & M | i thru M-133   | 1 |
|    | c. SSER #12, 1-7, Issue 34 | 1-8            | 1 |
| 2. | 9.3.2 and 11.B.3           |                |   |
|    | a. SER 9.3.2               | 9-16 & 9-17    |   |
|    | b. SSER #2, 11.B.3         | 22-2 thru 22-4 |   |
|    | c. SSER #6, 11.B.3         | 22-8 thru 22-9 |   |
| 3. | 10.4.6:                    |                |   |
|    | a. SER 10.4.6              | 10-9 and 10-10 |   |
| 4. | 10.4.8:                    |                |   |
|    | a. SER 10.4.8              | 10-11          |   |
| 5. | 12.3.1:                    |                |   |
|    | a. SER 12.1.4              | 12-2 & 12-3    |   |

## C. FSAR AMENDMENT DESCRIPTIONS:

(Amendment 55 through 72) - by related SER SECTION

- |    |                   |                          |   |
|----|-------------------|--------------------------|---|
| 1. | 6.1N and 6.1B:    |                          |   |
|    | a. 6.1.2          | Amend 55, 66             | 1 |
| 2. | 9.3.2 and 11.B.3: |                          |   |
|    | a. 9.3.2          | Amend 55, 57, 59, 66, 67 | 1 |
|    | b. 11.B.3         | Amend 67                 |   |
| 3. | 10.4.6:           |                          |   |
|    | a. 10.4.6         | Amend 66                 | 1 |
| 4. | 10.4.8:           |                          |   |
|    | a. 10.4.8         | Amend 55, 57, 66, 67     |   |
| 5. | 12.3.1:           |                          |   |
|    | none              |                          |   |

## CHEMICAL ENGINEERING BRANCH (ECEB)

## D. LETTERS ASSOCIATED WITH FSAR CHANGES:

1. 6.1N and 6.1B:
  - a. TXX-4491, dated 6/7/85
  - b. TXX-4613, dated 11/18/85
  - c. TXX-4653, dated 12/17/85
  - d. TXX-6157, dated 12/16/86
  - e. NRR-6664, dated 3/24/87
2. 9.3.2 and II.B.3:
  - a. TXX-3612, dated 01/18/83
  - b. TXX-4034, dated 08/26/83
  - c. TXX-4083, dated 12/08/83
  - d. TXX-4273, dated 08/20/84
  - e. NRR-3072, dated 01/23/84

3. 10.4.6:  
none

4. 10.4.8:  
none

5. 12.3.1:  
none

## E. SELECTED SDAR's (10 CFR 50.55 (e) Reports):

none

## F. TECHNICAL SPECIFICATIONS:

1. 6.1N and 6.1B:  
none

2. 9.3.2 and II.B.3:

- a. 6.8
- b. 3/4,6.4

3. 10.4.b:  
none

4. 10.4.8:  
none

5. 12.3.1:  
none

## G. STANDARD REVIEW PLAN (NUREG-0800)

1. 6.1N and 6.1B:

- a. 6.1.2

6.1.2-1 thru 6.1.2-4

## CHEMICAL ENGINEERING BRANCH (ECEB)

- |    |                   |                        |
|----|-------------------|------------------------|
| 2. | 9.3.2 and II.B.3: |                        |
|    | a. 9.3.2          | 9.3.2-1 thru 9.3.2-10  |
| 3. | 10.4.6:           |                        |
|    | a. 10.4.6         | 10.4.6-1 thru 10.4.6-4 |
| 4. | 10.4.8:           |                        |
|    | a. 10.4.8         | 10.4.8-1 thru 10.4.8-5 |
| 5. | 12.3.1            |                        |
|    | none              |                        |

## H. REGULATORY GUIDES (SELECTED APPLICABLE VERSIONS)

- |    |                             |                     |
|----|-----------------------------|---------------------|
| 1. | 6.1N and 6.1B:              |                     |
|    | a. 1.36 (2/23/73)           | 1.36-1 thru 1.36-3  |
|    | b. 1.54 (6/73)              | 1.54-1 thru 1.54-2  |
| 2. | 9.3.2 and II.B.3:           |                     |
|    | a. R.G. 1.2i, Rev. 1 (6/74) | 1.21-1 thru 1.21-21 |
| 3. | 10.4.6:                     |                     |
|    | a. R.G. 1.56, Rev. 1 (7/78) |                     |
| 4. | 10.4.8:                     |                     |
|    | none                        |                     |
| 5. | 12.3.1:                     |                     |
|    | none                        |                     |

## I. INDUSTRY STANDARDS:

- |    |                   |           |
|----|-------------------|-----------|
| 1. | 6.1N and 6.1B:    |           |
|    | none              |           |
| 2. | 9.3.2 and II.B.3: |           |
|    | a. ANSI N13.1     | 1 thru 39 |
| 3. | 10.4.6:           |           |
|    | none              |           |
| 4. | 10.4.8:           |           |
|    | none              |           |
| 5. | 12.3.1:           |           |
|    | none              |           |

CHEMICAL ENGINEERING BRANCH

SEE TABLE OF CONTENTS

| SER/SSER # | CORRESPONDING FSAR SECTION                                   | *<br>ADDRESSED IN FSAR AMEND #         | *<br>FSAR CHANGES SUBSEQUENT TO LATEST SSER |     | *<br>FSAR REVIEW REQUIRED |     | *<br>SSER REWRITE REQUIRED |     | REVIEW AREA    |
|------------|--|--|---|-----|---------------------------|-----|----------------------------|-----|----------------|
|            |  |  | NO  | YES | NO                        | YES | NO                         | YES |                |
|            |  |  | MIN   | MOD | MAJ                       | MIN | MOD                        | MAJ |                |
| 2.2.1      | Transportation Routes  |  | X   |     | X                         |     | X                          |     | ESGR/ECEB      |
| 2.2.2      | Nearby Military and Industrial Facilities                    |  | X   |     | X                         |     | X                          |     | ESGR/ECEB      |
| 6.1.2      | Organic Materials  | 55                                     |   | X   | X                         |     | X                          |     | ECEB           |
| 6.4        | Control Room Habitability                                    | 55, 56, 60, 64, 66, 68                 |   | X   |                           | X   |                            | X   | SPLB/PRPB/ECEB |
| 6.5.2      | Containment Spray System                                     | 66, 68                                 |   | X   |                           | X   |                            | X   | SPLB/ECEB/PRPB |
| 9.1.2      | Spent Fuel Storage   | 9.1.2, 9.1.3, 9.1.4, 4, 12, 38, 60, 66 |   | X   |                           | X   |                            | X   | SPLB/ECEB      |
| 9.2.1      | Station Service Water System                                 | 9.2.1, 1A(B), 7, 21, 39, 66, 68, 69    |   | X   |                           | X   |                            | X   | SPLB/ECEB      |
| 9.3.2      | Process Sampling System                                      | 9.3.2, APP 11B, 32, 42, 55, 59, 66     |   | X   |                           | X   |                            | X   | ECEB/SPLB      |
| 9.5.1      | Fire Protection Review                                       | 9.5.1                                  |   |     | X                         |     | X                          |     | ECEB/SPLB/CPFB |
| 10.4.6     | Condensate Cleanup System                                    | 10.4.6                                 | X   |     | X                         |     | X                          |     | ECEB           |
| 10.4.8     | Steam Generator Blowdown System                              | 10.4.8, 9, 42, 55, 66                  |   | X   |                           | X   |                            | X   | ECEB           |
| 12.1.4     | Decommissioning  | 12.1.4                                 |   | X   |                           | X   |                            | X   | ECEB           |
| 11.8.1     | Postaccident Sampling Capability                             | 11.8.1, 36, 66                         |   |     |                           | X   |                            | X   | ECEB           |
| 9.1.3      | Spent Fuel Pool Cooling and Cleanup System                   | 9.1.3, 27, 31, 33, 69                  |   | X   |                           | X   |                            | X   | SPLB/ECEB      |
| 9.2.3      | Domestic and Reactor Makeup Water Systems                    | 9.2.3, 68                              |   | X   |                           | X   |                            | X   | SPLB/ECEB      |
| 9.3.4      | Chemical and Volume Control Systems                          | 9.3.4, 12, 66                          |   | X   |                           | X   |                            | X   | ECEB/SPLB      |
| 9.5.4      | Emergency Diesel Engine Fuel Oil Storage and Transfer System | 9.5.4, 36, 51                          |   |     | X                         |     | X                          |     | SPLB/ECEB      |

\* Current for Amendments 55 through 69 only.

