



Public Service Company of Colorado

5909 East 38th Avenue, Denver, Colorado, 80207

August 13, 1982  
Fort St. Vrain  
Unit No. 1  
NDS-82-0748

FSV-29C

50-267

Mr. George Kuzmycz, Project Manager  
Special Projects Branch  
Division of Project Management  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

SUBJECT: Summary of Changes Incorporated  
into Updated Fort St. Vrain FSAR

Dear Mr. Kuzmycz:

As you requested, attached is a consolidated summary of changes incorporated into the Updated Final Safety Analysis Report for Fort St. Vrain. We have organized the summary sequentially, and edited out extraneous information such as transmittal letters, heading information and PSC review comments.

As you review the summary, should you have any questions, please do not hesitate to contact me or Mr. David Goss (303) 571-6713 for further information.

Very truly yours,

M. H. Holmes by J.R. Johns

M. H. Holmes, Nuclear Services Manager  
Nuclear Engineering Division

Distribution

NRC-Project Manager Only

DG/MHH:pa

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## DRAFT 1

### REWRITE UNIT 1 SUMMARY OF CHANGES

#### SECTION 1.1.1

- line 177: Reworded sentences to indicate that this is a submittal of an updated FSAR.
- lines 193-196: This information was added to make the FSAR update current with regard to operating history and testing status. In addition, the last paragraph ties the updated FSAR to the regulation and its requirements.
- line 196: Reworded text to indicate that reactor is not planned for operation at a power level above 330 MWe.
- line 199: The language was slightly changed for clarity and to avoid any appearance of intent to operate above 100%. PSC should examine this statement carefully to be sure it is acceptable as written.

References were added for Section 1.1.

#### SECTION 1.1.2

- line 206: Reflected additional FSAR appendices.
- line 224: Reflected operational status of the plant.
- lines 234-235: Reflected R & D programs discussed in Appendix A other than those incomplete at the time of issuance of the construction permit.
- after line 242: Briefly described Appendices F, G and H.
- line 257: Improved wording.

#### SECTION 1.2.1

- line 279: Changed "Applicant" to "Licensee".
- line 286: Made wording of sentence more current.
- line 289: Words were added to indicate that the FSV Security Plan is now in effect and controls access to the plant.
- lines 298-300: Updated population estimates based upon 1980 census.
- line 312: Changed "Applicant" to "Licensee".

SECTION 1.2.1 (Cont.)

- lines 313-317: Removed wording that indicated that insignificant amounts of radioactive liquid effluent are discharged. (Section 11).
- line 317: Changed verb tense.
- line 361: Changed verb tense.
- lines 361-362: Added Reference to Technical Specifications.
- line 365: Changed verb tense.
- line 366: Changed "Applicant" to "Licensee".

SECTION 1.2.2

- line 396: Hyphenated "load-following".

SECTION 1.2.2.1

- line 415: Indicated that an actual photograph of the facility is to replace Figure 1.2-1.
- lines 422, 429, 429, 432: Changed verb tense.
- line 449: Deleted "respectively", as it is misused.
- line 456: Changed "or" to "of".

SECTION 1.2.2.2

- line 474: Added date when Peach Bottom operation was discontinued.

SECTION 1.2.2.3

- lines 538-541: Clarified "zero neutron cross-section", so as to avoid confusion relative to tritium generation.
- line 557: Hyphenated "turbine-driven".
- line 555: Hyphenated "water-turbine".
- line 563: Improved sentence grammar.
- line 565: Changed verb tense.

SECTION 1.2.2.4

- lines 597-599: Changed verb tense.

SECTION 1.2.2.4 (Cont.)

line 600: Improved sentence grammar.

SECTION 1.2.2.5

line 660: Deleted "completely".

lines 643-652: PSC should advise whether they want the ACM system mentioned in this paragraph.

lines 682, 693: Changed verb tense.

SECTION 1.2.2.6

line 728: Clarified "spherical" reference to reserve shutdown balls.

SECTION 1.2.2.8

line 774: Reflected fifth 230-kv transmission line (Section 8).

line 779: Reflected addition of the PPS battery (Section 8).

lines 782-786: Referred to ACM. (Section 8)

SECTION 1.2.2.9

line 800: Editorial changes.

line 812: Sentence moved from lines 817-819 to before line 813 for improved readability.

SECTION 1.2.2.12

lines 845-848: Deleted reference to 1%/year helium leakage (Section 11).

line 847: Changed verb tense.

line 857: Changed "Averaged" to "Average".

line 858: Changed "AEC" to "NRC".

line 863: Made wording more current.

lines 866, 867,  
874, 875, 876: Changed verb tense.

SECTION 1.2.2.12 (Cont.)

- line 877-878: Added statement that off-site shipping of solid wastes has not yet been required (Section 11).
- line 882: Changed verb tense.

SECTION 1.2.2.13

- line 895: Changed "off-site" to "off site".
- line 924: Improved punctuation.
- line 927: Changed verb tense.
- line 933: Improved punctuation.
- line 942: Changed verb tense.
- line 947: Changed verb tense.
- line 954: Changed "leakrate" to "leak rate".

SECTION 1.3

- p.60, line 6.F: Changed value to 110,000 (Section 3).

SECTION 1.4

- lines 1230-1236: Two introductory paragraphs added to explain the FSV Principal Design Criteria.

SECTION 1.4.1

- line 1241,  
1242: Deleted reference to 1%/year leakage of primary coolant (Section 11).
- lines 1244,  
1247, 1250: Changed verb tense.
- lines 1252-  
1253: Made sentence more current.
- line 1253: Changed verb tense.
- lines 1255-  
1263: Incorporated a portion of the answer to NRC Question 6.2.
- line 1266: Changed wording to reflect the fact that solid waste has not yet been required to be shipped off-site for disposal.

SECTION 1.4.1 (Cont.)

lines 1290,  
1294, 1299,  
1306: Formed sentences.

SECTION 1.4.4

lines 1360-  
1365: We recognize that the ACM system is not considered either Class I or Safe Shutdown. However, PSC should advise whether they want the ACM system mentioned here.

line 1369: Corrected subsection title.

SECTION 1.4.5

line 1383: Removed the term "defined as follows" to avoid confusion.

lines 1383-  
1385: Added reference to Table 1.4-3, listing safe shutdown structure. Incorporated the answer to NRC Question 5.9 with editorial changes to improve clarity.

line 1391: Removed asterisk.

line 1399: Changed verb tense.

line 1396: Modified wording for clarity.

lines 1398-  
1401: Incorporated footnote into text.

line 1413: Referred to Appendix H for details of seismic analysis.

lines 1415-  
1433: Incorporated the answer to NRC Question 7.2.

lines 1435-  
1461: Incorporated the answer to NRC Question 5.23.

lines 1463-  
1466: Incorporated the answer to NRC Question 5.17.

line 1467: Added new Section title.

line 1473: Added new Section title.

line 1487: Added new Section title.

SECTION 1.4.5 (Cont.)

lines 1488-  
1541:

Incorporated the answer to NRC Question 6-1. Reflected qualification of safety-related equipment and instruments within 20 feet of potential steam leaks. (G-77076).

SECTION 1.4.6

Added section on environmental qualification of electrical equipment (P-80051).

SECTION 1.6:

lines 1617-  
1624:

Changed wording to reflect changes since original FSAR submittal.

lines 1625-  
1730+:

Reflected major changes to the plant since the last FSAR submittal.

We have included what we consider to be the major modifications made since the operating license was issued. PSC should advise whether there are any other modifications which should be included.

PSC should consider such items as diesel-driven fire pumps, HVAC changes in the reactor building, reverse osmosis unit, EG&G and other new moisture monitors, new stack gas monitors.

SECTION 1.7:

line 1742:

Changed verb tense.

line 1743:

Deleted the word "Applicant".

lines 1747-  
1749:

Referred to alternate names for General Atomic Company.

line 1754:

Added information on Stearns-Roger Corporation involvement with plant construction.

lines 1756-  
1760:

Changed verb tense.

line 1761:

Made wording more current.

line 1764:

Changed verb tense.

lines 1734-  
1764:

It is requested that PSC carefully review this section to ensure that it is sufficiently complete.

SECTION 1.3

- line 1772: Added words "and is being".
- line 1774: Added plant operational experience as evidence of plant safety.
- lines 1774-1779: Added punctuation and deleted words "are being conducted" from line 1778.

- Figure 1.2-1: This figure is to be replaced by a photograph.
- Figure 1.2-2: This figure has been greatly changed. It will be replaced by an updated PP-1.
- Figure 1.2-5: This figure will be replaced by an updated PA-1.
- Figure 1.2-9: This figure will be replaced with an updated PA-9.
- Figure 1.2-10: This figure will be replaced with an updated PA-10.
- Figure 1.2-11: This figure will be replaced with an updated PA-11.
- Figure 1.2-14: This figure will be replaced with an updated PA-14.
- Figure 1.2-16: This figure will be replaced with an updated PA-16.
- Figure 1.2-18: This figure will be replaced with an updated PA-19.
- Figure 1.2-19: This figure will be replaced with an updated PA-22.
- Figure 1.2-20: This figure will be replaced with an updated PA-23.
- Figures 1.4-1, 1.4-2, 1.4-3: These figures were added from NRC Question 6.1.
- Tables 1.4-1, 1.4-2: These tables were updated to include the line to the emergency water booster pumps (FCN-GA-3651). It is requested that PSC carefully review these lists for completeness.
- Table 1.4-3: We have incorporated this table from the response to NRC Question number 5.9. However, it appears that this information should be incorporated into existing Tables 1.4-1 and 1.4-2.

END OF DRAFT 1

## DRAFT 2

### SUMMARY OF CHANGES - REWRITE UNIT 1

#### SECTION 1 (excluding Section 1.5)

##### Section 1.1.2

- line 291: Changed "Engineered Safeguard Features" to "Engineered Safeguards" per PSC comments.
- lines 315-317: Changed "2" to II", and added a sentence referring to supplementary information in Appendix G per PSC comments.
- line 320: Added "discusses seismic analysis of the plant systems and" per PSC comments.
- line 322 Deleted an inadvertently entered paragraph.

##### Section 1.2.1

- line 370: Changed "Applicant" to "Licensee" per PSC comments.
- lines 457-458: Changed "the Licensee's" to "a Licensee" per PSC comments.

##### Section 1.2.2.1

- line 508: Corrected the spelling of "turbine".

##### Section 1.2.2.2

- line 601: Added a comma after "low" for readability.

##### Section 1.2.2.7

- lines 832-913: Incorporated the answer to NRC Question 7.1.

##### Section 1.2.2.9

- lines 975-976: Added reference to the hydraulic oil system per PSC comments.

##### Section 1.2.2.11

- line 1012: Changed "settling ponds" to "storage ponds" per PSC comments.

Section 1.2.2.12

- line 1035: Deleted "expected to be" prior to "significantly" per PSC comments.
- line 1039: Deleted "small and infrequent amount of potentially" prior to "radioactive" per PSC comments.

Section 1.2.2.13

- line 1072: Changed "would" to "will" per PSC comments.

Section 1.4.2

- line 1496: Added "gaseous" per PSC comments.

Section 1.4.3

- lines 1534,1541 Added dates for ASME code.

Section 1.4.5.1

- lines 1605,1607, 1617,1668 Changed "Safe Shutdown" to "Design Basis" per PSC comments.
- line 1630: Modified verb tense.

Section 1.4.5.3

- line 1703: Changed "Safe Shutdown" to "Design Basis" per PSC comments.

Section 1.4.5.4

- lines 1736,1745: Changed "a DBA" to "DBA-2" per PSC comments.
- line 1754: Added reference to Figure 1.4-4.

Figures 1.4-2, 1.4-3

- General Deleted note that 20 ft. is the closest distance to safe shutdown equipment.

Figure 1.4-4

- General Added this figure to show 5; 10; 15-ft curves (CN-1240).

SECTION 1.5

SECTION 1.5

- Line 10: "resume" changed to "brief summary" per PSC comments;  
"briefly given" changed to "given".
- Line 14: "resumes are not" changed to "summaries are not".

SECTION 1.5.6

- Line 166: "improved fuel designs intended for" changed to  
"certain fuel designs, some of which are intended  
for possible future" per PSC comments.

SECTION 1.5.7

- Line 194: "flow-induced movements" changed to "movements" per  
PSC comments.
- Line 196: "the problems" changed to "the temperature fluctuation  
problems" per PSC comments.

SECTION 1.5.9

- Line 224: "adsorbing" changed to "absorbing" per PSC comments.
- Line 225: "cyiindro" changed to "modified" per PSC comments.

Section 1.6

- lines 1862-1866: Added items 12, 13 and 14 per PSC comments.

Section 1.6.2

- line 1887: Changed letter to lower case.

Section 1.6.3

- line 1896: Deleted reference to the bearing water system  
per PSC comments.

Section 1.6.4

- lines 1908-1909: Reworded description of purpose of RCD's per  
PSC comments.

Section 1.6.5

- line 1918: Changed "maintain" to "reduce" per PSC comments.
- line 1919: Deleted "at 150°F" after "mechanisms" per PSC  
comments, and added reference to Section 5.9.2.8.2.

Section 1.6.6

- line 1927: Changed "which fulfills" to "in response to" per  
PSC comments.

Sections 1.6.12, 1.6.13, 1.6.14

- lines 1997-2021: Added descriptions of additional items mentioned  
in Section 1.6

## Section 2.1

- line 192: Corrected typographical error (added "s" to town).
- line 209: Deleted the words "the location for" to improve readability.
- line 212: Deleted the word "number".
- line 221: Included the correct name for the Denver Airport.
- line 226-227: Edited two sentences into one for better readability.
- Figure 2.1-1: Used newer map.
- Figure 2.1-2: Improved the quality of the map and also constructed the mileage circles more accurately. The names and boundaries of the counties are also identified.
- Figure 2.1-3: Improved the quality of this figure and also added the following items to be consistent with the text: (a) gas wells; (b) permanent residences within the boundaries; (c) irrigation ditches specifically cited in the text; (d) incorporated comments made by PSC.
- Figure 2.1-4: The date of the aerial photograph has been added to the caption. In addition, PSC comments have been incorporated.
- Figure 2.1-5: The date of the aerial photograph has been added to the caption.
- Figure 2.1-6: The date of the aerial photograph has been added to the caption. In addition, PSC comments have been incorporated.

## Section 2.2

- line 247: Changed verb tense.
- line 251: Deleted the word "Essentially".
- line 252: Deleted the words in parenthesis "(at least initially)".
- line 259: Changed "2300 ft" to read "approximately one-half mile".

## Section 2.2 (Cont'd)

- lines 262-270: This has been changed to reflect that the dwelling within the exclusion area was vacated and will not be reoccupied. (Mr. *Houston* PSC's *FARM* Manager, has advised that the building is in the process of being removed. Does PSC want to state this in the FSAR now or wait for the next revision?) The last two sentences were added to incorporate the residences within the PSC property boundaries on through Figure 2.1-3. In addition, references made to the Fort St. Vrain RERP regarding plans for notification of residents in case of emergencies. The last two sentences incorporate an update to PSC's responses to questions 2.1a and 2.1b.
- lines 273-280: This material was added to incorporate the responses to NRC questions 2.1c as well as a portion of the response to question 2.1a.
- line 288: The term "security building" replaced the word "plant".
- line 296: The word "fenced" has been added.
- lines 311-315: References 1, 2 and 3 have been added. The word "radiological" has replaced the word "radiation" (in two places).

## References for Section 2.2

This is an entirely new section which was added to identify references for Section 2.2. This approach is consistent with that used in all other sections of the FSAR.

## Section 2.3

- line 349: Corrected 1960 population for Loveland to 9,734.
- lines 355-356: The words "a population of" were added per PSC comments.

### Section 2.3.1

- line 369: The words "2300 feet" were replaced with the words "approximately one-half mile".
- lines 370-372: The words "as reported in the original FSAR" were added.
- line 373: This sentence was changed to reflect the fact that the population figures "were computed" based on the 1980 census.

### Section 2.3.1 (Cont'd)

- line 402: Added reference 1.
- line 405: Added the words in parenthesis to indicate that the 5-10 mile sectors are the only ones divided into 22-1/2 degree increments.
- lines 410-413: An entire paragraph was deleted which described the old method of determining rural population. The actual method for computing population on the basis of 1980 census is described in lines 400-410.
- lines 419-422: Information was added regarding the number of migrant and seasonal farm workers in the Greeley area. This information was obtained from the Colorado Division of Employment and Training. The information was obtained by telephone and confirmed in a letter to Mr. Neely dated May 19, 1982 (copy enclosed). It is important to point out that we were not able to get figures for the migrant and seasonal employment within 5 miles of the plant. Also there are no figures on visitors and other transients to the area. As indicated in Table 2.3-1, the total permanent population within 5 miles of the site is 3,148. 20% of that is 630. Therefore, since the number of migrant farm workers in the larger "Greeley area" averaged only 430 persons, it is safe to say that only the non-permanent residents within 5 miles of the reactor would probably amount to no more than a 20% increase over the number of permanent rural residents in that 5 mile radius.

### Section 2.3.2

- line 437: Begin a new paragraph.
- line 440-443: These two sentences correctly state that the actual population figures were taken from the Census for the years indicated. In addition, the method of obtaining the projected population figures is correctly stated. This information replaces several lines from the previous draft which indicated that projections were obtained from county and municipal planning commissions. It is important to note that population projections made by city and county commissions are made for entirely different purposes than the population projections for evaluation of nuclear plant sites. The quadratic extrapolation is considered to be conservative and therefore more appropriate for nuclear plant site evaluation.
- lines 446-451: Information was added to be consistent with the contents on new Table 2.3-4 which deals with the record of growth of the 6 small towns near the plant. (Note that the material for Table 2.3-4 was originally incorporated directly in the text. It was put in a separate table to eliminate problems experienced with the word processing system.

Section 2.3.2 (Cont'd)

- lines 454: All of the words following "relatively small" have been added. This statement is made to be consistent with the requirements of NRC's Standard Review Plan, Section 2.1.3.
- lines 457-460: This material was added to be consistent with the requirements of NRC's Standard Review Plan, Section 2.1.3. It is also important to note that this material replaces the response to NRC's question 2.1d.
- lines 464-467: The material from the previous draft was edited and changes were made to be consistent with the requirements of NRC's Standard Review Plan.

References for Section 2.3

These references were added at the end of the Section to be consistent with practices followed for all other sections of the FSAR.

Table 2.3-1: This entire table was revised to reflect the new figures from the 1980 Census. The figures were determined by using large scale maps of the areas, showing boundaries of census tracts, innumeration districts and, where appropriate, blocks. Arcs were drawn on these maps with the reactor site as the center. Work sheets were used to add up the population figures from the 1980 Census as they are distributed within the map segments defined by the various mileage arcs and the various radial lines drawn through the major compass points. (By separate transmittal, we are sending you a compilation of the internal memoranda which described the various approaches used in the conversion of the 1980 Census data used in the FSAR. See NPC-3061, dated June 1, 1982).

Table 2.3-2: This table was revised to show actual population figures for 1970 and 1980 and to present new population projections for the year 2000. The population projection is based on the equation shown in Note 1 of the table. (Also see NPC-3061, dated June 1, 1982). We would also call your attention to Note 2 of the table which pertains Commerce City and Boulder. These two cities did not maintain a consistently increasing population during the 1970-1980 period. Because of that, the  $a_2$  constant was negative; to avoid subtraction from the population projection, it was assumed to be zero for conservatism. With regard to Note 3, it is important to understand that Northglenn did not exist (apparently) in 1960 and therefore the population projection, based on only 2 points is linear rather than based on the quadratic equation.

Table 2.3-3: This table also has been revised to reflect actual 1970 and 1980 Census data as well as to incorporate the new projections for the year 2000. The comments made above on Table 2.3-2 are also applicable to this table.

Table 2.3-4: This is entirely a new table which was made from the information previously included in the text. The 1970 and 1980 figures for actual population were taken from the Census information for those years. The projected populations are as shown in Table 2.3-3. New discussion in the text correctly reflects the relationship between the growth rates of these 6 small towns nearest the plant site.

Figure 2.3-1: The title of this figure has been changed to make it clearer that this is the resident population. The population shown in the previous draft in sectors 112-1/2 to 135 at 3-4 miles and 4-5 miles were changed from 1561 to 1569 and from 92 to 123 respectively. This change is also reflected in Table 2.3-1.

Figure 2.3-2: In the previous draft, no population figures were filled in. This figure is a new map with the new 1980 Census population figures included. The caption of this figure has also been changed to indicate that this is resident population.

#### Section 2.4

line 492: Deleted quotation marks and added reference.

lines 495-503: This material was edited to improve the information found in the updated (1981) studies and to include reference 2 (Colorado Agricultural Statistics Publication on which the information is based).

line 513: Reference has been added to cite the master plans for Larimer and Weld Counties which were produced in 1977.

lines 522-526: The publication, which was the source of information in the original FSAR, is no longer published in the same form. Therefore, comparable updated information was not available. Because of this the paragraph was edited to be more general with respect to mineral production in Weld County.

line 534: All of the words following the word "site" were added to correct an omission from the earlier draft.

Section 2.4 (Cont'd)

line 539: Added reference 4 and changed the verb tense.

References for Section 2.4

This entire section is new and added to be consistent with the way references are handled in the FSAR.

Table 2.4-1: This table was completely revised to show information from the 1980-81 Directory of Colorado Manufacturers. In addition, telephone book yellow pages were used to further substantiate these listings, particularly those within a 10 mile radius. PSC questioned whether this table is necessary. In our opinion it is necessary because it was included in the original FSAR and is required to provide some indication of the extent of employment in the immediate vicinity which might bring in more people during the day than the permanent residents. This is not to be confused with the migrant farm worker population nor with any other "transient or visiting residents". The table presented in the earlier draft was much too detailed and included information beyond the scope of that included in the original FSAR. The table has been changed to be more consistent with the original FSAR.

Figure 2.4-1: Improvements have been made in this figure such that the legend for land use designation is easier to distinguish on the map.

Section 2.5.1

lines 619-622,  
631-635: Modified text per PSC comments.

line 649: Added references applicable to this section.

Section 2.5.2.

lines 703, 705: Deleted information pertaining to average blowdown rates per PSC comments. Note that deletion of this information results in less detail in the FSAR than the original.

line 742: Changed "restricted" to "limited" per PSC comments.

line 815: Corrected reference number; deleted "To our knowledge" per PSC comments.

line 828: Deleted "We are cognizant of the fact that" per PSC comments.

line 839: Corrected reference number.