## Enclosure 6

Action List for ECEB  
(TAC No. R00401)SER Section

- 2.2.1 Transportation Routes
- 2.2.2 Nearby Military and Industrial Facilities
- 6.1.2 Organic Materials
  - 6.4 Control Room Habitability
- 6.5.2 Containment Spray System
- 9.1.2 Spent Fuel Storage
- 9.2.1 Station Service Water System
- 9.3.2 Process Sampling System
- 9.5.1 Fire Protection Review
- 10.4.6 Condensate Cleanup System
- 10.4.8 Steam Generator Blowdown System
- 12.1.4 Decommissioning
- 11.8.1 Postaccident Sampling Capability

Review responsibilities are indicated by Branch initials in the margin. Undesignated items will be reviewed by CPPD independently or with consultation with the cognizant review branch.

## SECTION 2 - SITE CHARACTERISTICS

- 2.2.2 ° The FSAR describes a non-redundant smoke detector configuration for the control room air intakes (SER states that redundant detectors are provided).
- PRPB 2.3.3 ° TU Electric will update the list of meteorological instruments and relocate the back-up met tower in a future FSAR Amendment.
- PRPB ° TU Electric now commits to the requirements and applicable recommendations of the Second Proposed Revision 1 to RG 1.23, April 1986.
- PRPB ° The FSAR has deleted dewpoint temperature measurement from the parameters measured by the primary meteorological tower.
- 2.3.4 ° The SER says "staff used RG 1.145 to calculate short-term accident releases." The FSAR says (1A(B)) that RG 1.145 is not applicable to CPSES.
- 2.4.3 ° The SER states that the applicants' estimate for the probable maximum flood with a volume of 110,200 acre-ft, results in a discharge of 149,000 cfs. The FSAR states that the PMF, with a volume of 118,376 acre-ft, results in a discharge of 142,576 cfs.
- ° The SER discusses a 36-ft flood wave on the Brazos River from failure of DeCordova Bend Dam. The FSAR discusses consequences of this dam failure in terms of a 37-ft flood wave.
- 2.4.5 ° Section 2.4.11 of the FSAR contains the functional description of the safe shutdown impoundment low level alarm. This alarm provides no safety-related function and may be changed from time to time to correspond to lake level management efforts.
- ° The FSAR (Section 9.2) has increased the estimated maximum pond-return temperature from 113.2°F to 115°F.
- 2.4.6 ° TU Electric has submitted a post-construction groundwater monitoring program (FSAR Section 2.5.4.13) for staff review and approval.
- ° There is no basis in the FSAR for the SER statement that all backfill is at elevations greater than 789.7 ft.
- 2.4.7 ° The FSAR Section 2.4.12 incorporates the results of a reanalysis using a more conservative source term taken from the Westinghouse Radiation Analysis Design Manual, Rev. 5.
- ° The FSAR now reflects that the minimum release of water to Squaw Creek from Squaw Creek Reservoir is controlled by a permit from the Texas Department of Water Resources.
- 2.4.9 ° TU Electric has taken some minor exceptions to RG 1.59 (p. 1A(B)-26).



Section 2 (continued)

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- ESGB
- 2.5 ° As a result of the SWEC validation effort of design basis documents (including Dames and Moore) relating to geology and seismology, Section 2.5 has been reorganized and reworded to support the new information made available from the review of existing design documents and the development of new design studies. These changes affect text, tables and figures.
  - ° TU Electric has taken exceptions to RG 1.60 (listed in 1A(B) and 1A(N)).
  - 2.5.1 ° The FSAR does not support the SER conclusion that the closest faulting is approximately 6 miles from CPSES (this may represent the staff's own conclusions).
  - ° The FSAR does not discuss the potential for subsidence as a result of natural gas production (this may represent the staff's own analysis).
  - 2.5.4 ° The FSAR does not support the average permeability of 17.63 ft/day in the Twin Mountains formation.
  - ° The SER is not consistent with the FSAR with regard to results of unconfined compression tests (Table 2.5.4-1).
  - ° The FSAR has been revised to add a permanent drainage system under the turbine building to handle in-leakage due to perched water collected at the foundation exterior.
  - ° The SER is not consistent with the FSAR with regard to total and differential settlements (FSAR Table 2.5.4-7).
  - ° The SER cites compression and shear velocities at the foundation level that are slightly below the range of values listed in FSAR Table 2.5.4-5H.
  - ° The FSAR has deleted the discussion of the static lateral loads on vertical walls assuming equivalence to fluid pressure and densities of 56.0 pcf and 89.5 pcf for submerged and unsubmerged conditions, respectively.
  - 2.5.5 ° The SER needs to be revised to reflect changes in the method for determining the safety factor for the stability of slopes (assumed clay stone characteristics not found in FSAR).
  - 2.5.6 ° The SER states that four passes of a 10-ton vibratory roller were made to establish compaction of the rockfill embankment material during construction. The FSAR states that up to six passes were made (2.5.6.4.4).
  - ° The SER states that the average in-place dry density of the rockfill material was 120 pcf. The FSAR states that the average in-place dry density was 125 pcf.
  - ° The SER states that core material must have dry density greater than 95% between 4% below and 1% above the optimum moisture content. The FSAR states, "Strength properties were determined...at moisture contents ranging from 1% below optimum to 3% above optimum..." (2.5.6.4.3).
  - ° Errata did not pick up FSAR "Appendix 2.54" which should read "Appendix 2.5A" (p. 2-37 of SER).
  - ° The FSAR states that surface alignment monuments and piezometers will be surveyed periodically, rather than annually as stated in the SER (SER p. 2-39, FSAR p. 2.5-202).
  - ° The FSAR has deleted all reference to Gibbs and Hill procedures.

## SECTION 6 - ENGINEERED SAFETY FEATURES

- 6.1.1 ° The staff needs to verify acceptability of the use of designated material for ESF piping.
- 6.1.2 ° This section needs to cross-reference the SSER 9 evaluation of containment coatings (Appendix L).
  - ° Need to reflect staff review and approval of TU Electric program for containment coatings performance (TXX-4491, TXX-4613, TXX-4653, TXX-6157 - NRC letter dated 3/24/87).
- 6.2.1 ° TU Electric has performed a new containment analysis using SWEC's LOCTIC computer code because of errors discovered in the original analysis which used CONTEMPT-LT 26. New information, such as the deletion of the BIT and revised containment heat sink data based on current plant drawings and revised LOCA structural heat transfer coefficient were used and resulted in an increased containment peak temperature for the MSLB case. Tables and figures in this FSAR section have been revised to reflect the results of the revised containment analysis. SER references to use of CONTEMPT Code for containment analyses are no longer correct.
  - ° The FSAR has been revised to present one small double-ended rupture and two power levels (30% and 70%) instead of the previous two small double-ended ruptures at four power levels (102%, 70%, 30%, and hot shutdown).
  - ° The FSAR provides a description of the sensitivity study performed to determine the effects of varying containment initial conditions on peak pressure and temperature for the DEPSG and 9.908 square foot steam line breaks.
  - ° The parameters that were provided as a function of time have been revised, consolidated, and rearranged consistent with the parameters supplied by the LOCTIC code.
  - ° The assumption of a 1/8-inch air gap with thermal conductance of 1.6 Btu/hr-ft<sup>2</sup>-°F has been replaced with a more realistic assumption for interface conductance of 10 Btu/hr-ft<sup>2</sup>-°F.
  - ° The FSAR has revised the paint heat conductance for steel and concrete painted surfaces.
  - ° The LOCTIC code uses the Taganni structural heat transfer coefficient for LOCA analysis and the Uchida coefficient for MSLB analysis.
  - ° The maximum external differential pressure has been changed from 3.37 psid to 3.79 psid based on the conservative revision to the initial containment pressure.
  - ° The Westinghouse mass and energy release rates for the post-reflood phase are modified as discussed in the Broken Loop and Intact Loop Generator Analyses. In addition, the mass and energy release rates have been modified to include core decay heat and safety injection flow.
  - ° ECCS spillage is accounted for separately by the LOCTIC code since it was not included in the westinghouse WREFLOOD Calculation of mass and energy for the reflood phase.