Section 2.5.3

lines 921-923: Corrected reference number.

lines 1023-1024: Reworded this sentence per PSC comments.

References for Section 2.5

lines 1028-1059: Rearranged and corrected references based upon text.

Section 2.6.1.

line 1072: Corrected reference number.

Section 2.6.2.

line 1117: Corrected reference to Appendix G.

lines 1119-1154: Summarized information from the referenced report.

Section 2.6.3.

line 1165: Corrected reference to Appendix G.

line 1167: Referred to Section 2.6.2 for a summary of the report.

Section 2.6.4.

line 1179: Corrected reference to Appendix G.

Section 2.6.5.

line 1188: Corrected reference number.

lines 1192, 1222: Deleted quotation marks and indented to indicate quotation.

lines 1261-1263: Reworded sentence per PSC comments.

References for Section 2.6

lines 1286-1294: Rearranged references based upon text.

Sections 2.7, 2.7.1., 2.7.2.

lines 1298-1457: Replaced these sections with PSC rewrite.

After line 1361: Insert A added per PSC comments.

After line 1375: Insert B added per PSC comments.

### Section 2.8

- line 1465: Changed verb tense.
- line 1468: Added "historical".
- line 1470: Changed "three" to "four" for accuracy.
- lines 1471-1474: Included cross-reference summaries.

#### Section 2.8.1.

- line 1496: Corrected reference to Appendix G.
- lines 1499-1506: Summarized the results of the meteorological reports.

#### Section 2.8.2.

- line 1517: Corrected reference to Appendix G.
- lines 1520-1525: Summarized the results of the tornado study.
- line 1534: Deleted "BOULDER--" from the beginning of the sentence.
- line 1546: Referred to Figure 2.8-1.

#### Section 2.8.3.

- line 1587: Corrected reference to Appendix G.
- lines 1590-1616: Included a summary of the results from the revised climatological report.

#### Section 2.8.4.

- line 1626: Corrected reference to Appendix G.

#### Section 2.8.5.

- lines 1630-1647: Added this section to mention the current meteorological monitoring. (CN-1326)

#### References for Section 2.8

- lines 1651-1656: Added reference from Section 2.8.3.

Section 2.9

line 1664: Replaced the previous first two paragraphs of this section, which described the initial monitoring program, with the current paragraph. This was to provide a more current summary.

lines 1700-1701: Changed "year" to "five years" to accurately describe the monitoring program.

Section 2.9.1.

lines 1775-1776: Added explanation of five year monitoring program.

Section 2.9.3.

lines 1857, 1861,  
1864: Changed verb tense.

line 1866: Deleted paragraph describing chart recorder sensitivity and backup thermometer reading.

lines 1876-1879: Changed verb tense.

line 1890: Deleted paragraph concerning continuation of program evaluation, as it was replaced with the paragraph that follows.

lines 1893-1909: Added paragraph describing the electrical monitoring system. (CN-445)

Section 2.9.4.

lines 1924-1927: Replaced the former section with an updated paragraph describing the study results.

DRAFT 1  
PSC Review  
FSAR Rewrite Unit 4 (Chapter 3)  
Draft A (10-23-81)

Page 10

- o Para. 5, line 3 Add the word "hexagonal" between "...3.2.2.2)"  
and the word "blocks".  
line 539 Done.

Page 23

- o Line 57 Add the following sentence: "See Section 3.5.3.2 for  
additional discussion concerning burnable poison loadings."  
line 747 Done.

Page 31

- o Line 57 Tab setting needs adjustment to conform to previous  
numbered items.  
line 962 Not Done.

Page 35

- o Line 22 Delete the word "as" following the word "specified".  
line 1036 Done.  
o Item 3 Instructions are forthcoming which will relocate the  
paragraph to another section.

Page 37

- o Line 19 Delete the term "(6 years at 80% plant capacity factor)"  
and replace with the term "(6 fuel cycles at 300 EFPD/cycle)."  
line 1066 Done.

Page 43

- o Line 22 The core weight both here and in Table 3.3-1 should be  
consistent. Also, the weight of the RCD's should be added into  
both figures.  
line 1174 - Done.  
1175

Page 47

- o Para. 3 The sentence discussing the 1/2 scale test states that no  
problem exists. In reality, a problem did exist and it now appears  
that the RCD's resolved the problem. The wording should be worded  
to reflect this situation. Mention should also be made regarding  
the absence of operating temperatures during the 1/2 scale test.

\* lines 1264- This is discussed in section A.1.7.  
1273

Page 50

- o Line 7 Add the word "consists" after the word "structure".
  - line 1330 Done.
  - o Line 22 Add the word "block" after the word "support".
  - line 1345 Done.
  - 1346 2nd Para. Additional details are forthcoming.
  - o Line 59 Replace the word "event" with the word "vent".
- Moved per GA's comments. (See text).

Page 53

- o Line 50 Add "eighty (80)" between the word "test" and the word "specimens".
- line 1483 Done.
- o Line 51 Replace the word "at" with the word "during".
- line 1484 Done.
- o Line 51 Replace the word "These" with the term "Groups of sixteen (16)".
- line 1485 Done.

Page 68

- o Line 174 Replace "1.25:1" with "4.25:1".
- line 1821 Done.
- o Line 176 End the sentence after "8" and delete the term "of the initial core".
- line 1823 Done.

Page 69

- o Line 199 thru 208 Delete and replace with the following:
  - lines 1946 - Done.
  - 1862 Two startup neutron sources consisting of CF-252 encapsulated in platinum and stainless steel were originally installed in the core. The total initial neutron generation rate was approximately  $4 \times 10^6$  neutrons per second. In 1981, the neutron generation had decreased to about  $2.5 \times 10^6$  neutrons per second due to radioactive decay of the Californium-252. A third source consisting of CF-252 doubly encapsulated in stainless steel was added in December, 1981 with an initial neutron generation rate of  $1.88 \times 10^6$  neutrons per second.
- The initial activity of each of these sources does not exceed .5 curies and the total at any given time does not exceed
- The sources are located in the top layer of fuel elements, layer 4, of regions 9 and 16 (original elements) and 15 (December, 1981) as shown in Figure 7.3-2. The location of the sources within the fuel element is shown in Figure 3.4-4.

Page 72

- o Line 79 Add the term "and in the first and second" after the word "core".
- lines 1954 - See text.
- 1959
- Page 77

- o Line 6 Graphite should be spelled GRAFITE.
- lines 2019 - Not done, modified per GA's comments; see text.
- Page 78 Line 72 Correct the spelling of dowel.
- line 2135 Done.
- Page 80

- o Line 12 Add figure numbers.
- lines 2164 - Not done, original text restored.
- o Line 53 Delete the term "(see Section 3.4.2.1.1)".
- line 2206 Done.
- Page 86, Fig. 3.4-4

- o Sec. A-A Replace Caption "Neutron Source" with "Neutron Source *Location*".  
~~Location~~.

Page 92 thru 96

- o Since Figure 3.4-10 is to be deleted, the figure numbers on the figures that follow must be adjusted.

Page 103

- o Line 36 Add a new paragraph as follows:

"It should be noted that the material in the preceding relates to the initial core. Similar material relating to subsequent fuel reloads can be found in Safety Evaluations contained in PSC correspondence to the NRC, i.e. p-letters.

lines 2426 - Done with modification.  
2429

Page 110

o Line 144 Delete the entire paragraph and replace with paragraph 3 from page 130.

lines 2620 - Not done, because this refers to H-451 graphite.  
2623

Page 114

o Line 17 Replace the line with the following:  
line 2641 Not done, GA comments used instead.

"In the initial core, only one type poison rod was used. In segment 7 (reload 1) different....."

o Line 20 Delete the sentence beginning with "In the case...."  
Same as line 17.

o Line 23 Delete the words "to be".  
Same as line 17.

o Line 27 Add "(Reload 2)" between "8" and the word "and".

line 2650 Done.

o Line 40 Add the following sentence: "The spacers will be made of HLM graphite."

line 2660 Done.

o Line 49 Add "up to" between the word "in" and the word "each".

lines 2668 - Not done, see text.  
2672

o Line 56 Replace the word "is" with the word "was".

line 2676 Done.

o Line 57 Replace the word "is" with the word "was".

line 2678 Done.

o Line 61 Replace the term "will be" with the word "was".

line 2681 Done.

Page 130

o Line 18 Replace the word "unsufficient" with the word "insufficient".

line 3199 Done.

o Line 26 The second sentence is not a complete sentence. Correct as appropriate.

line 3204 Not done, paragraph deleted due to GA comments.

o Line 37 Replace the word "an" with the word "a".

o Same as above.

o Para. 3 Delete the entire paragraph and relocate to page 110

Not done, see above.

Page 134

- o Lines 21 thru 27 Delete this entire paragraph.
- lines 3268 - Done.
- 3270
- Page 140

- o Line 159 Begin the sentence as follows: "The depleted uranium isotopes....."
- line 3510 Done.

Page 164

- o Line 74 Add the word "is" after the word "This".
- line 4088 Done.

Page 195

- o Line 27 Replace the term "will be" with the term "has been".
- lines 4287 - Not done, paragraph deleted per GA comments.
- 4289 Line 33 Add the following phrase to the last sentence: ".... temperatures, therefore the original analyses are conservative and no new analyses are required."
- Same as above.

Page 224

- o Section 3.6.6.1 The text contains too much detail with dates, etc. Modify the wording to include a brief sequence of events and a short summary.
- o Line 56 Replace the term "identified as" with the term "as a part of".

Page 225

- o Line 105 Delete the word "to".

Page 226

- o Line 9 Correct the spelling of "changing".
- o Line 17 Correct the spelling of "maintain".

- o Line 48 Replace the word "has" with the word "have".
- o Line 59 Replace the word "germane" with the word "pertinent".

Page 227

- o Line 79 (1st) Capitalize "power".
- o Line 79 (2nd) Add a comma after the word "fluctation".
- o Line 108 The word "test" should be ~~fixed~~. *plural*

Page 228

- o Line 153 Begin the sentence as follows: "~~Second~~ *Several* parameters exhibited unidirectional changes....."

Page 229

- o Para. 1 Note: The purpose was to look for damages, not for the cause. Correct as appropriate.
- o Line 191 Remove the "(" from the word "to"
- o Line 194 Replace the word "of" with the word "and".
- o Line 194 Convert the parenthetical statement to a sentence.
- o Line 217 Explain "FDRS".
- o Line 224 Add the word "when" after "46".

Page 230

- o Line 288 Correct the spelling of "shift". (Thought we wouldn't spot it, didn't you?)
- o Line 291 Add the word "temperature" after the word "increasing".
- o Line 292 Add the word "temperature" after the word "decreasing".
- o Line 302 Correct the spelling of "operations".

Page 231

- o Line 332 The correct equation is illustrated in Att. 2.

Page 232, Table 3.6-4

- o Add the following 2nd line to the title "Prior to RCD Installation".
- o Add the appropriate units or an appropriate notation FOR THE COLUMN ENTITLED "CORE RESISTANCE".

Page 245

- o Line 25 Replace the sentence with the following: "The observed activities confirm this conservatism in that the activities are well below the expected."
- lines 5371 - Not done, GA modification used.  
5372

Page 261

- o Line 151 Add a ~~hyp~~ <sup>HYPHEN</sup> between the words "gamma" and "neutron".
- line 5738 Done.
- o Line 159 Replace the word "use" with the word "is".
- line 5746 Done, with modification.
- o Line 172 Replace the word "joint" with the word "coupling".
- line 5753 Done.
- o The sentences beginning with lines 166 and 172 are very similar and could be combined.
- o Done.
- o Line 176 Replace the word "joint" with the word "coupling".
- o See above.
- o Line 195 Replace the comma, after the word "gearing" with a semi-colon.
- line 5779 Done.

Page 262

- o Para. 5 This subject is much too detailed and should be generalized.
- lines 5831 - Done.  
5839

Page 266

- o Para 2 Delete the entire paragraph.
- lines 5974 - Done.  
5976

o Line 28 Delete the entire sentence.  
line 5986 Done.

o ADDITIONAL DETAILS ARE FORTHCOMING FOR THIS PAGE

Page 271

o Section 3.83 Replace the various terms, utilized throughout this section to describe the reserve shutdown absorbing material with the term "boron balls".

lines 6339 - Done.  
6367 Line 9 Replace the term "cylindro spherical balls of boron carbide in graphite" with the term "banded spherical balls of boronated graphite".

lines 6342 - Done.  
6344

Page 274

o Lines 10, 11, 12 Delete the entire sentence.  
line 6433 Done.

o Line 34 Move this sentence to the beginning of paragraph 3.

line 6444 Done.  
o Para. 3 Shorten and generalize this entire paragraph.

lines 6444- This is directly from Q&A 6.5 and should be kept.  
6467

Page 275

o Line 108 Delete the sentence which begins on this line. It's redundant to statements made in para. 1.

line 6529 Done.  
o Para. 2 This paragraph contains too much detail, e.g. valve size, pressure rating, applicable code, etc. Summarize this paragraph.

lines 6526- This is directly from Q&A 6.3. It has been modified slightly.  
6538

page 279

o Line 67 Place a period after the word "month".  
line 6632 Done.

Page 281

o Line 42 Delete the sentence beginning on this line and add the following phrase to the end of the preceding sentence: "at which time the bottles are replaced".

line 6769 Done.

Page 299

o Lines 12, 14, 15 Delete both sentences referring to Table 3.10-1.  
line 6964 Done.

Page 302, Table 3.10-1

o Delete this entire table.

Done.

**Revision A**

Page 35

- o Item 3 - Revise as follows and move to Section 3.2.3.5.  
"During normal reactor operation, low levels of oxidants (H<sub>2</sub>O, CO, CO<sub>2</sub>) are expected to be present at concentrations up to 10 vpm (parts per million by volume). In order to minimize graphite oxidation, burnable poison oxidation and metal corrosion, operation with primary coolant impurity levels exceeding 10 vpm are restricted in accordance with applicable Technical Specifications.  
Done.

Page 40

- o Add the paragraph described above.  
Done.
- lines 1130 -  
1135  
Page 50

- o Line 27 - Add the following sentence: "The core support posts are ATJ graphite and the permanent side reflectors are HLM graphite.  
Done.
  - o Line 23 - Delete the word "structure."  
Done.
- line 1345

Page 267

- o Insert the following paragraph between paragraph 4 and paragraph-5:  
Done.
- lines 6045 -  
6175
- The operability of the reserve shutdown system and the orifice valve and its drive are unaffected by the installation of the ICRD's.

The presence of the instrument package in the control rod channel will have an insignificant effect on the normal helium flow through the channel. Calculations indicate that the flows through the channel containing the instrument package, through the corresponding channel with the control rod withdrawn, and through the corresponding channel with the control rod inserted are essentially the same (within 10%).

The shutdown margin was calculated for the core configuration with instrumented control and orificing assemblies installed in regions 5 and 35 at the beginning (BOC), middle (MOC), and end (EOC) of cycle 3. In each case, the shutdown margin was found to be greater than or equal to 2%  $\Delta\rho$ .

The calculated shutdown margins of  $\geq 2\% \Delta\rho$  include the following conservative assumptions. First, it was assumed that all the

Pa-233 had decayed to U-233. Second, it was assumed that three regions were unrodded; namely, the regions containing the two instrumented control and orificing assemblies plus the region associated with the maximum worth control rod pair.

Calculations with the physics design code GAUGE have demonstrated the acceptability of using the standard rod withdrawal sequence when the instrumented control and orificing assemblies are installed for cycle 3. The power distributions are well within the allowable limits set by Technical Specification LCO 4.1.3.

Based upon the standard rod withdrawal sequence of cycle 3 region 5 becomes unrodded while the reactor is still subcritical. Thus, having the instrumented control and orificing assembly in region 5 has no significant impact on the normal power distribution.

Region 35 becomes unrodded, based upon the standard rod withdrawal sequence for cycle 3, at a power level of less than ~25%. Once the single rod of the instrumented control and orificing assembly has been withdrawn, it has no effect on the power distribution. When rodded, however, the presence of a single control rod in region 35 instead of a pair of rods does tend to increase the region's peaking factor (RPF).

This effect is most pronounced when the single rod is fully inserted (at power levels < ~25%) and results in about 34% increase in the RPF of region 35. However, this is a low power region (RPF < .6), and the change is easily accommodated by adjusting the Region 35 orifice valve. The power in the regions immediately adjacent to region 35 also increases by 9 to 14% with the remainder of the core regions increasing slightly (by  $\leq 5\%$ ) or decreasing slightly (by  $\leq 4\%$ ). Although the power distribution is somewhat different when instrumented control and orificing assemblies are installed, the differences are well within the Technical Specification limits of LCO 4.1.3. Further, as mentioned above, these changes are easily accommodated by orifice valve adjustments.

Since the instrument package extends the full length of the core and since it has a low neutron cross section for capture, the effect of its presence on the axial and radial power distribution is negligible.

The remaining control rod in each of the two instrumented drives may be inserted or withdrawn in the normal manner. Further, the scram insertion time for each of these two rods has been measured and found to be within Technical Specification requirements. As noted previously, these rods are not required to establish the shutdown margin necessary for compliance with Technical Specification requirements.

Mechanical failure of an instrument package is analogous to the failure of a control rod. The bottom of the instrument package has

been designed such that in the unlikely event of a failure the exit to the control rod channel would not be blocked to prevent flow of coolant gas.

Nevertheless, conservative thermal and fuel performance analyses have been performed assuming the instrument assembly drops to the bottom of the channel and completely blocks the coolant flow while the plant is operating at full power. These analyses show that, even under these most severe conditions and with the failure of the instrument assembly going unnoticed for 48 hours or more, the instrument package would not melt and the impact on fuel performance would be negligible. Actually, if the instrument package should fall, the failure would result in anomalous readings which would give immediate indication of such a failure.

The reflector block upon which the instrument package (weighing ~12 lbs.) would impact has been designed and tested to withstand the impacts of regular control rods with shock absorbers (weighing ~120 lbs.) falling from the withdrawn position.

Appropriate designed seals permit passage of the in-core instrumentation leads through the primary and secondary pressure boundaries while maintaining the systems' pressure integrity. All pressure retaining members were designed fabricated, and tested in accordance with the requirements of Section 3 of the ASME Boiler and Pressure Vessel Code for Class 1 components for the primary closure parts and Class 2 for the secondary closure parts and demonstrated to be acceptable in accordance with the existing pressure retention and leakage criteria.

Tests Performed to confirm and support the mechanical design and fabrication of the instrument assembly included the following:

- a. The actual instrumented assemblies have been pull-tested to 50% of the tensile yield stress, followed by careful re-inspection. The load placed on the assemblies during this test is a factor of five greater than the maximum anticipated tensile force.
- b. A mockup of the bottom three feet of the instrument support rod has been fabricated from production materials and tested at temperature to its failure point. This mockup represented all typical welds to the central support rod.
- c. A full-scale model of the entire instrument package has been made of appropriate structural material, inserted into a simulated control rod channel and flow tested. Air was used as the test fluid and was drawn through the control rod channel so as to simulate the range of Reynolds number expected in the reactor.

- d. The ability to manually insert and withdraw the instrument assembly into the control rod channel has been demonstrated by testing. The control rod channel mockup for this test modeled the maximum possible amount of control block misalignment for each block.

NOTE TO FSAR AUTHOR: The preceding is an excerpt from the Safety Evaluation attached to GP-C985.

END OF DRAFT 1

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## DRAFT 2

### REWRITE UNIT 4 SUMMARY OF CHANGES

#### SECTION 3.1

lines 538 - 539: (original and modified)  
Editorial change (per PSC comments) and  
section reference added.

#### SECTION 3.2.1

line 577: 100,000 Mwd/tonne burnup changed to 110,000  
Mwd/tonne per GA comments.

#### SECTION 3.2.2.1

lines 609 - 610: Editorial change.

line 623: (original and modified)  
RCD's added in first draft, subsequently modified  
per GA's comments.

lines 652 - 653: (original)  
Temperatures moved to Section 5.9.2.4, this  
section is referenced.

#### SECTION 3.2.2.2

lines 661 - 662: The 1800 EFPD was added per GA comments.

lines 678 - 688: (original and modified)  
Reference to H-451 graphite added. This para-  
graph represents a compromise between the  
original first draft (as prepared by NPC) and  
GA's comments. GA has agreed to this compromise  
in principle.

#### SECTION 3.2.2.3

lines 695 - 696: Editorial change.

line 740: (original)  
"will be" changed to "may be".

lines 747 - 748: Reference to Section 3.5.3.2 added per PSC comment.

line 751: "in the initial core" deleted.

line 752: Verb tense change.

line 753: Verb tense change.

line 754: (original)  
Both "will be's" changed to "may be".

line 764: Editorial change.  
line 769: Reference to section 6.7 changed to section 3.8.  
lines 774 - 776: (original and modified)  
Editorial change.

SECTION 3.2.2.4

line 788: Editorial change.

SECTION 3.2.2.7

line 922: Editorial change.

line 931: Editorial change.

line 959: (original)  
Verb tense change.

lines 962 - 964: (original and modified)  
Criterion ten added to be consistent with other  
design requirements.

SECTION 3.2.3.1

lines 995 - 997: Modified per GA comments.

SECTION 3.2.3.3

line 1028: Editorial change.

line 1036: "as" deleted per PSC comments.

line 1037: (original and modified)  
In the first draft, a third entry was added. It  
was later moved to section 3.2.3.5 per GA and  
PSC comments.

SECTION 3.2.3.4.1

line 1066: (original and modified)  
"5 fuel cycles at 300 EFPD" added per PSC comments.

SECTION 3.2.3.5

lines 1130 - 1135: These lines added per PSC's comments.

REFERENCES FOR SECTION 3.2

lines 1139 - 1144: Reference added (the "H-451 graphite SAR",  
referenced in line 685, section 3.2.2.2).

SECTION 3.3.1.1

- lines 1174 - 1175: Weights modified per GA comments.
- lines 1214 - 1215: (original and modified)  
RCD's added, and modified per GA comments.
- line 1217: (original and modified)  
Sentence on this line (in the first draft) was  
deleted per GA comments.
- lines 1220 - 1224: Description of RCD's added per GA's comments.
- lines 1236 - 1239: (original)  
Fluctuation and RCD's are discussed.