- SPLB            °    For the MSLB events, the statement that containment spray actuation occurs within 60 seconds of containment pressure reaching 20 psig has been replaced with an expanded description of the time it takes to achieve full containment spray flow. The two cases are the full double-ended rupture case and the partial double-ended rupture/split break case.
- SPLB            °    Tables 6.2.1-2; 6.2.1-2A; 6.2.1-3; 6.2.1-3A; 6.2.1-3B; 6.2.1-4 through 6.2.1-6; 6.2.1-8 through 6.2.1-10; 6.2.1-50; and 6.2.1-50A have been revised to reflect the revised containment analysis using the LOCTIC code.
- SPLR            °    Figures 6.2.1-1 through 6.2.1-3; 6.2.1-9 through 6.2.1-17; and 6.2.1-20 have been revised to reflect the revised containment analysis using the LOCTIC code.
- 6.2.2           °    The FSAR has taken an exception to ANSI N45.4 by using the alternate methodology of ANSI/ANS 56.8-1981 for ILRT (similar changes in NRC letter dated 8/23/84 and SSER 12, Section 6.2.5).
- °    The staff needs to review NPSH curve for the containment spray system.
- 6.2.3           °    The FSAR has added the pressure at which the water test (Pa) is to occur.
- °    The FSAR has changed the operation of MSIV bypass valves to local manual (ref. TU Electric letter of 12/8/86 in response to RAI of 2/27/86).
- °    The FSAR has changed the isolation criteria for turbine-driven auxiliary feedwater pump warm-up bypass lines.
- °    The FSAR has deleted the requirement to leak test relief valves as an isolation boundary if they relieve into containment.
- °    Local vent, drain and test connection valves are not included on FSAR list but have special measures to ensure that containment integrity is maintained.
- °    The staff needs to review the acceptability of a pressure gauge between containment isolation valves.
- °    The staff needs to review the acceptability of thermal relief valves as a containment boundary.
- °    The FSAK has changed Section 9.4A concerning the design pressure of this containment pressure relief system to 1.5 psig to be consistent with the containment design pressure criteria.
- °    The FSAR has revised Table 6.2.4-3 to designate the failure mode of a number of valves as Fail-As-Is.
- SPLB            6.2.4           °    The staff needs to resolve the inconsistency between the FSAR and SER on model used for zirc-hydrogen reaction (1.5% vs 5%).
- SPLB            °    The FSAR has revised Table 6.2.5-5 to reflect current system changes identified during the combustible gas control review.
- 6.2.5           °    The FSAR has provided the alternate methodology for ILRT of ANSI 56.8 (similar changes accepted by staff in letter of 8/28/84 and 6.2.5 of SSER 12).
- °    The staff needs to review the exemption request of 1/20/86 for a personnel airlock testing exemption to Appendix J.

SRXB

SRXB

SPLB/PRPB

SPLB/ECEB/

PRPB

SPLB/ECEB/

PRPB

- 6.3.2 ° The FSAR has changed the power supply for accumulators (breakers now locked out, vice control room key lock switch).
- 6.3.3 ° The RWST alignment in Modes 5 and 6 needs to be reviewed.
- 6.4 ° The staff needs to verify acceptability of chlorine leakage in the plant-specific analysis (800 cfm results in 125 inch water gauge over-pressure).
  - ° The FSAR has taken an exception to RG 1.95 (i.e., don't assume concurrent LOCA and chlorine release).
  - ° The FSAR no longer specifies that a signal from the plant vent stacks is used to switch to the recirculation mode.
  - ° The FSAR has deleted the statement that smoke detection in the control room air intake causes the control room HVAC system to automatically shift to the isolation mode. Upon detection of smoke, the control room ventilation is manually shifted.
  - ° The FSAR has deleted the outside makeup air flow measurement discussion.
  - ° The FSAR added the operator radiation doses to Table 6.4.3.
  - ° The FSAR has redefined the control room pressure envelope rooms and areas.
- 6.5.1 ° The FSAR has taken alternates to positions in RG 1.52 which the staff needs to review.
- 6.5.2 ° The staff needs to review the acceptability of a 2-region (sprayed, unsprayed) vs. 3-region containment spray model.
  - ° The FSAR has revised Table 6.5-6 based on the Westinghouse, "Radiation Analysis Design Manual, Standard Plant Model 412," Rev. 3 as applied to CPSES.
  - ° The FSAR revised the opening time of the spray pump isolation valves based on controlled throttling of the discharge flow rate to prevent the containment spray pump runout.
  - ° The FSAR has revised the Containment free volume from 2.985 million cubic feet to 3.031 million cubic feet, effective sprayed containment volume from 1.725 million cubic feet to 1.717 million cubic feet, and the fractional volume spray coverage from 57.8 percent to 56.7 percent.
- 6.6.1 ° The FSAR has incorporated the requirement to perform an augmented ISI in superpipe area.
- 6.6.2 ° The FSAR has incorporated the requirement to perform augmented ISI in superpipe area.

## SECTION 9 - AUXILIARY SYSTEMS

SPLB



SPLB

- 9.1.1 ° The procedures have been changed so that inspected fuel elements will be stored without poly bags.
- 9.1.2 ° The SER needs to be made consistent with the FSAR description of spent fuel pool capacity at time of licensing for Unit 1.
- 9.1.3 ° The FSAR adds GDC 1 as it applies to safety-related portions of the spent fuel cooling and purification systems.
  - ° The FSAR deletes GDC 3, as the fire protection program does not apply to this system.
  - ° The FSAR adds GDC 56 as it applies to the containment isolation portion of the system (for the skimmer line).
  - ° The FSAR adds GDC 61 as it applies to this system for capability of periodic testing, provisions for containment of radioactivity, decay heat removal from the spent fuel, reduction in fuel storage inventory under accident condition, and purification of the pool water.
  - ° The FSAR adds GDC 63 as it applies to the monitoring systems to detect loss of heat removal, excessive radiation levels, and for initiating appropriate safety action.
  - ° The FSAR adds the "wet cask pit" to the list of components served by this system.
  - ° The FSAR deletes one loop operation for case no. 1, as a single active failure needs not be postulated for full core unload (SRP 9.1.3).
  - ° The FSAR has been revised to reflect a change in sampling frequency of the RCS and refueling canal for boron from every 72 hours to daily (FSAR 9.1.4.2.2).
  - ° There have been a number of changes to FSAR Table 9.1.3 to reflect changes in design, calculations and project specifications, and to reflect plant as-built conditions.
  - ° The FSAR has revised Table 9.1.1 for decay heat produced, maximum spent fuel pool temperature and temperature rise to indicate the latest revised data based on a new calculation. Table 9.1.1 has also been revised to show the number of years after the plant is operational (instead of actual years), since the startup dates for Units 1 and 2 have been changed.
  - ° Table 9.1-1 has been revised (decay heat, maximum SFP temperature, temperature rise time columns) to indicate the latest revised data based on a new calculation. Also has deleted temperatures and time to rise to 180°F for full core unloading and one cooling loop operation.
- 9.1.4 ° The FSAR corrects the text to read "2.5 mrem or less," as per Westinghouse radiation design manual SPM 412, Rev. 3 (decimal point was missing).
  - ° The FSAR has deleted reference to WCAP 9198 (Reference (16)) because this report is not applicable to LPSES.
  - ° The fuel building overhead crane has been reclassified as seismic Category 1.
  - ° The SER statement that both reactors will not be refueled at the same time is not supported by a commitment in the FSAR.