TABLE 3.3-1

RCD's added to table per GA comments.

SECTION 3.3.1.2

- line 1277: Editorial change.

SECTION 3.3.2.1

- lines 1330 - 1331: (original and modified)  
Verb added per GA and PSC comments and editorial change.
- lines 1345 - 1346: (original and modified)  
PGX graphite added in NPC draft, modified per  
GA and PSC comments.
- lines 1351 - 1352: ATJ and HLM graphite added per PSC comments.

SECTION 3.3.2.2

- line 1478: (original and modified)  
ATJ graphite added per GA comments.
- lines 1481 - 1491: (original and modified)  
The PGX surveillance program was added to the  
NPC first draft and subsequently modified per  
GA and PSC comments.
- lines 1517 - 1520: (original)  
Cooling tube leak sealing method added.

### SECTION 3.4.1.1

- lines 1716 - 1720: (original and modified)  
Original text restored per GA comments.
- line 1724: Verb tense change.
- line 1731: Verb tense change.
- line 1733 - 1754: (original and modified)  
Discussion of precharacterized fuel elements  
added in first NPC draft, subsequently modified  
per GA comments.
- line 1761: Verb tense change.
- line 1766 - 1770: (original)  
Description of binder added.
- line 1785: (original)  
Fertile to fissile ratio changed.
- lines 1818 - 1823: (original and modified)  
Included to explain the two fertile to fissile  
ratios, subsequently modified per GA and PSC  
comments.
- lines 1825 - 1832: Modified per GA's comments.
- lines 1841 - 1843: Modified per GA's comments.
- lines 1846 - 1862: Added per PSC's comments.

### SECTION 3.4.1.2

- line 1888: "six years" changed to "1800 EFPD" per GA's  
comments.
- lines 1955 - 1959: (original and modified)  
Description of graphite added in NPC first draft  
and subsequently modified per GA's comments.

### SECTION 3.4.1.3

- line 1974: "Methods of Analysis" was deleted because it  
obviously should not be here. It is in  
section 3.4.2.1.2, lines 2142 - 2207.

SECTION 3.4.1.4

lines 1978 - 1998: (original and modified)  
Section on FTE's added in original first draft  
and modified per GA's comments.

SECTION 3.4.2.1.1

lines 2019 - 2123: (original and modified)  
These lines were modified in the first draft.  
The original text was restored per GA's comments.

line 2033: Editorial change.

line 2100: "programs" changed to "codes".

lines 2133 - 2135: (original and modified)  
Statement concerning stresses and RCD's added,  
modified per PSC and GA comments.

SECTION 3.4.2.1.2

lines 2194 - 2195: References added per GA's comments.

line 2206: (original and modified)  
"see section 3.4.2.1.1" deleted per PSC's  
comments.

SECTION 3.5.1

line 2378 (original)  
Verb tense change.

SECTION 3.5.2.1

lines 2417 - 2418: "for the initial core" added per GA's comments.

lines 2426 - 2429: References added per PSC's comments.

SECTION 3.5.3.1

lines 2520 - 2523: (original and modified)  
Changes which were made in the first draft (NPC),  
were modified per GA's comments.

SECTION 3.4 REFERENCES

lines 2258 - 2276: "Gulf General Atomic" changed to General Atomic.

SECTION 3.5.3.2

- lines 267 - 2675: (original and modified)  
These lines were modified in the first draft  
(NPC), and modified per GA's comments.
- line 2678: verb tense change, per PSC comments.
- line 2681: verb tense change, per PSC comments.
- lines 2687 - 2689: Lines moved from lines 2644 - 2660 per GA's  
comments.

SECTION 3.5.3.4

- lines 2767 - 2768: "typical" changed to "possible" per GA's  
comments.

SECTION 3.5.4.1

- lines 2841 - 2847: Discussion of thick buffer added per GA's  
comments.

SECTION 3.5.4.2

- line 2987: Footnote changed to reference.

SECTION 3.5.4.3

- lines 3069 - 3071: Footnote incorporated into text.
- lines 3082 - 3090: (original and modified)  
Paragraph added in first draft, modified per  
GA's comments.

SECTION 3.5.4.4

- lines 3101 - 3102: Footnote incorporated into text.
- line 3105: Unit on ".02" was deleted to agree with conven-  
tion.

SECTION 3.5.4.5

- lines 3173 - 3175: "at end of segment life" added per GA's comments.

SECTION 3.5.5.1

- line 3199: editorial change per PSC comments.

SECTION 3.5.6.1

- line 3268: paragraph deleted per PSC comments.

SECTION 3.5.7.1

- line 3467: Format change, per GA comments.
- lines 3470 - 3471: GGA changed to GA (twice).
- line 3481: This line is missing, reason unknown. It should read "improved during the last few years due largely to the efforts of".
- line 3510: Editorial change, per PSC comments.
- line 3523: GGA changed to GA.

SECTION 3.5.7.3

- line 3786: Verb tense change.

line 3790: Verb tense change.

lines 3900 - 3902: (original and modified)  
This paragraph was added in the NPC first draft,  
and subsequently modified per GA's comments.

#### SECTION 3.5 REFERENCES

lines 4105 - 4257: "Gulf General Atomic" changed to "General Atomic"  
in all cases.

#### SECTION 3.6.1

lines 4288 - 4289: paragraph deleted per GA's comments

#### SECTION 3.6.5.1

line 4812: (original and modified)  
"Under normal operating conditions," deleted  
per GA and PSC comments

SECTION 3.6.6

This section contains the GA writeup on the Fluctuation with PSC comments incorporated.

It should be noted that the PSC addition to line 5030 gives the impression that the redistribution of flow causes an immediate change in the graphite temperature distribution. This change is not immediate because of the heat capacity of the graphite. Therefore, this portion of the text should be restored per GA's original draft.

SECTION 3.7.2

line 5203: GGA changed to GA.

lines 5213 - 5214: "GA" changed to "General Atomic".

SECTION 3.7.3

line 5295: "GGA" changed to "GA".

SECTION 3.7.4.1.1

lines 5371 - 5372: (original and modified)  
Sentence reflecting observed values of gas have activities modified from first draft per GA's comments.

SECTION 3.7 REFERENCES

lines 5539, 5544 and 5569:  
"Gulf General Atomic" changed to "General Atomic"

SECTION 3.8.1.1

lines 5625 - 5629: (original and modified)  
A discussion of the gas seals was added in the first draft. This was subsequently modified per GA's comments.

- lines 5698 - 5709: (original and modified)  
A discussion of dry film lubricants was added to the first draft, it was subsequently modified per GA's comments.
- line 5738: Editorial change, per GA's and PSC's comments.
- line 5746: "use" changed to "was" per GA's comments.
- lines 5759 - 5775: (original and modified)  
A discussion of the control rod guide tubes was added and subsequently modified per PSC's comments.

---

line 5779: grammatical change per PSC's comment

- 
- line 5822: (original)  
Manual rewind tool defined.
- lines 5831 - 5839: (original and modified)  
A discussion of the CRD transfer battery was added and subsequently modified per PSC's comments.
- line 5852: Reference to section 6.7 changed to section 3.8.3.

SECTION 3.8.1.3 (original and modified)

- lines 5971 - 6183: New section added in first draft subsequently modified per GA's and PSC's comments.

SECTION 3.8.2

- lines 6304 - 6306: Reference to Appendix A deleted per GA's comments.

SECTION 3.8.3.1

- lines 6342 - 6344: (original and modified)  
Definition of "balls" changed in first draft, definition changed per PSC's and GA's comments.
- lines 6384 - 6385: "spheres" changed to "balls" in first draft; verb tense change in final draft.

SECTION 3.8.3.2

- line 6433: sentence deleted per PSC comments
- lines 6444 - 6467: (original and modified)  
Answer to question 6.5 incorporated in first draft, subsequently modified per PSC's and GA's comments.
- lines 6470 - 6472: Editorial change, and "spheres" changed to "balls".
- line 6477: "spheres" changed to "balls".

line 6484: "spheres" changed to "balls".  
line 6507: Rupture pressure changed per GA's comments.  
line 6513: Rupture pressure changed per GA's comments.  
lines 6526 - 6538: (original and modified)  
Originally from Q&A 6.3, modified per PSC's  
comments.

line 6542: "spheres" changed to "balls".  
line 6546: "spheres" changed to "balls".

#### SECTION 3.8.3.3

line 6604 (original)  
"spheres" changed to "balls".  
line 6614: (original)  
"spheres" changed to "balls".

#### SECTION 3.8.3.4

line 6641: (original)  
Verb tense change.  
line 6658: (original)  
Verb tense change.  
line 6667: (original)  
Verb tense change.  
line 6700: (original & modified)  
Frequency changed in first draft, period added  
per PSC comments  
lines 6717 - 6718: (original)  
Test results mentioned.

#### SECTION 3.8.3.5

lines 6759 - 6760: (original)  
Rupture disk pressure changed.  
lines 6769 - 6770: Editorial change, per PSC comment

#### SECTION 3.8 REFERENCES

lines 6788+: Reference 3 added, PSC should determine if  
Gulf-P Reports are suitable references.

SECTION 3.9.1

- lines 6849 - 6862: (original)  
Discussion of orifice drives added from Q&A 3.6.
- lines 6885 - 6887: (original)  
Discussion of lubricate added.

SECTION 3.10.1

- line 6927: Verb tense change.
- line 6928: Editorial change.

SECTION 3.10.2

- lines 6939 - 6952: (original and modified)  
Originally modified per tech specs and subsequently modified per GA's comments.

SECTION 3.10.3

- line 6964: (original and modified)  
Sentences deleted. *per PSC COMMENTS*
- \*\*Note: Table 3.10-1 and all reference to it deleted per PSC's comments.*
- lines 696<sup>8</sup> - 6970: Verb tense change, and Removal of plate\_out probe added per conversation with J. Johns, D. Goss, and and J. Levitt.

SECTION 3.10.4

- lines 6988 - 6990: (original)  
Verb tense changed.
- lines 6992 - 6993: (original and modified)  
Verb tense changed.
- lines 6996 - 6997: Verb tense change.
- lines 7002 - 7004: Verb tense change.
- line 7007: "Once a year" deleted per GA comments

## Summary of Changes to Rewrite Unit 4 Figures

3.1-2	Modified per GA
3.3-2	Modified per GA
3.3-3	New figure added from (P-79027 Figure 2)
3.3-4	New figure added from (P-79027 Figure 5)
3.4-1 - 3.4-4	Modified per GA
3.4-4	Modified per PSC
3.4-8	Modified per PSC
3.4-10	This was flagged for deletion in first draft Original figure has been restored
3.4-11 - 3.4-14	These figures were added in first draft then deleted per GA
3.5-3	Modified per GA
3.5-4	Modified per GA
3.5-8	Modified per GA
3.5-9	Modified per GA
3.6-1	First draft modified then modification deleted by GA
3.6-2	First draft modified then modification deleted. by GA
3.8-1a	New Figure 3.8-2
3.8-2	New Figure 3.8-3 -- GA's comments here not understood
3.8-3	New Figure 3.8-4 -- latest drawing revision used
3.8-4	New Figure 3.8-5 -- latest drawing revision used
3.8-5	New Figure 3.8-6
3.8-6	New Figure 3.8-7
3.8-7	New Figure 3.8-8 -- modified per GA
3.9-1	Latest drawing revision used
3.9-2	Latest drawing revision used

Summary of Changes to Rewrite Unit 4 Tables

3.1-1	Modified per GA
3.3-1	Modified per GA
3.4-1	Title was changed
3.4-2	Added in first draft then deleted per GA
3.5-1	Modified per GA
3.5-4	Modified per GA
3.5-7	Reference to Figure 3.5-3 corrected to Figure 3.5-4
3.5-29a	New Table 3.5-30
3.5-30	New Table 3.5-31
3.5-31	New Table 3.5-32
3.6-2	Modified per GA
3.6-4	Was added to first draft then deleted by GA
3.7-1	Modified per GA and PSC
3.10-1	This figure was added to first draft then deleted by PSC

END OF DRAFT 1

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REWRITE UNIT 6 SUMMARY OF CHANGES  
SECOND DRAFT

Section 4.1.2

- line 279 "Incorporated" deleted per PSC comments (see p 14 line 281 of first draft)
- line 296 Changed per PSC comments (see note 1 on Summary of Changes to the first draft)

Section 4.1.3

- line 358 Changed per PSC comments (see p 18, line 274 of first draft)

Section 4.1.5

- lines 452-455 Changed per PSC comments (see p 22, line 468 of first draft)
- lines 469-478 Summarized per PSC comments (see p 23, lines 480-500 of first draft)
- lines 495-496 Modified per PSC comments (see p 24, lines 515 and 517 of first draft)

Section 4.1.6

- line 518 Statement regarding removal of steam generators deleted per PSC comments (see p 25, lines 538-539 of first draft)
- Table 4.1-1 Footnote deleted per PSC comments

Section 4.2.1

- line 598 The discussion of tritium sources was deleted and incorporated into Section 11. This is per conversation between D.Goss/PSC and J. Phelps/NPC (see p 29 lines 620-636 of the first draft)

Section 4.2.2.1

- lines 791, 793-797 Modified per PSC comments (see p 38, lines 829,831,832-833 of first draft)
- line 815 Modified per PSC comments (see p 39, line 853 of first draft)
- line 818 Modified per PSC comments (see p 39, line 857 of first draft)
- line 871 Modified per PSC comments (see p 41, line 906 of first draft)

REWRITE UNIT 5 SUMMARY OF CHANGES  
SECOND DRAFT  
(Continued)

Section 4.2.2.3

line 1504 Modified per PSC comments (see comments on Section 4.2.2.3 of first draft)

Section 4.2.2.3.4

line 1599 "emergency water boost pump" changed to "emergency water booster pump"

line 1649 "will" changed to "may" per PSC comments on Section 4.2.2.3

Section 4.2.4.1

line 2083 Reference added per PSC comments (see p 52, line 1144 of first draft)

lines 2224, 2321,  
2347, 2362 and  
2374

"1967 edition" added per PSC comments (see p 58, line 1298 of first draft)

Section 4.2.4.3.1

lines 2690-2694 These lines were modified per PSC's instruction. (see Note 7 of the Summary of Changes that accompanied first draft)  
References 4.2 2901-2904 Footnote changed to Reference.  
Section 4.3.1.1

line 3066 Modified per PSC comments (see p 95, line 2132 of first draft)

Section 4.3.3

lines 3115-3116 Modified per PSC comments (see p 98 of first draft)

Section 4.3.4

line 3148 Modified per PSC comments (see p 99, line 2213 of first draft)

line 3192 "condensate booster pump" changed to "emergency water booster pump"

REWRITE UNIT 5 SUMMARY OF CHANGES  
SECOND DRAFT  
(Continued)

Section 4.3.5.2

line 3300

The remarks regarding "trimming" were deleted (see p 105, lines 2364-2370 of first draft)

line 3379

Sentence deleted per PSC comments (see p 109, line 2448 of first draft)

line 3527

"to 832 psi" deleted per PSC comments (see p 116, line 2597 of first draft)

Section 4.5

lines 3573-3577

Modified per PSC comments (see p 118, line 2644-2645 of first draft)

PSC Review  
FSAR Rewrite Unit 6  
Draft A (10-28-81)

Page 13

- o Line 25 - Add the term "by the means of the post tension method" after the word "prestressed".  
*Done - page 17, Line 880*

Page 15

- o Lines 147, 148, 149 - Correct the wording to conform to the original text.  
*Done - page 20, Lines 805-807*

Page 19

- o Line 30 - Replace "250<sup>0</sup>" with "265<sup>0</sup>".  
*Done - page 22, Line 894*
- o Item 8, Line 49 - The RCD's must be added to the list.  
*Done - page 23, Line 933*

Page 34

- o Line 59 - Reference #22 is not listed on page 100.  
*Done - Page 80, Lines 3510-3511*

Page 40

- o Line 11 - Should "150<sup>0</sup>" be "200<sup>0</sup>"?  
*No - 150<sup>0</sup>F (DC-11-1)*

Page 44

- o Line 73 - Revise the sentence to read ". . . purified helium at a pressure approximately 10 psig above primary coolant pressure".  
*Done - page 42, Lines 1729-1730*

Page 46

- o Line 33 - Figure 5.5-1 does not appear to be an appropriate reference (perhaps E25-1).  
*Done - page 43, Line 1770*

Page 46

- o Lines 45 thru 60 - Convert items numbered (1-7) from numeric to alpha characters.  
*Done - page 43, Lines 1782-1797*

Page 47

- o Line 116 - Add a hyphen between "compression" and "strut".  
*Deleted due to redundancy with Section 5.5.3.2*
- o Line 117 - correctly spell "poisson".  
*Deleted due to redundancy with Section 5.5.3.2*

Page 54

- o Line 20 - Change "would be" to "is".  
*Done - page 47, line 1996*

Page 82-90

- o Section 5.3.4 - Earthquake terminology is inconsistent throughout this section. Correct the terminology where appropriate, utilizing the terms "OBE" and "DBE". See examples for page 83.  
*Done - page 70, lines 3077-3078; page 71, lines 3112, 3120*

Page 83 --

- o Line 10 - Replace "design earthquake" to "OBE".  
*Done - page 71, line 3112*
- o Line 18 - Replace "maximum earthquake" to "DBE".  
*Done - page 71, line 3120*
- o Line 19 - Replace ".067" with "0.066".  
*Done - page 71, line 3120*

Page 84

- o Line 41 - The wording is apparently incorrect. It probably should be ". . . here the minimum margin of safety is . . ." Please verify.  
*This section deleted, as it is covered in section 14*

Page 85

- o Line 76 - Delete the word "graphite".  
*This section deleted, as it is covered in Section 14*
- o Line 78 - Replace "graphite" with "blocks".  
*This section deleted as it is covered in Section 14*
- Line 93 - Correct the spelling of "barrel".  
*This section deleted as it is covered in Section 14*

Page 87

- o Line ~~40~~<sup>216</sup> - Replace "around" with "~~appropriate~~ <sup>approximately</sup>".  
*This section deleted, as it is covered in Section 14*
- o Line 214 - Replace "around" with "~~appropriate~~ <sup>approximately</sup>".  
*This section deleted as it is covered in Section 14*

- o Line 221 - Delete "Nevertheless" and begin the sentence as follows:  
"An analysis. . .".  
*This section deleted as it is covered in Section 14*
- o Line 261 - Replace "undoubtedly" with "probably".  
*This section deleted as it is covered in Section 14*
- o Line 269 - Replace "0.067 g" with "0.066 g".  
*This section deleted as it is covered in Section 14*

Page 89

- o Line 325 - Add ~~the~~ "(SSE and LOFC)" after the word "accident".  
*This section deleted as it is covered in Section 14*
- o Line 325 - Delete "even".  
*This section deleted as it is covered in Section 14*
- o Line 326 - Delete "due to indications of the two loop trouble".  
*This section deleted as it is covered in Section 14*
- o Line 330 (1st) - Delete "(4 to 5 hours)".  
*This section deleted as it is covered in Section 14*
- o Line 330 (2nd) - Begin the sentence as follows: "Under these conditions, the PCRV is dep. . .".  
*This section deleted as it is covered in Section 14*
- o Line 333 thru 339 - These statements are awkward. Rewrite for clarification.  
*This section deleted as it is covered in Section 14*

Page 102, Figure 5.3.2

- o Revise as shown in Att. 1.  
*Done*

Page 138

- o Line 32 - Replace "line" with "lines."  
*Changed "lines" to "liner", page 106, line 4765*

Page 139

- o Line 11 - Replace "reduce" with "decrease".  
*Done - page 106, line 4776*
- o Line 15 - Replace "will not be" with "is not".  
*Done - page 106, line 4781*

Page 140

- o Line 107 - Delete the last sentence.  
*Done - page 108, after line 4872*

Page 146

- o Lines 8 thru 14 - Modify the tone of the discussion on malfunctioning gages to a more positive tone.  
*Done - page 112, lines 4990 -4996*
- o Line 23 - Add the word "half" after "about".  
*Done - page 112, line 5005*

Page 172

- o Line 31 - Add "does" after "dioxide".  
Done - page 125, Line 5562

Page 179, Figure 5.5-1

- o Title Line - Replace "Increased" ~~with~~ "Increase".  
Done

Page 187

- o Line 8 - Replace "170" with "169".  
Done - page 135, Line 5990

Page 193

- o Line 30 - Verify "0.82%".  
Done - page 140, Line 6345

Page 196

- o Line 104 - Capitalize ~~"This"~~ <sup>"Tjus"</sup>.  
Done - page 143, Line 6354

Page 213

- o Line 239 - This paragraph is too specific and committal. Rewrite as appropriate. *This paragraph was deleted as it is contained in Section 5.9.2.4. However, the paragraph was maintained in Section 5.9.2.4, as it*
- o Line 252 - End the sentence after "300°F". *is a commitment from the original text.*  
*This paragraph was deleted, as it is contained in Section 5.9.2.5.*

Page 239

- o Line 12 - Replace "has been" with "is".  
Done - page 163, Line 7323

Page 249

- o Line 112 - This doesn't appear to be the proper location for line 4r corrosion inspection results. Relocate as appropriate.  
Done - page 299, Line 13867

Page 256

- o Line 10 - Delete the first sentence.  
Done - page 175, Line 7949
- o Lines 58 thru 87 - This appears to be too much detail concerning instrumentation in this section. Consider putting this material in Chapter 7.  
Done - page 176, after line 7993 (Section omitted)

Page 282

- o Additional details are forthcoming.  
*No changes made; pages 179-180. Lines 8105-8182. Request that PSC verify that no changes are needed to this section.*

Page 312

- o Line 59 - Change "will be" to "have been".  
*Done - page 210, Line 9687*
- o Additional details are forthcoming.  
*No additional changes made. Request that PSC verify that no further changes are needed to this section.*

Page 383, 384, 385

- o Add title to table e.g. "Wall <sup>Panel</sup> ~~Panel~~ Location".  
*Done - Tables 5.10-3, 5.10-4, 5.10-5*
- o Place figure numbers at bottom of sheet.  
*These sheets are tables; therefore, no figure numbers were added.*

Page 386

- o Line 33 - Indicate where DC-1-1 can be located.  
*Done - page 231, Line 10666*

Page 433

- o Line 47 - Correctly spell "cavity".  
*Done - page 287, Line 12279*

Page 434

- o Line 46 - Delete "PCRV".  
*Done - page 268, Line 12327*

Page 435

- o Additional details are forthcoming.  
*See follow-on comments, pages 12-14.*

Page 442

- o Line 162 - Delete "of the FSAR".  
*Done - page 275, Line 12678*
- o Line 180 thru end of Subsection - Modify the tense to indicate that tests are complete.  
*Done - pages 275-276, Lines 12699-12746*

Pages 457 thru 461

- o *Done - pages 282-288, Lines 13037-13316*  
Clarify paragraph numbering.

Page 466

- o Line 66 - Replace "are" with "were".  
Done - page 292, line 13501

Page 461

- o Line 284 - Add "of operation" after "years".  
Done - page 288, line 13323
- o Line \*\* (By NPC) - what does this statement apply to?  
(Phase 3)

Page 473

- o Line 32 - Delete "PCRV".  
Done - page 297, line 13766

Page 474

- o Line 66 - Replace "transduced into" with "transducers are utilized in the".  
Done - page 299, line 13847

SECTION 5, DRAFT 1

Page 435

- o Line 9 - Change "50%" to "65%" to be consistent with Section 5.9.2.8.  
*Done - page 268, Line 12348*
- o Line 16 - Delete the sentence "exceptions are described in Section 5.9.2.8".  
*Done page 268, Line:12353*

Page 436

- o Add the following between lines 74 and 77 "during the initial rise to power program, seven localized areas were identified where the above criteria was not being satisfied. These "hot spots" are discussed in detail in Section 5.9.2.8.  
*Done - pages 269-270, Lines 12412-12414*

END OF DRAFT 1

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CHANGES TO FINAL DRAFT SECTION 5

Section 5.3.1.10

after line 1815

Deleted the design performance, as it is covered in Section 5.5.3.2.

Section 5.3.4.3.

after line 3131

Deleted this section, as it is covered in Section 14.

line 3137

Renumbered former Section 5.3.4.4. to Section 5.3.4.3.

Section 5.7.2

lines 6778-6779

Referred to Sections 5.9.2.4. and 5.9.2.5. for discussion of temperature control of the concrete interface with the PCRV cavity liner, and deleted redundant portions of the section.

after line 6797

Section 5.8.2.3.

line 7411

Referred to Section 5.13.2.3. for the results of PCRV leak test.

Section 5.9.2.2.

after line 8312

Incorporated NRC Q&A 3.1.

line 8313

"Hastelloy X" added per Q&A 3.1.

line 8315

Change reference per Q&A 3.1.

between lines  
8357-8360

Incorporated NRC Q&A 3.1.

line 8365

Reference to new figure 5.9-7 (from Q&A 3.1.) added.

Section 5.9.2.4.

lines 8852-8890

Incorporate description of core support floor cooling tube leaks. This description had previously been submitted in draft Section 3.3.2.1.

Section 5.8.2.5.9.

line 8052

Referred to borated graphite plug in top head penetration (Figure 5.8-8)

Section 5.9.2.8.3.

line 9725

Changed expected temperature rise from 21<sup>o</sup>F to 25<sup>o</sup>F (GA comments on Section 5)

Section 5.9.2.8.4.

line 9820

Changed water temperature rise to 47<sup>o</sup> to agree with Tables 5.9-1 and 5.9-2.

Section 5.12.4

line 12280

"linear" changed to "essentially linear"

Section 5.12.6.

lines 12367-12368

Reworded description of individual cooling tube temperature rise monitoring. (GA comments on Section 5).

line 12448

Deleted reference to one-day time limit to restore flow to cooling tubes (GA Comments on Section 5).

Section 5.13.1.1.

lines 12749-12758

Modified details of the pressure test (GA comments on Section 5).

Section 5.13.2.1.

line 12838

Referred to Section 5.13.2.3. for a summary of the PCRV leak test.

Section 5.13.2.3.

line 12998

Renumbered this section from Section 5.13.2.2.4.

Section 5.13.3.

lines 13119-13126

Incorporated results of the Hot Functional Test.

after line 13172

Deleted statement that individual cooling tube temperatures will match subheader temperatures within 1<sup>o</sup>F (GA comments on Section 5).

lines 13189-13198

Incorporated results from Hot Functional Test.

after line 13206

This sentence was deleted as it no longer applies.

lines 13239-13240

The wording was changed due to the fact that 100% power was not reached during the Hot Functional Tests.

lines 13267-13269 This sentence was modified to reflect the fact that analysis of the 100% power data had not been completed as of the effective date of the FSAR revision.

lines 13319-13334 *These lines were deleted and page 288-A added per PSC comments.*

Section 5.13.4.3.

line 13535 Deleted "12%", as the actual gage loss figures are reflected in Table 5.13-2.

Section 5.13.5

line 13858 Deleted requirement to inspect the specimen each time the shield plug is removed (PORC #442, 12/7/81).

lines 13862-13863 Referred to borated graphite plug in top head penetration (Figure 5.8-8).

lines 13866-13868 Incorporated results of SR 5.2.14.

Section 5.13.7.

line 13932 Changed testing intervals to 5 EFPY (SR 5.2.5).

Section 5.13.8

lines 14055-14056 Incorporated results of SR 5.2.2.

Criterion 44

line 3784 Modified per PSC comments (see p 123, line 2853 of first draft)

line 3798 Modified per PSC comments (see p 123, line 2868 of first draft)

Criterion 45

line 3846 References resolved (see p 131, line 2916 of first draft)

Criterion 46

lines 3898 &  
3904 Modified per PSC comments (see p 134, lines 2968 and 2974 of first draft)

lines 3910-3911 Modified per PSC comments (see p 135, lines 2981-2982 of first draft)

Criterion 48

line 4034 Replaced "including" with "and" per PSC comment (see p 141, line 3104 of first draft)

# DRAFT 1

## REWRITE UNIT 7 SUMMARY OF CHANGES

### FSAR SECTION 6

#### TABLE OF CONTENTS

lines 11 - 93: Added new Section 6.1 and adjusted all subsection numbering accordingly.

#### LIST OF TABLES

line 104: Added Table 6.1-1  
line 106: Adjusted Table numbers

#### LIST OF FIGURES

lines 116-190: Adjusted all Figure numbers  
line 120: Added Figure 6.2-3  
line 150: Added Figure 6.8-4

#### SECTION 6.0

lines 164-250: Added all new section to include definition of "Engineered Safeguards" and to incorporate Question and Answer 7.7.  
Table 6.1-1: Incorporated Table 7.1-1 from Question and Answer 7.7.  
lines 261-289: Reworded and reorganized the three (3) paragraphs of old subsection 6.1.1 to add clarity.  
line 306: Adjusted Section and Table numbers  
line 311: Adjusted Section numbers  
line 320: Adjusted Figure numbers  
line 359: Changed tense to "would be"  
line 400: Adjusted Figure number  
line 452: Adjusted Figure number  
line 464: Changed "Counting Room" to "former Radio-Chem. Lab"  
line 470: Changed "Counting Room" to "former Radio-Chem. Lab"  
line 536: Adjusted Table number  
line 566: Deleted "will" after "filters"  
line 568: Deleted "will" after "filters"

SECTION 6.0 (Cont.)

- line 569: Deleted "recent" after "iodine"
- line 570: Added "the" before "efficiency"
- line 574: Changed "will be" to "are"
- line 575: Changed "to be sure" to "to ensure that"
- line 576: Changed "has been" to "is"
- line 577: Changed "would be" to "is"
- line 625: Changed "Each" to "The"
- line 640-769: Updated Section 6.2.3.2.3 substantially to incorporate Tech. Spec requirements, and details from Questions 6.9, and 6.11, and pre-p letter 750122 and PSC CN-384.
- line 811-815: Added reference to ventilation exhaust monitors
- line 823: \ Adjusted Section number
- line 849: Added reference to Section 11.1.3.3. to incorporate Question and Answer 6.10
- line 886: Adjusted Figure number
- line 896: Adjusted Figure number
- line 900: Adjusted Figure number
- line 923: Adjusted Figure number
- line 974: Adjusted Figure number
- line 980: Adjusted Figure number
- line 1008: Adjusted Figure number
- lines 1224-1230: Added sentence describing the components of the steam/water dump system.
- line 1256: Added "(parts per million by volume)"
- line 1314: Relocated footnote to the location
- line 1442: Deleted "will" after "system"
- line 1446: Deleted "to" after "loop"

SECTION 6.0 (Cont.)

- line 1487: Deleted "contemplated" after "design"
- line 1489: Deleted "Thus there is little doubt..."
- lines 1496-1515: Added additional details from Question & Answer
- line 1518: Replaced "might" with "are"
- line 1523: Replaced "will be" with "is"
- line 1528: Replaced "will be" with "are"
- line 1534: Replaced "will" with "is"
- line 1537: Replaced "will be" with "is"
- line 1554: Replaced "was" with "were"
- line 1637: Replaced "will be" with "is"
- line 1695: Added "By reheat pipe restraints" after "provided"

SECTION 6.8

- General: Deleted the entire section concerning the reserve shutdown system.
- lines 1748-1750: Added sentence describing the components of the PCRV Safety Valve System.
- line 1779: Adjusted Figure number
- line 1799: Moved footnote to the end of the sentence
- line 1846: Replaced "will be" with "is"
- line 1941: Replaced "will" with "would"
- line 1957: Deleted "will"
- line 1960: Replaced "would be" with "is"
- line 1963: Replaced "will be" with "are"
- line 1966: Replaced "GGA" with "GA"
- line 1967: Replaced "were" with "is"
- line 2001: Replaced "will be" with "is"
- line 2003: Replaced "will be" with "is"

SECTION 6.3 (Cont.)

line 2016: Changed sentence tense  
line 2018: Changed sentence tense  
line 2022: Deleted "will"  
line 2023: Replaced "will be" with "is"  
line 2025: Replaced "will be" with "is"  
line 2025: Replaced "will be" with "is"  
line 2028: Replaced "will be" with "are"  
line 2031: Replaced "will be" with "are"  
line 2063: Clarified "MCA"  
line 2083: Adjusted Section number  
line 2093: Adjusted Section number  
line 2113: Adjusted Section number  
line 2185: Replaced "will be" with "is"  
line 2190: Replaced "were" with "are"  
line 2200: Replaced "will be" with "is"  
line 2221: Replaced "will be" with "is"  
line 2222: Deleted "will" after "which"  
line 2277: Adjusted Section number  
line 2230: Replaced "will be" with "is"  
line 2240: Adjusted Section number  
line 2254: Adjusted Section number  
line 2257: Deleted discussion on Reserve Shutdown System  
line 2370: Deleted "will" after "steel, and"  
line 2343: Adjusted Section number  
lines 2429-2435: Adjusted Section number  
line 2501: Added clarifying phrase "to the atmosphere through the pilot operated relief valve"

SECTION 6.3 (Cont.)

line 2516: Deleted comma  
line 2544: Adjusted Section number  
lines 2542-2556: Adjusted Section number  
line 2588: Replaced "will be" with "is"  
line 2696: Replaced "will be" with "are"  
line 2694: Deleted "will" after "devices"  
line 2749: Deleted "of the PSAR" after "Section 6"  
line 2754: Adjusted Section number  
line 2762: Added punctuation  
line 2765: Added punctuation  
line 2899: Added punctuation  
line 2916: Adjusted wording arrgt.  
line 2926: Replaced "will be" with "are"  
line 2928: Replaced "will be" with "is"  
line 2952: Adjusted wording arrgt.  
line 2976: Adjusted Section number  
line 2998: Adjusted Section number  
line 3030: Adjusted Section number  
line 3050: Adjusted Section number

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END OF DRAFT 1

REWRITE UNIT 7 SUMMARY OF CHANGES

SECTION 6

SECTION 6.1.1

- Line 237: Added date of IEEE-279.
- Line 248: Changed sentence to indicate that time required for the test "is minimal" rather than "only a few seconds" per PSC comments.
- Line 250: Added date of IEEE-279.
- Lines 273, : Rearranged the sentences in this paragraph per  
276-279 PSC comments.
- Lines 291-292: Changed verb tense.

SECTION 6.2.2

- Line 321: Changed "Above" to "About" per PSC comments.

SECTION 6.2.3.2

- Line 461: Changed "38,000" to "32,000" per PSC comments.

SECTION 6.2.3.2.1

- Line 531: Deleted "at all times" from the end of the sentence per PSC comments.
- Line 532: Deleted "central" before "control room" per PSC comments.

SECTION 6.2.3.2.2

- Line 552: Changed "activity" to "radioactivity" per PSC comments.
- Line 580: Changed "assumed for this report" to "concluded" per PSC comments.

SECTION 6.2.3.2.4

- Line 790: Changed "always" to "continually" per PSC comments.

SECTION 6.2.3.4

Lines 828-841: Rewrote this paragraph per PSC comments.  
Line 846: Deleted hyphens in "2 of 3" per PSC comments.  
Line 849: Reflected nitrogen supply per PSC comments.

SECTION 6.2.4.1

Line 905: Changed punctuation per PSC comments.  
Lines 934-936: Incorporated footnote.

SECTION 6.2.4.3

Line 1032: Deleted "AEC" as it is not necessary and causes confusion

SECTION 6.3

Line 1178: Added "for a short time" per PSC comments. -  
Line 1192: Changed "whenever" to "If" per PSC comments.  
Line 1194: Reflected the backup auxiliary boiler per PSC comments; changed "is" to "may be" per PSC comments.  
Line 1202: Changed "standby generator" to "standby diesel generator sets" per PSC comments.

SECTION 6.4.1

Lines 1234-1236: Changed "main steam stop check valve" to "superheater outlet stop check valve and controls" per PSC comments.  
Line 1253: Changed "valve" to "valves" per PSC comments.  
Lines 1266-1269: Rewrote these sentences per PSC comments.

SECTION 6.4.2

Lines 1393-1394: Changed verb tense.  
Line 1399: Changed "proves" to "indicates" per PSC comments.  
Line 1410: Changed verb tense.

SECTION 6.4.2 (Continued)

Lines 1420-1421: Reworded this sentence per PSC comments.

Line 1427: Changed verb tense.

SECTION 6.4.4

Line 1500: Changed "main steam stop check valve" to "superheater outlet stop check valves and controls" per PSC comments.

Line 1501: Added "and testing provisions" to consolidate this sentence with another that followed. Deleted reference to the PSAR. Deleted the sentence indicating that the emergency feed-water block valves are always closed during operation at power per PSC comments.

Line 1511: Added the appropriate section number.

SECTION 6.8.1

Line 1797: Added the date for the ASME code.

SECTION 6.8.2

Lines 1839-1840: Changed "at 710 psia" to "above primary coolant pressure" per PSC comments. Deleted "all" after "as" per PSC comments.

Line 1848: Added "coolant" per PSC comments.

Lines 1854-1856: Added the date for the ASME code.

Lines 1862-1866: Added dates for the referenced codes.

SECTION 6.8.2.1

Line 1884: Corrected reference to Technical Specification 4.2.7 .

Line 1885: Changed "50" to "100" per PSC comments.

SECTION 6.8.2.3

Line 1925: Added the date for the ASME code.

FSAR SECTION 7 SUMMARY OF CHANGES - DRAFT 1

Section VII

lines 313-316 Incorporated footnote.

Section 7.1

line 325 Added "certain" per PSC comments.

line 334 Included reference to loop scram and circulator trip per PSC comments.

Section 7.1.1.

line 361 Deleted asterisk for footnote.

lines 399-400 Incorporated footnote.

Section 7.1.1.1.

line 429 Deleted reference to higher than normal helium volume flow per PSC comments.

Section 7.1.1.2.

line 482 Added date for IEEE-279 per PSC comments.

line 654-657 Changed verb tense.

line 660 Corrected the reference, formerly to Appendix A.1.9.

lines 713-716 Rearranged sentence order and replaced "pull in" with "actuate" per PSC comments.

line 735 Deleted the sentence referring to removal of an input model per PSC comments.

lines 757-824 Incorporated the answer to NRC Question 7.9.

Section 7.1.1.4

line 975-977 Added "for instance" and modified punctuation per PSC comments.

line 986 Deleted the sentence referring to qualification for most severe environment per PSC comments.

Section 7.1.2.1

line 1135 Deleted sentence concerning pulse received light per PSC comments.

line 1170 Deleted asterisk for footnote

lines 1189-1193 Incorporated footnote

Section 7.1.2.3.

lines 1305-1306 Reworded sentence per PSC comments

line 1418 Added "most" per PSC comments

Section 7.1.2.4

line 1502 Deleted asterisk for footnote

Section 7.1.2.5.

lines 1546,1549-1550 Modified text to indicate attempt to dump proper loop per PSC comments.

line 1559 Added "high enough" per PSC comments.

line 1573 Changed "0.5 second" to "short" per PSC comments

line 1586 Changed "either" to "the opposite" per PSC comments

lines 1596-1598 Modified text to indicate attempt to dump proper loop per PSC comments.

line 1627 Added parenthetical statement per PSC comments

line 1628 Deleted sentence referring to placing a channel on test.

Section 7.1.2.6

line 1672 Added "on loss of ...." per PSC comments

line 1705 Added item 4 per PSC comments

line 1708 Renumbered former item 4 to item 5.

lines 1711-1719 Added loop shutdown actions per PSC comments

line 1732 Deleted sentence regarding overspeed trip per PSC comments

line 1822 Deleted "also" per PSC comments

Section 7.1.2.8

line 1903 Changed "thus" to "bypassing" per PSC comment

lines 1963-1964 Modified wording to indicate that bistable may be manually reset per PSC comments.

Section 7.1.2.9

lines 1965-1988 Added "Instrumentation" per PSC comments and reference to the pipe rupture detection system as it was an added section.

Section 7.1.2.10

line 2050 Deleted paragraph on identification of protective system components and wiring per PSC comments.

Section 7.1.3.2.

lines 2148-2150 Changed verb tense.

Section 7.1.4.1.

line 2233 Added items 2 & 3 per PSC comments.

line 2236 Added item f per PSC comment.

line 2270 Corrected reference to Table, formerly 7.1-8.

line 2278 Added "(1968 edition)" per PSC comments.

Section 7.1.4.2.2.

lines 2313-2314 Deleted "FSAR".

line 2317 Changed "always" to "normally" per PSC comments.

lines 2328, 2333 Deleted "FSAR"

line 2338 Changed "to" to "for"

line 2342 Added "1978" per PSC comments.

Section 7.1.4.2.3

line 2351 Deleted "of the FSAR".

Table 7.1-1

Footnote e Added footnote per PSC comments.

Table 7.1-2

Third page Added "(continued)" for clarity.

Table 7.1-3

Item 3 Added "(Wide range)" per PSC comments.  
Item 6 Changed location to Reactor Building per PSC comments.  
Item 8 Deleted parenthetical statement per PSC comments.  
Item 11 Corrected bus designations; added "on both buses" per PSC comments.

Table 7.1-4

General Reworked Table per PSC comments.

Table 7.1-5

Item 4 Changed "psi" to "psid" per PSC comments.  
Item 5 Changed Value to "+30" H<sub>2</sub>O".  
Item 6 Changed Trip level to 810 psig.  
Item 7 Changed "psi" to "psid", and changed trip level to 5 psid per PSC comments.

Table 7.1-8

General Deleted table as it is included in Section 6.

Figure 7.1-7

Note 3 Changed ".5 seconds" to "short delay", and "2" to "two" per PSC comments.  
Title Modified title per PSC comments

Figure 7.1-9

Upper left Changed "PE" to "FE" per PSC comments.

Figure 7.1-10

Upper left Modified per PSC comments  
Lower left Changed setpoints per PSC comments.

Figure 7.1-11

Lower right Deleted parenthetical statement per PSC comments.

Figure 7.1-13

General Added footnote per PSC comments.

Figure 7.1-15

Upper central Deleted "7640" per PSC comments

Section 7.2.1.2

line 2439 Changed verb tense.

Section 7.2.1.3

line 2679 Change "maintaining" to "set for" per PSC comments.

line 2730 Deleted "case" per PSC comments.

Section 7.2.2.2

line 2896 Changed "in the power range" to "at power" per PSC comments.

Section 7.2.2.3

lines 2946-2948 Reworded sentence per PSC comments.

line 2952 Deleted reference to the recorder per PSC comments.

Figure 7.2-1

General Changed setpoints per PSC comments.

Figure 7.2-3

General Modified main stream pressure line per PSC comments.

Section 7.3

line 3116 Deleted "all-welded" per PSC comments.

Section 7.3.1

General Nuclear Detector Decalibration information will be incorporated when it is received from PSC.

line 3133 Changed "dull" to "dual" per PSC comments.

line 3143 Added "power" per PSC comments.

line 3162 Changed verb tense.

Section 7.3.1.1

line 3228 Changed "cps" to lower case letters.

lines 3389-3390 Replaced percentages with "hi-level" per PSC comments.

lines 3402-3412 Reworded sentences to reflect the third neutron source (CN-1411).

line 3416 Deleted sentence concerning final detector location per PSC comments.

line 3417 Deleted sentence concerning temporary movable sources per PSC comments.

Section 7.3.2.1

lines 3500,3503,  
3527 Changed trip points per PSC comments.

Section 7.3.2.2

line 3656 Corrected spelling of "in".

Section 7.3.2.3

line 3599 Changed "power level" to "temperature" per PSC comments.

lines 3658-3659 Deleted reference to a remote temperature recorder per PSC comments.

lines 3686,3697  
3698 Changed trip point per PSC comments.

line 3706 Deleted reference to storage flasks per PSC comments.

lines 3710-3711 Changed dewpoints per PSC comments.

Section 7.3.2.5

line 3853 Reworded sentence per PSC comments.

line 3886 Deleted "to the FSAR".

Section 7.3.3.1

lines 3925,3937 Referred to thermocouples rather than thermometers per PSC comments.

line 3956 Changed spine pressure per PSC comments.

line 3961 Changed "Thermometer" to "Thermocouple" per PSC comments.

line 3967 Corrected reference to Appendix A.

line 3970 Deleted "Thermometer" per PSC comments.

lines 3991,3999 Referred to thermocouples rather than thermometers per PSC comments.

Section 7.3.3.2.2

line 4065 Corrected reference to figure 7.3-16.

line 4067 Added hyphen in "PE-1108".

line 4083 Added hyphen to valve numbers.

line 4101 Added "a".

Section 7.3.4

line 4197 Made "chromatograph" singular per PSC comments.

line 4212 Added "gas waste" per PSC comments.

line 4311 Corrected reference to Section 11.