- The FSAR has revised the load combinations for the fuel building overhead crane to include OBE and SSE with lifted load. The loading combinations for the polar crane includes OBE with lifted load and SSE without lifted load.
  - The FSAR now states that the polar crane has a maximum "critical" load of 175 tons (instead of "non critical").
  - Contrary to SER p. 9-7, the FSAR states that the spent fuel handling tool and portions of the fuel transfer system components are not seismic Category I.
- 9.1.5 ◦ TU Electric has committed to implement any appropriate actions identified in Phase II of NUREG-0612 regarding the handling of heavy loads (TXX-4306 dated 9/24/84).
- 9.2.1 ◦ The FSAR deleted the SSW supply to the fire protection booster pumps, as the CPSES design no longer includes fire protection booster pumps. (SER needs to delete the reference to booster pumps and associated valves on pp. 9.8 and 9.9.)
- The SER needs to be revised to delete the SSW back-up source to the fire protection booster pumps, as SER Section 9.2.1, on p. 9-8, 1st paragraph indicates, the "SSW can be used as a back-up water supply for the fire protection booster pumps."
  - The FSAR revised various SSW and CCW temperatures and time to cooldown on RHR (see discussion under FSAR Section 5.4.7).
  - The FSAR has revised the system operating description to reflect the operation of both SSW pumps to minimize the corrosion due to stagnation in the idle train under the previous mode of operation.
  - The FSAR has added the use of a toxic non-oxidizing biocide for the control of Asiatic clams and corrosion inhibitor in the station service water system.
  - The FSAR has been revised to reflect both pumps of Train "A" and Train "B" in operation to minimize corrosion due to stagnation.
  - The FSAR has deleted Figure 9.2.2 which is replaced by Figure 9.1-1 for process flow and Figures 1.2-45 and 1.2-46 for equipment layout.
  - The FSAR has deleted the epoxy-based lining in order to prevent sheet mode failure, which can plug safety-related heat exchangers served by SSW System.
  - The SER needs to be revised to reflect that both trains of SSW operate at all times to minimize corrosion (SER Section 9.2.1).
  - The FSAR has revised the SSWS outlet temperature from 122°F to 130°F as a result of normal cooldown of one unit using 2 SSWS pumps and 2 SSWS heat exchangers to cool the RCS from 350°F to 140°F in 24 hours.
  - FSAR table 9.2.1 has been revised to: (1) add thermal relief valves for overpressure protection of systems as per the ASME Code Section III requirements; (2) reflect the deletion of the expansion joint and add a hard piece of pipe; and (3) add vacuum breakers to the service water system to prevent/mitigate water hammer in the system.

- 9.2.2 ° The FSAR has revised the time to cooldown on RHR and revised CCW temperatures (see discussion under FSAR Section 5.4.7).
- ° The FSAR has added a rotary instrument air compressor package for the non-safeguards loop to provide additional instrument air capacity.
  - ° The FSAR has added the reactor coolant post-accident sampling system sample cooler to the list of the components cooled by the non-safety loop of the component cooling water system.
  - ° The FSAR has deleted the low flow alarms for the control room air-conditioning condensers, as the cooling water flow is regulated by refrigerant pressure.
  - ° The FSAR has clarified that CCWS pumps Trains A and B control switches are located on the hot shutdown panel. CCWS pump Train A transfer switch is located on the shutdown transfer panel and CCWS pump Train B transfer switch is located on the hot shutdown panel.
  - ° The FSAR has added handwheels to the level control valves to the CCW surge tank, which provides the capability of providing the make-up water in the event of loss of instrument air to the control valves.
  - ° The FSAR has revised the chilled water system by: (1) changing the CCW regulating valve automatic control, actuated by refrigerant pressure; (2) adding the accumulator back-up tank; and (3) adding valve handwheels for operator action.
  - ° The SER (p. 9-10) refers to the surge tank and drain tank atmospheric vent valves, which have been deleted from the FSAR.
  - ° The FSAR has changed the valve status from "passive" to "active" on the CCWS inlet and outlet valves to the ventilation chiller and letdown chiller condensers, necessitating closure of these valves on an "S" signal (FV-4650A and B).
  - ° The FSAR has upgraded the CCW flow instrumentation to class 1E to provide isolation of the CCW to the RCP thermal barrier following thermal barrier tube rupture. In addition, control grade alarms alert the operator to a potential rupture of the RCP thermal barriers.
  - ° FSAR Table 9.2.3 has added additional corrosion inhibitors to the list of inhibitors to be qualified for use in the CCW system to provide a more effective corrosion protection program for the CCW system.
  - ° FSAR Figure 9.2.3 has been revised to reflect existing system configuration based on the design validation program and to reflect the as-built system.
- CEB/SPLB 9.2.3 ° FSAR Table 9.2-9 has changed the analysis of demineralized water to reflect the latest water chemistry requirements for conductivity, chloride, fluoride and silica.
- ECEB/SPLB ° FSAR Table 9.2-10 has changed the specification of reactor makeup water to reflect the latest water chemistry requirements for conductivity, chloride, fluoride, TSS, TDS and silica. In addition, the footnote on oxygen concentration of the RCS has been revised.
- ° The FSAR has added a paragraph describing the provision of a demineralized water transfer pump which is the primary source of fire suppression water to the containment hose stations and the deluge piping in the charcoal section of the containment preaccess filters.



Section 9 (continued)

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- The FSAR has added a demineralized water source to perform turbine generator primary flow rate testing during refueling outages.
  - The FSAR has been revised to clarify that the required minimum quantity of water is available during normal plant operation to achieve and maintain safe, cold shutdown. This includes Modes 1 through 5 of the TS. A description of the systems that require a seismic Category 1 makeup supply has been added.
  - The FSAR has corrected the discharge location for the water treatment system from the evaporation pond to the low volume waste treatment facility to make it consistent with FSAR Sections 9.2.3 and 9.2.8.
  - FSAR Figure 9.2-5 has been updated to reflect as-built conditions.
- 9.2.4 ◦ The FSAR has changed the sewage treatment plant capacity from 10,000 gpd to 105,000 gpd, revising the capacity of the treatment plant to reflect actual plant conditions.
- The FSAR has changed the requirement for drawing samples of potable water from several buildings to a single sample drawn daily, consistent with Texas Department of Health Drinking Water Standards, Section VI, paragraph A.
  - The SER needs to reflect that the potable water system no longer serves as backup lubricating water for the circulating water pumps.
  - FSAR Figures 9.2-6 and 9.2.7 have been revised to reflect as-built conditions.
- SPLB 9.2.5 ◦ The FSAR has revised the basis for heat rates of cooling water discharged into the SSI from one train to two train operation (see discussion under FSAR Section 5.4.7).
- The FSAR has revised the basis of spent fuel pool heat loads (see description under FSAR Section 5.4.7).
  - The FSAR has revised the temperatures for component cooling water and service water (see description under FSAR Section 5.4.7).
  - The FSAR has revised the text based on the results from the revised safe shutdown impoundment heat load calculation, which uses maximum heat loads in lieu of gradient heat load during the duration of a LOCA period (accompanying FSAR Tables 9.2-11 and 9.2-14 and FSAR Figures 9.2-8 and 9.2-10 have been deleted).
- SPLB ◦ The FSAR has revised various component cooling water temperatures (see description under FSAR Section 5.4.7).
- 9.2 ◦ The FSAR has modified the CST high level control, which prevents CST overpressurization in the event of condenser surge by isolating the makeup and reject line on CST Hi-Hi level. The condenser hot well is designed to the postulated surges in the event of CST high level.
- FSAR Figure 9.2-6, p. 9-14), needs to be revised to delete the description of the CST because surge overflow is routed to the con-

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- The SER (p. 9-14) needs to be revised to reflect the CST usable capacity of 270,000 gal.
- 9.3.1 ◦ The FSAR has revised the instrument air system design to incorporate the rotary air compressor and its components, as additional system capacity is required. Also, the component description, system operation, instrumentation and power supply sections have been changed to reflect this system design change (also see FSAR Table 9.3-1).
- The FSAR has deleted the pressurizer PORVs from the FSAR text for the instrument air system, as these PORVs are now supplied by nitrogen accumulators (also see FSAR Table 9.3-3).
- ECEB/SPLB 9.3.2 ◦ The FSAR has deleted the boron injection tank, as the CPSES design does not include it.
- ECEB/SPLB ◦ The FSAR has revised the steam generator blowdown on-line analysers to detect specific conductivity instead of pH (also see FSAR Table 9.3-4 Sheet 3).
- ECEB/SPLB ◦ The FSAR has changed the description of steam generator blowdown sample isolation upon an alarm from the monitor. In place of only sample isolation, it notes that the outboard sample and inboard process isolation valves close. Manual operation from the control room remains unchanged.
- The FSAR has revised Table 9.3-3 to show the addition of air-operated valves that isolate the steam generators during DBAs and HELBs.
- The FSAR has made minor revisions to Table 9.3-5 to reflect the existing design of the liquid storage tanks.
- The FSAR has revised Figures 9.3-1 through 9.3-11 to reflect plant as-built conditions.
- 9.3.4 ◦ The FSAR has been revised to delete the automatic start of the reactor make-up water pump on demand from the reactor makeup controller. Reactor makeup water pumps do not have a safety function and run continuously in normal operation, which allows the deletion of the automatic start function.
- 9.4 ◦ The FSAR has revised Tables 9.4-2, 9.4-4, 9.4-5, 9.4-6, 9.4-9 and 9.4-10 to reflect plant as-built conditions.
- The FSAR has revised Figures 9.4-1 through 9.4-9, 9.4-11, 9.4-12, 9.4-14, and 9.4-15 to reflect plant as-built conditions.
- SPLB 9.4.1 ◦ The FSAR has revised the text to clarify the control room location and the design parameters for the systems servicing the control room area.
- SPLB ◦ The FSAR has added the function of the non-safety-related air-conditioning units servicing control room areas.
- SPLB ◦ The FSAR has changed the operator action time from eight hours to one hour for stopping one pressurization and one filtration unit fan.

- SPLB      ° The FSAR has deleted the plant vent stack high radiation monitor from the primary plant ventilation exhaust. Two redundant radiation monitors are provided for each control room air intake vent in lieu of an earlier design which employed one air intake monitor with backup from a plant vent stack high radiation monitor located on the primary plant ventilation exhaust. The SER is no longer correct and the phrase "plant vent stack high radiation signal" needs to be removed.
- SPLB      ° The FSAR has provided a statement that the chlorine detectors are not missile protected. This is because locating the detectors within the protected area adversely effects their operating sensitivity. Credit for their operation is not taken during postulated tornado events.
- SPLB      ° The FSAR has changed the reference applicable to the iodine adsorbers from RG 1.52, Rev. 1 to the currently applicable revision as discussed in Appendix 1A(B).
- SPLB      ° The SER (p. 9-21) reflects that the control room HVAC system has provisions for purging of smoke or other contaminants with no recirculation by bringing in fresh outside air and exhausting the contaminated air to the outside. The FSAR states that portable smoke detectors are used to remove heavy concentrations of contaminants (FSAR 9.4.1.3).
- SPLB      ° The SER states that redundant smoke detectors are located in the control room air intake (the FSAR describes non-redundant smoke detector installation).
- 9.4.2 ° The FSAR has changed the fuel building room temperature during normal condition and adds the emergency condition room temperatures for the spent fuel pool heat exchanger and pump rooms (also deleted Table 9.4-2a).
- ° The FSAR has revised the operation of the ventilation system in accordance with the resolution of SDAR 84-27 (see HVAC PSR). A slight negative pressure is maintained in the fuel handling building during normal operation or a fuel handling accident. However, upon the loss of offsite power, the FHB exhaust will not be maintained by the primary planed exhaust units, so this reference has been removed. In addition, the ambient temperature for the spent fuel pool cooling pumps is maintained by emergency fan coil units and the safety-related chilled water system.
- ° The FSAR has removed a sentence stating that modulating supply air dampers control the slight negative pressure in the fuel handling area.
- ° The FSAR has added an air handling unit for storage room 250A in the fuel handling building to adequately cool the non-safety-related equipment.
- ° The FSAR has added a paragraph defining the safety class and seismic category of the fuel building exhaust duct work, the emergency fan coil units, and the spent fuel exhaust fans.

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- The SER (p. 9-22) states that before refueling operations, the FHB exhaust is directed to the 50% ESF exhaust filtration units. This statement is not supported by the FSAR, in fact, current design is a modular ventilation system.
- 9.4.3 ◦ The FSAR has added emergency fans for room 100 to provide cooling, as per loss-of-non-safety equipment ventilation design change (also, deleted Table 9.4-2a).
  - The FSAR has removed the reference to the need to modulate auxiliary building supply dampers in order to maintain a slightly negative pressure and added wording to indicate that it is the emergency fan coil units which control the air temperature.
  - The FSAR has revised the section to include that a slight negative pressure is also maintained during and after a LOCA.
  - The FSAR has added a description of the recycle holdup tank compartments and the potential effects of a rupture of the tank diaphragms.
  - The FSAR has provided emergency fan coil units for each of the various pumps required for a LOCA. Each compartment is maintained at an ambient temperature conducive to the long-term operation of the equipment contained therein.
  - The FSAR defines fourteen exhaust units as non-ESF and adds two ESF exhaust units.
  - The FSAR has been revised to add a description of the interlocking of the supply and exhaust fans.
  - The FSAR has upgraded all of the exhaust system up to the fan discharge to seismic Category I, but the reference to ANS Safety Class 3 is dropped. The air supply system is upgraded from seismic Category II to Category I, except for the fans and dampers which change from non-seismic to Category II.
  - The SER (p. 9-24) states that the redundant ESF exhaust units exhaust the air through the auxiliary building's ESF filter systems. This statement is not supported by the FSAR, in fact, current design is a modular ventilation systems.
- 9.4.4 ◦ The FSAR has modified the description of the modulation of supply air to maintain negative pressure. Modulation will not be necessary to maintain the negative pressure due to fan sizing.
  - The FSAR has modified the description of the operation of the system treating as one case the loss of offsite power together with a LOCA. The new description clarifies the use of the emergency fan coil units in the ESF pump rooms.
  - The FSAR has upgraded the main air supply system from seismic Category II to I.
  - The FSAR has added the function of maintaining ambient temperature above the lower limit for some process piping to the original personnel comfort function of the unit heats.
  - The FSAR now states that only compartments containing ESF motor-driven pumps will have emergency fan coil units. These motors are the chief heat generators requiring the cooling coils.

- The FSAR has separated the specification for the exhaust system to show some NNS, seismic Category II construction where it does not interfere with safety functions.
- 9.4.5 ◦ The FSAR has changed Section 9.4A concerning the design pressure of the containment pressure relief system to 1.5 psig, to be consistent with the containment design pressure criteria.
- The staff has not provided a review of the following systems:
  - containment air recirculation and cooling system (FSAR Section 9.4A);
  - control rod drive mechanism ventilation system (FSAR Section 9.4A);
  - neutron detector well cooling system (FSAR Section 9.4A);
  - containment preaccess filtration system (FSAR Section 9.4A);
  - reactor coolant pipe penetration cooling system (FSAR Section 9.4A); and
  - plant ventilation chilled water system (FSAR Section 9.4E).
- The staff has provided a review (SER Section 6.2.3) only of the isolation aspects of the:
  - containment pressure relief system (FSAR section 9.4A); and
  - containment purge supply and exhaust system (FSAR Section 9.4A).
- The FSAR has revised Section 9.4B, service water intake structural ventilation system, and changed the maximum indoor design temperature to 132°F based on new calculations.
- FSAR Section 9.4C provides the correct function for the diesel generator ventilation system. The description previously described the function of supplying combustion air but this function is accomplished by the diesel generator combustion air intake and exhaust system (see FSAR Section 9.5.8). The SER needs to be revised to delete the system function of providing outside air for diesel combustion.
- The FSAR has clarified the operation of the diesel generator building exhaust fans. Sufficient fans are started to ensure adequate room ventilation. The number of fans operating is limited during the winter months to prevent the room temperature from falling below the minimum design temperature (FSAR Section 9.4C).
- The FSAR has added the description of the isolation dampers in the MSFW piping area ventilation system, which protects the safety-related equipment located in the nearby areas from the effects of MSFW pipe breaks (FSAR Section 9.4C).
- The FSAR has changed the hydrogen concentration level to 2% per ANSI/ANS 59.2-1985 (FSAR Section 9.4C).
- The FSAR has described the dampers and heaters that provide makeup air and heating, following a loss of offsite power, to maintain the battery room under design conditions (FSAR Section 9.4C).