Section 7.3.5.2

line 4596 Changed "ke V" to "KeV".

lines 4603-4604	Reworded sentence for clarity.
lines 4606-4607	Reworded sentence for clarity.
line 4611	Corrected reference to Figure 7.3-17.
line 4612	Deleted quotes from "representative sample".
line 4616	Changed "pin" to "pen"
line 4626	Added "in" per PSC comments
line 4632	Corrected notation.
line 4644	Corrected notation
line 4654	Corrected notation
line 4672	Corrected notation
line 4688	Deleted "and temperature" per PSC comments
line 4691	Changed "most" to "root" per PSC comments
line 4763	Changed "meaning" to "context" per PSC comments
<u>Section 7.3.5.3.</u>	
line 4782	Corrected spelling of "NIM" per PSC comments
line 4789	Deleted specific reference to buses per PSC comments
<u>Section 7.3.6</u>	
lines 4799-4806, 4815-4819	Incorporated the answer to NRC Question 14.17.
line 4825	Deleted "During shutdown for refueling" and replaced "are" with "can be".
lines 4827-4831, 4837-4852	Incorporated the answer to NRC Question 14.17.
<u>Section 7.3.7</u>	
line 4896	Added "the"
<u>Section 7.3.10</u>	
lines 4980-5066	Incorporated the answer the NRC Question 7.13.
<u>References for Section 7.3</u>	
lines 5070-5074	Added reference from Section 7.3.6. (Q&A 14.17)
<u>Table 7.3-2</u>	
General	Revised Table per PSC comments

Figure 7.3-2

General Added third startup source (CN-1411).

Figure 7.3-3

General Changed setpoints per PSC comments.

Section 7.4.1

line 5101 Corrected spelling of "breathing".

line 5175 Corrected spelling of "480".

lines 5186-5188 Added "Auxiliary Electrical" per PSC comments.

line 5190 Added "480 v Switchgear Room" per PSC comments.

line 5203 Changed "operating conditions" to "operations" per PSC comments.

Section 7.4.2

General Technical Support Center information will be incorporated when it is received from PSC.

line 5288 Added reference to the backup auxiliary boiler per PSC comments.

Figure 7.4-1

General It is our understanding that this figure is being updated by PSC. The figure will be corrected when an updated version is received.

Criterion 15

line 5647 Deleted "FSAR".

NPC CHANGES TO FSAR SECTION 7

Section 7.3.4

- lines 4180-4183      Moisture measurement is listed as a measurement capability for penetrations B1 and B6 in the primary coolant system. (CN-226)
- lines 4215-4218      The 4-inch drop tube to allow gas samples to be sent to the radiochemical laboratory is mentioned. (CN-1289)
- lines 4220-4226      The gas chromatographs are briefly described. (CN-1117)
- lines 4234-4235      The helium circulator seals are mentioned as a potential source of moisture leakage into the primary coolant.
- lines 4236-4239      These sentences are modified to indicate that the primary coolant is continuously monitored for moisture. (CN-226)
- lines 4254-4261      The addition of the depressurizing box is documented. (CN-226)

Section 7.3.5.2

- lines 4463-4464      The wording is changed to reflect the addition of a second iodine monitor. (CN-810)
- lines 4465-4467      The Ping-1 monitor is listed as a backup to the particulate and iodine monitors. (CN-447)
- lines 4555-4573      A description of the second Beta Particulate and Iodine Monitor is added. (CN-810)
- lines 4575-4648      A description of the PING-1 Monitor is added (CN-447)
- lines 4655-4674      The description of meteorological instrumentation is updated. (CN-1326)
- line 4743            The wording is modified for applicability.

Section 7.3.5.3

lines 4748-4765

The information from the answer to NRC Question 7.12 is incorporated into this section. The description of cable routing is updated to reflect the new criteria. (FCN-GA-3070)

Section 7.3.9

lines 4888-4920

This section was added to describe seismic instrumentation from the answer to NRC Question 5.10.

Figure 7.3-15

This figure is updated by CN-315.

Figure 7.3-16

This figure is updated by CN-315.

Figures 7.3-17,  
7.3-18

These figures are added to illustrate the PING-1 Monitor. (CN-447)

Section 7.4

line 4924

The listing and description of the criterion are incorporated into Appendix C and deleted from this section.

Section 7.4.1

lines 4932-4948

It is requested that PSC carefully review this paragraph for accuracy based on ventilation system and fire protection system changes.

lines 4946-4947

The wording is changed to reflect the use of the air breathing system.

lines 4951-4964

The answer to NRC Question 7.14 is incorporated.

lines 4966-4969

The operating environment of the control room is discussed from the answer to NRC Question 7.5

lines 4971-4972

Reference is made to Section 9.8.3 for details of the fire protection provisions.

lines 4989-5032

The answer to NRC Question 7.5 is incorporated into this section as modified by FGLP-1779.

lines 5036-5044

The description of the data logging system is updated based upon our current knowledge. It is requested that PSC carefully review this paragraph to confirm its accuracy.

lines 5044-5045

The answer to NRC Question 7.10 is incorporated.

Section 7.4.2

- lines 5069-5071 It is requested that PSC verify that this statement is accurate with regard to current emergency procedures.
- lines 5077-5094 Some modifications have been made to the I-49 panel. These modifications are not reflected here. This section will be revised when information is received from PSC.
- lines 5109-5144 It is requested that PSC review these paragraphs to ensure that they conform with current equipment capability and practices at Fort St. Vrain.

Section 7.4.3

- lines 5151-5153 The wording is changed to reflect the addition of the PPS bus.—(Section 8)
- line 5164 The last sentence in the original section 7.4.3 is deleted to reflect the addition of the PPS bus. (Section 8)
- Figure 7.4-1 This figure is added from the answer to NRC Question 7.14. This figure will require updating based upon the updated Section 9.8.3.

Summary of Tables

- Table 7.3-2 This table is Table 7.12-1 from the answer to NRC Question 7.12. The table is modified to reflect the addition of the iodine monitor and the PING-1 monitor. (CN-447, CN-810)
- Table 7.4-1 This table is added from FGLP-1779.

Discussion of GA Comments on FSAR Section 7

Comment 1

GA's revised Section 7.8 was deleted because that information was to be incorporated into Section 9.7.3.1, where it currently exists.

Comment 2

GA's revised Section 7.3.5.3 was deleted as it was virtually identical to information which had been incorporated into Section 7.3.5. The title was changed because Section 7.3.5.3 was added to incorporate Q&A 7.12. The change in the title of this particular subsection, however, does not imply a change to the title of the Ping-1 monitor. Figure 7.3-17 therefore does not require a change in title.

Comment 3

GA's Figures 7.3-18 and 7.3-19 were renumbered to Figures 7.3-21 and 9.7-2, respectively.

Comment 4

A generic version of GA's Table 7.1-8 is included in Table 6.1-1.

Comment 5

Efforts will be made to clarify the "approximately equal to" sign in item 4 of Table 7.1-5.

Comment 6

This modification has been made.

Comment 7

The reference to Table 6.1-1 has been verified.

Comment 8

These modifications have been made.

Comment 9

The paragraphs referred to were deleted, as this information had been incorporated into Section 5.8.2.5.9.

Comment 9a

Lines 4064 & 4065 refer to Figure 7.3-21, which was submitted by GA as Figure 7.3-18.

Comment 9b

GA's Figure 7.3-18 was not deleted, but was redesignated as Figure 7.3-21.

Comment 10

Figures 7.1-6 and 7.3-1 were not modified.

Comment 11

A better copy of Figure 7.1-15 will be submitted in the final FSAR.

Comment 12

Figures 7.3-15 and 7.3-16 will be revised to reflect these comments.

Comment 13

See Comment 2.

Comment 14

A better copy of Figure 7.1-14 will be submitted in the final FSAR.

Comment 15

See Comment 2.

DRAFT 1

FSAR SECTION 8 SUMMARY OF CHANGES

Section 8.2.1.1

lines 262, 273, 275,  
276, 279, 286

Added reference to the fifth 230Kv transmission line,  
to the Platte River Power Authority. (P-80373, CN-633)

Section 8.2.1.2

lines 316, 320, 324

Added reference to the fifth 230Kv transmission line,  
to the Platte River Power Authority. (P-80373, CN-633)

line 327

Changed verb tense.

lines 336-531

PSC is currently rewriting this section to conform  
with actual plant history.

*who?  
Platte?*

Section 8.2.2.2

lines 664-667

A statement is added referring to the ACM as a backup  
system for supplying power to the 480v essential  
loads, and reference is made to the subsection on ACM.

line 672

Reference is made to the subsection on cable separation.

Section 8.2.2.3

lines 680-682,  
685-689

The text is modified to reflect the addition of  
non-interruptible instrument power bus 1C. (P-76104)

Section 8.2.2.4

lines 704-706

A brief description of the battery charger on the  
DC tie bus is added. (P-77154)

lines 711-713

A brief description of the PPS battery is added. \_  
(P-76104)

Section 8.2.3

line 751

The text is modified to reflect the additional 230Kv line. (P-80373, CN-633)

lines 769-770

Reference is made to the appropriate subsection describing the diesel.

lines 781-784

ACM is mentioned as a backup source of electrical power. References are made to the appropriate subsections describing cable separation and ACM.

Section 8.2.3.3

lines 821-833

Incorporates the answer to NRC Question 8.1.

Section 8.2.3.3.1

lines 839-898

Incorporates the answer to NRC Question 8.1.

lines 900-910

Incorporates the answer to NRC Question 7.5.

lines 913-967

Incorporates the answer to NRC Question 8.1.

Section 8.2.3.3.2

lines 971-1090

Incorporates the answer to NRC Question 8.1.

lines 1092-1102

Incorporates results of NFSC Audit C-80-1.

Section 8.2.3.4

lines 1123-1125,  
1128

Reference is made to the PPS battery and Instrument Bus No. 1C. (P-76104)

Section 8.2.3.5

line 1140

Reference is made to the additional 230Kv transmission line. (P-80373, CN-633)

lines 1146, 1150,  
1152

Former Table 8.2-1 was reworked based upon the revised diesel loading sequences. Tables 8.2-4 through 8.2-7 were provided by PSC to replace former Table 8.2-1 and include the information presented in Tables 8.1-4 and 8.1-5 from the answer to NRC Question 8.1. The text was revised to reflect these modifications.

Section 8.2.3.5 (cont.)

- lines 1212, 1213 This sentence was reworded for clarity.
- lines 1220, 1223,  
1224 The updated table numbers are reflected.
- lines 1229-1265 The answer to NRC Question 8.1 is incorporated. Figures 8.2-17 through 8.2-21, formerly from the answer to NRC Question 8.1, are being revised by PSC.

Section 8.2.4

- line 1271 Identification is made of the GAI-TRONICS system.
- lines 1287-1301 A brief description is made of the communication capability of the plant based upon the Radiological Emergency Response Plans. Also reference is made to the Dimension 400 telephone system.

Section 8.2.5.1

- line 1323 Reference is made to the fifth 230Kv transmission line. (P-80373, CN-633)
- lines 1350-1362 The answer to NRC Question 8.2 is incorporated.
- lines 1380-1385 The fire protection system is briefly mentioned here. (CN-302)

Section 8.2.5.2

- lines 1405-1411 The two-cycle transfer between the Unit Auxiliary Transformer and the Reserve Auxiliary Transformer is described. (CN-511)
- line 1419 Reference is made to the fifth 230 Kv transmission line. (P-80373, CN-633)
- line 1429 The revised table numbers are reflected.
- lines 1492, 1498,  
1499 The wording was modified to reflect the addition of the PPS battery and Instrument Bus No. 1C. (P-76104)
- lines 1504, 1505 The ACM is mentioned as a backup source of power in the event that neither standby generator could start.

Section 8.2.5.2 (cont.)

line 1610

The revised table numbers are reflected.

line 1658

Table 8.2-8, formerly Table 8.2-2, is undergoing revision by PSC.

lines 1662, 1663

Reference is made to the automatic transfer switches used with ACM. (P-77086, CM-447, P-78100)

Section 8.2.7

lines 1665-2122

This section is added to describe essential cable separation. It includes seven subsections and incorporates the answer to NRC Question 74. ~~G-75012, 4/2/75~~

~~P-75012, 4/2/75, P-76046, P-76127, P-76128, 12/8/72, P-76021, P-75024, P-76089, P-76104, P-76132~~

Section 8.2.8

lines 2126-2553

This section is added to describe the ACM. It is divided into five subsections.

References For Section 8.2

lines 2562-2592

References are added pertaining to Section 8.2.

Section 8.3

lines 2617, 2618

Condition number 6 is modified to require operation of the PFS battery charger/inverter. (LCO 4.6.1)

line 2621

For clarity, the type of fuel in underground storage is specified as diesel fuel.

Section 8.4

lines 2644, 2645

Verb tense change.

lines 2659-2670,  
2674, 2675

ACM diesel surveillance tests, standby diesel surveillance tests and quarterly battery tests are included. (SR 5.2.20, SR 5.6.1, SR 5.6.2)

Section 8.4 (cont.)

line 2680

Changed bus designations to reflect current nomenclature.

## Tables

- 8.2-1 Formerly Q&A Table 8.1-3. A note taken from the text of Q&A 8.1 was added to the table.
- 8.2-2 Formerly Q&A Table 8.1-1. Dates of the surveys will be included when they are determined.
- 8.2-3 Formerly Q&A Table 8.1-2.
- 8.2-4 through 8.2-7 These tables were supplied by PSC to replace former Table 8.2-1. These tables include the information provided in Q&A Tables 8.1-4 and 8.1-5.
- 8.2-8 Formerly Table 8.2-2. This table is undergoing revision by PSC.
- 8.2-9 This table lists ACM equipment. The list was taken from P-77086.

## Figures

- 8.2-1 This figure is updated based upon a more recent map.
- 8.2-2 This figure is undergoing revision by PSC.
- 8.2-3 This figure is updated to reflect the addition of the fifth 230Kv line to the Platte River Power Authority. (P-80373, CN-633)
- 8.2-4 This figure or a similar figure may or may not be included in the final version, depending upon the revisions made by PSC to Section 8.2.1.2.
- 8.2-5 Revised by drawing E-1001P.
- 8.2-7 Revised by drawing E-1006H.
- 8.2-9 Revised by drawing E-1007U.
- 8.2-10 Revised by drawing E-1008AA.
- 8.2-11 Revised by drawing E-1009K.
- 8.2-12 Revised by drawing E-1010K.

Figures (cont.)

- 8.2-13 Revised to include Battery Charger 1D, Battery 1C and its battery charger/inverter, and Instrument Bus 1C.
- 8.2-14 Revised by drawing E-1096T.
- 8.2-15 Revised by drawing E-1097X.
- 8.2-16 Revised by drawing E-1098U.
- 8.2-17 Formerly Q&A Figure 8.1-1. This figure is undergoing revision by PSC.
- 8.2-18 Formerly Q&A Figure 8.1-2. This figure is undergoing revision by PSC.
- 8.2-19 Formerly Q&A Figure 8.1-3. This figure is undergoing revision by PSC.
- 8.2-20 Formerly Q&A Figure 8.1-4. This figure is undergoing revision by PSC.
- 8.2-21 Formerly Q&A Figure 8.1-5. This figure is undergoing revision by PSC.
- 8.2-22 Formerly Q&A Figure 7.4-1.
- 8.2-23 Added from P-77086.
- 8.2-24 Added from P-77086.
- 8.2-25 Formerly Figure 8.2-17.
- 8.2-26 Taken from Q&A page 8.1-10. This figure number will be rearranged to follow Figure 8.2-16.

**END OF DRAFT 1**

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DRAFT 2

SECTION 3

SUMMARY OF CHANGES

Section VIII

line 196

Added "normal" per PSC comments.

Section 8.2.1.1

line 269:

Deleted "as projected in 1972".

lines 283-286:

Modified wording to reflect Smokey Hill and Pawnee lines.

line 294:

Changed "connected" to "tied" for consistency.

line 320:

Deleted the opening phrase which indicated that transmission line construction has not been extensive.

line 324:

Added a comma.

Section 8.2.1.2

lines 331-549:

This section may be rewritten by PSC. The revised section will be incorporated if it is received.

lines 339-340:

Modified wording to reflect the Smokey Hill and Pawnee lines.

lines 346:

Deleted "for loss of the largest unit" per PSC comments.

line 368:

Deleted "usually" per PSC comments.

line 478:

Changed "Canon" to "Cañon" per PSC comments.

line 510:

Corrected spelling of "series".

Section 8.2.1.3

line 567:

Changed "conducts" to "connects" per PSC comments.

Section 8.2.2

line 584:

Changed "less than 250 hp" to "250 hp or less".

Section 8.2.2.1

line 601:

Deleted "of full capacity" after "transformer" per PSC comments.

Section 8.2.2.2

line 649:

Modified sentence to correct grammar.

line 686:

Corrected reference to Section 8.2.3.

Section 8.2.2.3

lines 704-705:

Modified wording, per PSC comments, to more accurately reflect the power supplies to the inverters.

Section 8.2.2.4

line 717:

Added "station" per PSC comments.

line 724:

Changed "a separate" to "another" per PSC comments.

lines 731-733:

Modified wording per PSC comments.

Section 8.2.3

line 790:

Corrected reference to Section 8.2.3.3.

line 804:

Corrected reference to Section 8.2.3.

Section 8.2.3.3

line 850:

Deleted, per PSC comments, a sentence indicating that the generators start automatically on loss of the unit, auxiliary transformer power, supply.

Section 8.2.3.3.1

lines 860,866:

Modified wording, for clarity, per PSC comments.

line 880:

Hyphenated "dual-engine".

line 897:

Changed "independent" to "its own" per PSC comments.

lines 940,946:

Changed "rate" to "consumption" per PSC comments.

lines 971-972:

Modified the order of words per PSC comments.

Section 8.2.3.3.2

line 1121:

Added "the test of" per PSC comments.

Section 8.2.3.4

lines 1139,1140:

Added "A.C." per PSC comments.

#### Section 8.2.3.5

- line 1167: Deleted "in" after "B" per PSC comments.
- lines 1234,1242: Changed "auxiliaries" to "equipment" per PSC comments.
- line 1254: Corrected spelling of "designed".
- line 1262: Corrected reference to Figure 8.2-18.
- line 1263: Changed "assumed on" to "loaded onto", and "along each" to "at each point of" per PSC comments.
- line 1265: Corrected reference to Figure 8.2-19.
- line 1267: Added "dotted" per PSC comments.
- lines 1269-1270: Deleted, per PSC comments, a phrase indicating that damage to the plant might occur with the lower load, and modified the wording for sentence cohesiveness as a result of the change.
- line 1272: Corrected reference to Figure 8.2-20.
- line 1273: Changed "assumed on" to "loaded onto" per PSC comments.
- lines 1273-1274: Changed "along each" to "at each point of" per PSC comments.
- line 1275: Corrected references to Tables 8.2-6 and 8.2-7, and Figure 8.2-21.
- line 1276: Corrected reference to Figure 8.2-22.
- line 1279: Changed "Also shown is" to "Table 8.2-21 also shows" per PSC comments.

#### Section 8.2.4

- line 1288: Deleted "the" before "GAI-TRONICS" per PSC comments.
- lines 1308-1309: Modified wording to reflect the Dimension 2000 and the Dimension 400 telephone systems per PSC comments.
- lines 1314-1315: Modified wording to describe the battery powered radios as being "powered by a non-interruptible power source" per PSC comments.

#### Section 8.2.5.1

- line 1369: Corrected spelling of "systems".
- line 1374: Deleted "any" before "direct" per PSC comments.
- line 1376: Deleted "any" before "redundant" per PSC comments.
- line 1378: Rewrote sentence, per PSC comments, to eliminate reference to failure of both redundant actions for any system.
- lines 1387,1392: Changed "cable spreading room" to "auxiliary electric equipment room" per PSC comments.
- line 1397: Changed "special" to backup" per PSC comments.

#### Section 8.2.5.2

- line 1416: Changed "both" to "all" per PSC comments.
- lines 1416-1418: Changed "startup bus" to "auxiliary transformer" per PSC comments.
- line 1418: Deleted "and the circuit breaker to the reserve power supply is closed automatically" per PSC comments.
- lines 1424,1436: Changed "units" to "generators" per PSC comments.
- line 1508: Deleted "60 Hertz" before "synchronous" per PSC comments.
- line 1518: Corrected reference to Section 8.2.8.

#### Section 8.2.6

- line 1576: Corrected reference to Section 8.2.8.

#### Section 8.2.7

- lines 1590-1592: Added "an extensive...8.2.7.7. and" per PSC rewrite.
- line 1593: Ended the sentence after "Section 8.2.8" per PSC rewrite.

#### Section 8.2.7.1

- lines 1597-1713: Replaced this section with PSC's rewritten version.

#### Section 8.2.7.2

- line 1722: Delete "all" before "major" per PSC comments.

Section 8.2.7.2 (Cont'd)

- line 1724: Split sentences per PSC rewrite.
- line 1735: Replaced "thermometers" with "thermocouples" per PSC rewrite.
- lines 1741-1742: Reworded this sentence per PSC rewrite.
- lines 1750-1751: Corrected verb conjugation; added "instruments" per PSC rewrite.
- line 1755: Changed "thermometer" to "thermocouple" per PSC rewrite.
- line 1767: Reworded this sentence per PSC rewrite.
- line 1772: Changed "thermometer" to "thermocouple" per PSC comments.
- lines 1777,1780: Changed "sensors" to "signals" per PSC rewrite.
- lines 1784-1785: Reworded this sentence per PSC rewrite.

Section 8.2.7.3

- lines 1795-1799: Reworded these sentences per PSC rewrite.  
1803
- line 1808: Changed "Insulated Power Cable Engineers Associated (IPCEA)" to "Insulated Cable Engineers Associated (ICEA)" per PSC rewrite.
- lines 1821-1822: Modified this paragraph per PSC rewrite.

Section 8.2.7.4

- line 1828: Added "Tray Fire" per PSC rewrite.
- line 1833: Added "cable tray" per PSC rewrite.
- line 1837: Changed verb tense.
- lines 1844-1850: Modified these sentences per PSC rewrite.

Section 8.2.7.5

- lines 1860,1861: Modified this section per PSC rewrite.  
1863

Section 8.2.7.7

- lines 1944-1948: Modified this section per PSC rewrite.