Section 9 (continued)

- 9 -

- The FSAR has revised the indoor design conditions for the security office, deleted the humidity requirement and updated the temperature to represent the present as-built conditions (FSAR Section 9.4C).
- The FSAR has added a non-safety related HVAC System for the new Battery and Charging Room which provides back-up DC power to the emergency lighting in the control room.
- The FSAR has revised Section 9.4D with the following changes:
  - updated the design parameters of flow and velocity based on revised design documents;
  - clarified the flow through the vents based on the present design; and
  - added the classification of the vent stack as seismic Category II and its effects on safety-related systems in the event of failure.
  
- 9.4.6 ◦ The FSAR has revised Section 9.4F to correct the capacity of the safety-related chillers to 101 tons. This is consistent with the project specification and design criteria.
- SER (p. 9-28) states that functional tests and inspection for the safety chilled water system are to be included in the TS.
  
- 9.5.1 ◦ The changes to the fire protection program that have occurred since SSER 12 was published are being reviewed by A. Singh (RIV) and various contractors. Inspection Reports 50-445/84-44 and 50-445/87-22 examined establishment and implementation of the fire protection program and compliance with the requirements of BTP APCSB 9.5.1 Appendix A and 10 CFR 50, Appendix R. CPPD will coordinate the issuance of the SER with NRP.
- FSAR Section 7.4.2 has added an additional fire to be analyzed for shutdown from outside the control room.
- Section 13.3B contains some discussions of the fire protection program.
- TXX-6376 and TXX-6582 list TU Electric responses to SSER 12, Section 9.5.1.
- Additional changes to Section 9.5.1 will be submitted in a future FSAR amendment.
  
- 9.5.2 ◦ The SER (which states that there are three paging zones for the public address system) is not consistent with the FSAR (which states that there are two paging zones, the administration building and the main plant [which is further subdivided into 4 zones]).
- The SER states that the PABX telephone system has 28 trunk lines. This is without basis in the FSAR.
- The SER credits the intraplant portable radio transmitter-receiver system with providing communication between the control room and other buildings. The FSAR does not make a commitment to retain a walkie-talkie in the control room. Walkie-talkies may be used by the fire brigade and other chief users outside of the control room.



- The FSAR has provided a thorough listing of the site emergency communication systems.
  - The FSAR has deleted the description of the sound-powered telephone system. This system is not used as the primary communication system for hot or cold shutdown, as the intraplant portable radio communication system is used for abnormal and emergency conditions.
  - The FSAR has provided a more accurate and thorough description of plant-to-offsite emergency telephone systems.
  - The FSAR has added reference to rotating beam lights to clarify the type of visual indication provided with the evacuation alarm.
  - The FSAR describes the page-party/public address system as a backup to the portable radio system for use by plant operators during hot shutdown for technical accuracy.
- 9.5.3
- The FSAR has been revised to add information and references concerning the illumination level provided by the AC essential lighting systems and DC emergency lighting systems.
  - The staff needs to revise the SER to reflect that AC essential and DC emergency lighting systems have been reclassified from 1E to non-1E (DC emergency lighting now has own batteries).
  - The staff needs to review the FSAR description of lighting levels.
  - The staff needs to review the acceptability of fixed fluorescent units.
  - The FSAR has revised reference to the IES Lighting Handbook to 1981 application volume.
  - The turbine building battery pack lighting is rated for four hours.
  - Due to reclassification from 1E to non-1E, testing of the AC essential lighting system will not be conducted during periodic EDG loading test.
- SPLB 9.5.4
- The FSAR has clarified the system description for filling, venting, draining and removing condensate from storage tanks, per as-built conditions and in compliance with NRC Regulatory Guide 1.137 and ANSI N195.
- SPLB
- The FSAR reflects replacement of simplex strainers with duplex strainers. This update in filter removal capability eliminates the clogging of filters and improves the availability of quality diesel fuel oil supply to the diesel generators.
- SPLB
- The FSAR has revised the fuel oil day tank capacity from 4-1/2 hours to useable capacity of 3 hours of continuous operation of diesel generators at rated 100% load. This exceeds the requirements of NRC Regulatory Guide 1.137 and ANSI N195 (66 minutes of continuous operation). The FSAR has also deleted the tank capacity in gallons as it varies with the density of fuel oil. SER (p. 9-39) needs to be updated.
- SPLB
- The FSAR has deleted the reference to the diesel generator fuel oil booster pump, the motor driven engine pump, and the auxiliary lube oil pump during emergency operation of the EDG.
- SPLB
- The FSAR has replaced the vacuum pumps with centrifugal blowers for diesel generator crankcase ventilation to provide positive means of forced ventilation through the diesel generator crankcase and to reflect the as-built conditions.



SPLB




SPLB

SPLB/SELB

## 9.5.4 (continued)

- FSAR Figure 9.5-5 has been revised to add the following:
    - note for removal of strainer element from Y-strainer;
    - duplex strainer as per requirements of ANSI N195;
    - day tank vent pipe vacuum breakers which are located in the missile protected area and seismically supported; and
    - miscellaneous technical and editorial changes to the figure to make it consistent with vendor drawings and isometric drawings.
  - The SER (Section 9.5.4.2, page 9-39, paragraph 4) needs to be revised for venting components which are seismically supported, but are not ASME Section-III, Class 3. Missile protection is provided for vent paths.
  - The SER (Section 9.5.4.2, page 9-39, paragraph 5) needs to be clarified for the exceptions to Regulatory Guide 1.137.
  - The FSAR has revised the fuel oil monitoring program to conform to current standards. The revised testing will test the parameters which indicate degradation or contamination of fuel during transit (ASTM D975-74 is updated to ASTM D975-81 and ASTM D270-65 is updated to ASTM D4057-81).
  - The FSAR has deleted "30% diesel generator set efficiency" and replaced it with "Fuel Consumption based on test data".
- 9.5.5 ◦ The FSAR has deleted reference to the motor driven jacket water pump, which is not available during emergency operation of the EDG. Need to update the SER (p. 9-40).
- The SER (p. 9-40) needs to delete reference to GDC 17.
- 9.5.7 ◦ The FSAR has deleted reference to the motor driven lube oil pump which is not available during emergency operation of the EDG. Need to update the SER (p. 9-43).
- 9.5.9 ◦ The staff needs to review responses to NUREG-1216 for TDI diesel engines (TXX-6236). See SSER 6, Section 9.5.9 and Appendix I. SSER 12 lists this as Outstanding Issue (32) and as License Condition (15).

## SECTION 10 - STEAM AND POWER-CONVERSION SYSTEM

- 10.1 ° FSAR Table 10.1-1 has changed the turbine generator output to 1,203,378 KW with valves wide open. This change represents about a 0.2% increase.
- SPLB 10.2 ° The FSAR reflects that the 90-10 copper nickel alloy MSR tube bundles and tube sheets have been replaced with ferritic stainless steel tubes and inconel clad carbon steel tube sheets to prevent degradation of steam generator tubing.
- 10.2.1 ° The FSAR states that one main steam and one low-pressure stop-and-control valve will be inspected every 40 months and that all valves will be inspected within 10 years, as required by tech specs.
- 10.2.2 ° The FSAR has been revised to correct the statement "the high-pressure turbine cannot generate missiles." It is now clear that the high pressure turbine can generate missiles, but they are bounded by the low pressure turbine missile.
- EMTB ° The staff needs to review TU's letter (TX-4512, dated 7/15/85) which seeks to provide basis for removal of License Condition (4) in SSER 12.
- EMTB ° SSER 6 states that TU will conduct a visual and surface examination of the turbine discs every 5 years. The FSAR (Section 10.2.3.6) states that visual inspections will be conducted at refueling shutdowns at intervals not to exceed three years.
- SPLB 10.3.1 ° The FSAR has updated the main steam system design parameters based on the design calculations.
- ° The FSAR has changed the limit on steam generator pressure for RHR operation and natural cooldown from 125 psia to 100 psia (FSAR Section 10.3.1 and Table 10.3-3).
- ° The FSAR adds safety-related air accumulators for SG PORVs, as the compressed air system is not safety-related.
- ° The SER states that SG PORVs are provided with nitrogen accumulators and needs to be corrected.
- ° The staff needs to complete its review of the change in MSIV bypass valve operation to manual (this was listed as Confirmatory Issue (27) in SSER 12).
- ° The FSAR states that the MSIV bypass valve will be locked closed during power operation. This replaces a commitment for a design to stop flow in either direction.
- ° The SG PORVs are required to have the capability to be operated remotely from the control room following a SSE, coincident with the LOOP.
- ° The SER needs to be revised to delete discussion of closure of MSIV bypass valve closure time upon receipt of MSIV closure signal, as these valves are now manual.
- ° The FSAR updates the hydrostatic test pressure of the MSIV shell as per ASME B&PV Code, Section III, Table NB 3531-9 (for a 600-lb welded end valve).
- ° The FSAR has clarified the hydrostatic disc testing as per ASME B&PV Code, Section III, paragraph NB 3531.2(c).
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## 10.3.1 (continued)

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SPLB

- The FSAR has changed the Main Steam Safety valve blowdown to 5% of the set pressure of the safety valve, as per ASME B&PV Code, Section III, Subsection NC 7614.1 and Specification 2323-MS-77, Rev. 2.
  - The FSAR has changed the material classification of nonpressure retaining components of the MSIVs to match the design.
  - The FSAR has changed the secondary water chemistry to agree with the recommendations of the EPRI Owners Group for optimum performance of the steam generators.
  - The SER (p. 10-4) states that the plant can be brought to cold shutdown from the control room using only safety-grade mechanical and electrical systems in the event of LOOP or loss of instrument air.
  - MSIV actuators are designed to ASME B&PV Section VIII in lieu of ASME B&PV Code Section III as per ASME Code Section III subarticles NA-1120 and NA-1130.
- 10.3.3 ◦ The SER states (p. 10-6) that low alloy steel is not utilized for main steam or feedwater system components and that RG 1.50 is not applicable. The FSAR, however, states that preheat temperatures for welding low alloy steel are in accordance with RG 1.50 (FSAR Section 10.3.6.2).

- 10.4 ◦ The auxiliary steam system, the extraction steam system, the turbine oil and purification system, and the turbine plant cooling water system are not addressed in the SER, but have undergone changes since the last review of the FSAR.

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SPLB

- 10.4.1 ◦ The FSAR reflects the installation of titanium tube bundles (formerly copper-nickel alloy), and titanium clad carbon steel tube sheets (formerly aluminum-bronze), in the Unit 1 and 2 main condenser shells to improve the ability of condenser tubes and tube sheets to resist long term corrosion, erosion or stress cracking.
- The new leak-tight tube sheet design features solid tube sheets in addition to welded tube-to-tube sheet joints, which results in deletion of the tube sheet pressurization system.
- 10.4.5 ◦ The FSAR reflects the installation of titanium tube bundles (formerly copper-nickel alloy), and titanium clad carbon steel tube sheets (formerly aluminum-bronze), in the Unit 1 and 2 main condenser shells to improve the ability of condenser tubes and tube sheets to resist long term corrosion, erosion or stress cracking.
- The FSAR indicates that there are no performance tests identified for the circulating water system butterfly valves. Continued maintenance activities assure proper functioning of the valves and valve operators.
  - The FSAR deletes mention of the specific amount of chlorine added, as concentration depends on the location of the sample measurement. The NPDES permit limits chlorine to 0.2 ppm, average, and 0.5 ppm, maximum.

- 10.4.7 ° The FSAR has added the NRC Reg Guide and ANSI Standard applicable to the Condensate and Feedwater System.
- ° The FSAR has added the MSR separator drain tank (which provides condensate to the system) to the discussion.
  - ° The FSAR has revised the useable volume, design volume and the availability of the condensate storage tank volume for emergency use by the AFW system.
  - ° The FSAR has revised the useable volume of 270,000 gallons (needs to be reflected in the SER, which now states 276,000 gallons).
  - ° The FSAR has been revised to add a description of the full flow flushing operation.
  - ° The FSAR has revised the description of the SG sampling system to delete reference to SGs 3 and 4 (sample lines were capped).
  - ° The FSAR has been revised to add the classification of the condensate and feedwater piping in the Safeguards Building (non-nuclear Safety, Seismic Category II).
  - ° The FSAR identifies condenser hot well low level as an additional trip for the condensate pumps.
  - ° The FSAR identifies that transfer from the feedwater control bypass valves to the feedwater control valves is manually initiated.
- SPLB ° The FSAR has made numerous changes with regard to the feedwater isolation valve as a result of concerns regarding water hammer and SG vibration issues.
- SPLB ° The FSAR has been revised to replace the feedwater bypass tempering valve with the feedwater split flow bypass valve.
- ° The FSAR had modified the controls on the feedwater isolation bypass valve to remain closed instead of automatically open upon lack of water hammer permissives.
  - ° The FSAR has added RG 1.32, 1.47, 1.53 and 1.75 as applicable to the condensate and feedwater systems.
  - ° The FSAR has been revised to indicate that the FIBV is manually opened to purge pockets of cold water.
- SPLB ° The FSAR has changed the flow split from 90:10 (at 40%-100% load) to 90:10 at 100% load and somewhat less than 90:10 from 50% to 100% load to match the as-built system.
- SPLB ° A water hammer test has been added to FSAR Section 14.2. The test report demonstrating water hammer adequacy is available on site for review. The staff needs to review the results and if found acceptable, remove restriction cited in SSER 4, p. H-12.
- SPLB ° The FSAR has added four Feedwater Bypass Valves (air operated butterfly valves) to the active valve list to assure that they will close for the feedline break.
- 10.4.8 ° The FSAR has changed the SG blowdown water chemistry to match the latest evaluation of the anticipated conditions with and without a leak from the primary side. This change deletes free hydroxide from both analyses, and hydrazine and morpholine from the analysis without leak, and eliminates the estimate of particle size.
- ° The FSAR returns to the original estimate for Si at less than 1 mg/l
  - ° The FSAR has added air operated valves in place of motor operated valves to isolate SGs during DBAs and HELBs.
  - ° For the non-safety related portion of SG blowdown, the SER implies that RG 1.143 is met. However, the FSAR specifically indicates CPSES does not commit to RG 1.143 for this portion of SG blowdown system and ASME, Section VIII is met.

ECEB



ECEB

SPLB



- 10.4.9
- The FSAR has added warm-up valves and steam supply bypass lines to the TDAFW pump to pre-warm the steam supply lines to minimize transient effect during TDAFW pump surveillance testing (see also FSAR Figure 10.3-1).
  - The FSAR has added safety-related accumulators to steam valves for the TDAFW pump to permit valve closing for containment isolation or to isolate a depressurized SG.
  - The FSAR has changed the design parameters for the AFW components based on the design documents, certified pump curves and W-SIP 10.1.
  - The FSAR has stated that the AFW design basis is (1) 4 hours operation at hot standby in the event of onsite/offsite power available with single failure, and (2) 2 hours of operation at hot standby in the event of main steam or feedwater line breaks.
  - The revised useable volume of 270,000 gallons needs to be reflected in the SER (which now states 276,000 gallons).
  - The FSAR has revised the AFW system description with regard to number of pumps, pump capacities, and discharge piping configuration.
  - The FSAR has added a discussion of the AFW system performance during a large break LOCA.
  - The FSAR states that either both motor-driven pumps or the turbine-driven pump alone is required to take the plant to safe shutdown.
  - The FSAR states that, depending on the severity of the event, either the two motor-driven pumps or all three AFW pumps auto-start following a MSLB or a FLB.
  - The FSAR has added ANS Safety Class 2 for the AFW system containment penetration boundary and a connection to feedwater.
  - Upon automatic initiation of the AFW system, isolation of SG blowdown and sampling for all SGs occurs.
  - The FSAR adds high flow to auto trip of the flow control valves from manual flow control to automatic pressure control to protect the pumps (now requires low discharge pressure and high flow).
  - The FSAR has been revised to identify that the TDAFW turbine has a mechanical/hydraulic governor in lieu of an electronic governor.
  - SER Section 10.4.2.1 needs to be revised to reflect FSAR Table 10.4-8.
  - The FSAR has been revised to be consistent with the Westinghouse requirements that pump response be based on the receipt of an actuation signal.
  - The FSAR has deleted the low suction pressure trip to prevent a spurious low pressure signal from tripping the AFW system.
  - The FSAR has been revised to reflect CST alarms for HI-HI, LO, and LO-LO.
  - The FSAR clarifies that low discharge pressure alarms are only provided for the motor-driven AFW pumps.