### Section 8.2.8

line 1960: Added "of providing electric power" per PSC comments.

### Section 8.2.8.1

line 1975: Deleted sentences referring to IACM per PSC comments.

line 1976: Deleted "congested cable areas and" after "from" per PSC comments.

line 1978: Deleted "therefore" after "are" per PSC comments.

line 1988: Replaced "disconnect" with "throw" per PSC comments.

line 1989: Deleted "control system wiring and" after "and" per PSC comments.

line 1991: Deleted "at the affected lighting control panels" from the end of the sentence per PSC comments.

### Section 8.2.8.3

line 2020: Corrected reference to Figure 8.2-24.

line 2021: Deleted "to perform its design functions" from the end of the sentence per PSC comments.

line 2022: Deleted "dedicated" before "diesel" per PSC comments.

line 2040: Added "selected" per PSC comments.

lines 2041-2042: Added these two items per PSC comments.

line 2047: Changed verb tense.

line 2051: Added "electrical" per PSC comments.

line 2053: Corrected reference to Table 8.2-9.

line 2058: Corrected reference to Figure 8.2-25.

line 2089: Deleted "dedicated" after "separate" per PSC comments.

line 2099: Deleted "HEMA 1" per PSC comments.

line 2101: Deleted the description of MCC loads and 480v switchgear per PSC comments.

line 2105: Changed "120v/277v" to "120v or 277v", and changed "and" to "or" per PSC comments.

Section 8.2.3.4

line 2155: Deleted "as follows" from the end of the sentence per PSC comments.

Section 8.2.3.5

line 2310: Deleted paragraphs pertaining to reactor cooling per PSC comments.

References for Section 8.2

lines 2348-2350: Improved format.  
2359,2362,2374

Table 8.2-2

General The dates of the surveys will not be furnished due to the informal nature of these surveys.

Table 8.2-8

General Deleted wattages, lighting cabinets, and exit signs per PSC comments.

Figure 8.2-2

General This figure is to be replaced by an updated version.

Figure 8.2-4

General This figure may be deleted if Section 8.2.1.2 is rewritten by PSC.

Figure 8.2-16

General This figure will be replaced by E-1098U.

Figures 8.2-18 to  
8.2-22

General These figures are to be replaced by updated versions which have been provided by PSC.

Section 8.4

line 2434: Changed "during the plant refueling outages" to "twice per year" per PSC comments.

line 2437: Added "sets" per PSC comments.

lines 2440-2442: Reworded this sentence per PSC comments.

Section 8.4 (Cont'd)

- line 2462: Reworded the sentence to include instrument bus 1C per PSC comments.
- line 2474: Deleted "the" before "Public" per PSC comments.
- line 2486: Deleted "and tap changer" per PSC comments.
- line 2488: Deleted "(and filter if needed)" per PSC comments.
- lines 2501,2503: Deleted "isolated phase" before "bus" per PSC comments.
- line 2554: Deleted "area" before "load"; added "data"; deleted "supervisory control" after "telemetering" per PSC comments.
- line 2557: Deleted "to match other machines on the system" from the end of the line per PSC comments.
- line 2567: Changed "protection" to "protective" per PSC comments.
- line 2569: Corrected punctuation.

# DRAFT 1

## SUMMARY OF CHANGES TO FSAR SECTION 9

### Section 9.1.1.1

- lines 418 - 423      Changed verb tense.
- lines 439 - 441      Incorporated footnote into text.

### Section 9.1.1.2

- lines 490 - 504      Incorporated the answer to NRC Question 9.6.
- lines 507 - 609      Incorporated the answer to NRC Question 9.1.
- lines 633 - 635      Referred to Section 3.8.1.1 for discussion of voltage device to maintain the rods withdrawn during refueling.
- line 638              Changed "locked" to "held", to reflect use of voltage device.
- line 643              Former Figure 9.1-3 is renumbered to Figure 9.1-6.
- line 672              As a result of a review of the refueling procedure, keys or keyways were machined to allow alignment, during refueling. Some reference is made to keys and keyways for alignment in line 1646. It is requested that PSC verify that this discussion is a complete description of the keys and keyways as they exist.
- line 685              Former Figure 9.1-4 is renumbered to Figure 9.1-5.
- lines 713 - 723      Incorporated the answer to NRC Question 9.3.

### Section 9.1.1.2.1

- line 780              Former Figure 9.1-3 is renumbered to Figure 9.1-6.
- lines 798 - 799      Former Figure 9.1-3 is renumbered to Figure 9.1-6.
- line 808              "Gulf General Atomic" changed to "General Atomic".

Section 9.1.1.3

- lines 876 - 877      Changed verb tense.
- lines 880 - 942      Incorporated the answer to NRC Question 9.2.

Section 9.1.1.4

- lines 976, 984-988      Updated requirements based upon current Technical Specifications and meeting with Chuck Fuller and Frank Novachek on 4/6/82.

Section 9.1.1.5

- line 992      Corrected title.
- lines 996 - 997      Deleted opening phrase due to redundancy, changed verb tense.
- lines 1006 - 1008      Added requirement of SR 5.7.1 (b).

Section 9.1.2.2.1

- line 1087      Former Figure 9.1-5 is renumbered to 9.1-7.
- lines 1112, 1127      Former Figure 9.1-6 is renumbered to 9.1-8.
- lines 1129 - 1144      Incorporated the answer to NRC Question 9.6 (2).
- lines 1156 - 1160      Added a brief description of the fuel storage building. (CI-311)

Section 9.1.2.2.2

- lines 1168 - 1170      Deleted statement that the fuel storage well contains helium at 11-12 psia prior to loading or unloading fuel. (Meeting with Chuck Fuller and Frank Novachek, 4/6/82)
- lines 1191 - 1194      Indicated that about one-third of the active fuel from a core can be held in the storage wells. Also added a statement to clarify the use of the central column. (Meeting with Chuck Fuller and Frank Novachek, 4/6/82)

Section 9.1.2.2.3

- line 1243 Reflected the 170 ton rating of the crane. (GLP-4640)
- lines 1208 - 1240 This procedure was completely reworked to reflect actual practice. As a part of this reworking the answer to NRC Question 9.6 (1) was incorporated as well as FCN-SC-729. (Meeting with Chuck Fuller and Frank Novachek, 4/6/82)
- 1251 - 1276
- 1282 & 1283
- 1286

Section 9.1.2.2.4

- lines 1294 - 1312 Reworked this section to reflect actual practice. (Meeting with Chuck Fuller and Frank Novachek, 4/6/82)

Section 9.1.2.4

- lines 1367 - 1368 Changed verb tense.
- lines 1375 - 1376 Modified requirements to conform with Technical Specifications and actual operation. (Meeting with Chuck Fuller and Frank Novachek, 4/6/82)
- 1382, 1387-
- 1393

Section 9.1.2.5

- lines 1401 - 1403 Changed verb tense.

Section 9.1.3

- lines 1407 - 1423 Incorporated the answer to NRC Question 9.6 (3).

Section 9.2.1.1

- lines 1456 - 1461 Reflected upgraded rating of the reactor building crane (GLP-4640; Meeting with Bob Gunnerson, 4/5/82)

Section 9.2.1.2

- lines 1511 - 1518 Incorporated the answer to NRC Question 9.4 as modified by CN-741.

Section 9.2.1.3

- lines 1527 - 1529      Corrected punctuation.
- line 1539              Reflected upgraded rating of reactor building crane (GLP-4640; Meeting with Bob Gunnerson, 4/5/82)
- line 1543              Changed verb tense.

Section 9.2.2.1

- lines 1573 - 1574      Changed verb tense.

Section 9.2.2.2

- lines 1608 - 1640      Incorporated the answer to NRC Question 9.6 (7).

Section 9.2.3.1

- line 1741              Indicated that nitrogen rather than helium is used for storage of control and orificing assemblies (FCN-GA-2189).

Section 9.2.3.2

- lines 1793 - 1799      Reflected the use of nitrogen in the wells, rather than helium (FCN-GA-2189).
- line 1813              Changed verb tense.

Section 9.2.4.2

- lines 1871 - 1876      Incorporated the answer to NRC Question 9.6 (5).  
1887 - 2008

Section 9.2.5.2

- line 2070              Changed verb tense.

Section 9.2.5.3

- lines 2113 - 2116      Changed verb tense.

Section 9.2.6.3

lines 2158 - 2160 Indicated that the reserve shutdown material has been removed by the reserve shutdown vacuum tool. (Pre-P, 3/4/75: A0.75-07)

lines 2165 - 2166 Changed verb tense.

Section 9.2.7.1

lines 2183 - 2185 Changed verb tense.  
2195, 2199

Section 9.2.7.2

lines 2241 - 2244 Changed verb tense.

Section 9.2.7.3

line 2268

No change

Section 9.2.8.2

line 2325 Changed verb tense.

Section 9.2.9.1

lines 2422, 2425 Changed verb tense.  
2436

line 2441 Added criterion to cover change out of control rod shock absorbers. (CN-1308)

Section 9.2.9.2

lines 2466 - 2468 Changed verb tense.

line 2477 Reflected the fact that only high level solid waste is packaged in cell, and that low level waste is packaged in a compactor. (Meeting with Bill Woodard, 4/7/82)

Section 9.2.9.2 (Cont'd)

lines 2480 - 2494  
2499, 2502

The wording of this procedure was modified to indicate that the steps necessary for decontamination are taken, but that every contaminated item is not necessarily processed in the order given, depending upon the nature of the item and its level of contamination. (Meeting with Bill Woodard, 4/7/82)

Section 9.2.9.3

lines 2519 - 2521

Changed verb tense and reworded for clarity.

Section 9.2.10

line 2566

Former Figure 9.2-3 is renumbered as Figure 9.2-6.

lines 2573 - 2575

This sentence is reworded to indicate that the helium within the barrier is vented to the reactor plant exhaust system. (Meeting with Ward Craine, 4/7/82)

Section 9.3.3

lines 2682, 2695  
2697 - 2698  
2713 - 2715

Changed verb tense.

Section 9.4.2

--

It is requested that PSC consider whether it is desirable to include any updated estimates in this section to more closely reflect actual amounts of impurities and moisture absorbed.

Section 9.4.2.1

line 2779

Deleted footnote.

lines 2817 - 2818  
2840, 2861

Changed verb tense.

Section 9.4.2.2

- lines 2922 - 2950 Incorporated the answer to NRC Question 9.9.
- line 2976 Former Figure 9.7-2 is renumbered as Figure 9.7-3.
- lines 3031, 3033 Indicated that electric inductive heaters are used, rather than external electric heaters, to maintain the titanium sponge at the desired temperature of 700<sup>o</sup>F. (FCN-GA-2586, FCN-GA-2238, FCN-GA-2253)-----
- lines 3064 - 3065 Deleted phrase "except hydrogen removal and regeneration sections". (GP-1319)

Section 9.4.3.1

- lines 3135 - 3138, Modified description of purification train operation/regeneration cycle to reflect actual process. (Meeting with Jack Reesy, 4/5/82)-----
- 3141 - 3142
- lines 3159 - 3193 Incorporated the answer to NRC Question 11.2.

Section 9.4.3.2

- lines 3200 - 3202 Modified wording to more accurately reflect the operation of the purification trains.
- lines 3244 - 3259 Added discussion of means of eliminating possibility of flammable gas hazard. (FCN-GA-3164)
- line 3297 Changed verb tense.

Section 9.4.3.3

- lines 3320 - 3321 Changed verb tense.
- line 3331 Reworded paragraph to refer to Appendix D for method of depressurization.

Section 9.4.5

lines 3410, 3443,  
3447 - 3448      Changed verb tense.

Section 9.4.6

lines 3479 - 3509      Incorporated the answer to NRC Question 9.10.

lines 3502, 3507      Reference is made to flow rates in the units of  
SCF. PSC is requested to clarify the units to  
be used.

lines 3550 - 3553      Incorporated footnote into text.

Section 9.4.7

lines 3600 - 3602      Revised discussion of purification train to  
address normal and abnormal operating conditions.

References for Section 9.4

lines 3619 - 3628      Added references from the answer to NRC Question 9.9.

Section 9.5.5

lines 3759 - 3760      Moved statement that the helium storage tanks  
and the transfer compressor are protected by  
relief valves from line 3802.

lines 3768 - 3769      Changed verb tense.  
3773, 3779-  
3780

lines 3792 - 3795      Incorporated footnote into text.

lines 3802 - 3833      Incorporated the answer to NRC Question 9.8.

Section 9.6.2

lines 3875 - 3887      Actual refrigeration loads are being determined by  
Mike Lehr. These loads will be incorporated into  
the text when the results of the test are received.

Section 9.6.2 (Cont'd)

lines 3879 - 3882      Incorporated footnote into text.  
lines 3908, 3918-      Incorporated footnote into text.  
3923

Section 9.6.4

lines 4004 - 4006      Changed verb tense.  
line 4009              Changed minimum inventory to 650 gallons.  
                            (CN-487, P-77250)  
line 4033              Deleted term "very highly".

Section 9.6.5

line 4042              Hyphenated "boil-off".  
line 4112              Changed verb tense.

Section 9.6.6

lines 4133 - 4134      Changed verb tense.  
lines 4138 - 4147      Reworded paragraph to reflect low liquid nitrogen  
4149 - 4150              inventory limit of 650 gallons. (CN-487, P-77250)

Section 9.7.2

lines 4223 - 4259      Incorporated the answer to NRC Question 9.13.

Section 9.7.3.1

lines 4366 - 4479      Incorporated the answer to NRC Question 7.8.

Section 9.7.3.4

line 4534              Former Figure 9.7-2 is renumbered as Figure 9.7-3.

Section 9.7.3.5.3

lines 4605 - 4607      Changed verb tense.  
4609, 4612 -  
4613

Section 9.7.3.5.4

lines 4636 - 4637      Changed verb tense.  
4666 - 4668  
4726 - 4727  
4737 - 4741

Section 9.7.3.5.5

lines 4758 - 4759      Referred to Section 9.7.3.1 for a description  
of the flow scanner.

Section 9.7.4.1

lines 4803 - 4848      Incorporated the answer to NRC Question 7.8:  
lines 4854 - 4855      Changed verb tense.

Section 9.7.5

lines 4883 - 4898      Incorporated the answer to NRC Question 7.8.

Section 9.7.6

lines 4949 - 4954      Modified text to conform with LCO 4.2.14.

References for Section 9.7

lines 4968 - 4974      Added reference from the answer to NRC Question 9.13.

Section 9.8.1

lines 4997 - 4998      Changed verb tense.  
5008 - 5009

Section 9.8.1.1

lines 5056 - 5059      Changed verb tense.  
5077

Section 9.8.2

lines 5085 - 5086      Changed verb tense.

Section 9.8.3

All                      Rewritten by Proto-Power. This subsection will  
be redesignated as Section 9.12. \_\_\_\_

Section 9.8.3.5.3

General                      Added reference to the applicability of  
10CFR50, Appendix R, Fire Protection  
Program.

Section 9.8.4.1

lines 5157 - 5159      Modified text to conform with LCO 4.2.4.

Section 9.9.1

line 5200                      Corrected punctuation.  
lines 5218 - 5219      Referred to Section 8.2.7.6 for separation  
criteria.

Section 9.9.2

lines 5236 - 5239      Added statement referring to Chicago Penumatic  
compressor as backup source of service air.  
(CN-1286)

Section 9.9.3

lines 5250 - 5253      Reworded to conform with LCO 4.3.6.

Section 9.9.4

lines 5261 - 5267 Incorporated SR 5.3.6.

Section 9.10.1

lines 5280 - 5281 Corrected description of source of steam for building heating. (CN-1354)

line 5289 If it is desired by PSC, the wording of this sentence will be changed to reflect the existence of the second auxiliary boiler.

lines 5291 - 5296 Changed verb tense.

Section 9.10.3

lines 5313 - 5315 Changed verb tense.

Section 9.11

line 5321 New section added on hydraulic system.

Sections 9.11.1, 9.11.2, 9.11.3, 9.11.3.1, 9.11.3.2, 9.11.4

lines 5325 - 5541 New sections added (SD-91-2(K)).

Section 9.11.5

lines 5545 - 5574 New section added (LCD 4.3.7; Pre-P, 1/24/75).

Section 9.11.6

lines 5578 - 5585 New sect added (SR 5.3.5).

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END DRAFT 1

## DRAFT 2

### REWRITE UNIT 9 - SECTION 9

#### SUMMARY OF CHANGES

##### Section 9.1.1.2

- lines 530-532: Rearranged sentence order per PSC comments.
- line 649: Changed "orientate" to "orient".
- lines 655,658: Reworded these sentences for clarity.
- line 668: Deleted "annual" before "refueling" per PSC comments.
- line 683: Changed "locked" to "held" per PSC comments.
- line 733: Deleted "chamfered" before "end" per PSC comments.
- lines 769-774: Rearranged sentence order per PSC comments.

##### Section 9.1.1.3

- line 995: Changed " $K_{eff}$ " to "K-effective" due to word processing system limitations.
- lines 1000-1061: Incorporated the answer to NRC Question 6.6.

##### Section 9.1.1.5

- line 1105: Deleted "annual" before "refueling" per PSC comments.
- line 1115: Changed letters to lower case.

##### Section 9.1.2.2.1

- line 1239: Added "plant" per PSC comments.

##### Section 9.1.2.2.3

- line 1321: Corrected spelling of "recanned".
- line 1353: Changed "160" to "170" per PSC comments.
- line 1363: Corrected spelling of "with".

Section 9.1.2.2.3 (Continued)

- line 1377: Deleted "Note that" before "these" per PSC comments.
- line 1378: Added "therefore" per PSC comments.
- line 1597: Changed "160" to "165.5" per PSC comments.

Section 9.2.2.1

- line 1684: Corrected reference to Section 11.2.2.

Section 9.2.10

- line 2649: Changed letters to lower case.

Section 9.3.1

- line 2747: Changed "disposes of spent" to "transfers" per PSC comments.

Section 9.3.2

- line 2758: Changed "is" to "may be", and deleted "10%" before "detergent" per PSC comments.
- line 2765: Changed "is" to "may be" per PSC comments.
- line 2768: Deleted reference to 50-gallon containers per PSC comments.
- line 2769: Changed "is" to "can be" per PSC comments.
- line 2772: Changed "is" to "may be" per PSC comments.

Section 9.3.3

- lines 2793-2796: Rearranged sentence order, changed "controlboard" to "control board", changed "to" to "on", added "are mounted", and changed "brought" to "displayed" per PSC comments.
- lines 2810,2815,  
2816 Changed "a disposal" to "an exposure" per PSC comments.

Section 9.3.3 (Continued)

line 2825: Deleted "(primarily during refueling)" after "infrequently", and moved the word "thus" to the beginning of the sentence per PSC comments.

Section 9.4.1

lines 2842-2843: Reworded the sentence, per PSC comments, to add reference to PCRV safety valves and inlet lines.

line 2849: Changed "maintains" to "removes" per PSC comments.

line 2851: Changed "at" to "to" per PSC comments.

Section 9.4.2.1

line 2883: Changed "14.6" to "14.8" per PSC comments.

line 2893: Changed "34.3" to "34.5" per PSC comments.

line 2910: Added "CO<sub>2</sub>"; changed "475" to "10"; deleted redundant line per PSC comments.

line 2917: Deleted "say 30 ppm" after "higher" per PSC comments.

line 2922: Deleted "and surfaces in" after "refueling" per PSC comments.

Section 9.4.2.2

line 3009: Deleted "unlikely" before "event", and changed "a" to "an extended" per PSC comments.

line 3061: Changed "the hypothetical" to "a permanent" per PSC comments.

line 3064: Added "the high temperature filter adsorber".

lines 3102-3104: Added "F", "by", "from the low temperature adsorber", and "then" per PSC comments.

lines 3138-3147: Replaced former sentence with sentences provided by PSC.

line 3164: Deleted "Nash Model MD-623" after "regeneration compressor" per PSC comments.

Section 9.4.2.2 (Continued)

- line 3179: Added "in the normal helium purification trains" per PSC comments.
- line 3192: Added this paragraph provided by PSC.
- lines 3202-3204: Added the dates for the ASME Code.
- line 3241: Added "the onset of" per PSC comments.

Section 9.4.3.1

- line 3251: Changed title to include abnormal operation per PSC comments.
- lines 3261-3289: Replaced former paragraph with paragraphs supplied by PSC.
- lines 3295-3297: Rearranged sentence order per PSC comments.
- lines 3307-3308: Changed "1100°F" to "850°F"; changed "four" to "18"; added "with inductive heaters surrounding each hydrogen getter vessel" per PSC comments.
- line 3315: Changed letters to lower case.
- line 3317: Referred to Figure 9.4-2, which is incorporated as a duplicate of Figure 14.8-1. Deleted the previously next sentence per PSC comments.
- lines 3319-3322: Changed letters to lower case.
- lines 3326-3328: Corrected the spelling of "A"; added "material"; changed letters to lower case per PSC comments.
- lines 3334-3337: Changed letters to lower case.

Section 9.4.3.2

- lines 3351-3352: Added "but may be regenerated..." per PSC comments.
- line 3353: Added "spent" per PSC comments.
- line 3365: Added "when"; deleted "as follows" after "out" per PSC comments.
- line 3367: Modified punctuation per PSC comments.
- line 3372: Changed "450°F" to "550°F" per PSC comments.

Section 9.4.3.2 (Continued)

- line 3393: Deleted information from FCN-GA-3164 per PSC comments.
- line 3407: Added "normal"; deleted "the normal time before regeneration" after "months" per PSC comments.
- lines 3408-3409: Added "under abnormal conditions" per PSC comments.

Section 9.4.3.3.1

- line 3431: Divided Section 9.4.3.3 for clarity.
- lines 3436,3453: Changed "75" to "100" per PSC comments.

Section 9.4.3.3.2

- line 3463: Divided Section 9.4.3.3 for clarity.
- lines 3477-3523: Added this information to describe system operation during depressurization (G-81048).

Section 9.4.3.4

- lines 3549-3551: Added "of the helium purification system dryers" per PSC comments.

Section 9.4.5

- line 3608: Changed "day" to "week" per PSC comments.

Section 9.4.6

- lines 3666-3667: Changed "contain" to "collect"; changed "79" to "99"; added "effective full power"; changed "on-stream time" to "operation" per PSC comments.
- line 3694: Changed "700°F" to "600°F", and added "is less than" per PSC comments.
- line 3696: Added "is less than" per PSC comments.
- line 3709: Changed "about 99%" to "over 96%" per PSC comments.
- line 3710: Added "under normal operating conditions" per PSC comments.

Section 9.4.7

- line 3771: Changed "only about one day" to "less than one week" per PSC comments.
- lines 3772,3795: Deleted reference to the hydrogen removal section per PSC comments.
- line 3800: Deleted sentence pertaining to hydrogen removal system failure per PSC comments.

Table 9.4-1

- Footnote "C": Added footnote to document the reference for design activities.

Section 9.5.5

- line 3948: Changed "cool" to "cooled".
- lines 4010,4023: Changed "storage" to "supply" per PSC comments.

Section 9.6.3

- line 4169: Changed "ullage" to "usage" per PSC comments.

Section 9.7.2

- line 4428: Deleted "It is well known that" from beginning of sentence per PSC comments.

Section 9.7.3.5.4

- line 4863: Deleted "and" before "cycle".
- lines 5021,5024: Added a comma.

Section 9.8.3

- lines 5286,5290,  
5305: Former Section 9.8.3 was shifted to Section 9.12, and the former Section 9.8.4 became Section 9.8.3.
- line 5309: Former Section 9.8.4.3 was incorporated into Section 9.12.

Section 9.9.2

line 5374: Added "or backup auxiliary boiler" per PSC comments.

Section 9.10.1

lines 5414-5416, 5423 Added reference to the backup auxiliary boiler per PSC comments.

Section 9.11.3

line 5505: Deleted reference to former Figure 9.11-2, as it was redundant and therefore deleted.

line 5545: Referred to Figure 9.11-2, as the former Figure 9.11-3 was renumbered.

line 5551: Referred to Figure 9.11-1, as the former Figure 9.11-4 was incorporated into this figure.

Section 9.11.5

line 5694: Changed "are" to "is".

Figure 9.11-1

General Incorporated former Figure 9.11-4.

Figure 9.11-2

General Former Figure 9.11-2 deleted, as important details are included in Figure 9.11-1. Therefore, former Figure 9.11-3 was renumbered to Figure 9.11-2.

Section 9.12

line 5723: This section is renumbered from Section 9.8.3.

Section 9.12.1

line 5727: Formerly section 9.8.3.1.

lines 5759,5762, 5766,5769 Deleted "of the FSAR".

Section 9.12.2

line 5773: Formerly Section 9.8.3.2.

Section 9.12.2.1

line 5777: Formerly Section 9.8.3.2.1.

Section 9.12.2.2

line 5789: Formerly Section 9.8.3.2.2.

Section 9.12.2.3

line 5807: Formerly Section 9.8.3.2.3.

lines 5818-5819: Added sentence provided by PSC.

lines 5823-5825: Rearranged sentence order per PSC comments.

line 5829: Changed "comply" to "is in accordance" per PSC comments.

line 5838: Changed "comply" to "are in compliance" per PSC comments.

line 5839: Added "for a Class 2 system" per PSC comments.

line 5842: Deleted two sentences per PSC comments.

Section 9.12.2.4

line 5892: Formerly Section 9.8.3.2.4.

lines 5905-5906: Changed "cooling" to "supplying power to equipment which cools" per PSC comments.

line 5909: Deleted "of the FSAR".

Section 9.12.3

line 5913: Formerly Section 9.8.3.3.

Section 9.12.3.1

line 5917: Formerly Section 9.8.3.3.1.

line 5941: Changed "to" to "of" per PSC comments.

Section 9.12.3.2

- line 5949: Formerly Section 9.8.3.3.2.
- line 5961: Deleted "heat sensing" before "ionization" per PSC comments.
- line 5962: Deleted sentence referring to Table 5.8.3-1 per PSC comments.

Section 9.12.3.3

- line 5970: Formerly Section 9.8.3.3.3.
- line 5978: Corrected reference to Figure 9.12-1.
- line 6007: Corrected reference to Figure 9.12-2.
- line 6032: Deleted "any one of five devices" per PSC comments.
- line 6034: Deleted reference to several relays per PSC comments.
- line 6040: Deleted "any one of four devices" per PSC comments.
- line 6042: Deleted "operation of its differential....over-current trip relay" from the original text per PSC comments.
- lines 6052-6055: Added sentence pertaining to CO<sub>2</sub> extinguishers per PSC comments.
- lines 6060-6063: Added sentence pertaining to spray shields per PSC comments.
- line 6084: Corrected reference to Figure 9.12-1.
- line 6093: Corrected reference to Figure 9.12-3.
- line 6101: Deleted "15 second" prior to "preset" per PSC comments.
- line 6125: Corrected reference to Figure 9.12-4.
- line 6140: Added "and manual" per PSC comments.
- line 6144: Added "only" per PSC comments.

Section 9.12.3.4

- line 6157: Formerly Section 9.8.3.3.4.
- line 6168: Corrected reference to Figure 9.12-5.
- line 6175: Corrected spelling of "an".
- line 6200: Deleted parenthetical statement per PSC comments.
- line 6210: Changed "will be" to "are" per PSC comments.
- line 6231: Changed "rating" to "ratings" per PSC comments.
- line 6234: Hyphenated "air-tight".
- line 6237: Deleted "rated" before "fire stop" per PSC comments.:

Section 9.12.4

- line 6242: Formerly Section 9.8.3.4.
- line 6296: Deleted "of the FSAR".

Section 9.12.5

- line 6300: Formerly Section 9.8.3.5.

Section 9.12.5.1

- line 6304: Formerly Section 9.8.3.5.1.
- line 6314: Deleted sentence referring to Table 9.8.3-1 per PSC comments.

Section 9.12.5.2

- line 6343: Formerly Section 9.8.3.5.2.
- line 6378: Changed "was" to "were".

Section 9.12.5.3

- line 6390: Formerly Section 9.8.3.5.3.
- line 6395: Added "applicable" per PSC comments.

Section 9.12.6

line 6399: Formerly Section 9.8.3.6.

line 6419: Added statement supplied by PSC.

Section 9.12.7

line 6536: Formerly Section 9.8.3.7.

Former Table 9.8.3-1

General Deleted per PSC comments.

Figure 9.12-1

General Formerly Figure 9.8.3-1.

Figure 9.12-2

General Formerly Figure 9.8-2.

Figure 9.12-3

General Formerly Figure 9.8.3-3.

Figure 9.12-4

General Formerly Figure 9.8.3-4.

Figure 9.12-5

General Formerly Figure 9.8.3-5.

Criterion 3

lines 6599-6643: Replaced former discussion with discussion provided by PSC.

Criterion 59

line 6727: Deleted "can be diverted" after "effluent".

Criterion 67

line 6874: Spelled out "micro".

## Figures and Tables

Figure 9.1-3	Formerly Figure 9.6-5 from Q&A 9.6.
Figure 9.1-4	Formerly Figure 9.1-1 from Q&A 9.1.
Figure 9.1-5	Formerly Figure 9.1-4.
Figure 9.1-6	Formerly Figure 9.1-3.
Figure 9.1-7	Formerly Figure 9.1-5.
Figure 9.1-8	Formerly Figure 9.1-6.
Figure 9.1-9	Formerly Figure 9.6-2 from Q&A 9.6.
Figure 9.1-10	Formerly Figure 1.2-15.
Figure 9.1-11	Formerly Figure 9.6-4 from Q&A 9.6
Figure 9.2-2	Formerly Figure 9.6-6 from Q&A 9.6.
Figure 9.2-3	Formerly Figure 9.6-7 from Q&A 9.6.
Figure 9.2-4	Formerly Figure 9.6-8 from Q&A 9.6.
Figure 9.2-5	Formerly Figure 9.2-2.
Figure 9.2-6	Formerly Figure 9.2-3.
Figure 9.3-1	To be updated as <u>PF</u> drawings are updated.
Table 9.4-1	Added footnote b to indicate that design tritium activity is based upon a tritium/helium ratio of $2 \times 10^{-7}$ .
Table 9.4-2	Modified footnote c to indicate that design tritium activity is based upon a tritium/helium ratio of $2 \times 10^{-7}$ , and to avoid the inference that the hydrogen getters absorb all of the tritium from the plant.
Figure 9.4-1	This figure will be updated as <u>PF</u> drawings are updated.
Figure 9.5-1	This figure will be updated as <u>PF</u> drawings are updated.

Figures and Tables (cont'd)

Figure 9.6-1	This figure will be updated as <u>PF</u> drawings are updated.
Figure 9.7-1	<del>This figure will</del> be updated as <u>PF</u> drawings are updated.
Figure 9.7-2	Formerly Figure 7.8-1 from Q&A 7.3.
Figure 9.7-3	Formerly Figure 9.7-2.
Table 9.8-1	Submitted by Proto-Power as Table 9.8.3-1.
Figure 9.8-1	This figure will be updated as <u>PF</u> drawings are updated.
Figure 9.8-2	Submitted by Proto-Power as Figure 9.8.3-1.
Figure 9.8-3	Formerly Figure 9.8-2. This figure will be updated as <u>PF</u> drawings are updated.
Figure 9.8-4	Submitted by Proto-Power as Figure 9.8.3-3.
Figure 9.8-5	Submitted by Proto-Power as Figure 9.8.3-4.
Figure 9.8-6	Submitted by Proto-Power as Figure 9.8.3-5.
Table 9.11-1	Table I from SD-91-2(K).
Figure 9.11-1	<u>PF-91</u> . This figure will be updated when PF drawings are updated.
Figure 9.11-2	<u>PF-91-1</u> . This figure will be updated when PF drawings are updated.
Figure 9.11-3	<u>PF-91-2</u> . This figure will be updated when PF drawings are updated.
Figure 9.11-4	<u>PF-91-3</u> . This figure will be updated when PF drawings are updated.

# DRAFT 1

## SUMMARY OF CHANGES TO FSAR SECTION 10 (EXCLUDING SECTION 10.3)

### Section 10.1

- line 277: Clarified reference to Section 8.2.3 to be Section 8.2.3.5.
- line 298: Clarified reference to Section 7.1.2 to be Section 7.1.2.5.

### Section 10.2

- lines 532 - 615: It is requested that PSC verify that these procedures continue to reflect current operating practices. Particular attention should be given to the matter of hot restart.
- line 576: Improved sentence grammar.
- line 607: Changed "around" to "about".
- lines 612 - 614: Modified wording for clarity.

### Section 10.2.1

- lines 642 - 643: Modified wording for clarity.
- line 663: Corrected punctuation.
- line 671: Corrected punctuation.

### Section 10.2.2.2

- line 786: Deleted discussion of makeup water requirements, as this is discussed in Section 2.
- lines 791 - 792: Referred to Section 2.5.1 for discussion of makeup requirements. An actual number for makeup water requirements will be added, pending PSC approval of the requirements stated in the update of Section 2.5.1.

### Section 10.2.3

- line 814: Changed verb tense.
- line 818: Changed verb tense.
- line 826: Hyphenated "after-condenser".
- lines 844 - 845: Deleted "if found necessary" as it contributes nothing, but potentially raises questions.

### Section 10.2.3.1

- line 875: Changed verb tense.
- lines 894 - 928: Added discussion of automatic control of boiler feed pumps (CN-695).

### Section 10.2.3.4

- line 985: Changed verb tense.
- lines 987 - 988,  
996 - 1043: Incorporated the answer to NRC Question 10.1.

### Section 10.2.4

- lines 1054 - 1061,  
1068 - 1083: Incorporated the answer to NRC Question 14.7.
- line 1071: Revised discussion of the regenerant solution disposal.
- lines 1110 - 1117: Included discussion of reverse osmosis unit (CN-940, CN-1048, CN-477). PSC should confirm the statement regarding organic iron.

### Section 10.2.5.1

- lines 1144 - 1148: It is requested that PSC confirm the acceptability of reheater flooding. (See NPC 2922 dated 1/18/82; also see line No. 1325).

Section 10.2.5.2

lines 1160 - 1175: Incorporated the answer to NRC Question 5.18.

Section 10.2.5.3

line 1249: Changed main steam electromatic safety valve setpoint to 2670 psig (FCN-GA-2607).

line 1250: Corrected punctuation.

line 1254: Changed verb tense.

line 1313: Clarified wording.

line 1325: See comment for line 1144 regarding reheater flooding.

lines 1315 - 1335, 1346 - 1347: Incorporated the answer to NRC Question 14.8.

line 1374: Changed verb tense.

Section 10.2.6

lines 1402 - 1428: Currently, no discussion of the second auxiliary boiler is included. If PSC desires such a discussion, it will be included in the final draft. *YES*

lines 1438 - 1439: Changed listed capacity to 40,000 gallons, rather than 72 hours, to avoid a conflict with discussion in Section 8 concerning use of these tanks for backup for the emergency diesels.

Section 10.2.8

lines 1518 - 1583: Incorporated the answer to NRC Question 10.2 (GP-1219).

## DRAFT 2

### Summary of Changes

#### Section 10

lines 225-227 Described location of backup auxiliary boiler (CN-1084)

#### Section 10.1

lines 273-274 Changed "running on" to "supplying" per PSC comments.

#### Section 10.1.2

line 396 Added "circulator" per PSC comments.

#### Section 10.1.4

line 452 Deleted "during low load operation" per PSC comments.

line 464 Added reference to backup auxiliary boiler per PSC comments.

Figure 10.1-1 Added reference to backup auxiliary boiler per PSC comments.

#### Section 10.2

line 502 Changed "Close" to "Closed" per PSC comments.

line 542 Added a comma per PSC comments.

line 543 Added reference to backup auxiliary boiler per PSC comments.

lines 553-556 Changed wording to conform with OPOP III.

line 572 Added reference to backup auxiliary boiler per PSC comments.

#### Section 10.2.1

line 675 Added reference to backup auxiliary boiler per PSC comments.

#### Section 10.2.2.1

line 743 Added reference to backup auxiliary boiler per PSC comments.

#### Section 10.2.2.2

line 796 Changed "makeup water" to "water" per PSC comments.

lines 797-798 Changed "flows into" to "is pumped into", and indicated that the two lined settling ponds overflow to two lined storage ponds per PSC comments.

### Section 10.2.3.1

- line 871 Added reference to backup auxiliary boiler per PSC comments.  
line 891 Changed "control pump" to "pump control" per PSC comments.  
line 916 Deleted two sentences per PSC comments.

### Section 10.2.4

- line 1071 Changed "yard drain system" to "waste evaporation pond" per PSC comments.

### Section 10.2.5.1

- lines 1142-1144 Indicated correct valves which isolate cold reheat loop header per PSC comments.

### Section 10.2.5.2

- line 1157 Added "materials and standards for the" per PSC comments.  
lines 1163-1167 Added introductory sentences for readability improvement. Changed "B31" to "B31.7" per PSC comments.  
line 1170 Added "(1967 edition)" per PSC comments.  
line 1204 Added "(1967 edition)" per PSC comments.  
line 1213 Added "(1967 edition)" per PSC comments.

### Section 10.2.5.3

- lines 1331-1332 Added reference to the attempt to restore the dumped loop and to dump the correct loop per PSC comments.  
lines 1335,1341,  
1345 Renumbered paragraphs.  
line 1407 Added reference to backup auxiliary boiler per PSC comments.

### Section 10.2.6

- line 1411 Changed title to include reference to backup auxiliary boiler per PSC comments.  
lines 1415-1420 Added description of backup auxiliary boiler per PSC comments.  
line 1421 Changed "turbine" to "turbines" per PSC comments.

line 1425 Added reference to backup auxiliary boiler per PSC comments.  
line 1427 Added reference to backup auxiliary boiler per PSC comments.  
line 1434 Added reference to backup auxiliary boiler per PSC comments.  
line 1439 Added reference to backup auxiliary boiler per PSC comments.  
line 1444 Added reference to backup auxiliary boiler per PSC comments.  
line 1445 Added "along with two fuel oil pumps" per PSC comments.

Table 10.2-1

Number 14 Changed "settling ponds" to "storage ponds" per PSC comments.

REWRITE UNIT 12 SUMMARY OF CHANGES

SECTION 10.3

SECTION 10.3.1

- line 8399: "four" changed to "five" per PSC comments
- lines 8413-8415: "operating procedure" changed to "sequence of events"  
"25% in 2-1/2 minutes" changed to "28% in 5 minutes"  
all per PSC comments
- line 8420: portion of sentence deleted per PSC comments
- line 8427: "25%" changed to "28%" to agree with line 8415

SECTION 10.3.2

- line 8483: "or deaerator" added per PSC comments

SECTION 10.3.3

- line 8576: verb tense change
- line 8578: "backup auxiliary boiler" added per PSC comments

SECTION 10.3.4

- lines 8596-8609: modified per PSC comments

SECTION 10.3.6

- line 8642: "backup auxiliary boiler" added per PSC comments

SECTION 10.3.7

- last paragraph deleted per PSC comments

SECTION 10.3.9

- line 8747: "safe shutdown" changed to "design basis"
- line 8754: "backup auxiliary boiler" added per PSC comments
- lines 8766-8768: "firewater booster pumps" changed to "emergency water booster pumps"

SECTION 10.3

Figure 10.3-4 1 circulating water makeup pump deleted per PSC  
comments

Figure 10.3-7 1 circulating water makeup pump deleted per PSC  
comments

Firewater booster pumps changed to emergency water  
booster pumps per PSC comments

Section 10.4

Lines 1616 - 1642: Included discussion of applicable LCO's (LCO 4.3.2, LCO 4.3.3, LCO 4.3.4, LCO 4.3.5, CN-999).

Section 10.5

Lines 1650, 1654, Changed verb tense.  
1660, 1661, 1672,  
1673, 1676, 1681,  
1685, 1688, 1696,  
1700, 1707, 1711,  
1712, 1715, 1721,  
1728, 1734, 1740,  
1743:

Figures and Tables

Figure 10.1-1 is to be updated as PF-2-5 is updated.

Figure 10.1-2 is to be updated as PF-22 is updated.

Figure 10.2-1 may require update. It is requested that PSC revise these numbers, if necessary, based upon current data.

Figure 10.2-2 is to be updated as PF-31 is updated.

Figure 10.2-3 is added from Q&A 10.1.

Table 10.2-1: It is requested that PSC verify that the water-steam inventories have not changed.

Table 10.2-2: Changed main steam electromatic relief valve setting to 2670 psig (FCN-GA-2607).

DRAFT 1  
SUMMARY OF CHANGES TO FSAR SECTION 11

Section 11.1.1

lines 149 - 182

Added from Question and Answer 11.1. Table 11.1-1 was also added from Question and Answer 11.1-1. Some editorial changes were made to this answer.

Section 11.1.1.1

line 204

Verb changed from "will" to "may" (because this shipping has never been done).

line 206

Verb changed from "will" to "may" (because this shipping has never been done).

Section 11.1.1.2

line 212

The first sentence in this section was deleted. This was done because a substantial quantity of tritiated water has been generated in the past.

line 218

Reference to footnote deleted (see lines 219 - 221)

lines 219 - 221

The footnote at the bottom of page 11.1-1 was incorporated into the text.

line 236

The first sentence regarding liquid wastes was deleted because of the amount of tritiated water produced.

line 243

"or as the result of an accident" was replaced with "and the release of tritiated water".

line 255

Verb tense change, "is" changed to "may".

line 267

"accident" changed to "postulated accident".

line 273

Verb tense change. "is" changed to "would be".

line 291

"possibly, some tritium" changed to "some tritium".

lines 303 - 304

Sentence added to reflect design bases of system.

Section 11.1.1.3

line 313	Footnote deleted and incorporated into text at the line 326 - 333.
lines 319 - 322	Added per FCN-3164.
lines 326 - 333	Added from footnote (see line 313).
line 339	"item 1C of table 11.1-2" added per FCN-3164.
line 341	"of table 11.1-2" added for clarity.
line 342	"gasbourne" changed to "gas borne"
line 358	"of table 11.1-2" added for clarity.
lines 435 - 475	Added from Question and Answer 11.4.
lines 481 - 490	added from Question and answer 11.4, PSC letter PG-27 and PSC-GA review of this section (see notes)
lines 523 - 547	This section was modified to reflect the current operating experience regarding tritium. This section has been reviewed by PSC and GA. The source material for this section is consistent with GA-A13461.
line 561	"recently" deleted.
lines 576 - 578	editorial change
lines 582 - 589	Paragraph added to reflect current operating history. The sentence on lines 584 - 588 was modified per GA & PSC comments on this section.
lines 594 - 596	Verb tense changed.
lines 602 - 603	"200 ft. meteorological tower" changed to "meteorological monitoring instrumentation".
line 612	"on" changed to "for"
line 616	"10 CFR 20.150" changed to "10 CFR 20.105". This was a typographical error in the original text.
line 635	"area" added
line 646	Reference 5 added per Question and Answer 11.5.

lines 665 - 666 Milk consumption added per Question and Answer 11.5.  
line 686 "in the gaseous form" added for clarity.  
~~line 691~~ *Fix Table references.*  
lines 708 - 712 This section was replaced per instruction from D. Goss at PSC. Several editorial changes were made in the paragraph. (E. G. no IACM)

#### Section 11.1.2.2

lines 719 - 732 Added from Question and Answer 11.3(a).  
lines 756 - 764 Added from Question and Answer 11.3(a).  
lines 766 - 778 Added from Question and Answer 11.2.  
lines 791 - 793 "Laboratory Analysis" changed to "Analysis"  
  
line 797 Verb tense changed.  
line 800 Verb tense changed.  
line 803 Verb tense changed.  
lines 817 - 838 Added from Question and Answer 11.3(b).

#### Section 11.1.2.3

line 886 "Influent" deleted to reduce redundancy.  
lines 925 - 938 Added from Question and Answer 11.6. and editorial changes made.  
  
line 959 parenthetical expression regarding regeneration of He purification system deleted (see lines 149-182)  
lines 960 - 962 ", although no such leakage is anticipated" was deleted.  
lines 966 - 970 Added from FCN-2211.  
lines 1034 - 1040 Changed per FCN-3164.  
lines 1066 - 1070 Added per FCN-3164.  
lines 1077 - 1080 Footnote incorporated into text.  
lines 1099 - 1104 This section was replaced per instruction from D. Goss at PSC. Several editorial changes were made to the paragraph. (E. G. no reference to IACM)

Section 11.1.3.2

lines 1123 - 1161 Added from Question and Answer 11.3(c). The table referenced is Table 11.3-1 of question 11.3.