SPLB

## SECTION 12 - RADIATION PROTECTION

- PRPB  
PRPB
- 12.1.1 ° The position titles in this section have been changed.  
° The Radiation Protection Manager position now encompasses the former position of Health Physics Engineer. The staff also needs to review the qualifications of the RP Manager (FSAR 13.1.3.1).
- 12.1.2 ° There is a discrepancy with which revision of RG 8.8 applies to CPSES (SER states Rev 3, FSAR states Rev 2).
- PRPB  
↑  
PRPB
- 12.2 ° Staff needs to review updated source term information in tables and text resulting from the SWEC corrective action program.  
° The vent computer code used for calculations of airborne radioactive materials is no longer in use at CPSES.  
° NUREG-0017, GALE input was not used (contrary to statement in SER). Staff needs to review.
- 12.3.3 ° TU has added a commitment to conform to RG 1.140 in addition to RG 1.52.
- PRPB  
↑
- 12.3.4 ° The staff needs to review updated text and tables to this section which reflect design basis changes and as-built configurations.  
° An inconsistency in the SER needs to be corrected to reflect that continuous records of the area radiation monitors (ARMs) throughout the plant are not kept.  
° SER Section 12.3.4 is inconsistent with FSAR Section 11.5.1.2 and Table 12.3-8.  
° The SER states, "All installed instruments in the airborne radioactive monitoring system have independent emergency battery power supplies." There is no basis in the FSAR for this statement.  
° The FSAR has revised Table 12.3-8 to modify the setpoint bases for the HRRMs.
- PRPB  
↑
- 12.5 ° The titles and responsibilities in this section have been changed to reflect the current Nuclear Operations organization.  
° Numerous minor changes have been made to reflect the updated health physics program.  
° The qualifications of the Radiation Protection Manager (new position) need to be reviewed.  
° The location of the TLD reader has been changed from the health physics office to the Personnel Dosimetry Processing Facility.  
° The SER needs to clarify that radiation work permits and general access permits are no longer issued by the Chemistry and Health Physics Engineer (position no longer exists), but are controlled by procedure.  
° The FSAR has revised Table 12.5-2 to reflect actual radiation protection equipment and delete sensitivity.
- PRPB  
↑



SECTION 22 - TMI-2/REQUIREMENTS

- I.A.2.3 ° The SER incorrectly states that FSAR Subsection 13.2.1 describes the certification of instructors.
- LHFB I.C.1 ° This remains an open item from SSER 12 (License Condition (13)-system functional task analysis).
- LHFB ° The staff needs to review the function and task analysis submitted by letter dated 12/16/85 (TXX-4641).
- I.C.5 ° Due to organizational changes within TU, titles and reporting responsibilities have changed for feedback of operating experience.
- I.C.7 ° The SER incorrectly states (p. 22-18) that FSAR Section 13.5 describes Westinghouse participation in the development of low power and power ascension test procedures.
- ° The discussion of Westinghouse Owners' Group efforts needs to be revised (the present discussion is garbled).
- LHFB I.D.1 ° A CRDR audit was conducted in 1984 and subsequent major changes have been made to the control room. TU may need to conduct environmental surveys and update the FSAR. Another staff audit may be required.
- LHFB ° The staff needs to review the function and task analysis submitted by letter dated 12/16/85 (TXX-4641).
- LHFB ° Some open HEDs remain from SSER 6.
- LHFB I.D.2 ° SPDS isolator test program results to be submitted by TU Electric.
- LHFB ° TU Electric needs to respond to open items identified in SSER 12.
- LHFB I.G.1 ° Appendix 5A to the SER needs to be reviewed (applicability of Natural Circulation tests at Diablo Canyon to CPSES).
- PRPB II.B.2 ° Numerous changes have been made to reflect the corrective action program.
- PRPB ° The model has been revised to reflect PASS sources.
- PRPB ° The hot cell has been eliminated.
- PRPB ° The FSAR has revised the assumptions for some accident analyses, resulting in changes to the TU Electric response to this TMI item.
- ECEB II.B.3 ° TU Electric has added relief valves to process sampling systems for overpressure protection per ASME code Section III, NC-7155.
- ECEB ° The hot cell has been eliminated.
- ECEB ° The staff needs to provide a new SER rewrite to reflect that the PASS must be demonstrated operable prior to exceeding 5% power.
- ECEB ° The staff may need to review procedures.
- II.B.4 ° The SER indicates that the staff will verify completion of: (1) training program before fuel loading; and (2) training of all operational personnel before full power operation.
- EMEB II.D.1 ° New information has been provided in the FSAR on correct safety valve ring settings.
- ° The SSER needs to close out this issue based on review of associated correspondence (TXX-4849 dated 6/13/86; TXX-6398 dated 4/15/87; TXX-88216 dated 2/12/88).

- SPLB 11.E.1.1° SER Recommendation GS-4 states that the staff will verify plant procedures.  
 ° The SER states that the staff should verify acceptability of auxiliary feedwater system test results.
- SPLB ° The response to Recommendation GS-7 and GL-5 should be reviewed in conjunction with 11.E.1.2.
- SPLB 11.E.1.2° Staff needs to review design aspects of this item and provide SER input.
- 11.E.4.1° The SER states that the 48-inch containment purge supply and exhaust valves, will be "sealed"-closed. Clarification of closure requirements should be provided.
- SPLB 11.E.4.2° This item was listed as Confirmatory Issue 10(j) in SSER 12. The staff will have to review applicants' response to close this item (TXX-4644 dated 12/16/85).
- SICB/SRXB 11.F.2 ° This item was identified as a license condition (16) in SSER 6.  
 SICB/SRXB ° Staff needs to review revised program description of this item (TXX-88096 dated 1/22/88).  
 SICB/SRXB ° The numerical values in Table 22.1 of SSER 6 are not consistent with the FSAR.
- 11.K.1 ° The SSER states that staff must verify that the requirements of C.1.5 and C.1.10 for IE Bulletins are satisfied prior to licensing.
- SRXB 11.K.3.5° This item was listed as Confirmatory Issue 10(k) in SSER 12. The staff must review information submitted in response to GL 85-12 on selection and implementation of automatic RCP trip during LOCA (TXX-4904 dated 9/24/86).
- SICB 11.K.3.9° The staff needs to review an alternate method for disabling the derivative action of the PID controller.
- 11.K.3.11° Although SSER 6 states that closeout of this item is subject to closure of 11.K.3.2, and although 11.K.3.2 was closed out in SSER 6, the SSER write-up didn't specifically close out 11.K.3.11.
- 11.K.3.30° The SSER write-up needs to reference the NRC SER issued 10/26/87 on the small break LOCA computer code.
- 11.K.3.31° The staff needs to review use of the NOTRUMP code.  
 ° SSER 6, Confirmatory Item 10(m) incorrectly references 10 CFR 50.56 (the correct reference should be 10 CFR 50.46).  
 ° The response to this TMI Item has been revised to include reference to the Westinghouse Owners Group analyses which generically demonstrate that the previously used WFLASH code is conservative compared to the newly approved NOTRUMP code.



- PEPB III.A.1.2°SSER 3, Appendix G Item 3.H requires onsite post-implementation review of ERFs.
- PEPB °The FSAR has changed the time to man the TSC from 40 minutes to 60 minutes.
- SPLB III.D.3.3°Staff needs to review the applicants' new plans for analyzing silver zeolite cartridges.