Section 11.1.3.3

lines 1185 - 1198 Added from Question 6.10. Figure referenced is Figure 6.10-1 from Question and Answer 6.10.

lines 1218 - 1222 Modified per FCN-3164.

Section 11.1.3.4

lines 1278 - 1310 Added from Question and Answer 11.7. Table referenced is from Table 11.7-1, Question and Answer 11.7. editorial changes made.

line 1313 editorial change

line 1356 editorial change

lines 1376 - 1378 All reference to liquid waste system deleted.

Section 11.1.4

lines 1440 - 1444 Modified per Technical Specification SR 5.5.1.

lines 1463 - 1464 Modified per Technical Specification SR 5.5.1.

References

lines 1483 - 1486 References added. (GA-A13461 per lines 528-547, and from Question and Answer 11.5, see lines 646)

Section 11.2.1

lines 1505 - 1508 PSC commitment to ALARA concept added.

lines 1510 - 1512 Added from Question and Answer 7.12.

Section 11.2.2.1

lines 1528 - 1530 Added from Question and Answer 9.6-4.

Section 11.2.2.2

lines 1546 - 1550 editorial changes

Section 11.2.2.4

line 1581 "Gulf General Atomic" changed to "General Atomic".  
line 1585 "GGA" changed to "GA" and "General Atomic".  
lines 1685 - 1687 "which is truncated after ISCT + 1 terms" was deleted per conversation with D. Alberstein at GA.  
line 1692 "serves" changed to "solves". This was a typographical error in the original text.  
"one-space dimensional" changed to "one dimensional"  
line 1699 Statement regarding "extensive edit features" deleted because it is irrelevant.

Section 11.2.2.6

lines 1866 - 1950 Added from Question and Answer 11.3.

Section 11.2.3

line 1960 "level" changed to "levels".  
lines 1964 - 1974 Added from Question and Answer 6.2..

Section 11.2.3.1.1

lines 2010 - 2011 ALARA referenced.  
lines 2013 - 2013 Referenced to Section 7.3.5.2 added. (see Notes)

Section 11.2.3.1.2.1

lines 2081 & 2086 Underline added.  
lines 2094 - 2131 Added from Question and Answer 11.9(1), and editorial changes made (see notes)  
lines 2133, 2141 Underline added.  
2143  
lines 2224 - 2230 Editorial change.  
lines 2279 - 2298 Added from Question and Answer 11.10 and CN-810.



CHANGES TO SECTION 11 FIGURES

11.1-1 this will be updated with other PF drawings.  
11.1-2 this will be updated with other PF drawings.  
11.1-3 from 6.10-1 Question - will probably be updated with other PF drawings  
11.2-1 from 11.8-1 Question  
11.2-2 from 11.8-2 Question  
11.2-3 was 11.2-1  
11.2-4 was 11.2-2 - this figure will be updated along with PF-63

CHANGES TO SECTION 11 TABLES

<u>NEW NUMBER</u>	<u>OLD NUMBER</u>
11.1-1	11.1-2
11.1-2	11.1-1 - also added 1 C from FCN-3164 Helium Purification System Regeneration Off-Gas
11.1-3	11.1-2a - changes made per conversation between Jim Phelps and Jeff Johns concerning He3/H4 ratio
11.1-4	11.1-3
11.1-5	11.1-4
11.1-6	11.1-5
11.1-7	11.1-6
11.1-8	11.3-1 Question
11.1-9	11.3-2 Question and Answer
11.1-10	11.3-3 Question
11.2-1	Same
11.2-2	11.9-1 Question
11.2-3	11.2-2 - This table should be updated if necessary by PSC

DRAFT 2

REWRITE UNIT 9 SUMMARY OF CHANGES

FSAR SECTION 11

SECTION 11.1.1

- lines 201-203: modified per PSC comments  
line 209: wording changed per PSC comments  
lines 219-221 modified per PSC comments

SECTION 11.1.2

- lines 244-246: modified per PSC comments and "uCi" changed to "micro-Ci"  
line 255: "uCi" changed to "micro-Ci"  
lines 262-263: "Gross Beta" added per PSC comments, "uCi" changed to "micro-Ci"; "at the plant site" deleted per PSC comments  
line 266: first sentence deleted per PSC comments  
lines 269-270: "The majority of" and "small quantities of" added per PSC comments  
lines 271-272: modified per PSC comments  
line 280: "uCi" changed to "micro-Ci"  
line 319: reworded per PSC comments

SECTION 11.1.1.3

- line 344: "active" changed to "radioactive" per PSC comments  
line 347: sentence from FCN 3164 deleted per PSC comments  
line 351: sentence from FCN 3164 deleted per PSC comments  
line 366: "gaseous" added per PSC comments  
line 386: "in the highly unlikely event" deleted per PSC comments  
line 649: "Whole Body Gamma" added per PSC comments

SECTION 11.1.1.3 (Cont.)

lines 652,684: "area" added per PSC comments  
lines 709, 710,  
718: "MPC<sub>a</sub>" changed to "MPC for air" to facilitate word  
processing

SECTION 11.1.2.1

line 744: rest of section deleted per PSC comments

SECTION 11.1.2.2

lines 756-757: modified per PSC comments  
lines 781-782: code date added per PSC comments  
lines 787-788: code date added per PSC comments  
line 801: "with quick opening flatheads" deleted per PSC comments  
line 803: sentence regarding "lifting lugs" deleted per PSC  
comments  
lines 808-809: modified per PSC comments  
line 824: "uCi" changed to "micro-Ci", "gross Beta activity"  
added per PSC comments  
line 829: "below" changed to "less than" per PSC comments,  
"uCi" changed to "micro-Ci"  
lines 830-832: modified per PSC comments  
line 851: "4 hours" changed to "1 hour" per PSC comments  
Note: safety evaluation will be written for this change.  
Test T-168 will be mentioned.  
lines 855-860: modified per PSC radiation protection section comments  
line 875: "periodic" deleted per PSC comments  
line 880: "made" changed to "performed" per PSC comments  
line 884: "u" changed to "microns"

SECTION 11.1.2.2 (Cont.)

line 888: "water" changed to "waste" per PSC comments  
lines 893-895: discussion of bypass line around liquid waste  
system oil separator added per PSC comments.  
Source is CN-1299.  
line 898: "Liquid waste" added per PSC comments

SECTION 11.1.2.3

line 925: modified per PSC comments  
line 936: end of sentence deleted per PSC comments  
lines 947-948: "waste" and "in the control room" added per PSC comments  
line 961: "u" changed to "micron"  
line 968: "Not the last step in the activity monitoring chain  
it is..." deleted per PSC comments  
line 990: "infrequent" deleted per PSC comments  
line 1003: "Vacuum" changed to "liquid drain" per PSC comments  
lines 1019-1022: code dates added per PSC comments  
lines 1042-1043: "is designed so" added per PSC comments  
line 1062: "due to operator error" deleted per PSC comments  
lines 1069-1076: changed per PSC comments  
line 1100: paragraph deleted per PSC comments because  
FCN-3164 did not work  
line 1108: "uCi" changed to "mirco-Ci"

SECTION 11.1.3.1

line 1130: modified per PSC comments  
lines 1169-1170: modified per PSC comments, "uCi" changed to "micro-Ci"

SECTION 11.1.3.3

line 1207: "backup" deleted per PSC comments

SECTION 11.1.3.4

lines 1238-1241: modified per PSC comments to include regeneration of the helium purification system

line 1241: paragraph deleted per PSC comments (FCN-3164)

line 1299: manufacturer name and delivery date deleted per PSC comments

SECTION 11.1.4

line 1411: "While it is anticipated that the situation will not occur..." deleted per PSC comments

lines 1418-1423: this paragraph rewritten to paraphrase Tech. Spec. 4.8.1(c) at Mike Holmes request

line 1456: "vent monitor system" changed to "reactor building ventilation exhaust stack"

REFERENCES FOR 11.1

line 1497: date added

SECTION 11.2.1

line 1521: "is" added per PSC comments

line 1525: "required" changed to "utilized" per PSC comments

SECTION 11.2.2.2

line 1566: "each worker" changed to "design limit" per PSC comments

SECTION 11.2.2.4

line 1599: "General Atomic" changed to "GA"

lines 1658-1677  
and Table 11.2-4: added to incorporate Question and Answer 14.18

SECTION 11.2.2.5

line 1843: "absorber" changed to "adsorber"

SECTION 11.2.2.5

lines 1890, 1896,  
1897, 1907, 1910-  
1911, 1935, 1945-  
1946, 1971: "PCRV room" changed to "reactor building" per PSC  
comments

line 1947: modified per PSC comments

SECTION 11.2.3

line, 1981,  
1985-1986: modified per PSC comments

line 2019: "Health Physics" changed to "Radiation Protection"  
per PSC comments

SECTION 11.2.3.1.2.1

lines 2092-2093: "Silver Zeolite" added per PSC comments

line 2120: "calibrated" changed to "ranging"

lines 2122, 2125,  
2147, 2148, 2149: " $\mu$ Ci" changed to "micro-Ci"

line 2202: "Nobel" changed to "Noble"

lines 2211, 2227: "area" added per PSC comments

lines 2211, 2217  
2220, 2223: " $\mu$ Ci" changed to "micro-Ci"

line 2238: misspelling corrected

line 2248, 2252: " $\mu$ Ci" changed to "micro-Ci"

lines 2290-2294: discussion modified for clarity per PSC comments

lines 2301, 2331,  
2338-2344: " $\mu$ Ci" changed to "micro-Ci"

line 2348: spelling of "is" corrected

lines 2368-2370: channel 6213 added

SECTION 11.2.3.1.2.1 (Cont.)

lines 2378, 2379,  
2381, 2418, 2440: "µCi" changed to "micro-Ci"

lines 2395-2397: modified per PSC comments

lines 2426-2428: channel 46212 added

SECTION 11.2.3.1.2.2

lines 2472, 2476,  
2481: "blow" changed to "open" per PSC comments

SECTION 11.2.3.1.3

lines 2488-2513: section names added and text modified for clarity  
per PSC comments

line 2520: "cartridge" changed to "charcoal or zeolite cartridge"  
per PSC comments

line 2523: reference to Section 7.3.5.2 added

SECTION 11.2.3.1.4

line 2537: "required" changed to "provided" per PSC comments

SECTION 11.2.3.1.5

lines 2572-2574: modified per PSC comments

line 2608: reference to figure added

line 2618: "thermometers" changed to "thermocouples" per  
PSC comments

line 2621: reference corrected

line 2625: periodicity changed to concur with Tech. Specs.

lines 2639-2640: channel 6213 added per PSC comments

line 2674: "blowing" changed to "opening" per PSC comments

lines 2692-2693: channel 26212 added

SECTION 11.2.3.1.6

line 2708: last paragraph deleted per PSC comments

SECTION 11.2.3.2.1

line 2723: "or" added per PSC comments

SECTION 11.2.3.2.2

lines 2770-2771: modified per PSC comments

lines 2787, 2790,  
2794: "dose rate" changed to "exposure rate" per  
PSC comments

line 2789: "calibrated" changed to "range" per PSC comments

TABLE 11.2-3: asterisk added at Channel RT-93251-1

## DRAFT 1

### REWRITE UNIT 11 SUMMARY OF CHANGES

#### FSAR SECTION 12

The nature of the changes in the station organization and the shift of emphasis from construction to operation makes most of the material in the original FSAR completely irrelevant. To provide some sort of historical perspective in the Updated FSAR, we have elected to summarize some of the material from the original FSAR and include it (such as that shown in Section 12.1.2 and 12.2.1).

Because the changes have been quite extensive throughout this section, it is virtually pointless to attempt to provide a line-by-line description of changes. Therefore, for each subsection, the description of change indicates the nature and extent of the changes and identifies the source of the information used to make the change.

#### SECTION 12.1.1

Virtually all of the titles for plant organization positions have been changed to reflect the current organizational setup. Also, a new chart, Figure 12.1-1, showing the current organizational setup has been provided for. The general discussion of the background and responsibilities of the four persons holding management positions in nuclear production is all new material. The description of the responsibilities and authority of the shift supervisor was extracted from a memorandum describing departmental policy which was issued by Oscar Lee, dated 1-25-82 (and is further identified as OP Order No. 80-18. Also see P-82025 dated 1-25-82.)

#### SECTION 12.1.2

Some historical perspective is provided here by referencing the organization for initial plant startup as depicted in the original FSAR Figure 12.1. The new organizational chart for operation of Fort St. Vrain is identified in the new Figure 12.1-2. This chart was taken from the Technical Specifications but was subsequently modified to incorporate changes included in a PSC memo dated 12-22-81 from Ewald to Oscar Lee, concerning nuclear production organization structure changes. The description of the positions which make up the shift complement is based primarily on the Technical Specifications.

Because the start-up tests have not been completed up to 100% power, the original FSAR commitment to have GA shift engineering and other GA advisors available for start-up testing may still be considered in force by the NRC. Therefore, material has been included here to indicate that the GA advisory personnel are available on request.

### SECTION 12.1.3

Because there have been extensive changes to the organizational setup, this section has been broken down into three subsections, one for each of the departments in the new organization. In each subsection, there is a description of the responsibilities of the organization and of the responsibilities of the various people within the organization.

#### SECTION 12.1.3.1

Most of the material in this subsection is derived in part from material contained in the original FSAR, but extensive changes have been made because of changes in titles and changes in allocation of duties and responsibilities among the various managers and supervisors.

The responsibilities of the Superintendent of Maintenance have been changed to include responsibilities for incore refueling operations. Furthermore, the requirement that all fuel handlers hold the special NRC Senior Operators License has been included in the description of those responsibilities.

#### SECTION 12.1.3.2

The Radiation Protection department did not exist in the original FSAR, therefore this section is completely new, but it does contain some of the information from the old FSAR, particularly that concerning the Health Physics Supervisor (previously the Senior Health Physicist). As with the previous sections, all titles have changed significantly and have been incorporated in this new section.

SECTION 12.1.3.3

The Technical/Administrative Services department did not exist in the old FSAR. This new section incorporates material to describe the responsibilities of each supervisor in this new department. In addition, there is new material which outlines the new Technical Advisor requirements and a description of their responsibilities. There is also new material describing the responsibilities of the Supervisor of Maintenance Quality Control.

SECTION 12.1.4

This section, which describes the training and background of key personnel, has been changed extensively to reflect the new organization as well as the backgrounds and qualifications of the people who now fill those key positions. The source of information for this material was PSC letter dated 10-15-79, P-79233. However, that material is approximately two and one-half years out of date and it was updated for inclusion in the FSAR. There were some people who were not at Fort St. Vrain at the time of the submittal of the P-79233, and some of the current positions and organizations did not exist at that time. Information was drawn from the position specifications data base in the PSC computer as well as from Training Department files.

SECTION 12.1.5

This section deals with the responsibilities, qualifications and experience of the General Atomic support or advisory personnel. Again, to provide some historical perspective, we have referred to the description of those GA responsibilities as described in the original FSAR. As indicated earlier, the PSC option to continue to utilize GA advisory personnel as needed has been incorporated here. The description of specific GA positions has been deleted but much of the material describing background and experience of the GA personnel has been retained from the original FSAR.

SECTION 12.1.6

Because the Nuclear Engineering Division did not exist in the original FSAR, all the material here is new. The source of the information at the beginning was Mr. Larry Brey's position description. We have added some information to tie the text material in with Figure 12.1-3, which shows the Nuclear Engineering Division organization chart.

SECTION 12.1.7

This is a new section which was added to summarize the other PSC engineering and technical support that would be available to Fort St. Vrain to assist them in dealing with an emergency. PSC letter dated 10-15-79, P-79233, is also referenced here because that submittal included a great deal of information about PSC resources, other than Fort St. Vrain. Excerpts from the response to question 12.1 have also been included in this section.

SECTION 12.1.8

This new section has been included to point up the fact that PSC does have contractual relationships with a number of outside firms and consultants who are committed to provide technical support when needed. Some material remains from the original FSAR and some has been incorporated from PSC letter dated 10-15-79, P-79233.

FIGURE 12.1-1

This figure was taken from the Technical Specifications, Figure 7.1-1. Notations have been added to it to refer to other figures where additional organizational detail may be found. Other notations have been added to identify the NFSC and PORC.

FIGURE 12.1-2

This Figure was taken from the current Technical Specifications, Amendment 24, page 7.1-20. However, it was revised in accordance with the December 22, 1981 memo from Ewald to Lee.

FIGURE 12.1-3

This organizational chart for the Nuclear Engineering Division was constructed by us based on the information in Mr. Brey's position description.

#### TABLE 12.1-1

This is a completely new table which has been added to compare Fort St. Vrain's key positions with those identified in ANSI N18.1. This type of presentation was originally submitted to the NRC in PSC letter dated 10-16-79, P-79233. However, it has been edited to reflect current organization structure, current titles, and re-definition of responsibilities.

#### SECTION 12.2.1

The information from the original FSAR has been condensed considerably and edited to provide some historical background on the training of the initial plant staff. Table 12.2.1 through Table 12.2.4 have been deleted because they are no longer pertinent; however, they are referred to in order to provide an historical link between the updated FSAR and the original FSAR.

The purpose of summarizing this information and bringing it forward into the updated FSAR is to point out the fact that 16 of the 20 persons who completed this initial training and licensing remain employed with PSC, and, of those, 11 remain in positions at the Fort St. Vrain plant.

#### SECTION 12.2.2

The first two paragraphs contain material from the original FSAR, but it has been changed somewhat to reflect the current policies and positions. The remaining paragraphs in this section are completely new and also reflect current practices. That portion of this section that deals with the technical advisor training is completely new and was taken from information obtained from the Training Department.

#### SECTION 12.2.3

This section also retains some material from the original FSAR but the last portion of the paragraph is new.

#### SECTION 12.2.4

This entire introductory section was written based on the current Radiological Emergency Response Plan. This section was further broken down to permit discussion of the on-site and off-site emergency response force training.

#### SECTION 12.2.4.1

All of the material in this section was taken from the Training Program Administrative Manual (TPAM), Section 4, Situation Response Training Program. It has been condensed considerably to provide only the basic information regarding who is subjected to training and the content of the training programs.

#### SECTION 12.2.4.2

This section also was condensed from material given in the TPAM, in particular Section 4.6.

#### SECTION 12.2.5

Almost all of the material in this section is new. The material on licensed operator requalification programs was taken from Administrative Procedure G-7A, Issue 4. The material on technical advisory training and retraining was taken from PSC letter dated 12-30-80, P-80444.

#### SECTION 12.2.5.1

All of this material was taken from Administrative Procedure G-7A, however it has been condensed and edited to conform more closely to the style of writing in the remainder of this section.

#### SECTION 12.2.5.2

This material also is taken from Administrative Procedure G-7A.

#### SECTION 12.2.5.3

Information on the training review panel is taken from Administrative Procedure G-G-7A.

SECTION 12.2.5.4

Information on technical advisor requalification was taken from P-80444.

TABLE 12.2-1

This information was taken from Administrative Procedure G-7A.

TABLE 12.2-2

Likewise this information came from Administrative Procedure G-7A.

TABLE 12.2-3

This information was extracted from Procedure G-7A.

SECTION 12.3

The opening statements in this section were taken from the Administrative Procedure Manual, Procedure G-2.

SECTION 12.3.1

All of the material in this section is completely new and is based on the present procedure system.

SECTION 12.3.2

The opening paragraph was written to introduce the Radiological Emergency Response Plan. The second paragraph was taken from section two of the Ft. St. Vrain RERP. The next paragraph simply lists the more important plans and procedures which make up the Ft. St. Vrain emergency response plan overall package.

SECTION 12.3.2.1

This is an entirely new section and the material for it was extracted from Section 3 of the Ft. St. Vrain RERP.

#### SECTION 12.3.2.2

This is new material and was extracted from Section 4 of the Ft. St. Vrain RERP. The principal reason for including this material was to provide some reference material concerning emergency plans in the FSAR. In addition, it would seem wise to do so because the NRC Standard Review Plan indicates that this material should be included. Also, NRC Question 12.3 dealt with matters which are now answered by the material included here in terms of the current RERP.

#### SECTION 12.3.2.3

It was not considered desirable to include all of the Tables from the RERP which define the various action levels. However, it was considered important to at least make reference to the fact that the accidents analyzed in Section 14 are dealt with in the RERP in terms of initiating events and incident classifications.

#### SECTION 12.3.2.4

This material is new and merely describes the implementing procedures for the RERP.

#### SECTION 12.3.2.5

This is a new section also, and was extracted from the Medical Emergency Plan.

#### SECTION 12.3.2.6

This material had previously been included in the original FSAR as Section 12.3.2. However, with the new setup for the FSAR it appeared more logical to locate it here. The information was edited and rewritten based on current procedures and practices. The list of emergency procedures topics was extracted from the emergency procedure.

#### SECTION 12.3.3

This section from the original FSAR was retained but was edited to conform to the current RERP and current practices. It is considered desirable to continue to compare the RERP to the Appendix E of 10CFR50.

Some of the details were eliminated from Item B. The material under Item C was deleted and reference was made to new Section 12.3.2.2. Part D was edited extensively to delete references to future actions or intent and to correct nomenclature, organization title and current practices. In Part H, reference is simply made to new Section 12.2.4.

#### SECTION 12.4

A reference has been added to 10CFR50, Appendix B, and to Appendix B of the updated FSAR. Also, at the end of the paragraph, information is included regarding reporting requirements of the license and technical specifications.

#### SECTION 12.5

This entire section has been revised to conform to the current Technical Specifications. Most of the material in this section was actually extracted from the current Technical Specifications.

#### SECTION 12.5.1

Information has been included concerning the operational information assessment group and some of the information is from the original FSAR but it has been extensively edited.

#### SECTION 12.5.2 and 12.5.3

The information has been extracted from the current Technical Specifications and edited for inclusion here.

#### SECTION 12.5.4

This is a new section which was inserted to complete the information pertaining to review and audit of operations. Reference is made primarily to Appendix B of the updated FSAR for the QA program for operations.

#### SECTION 12.6

This is a new section dealing with station security. It was agreed very early in the FSAR update planning that few details of plant security were to be included in the updated FSAR. However, there was an NRC question on security and it was considered advisable to include this section, primarily to refer to the Ft. St. Vrain Security Plan. This section provides some information which will be useful for reference purposes and to identify the principal regulations and NRC guidance which have been utilized in the preparation of the Security Plan. This is considered prudent from the standpoint of possible review against the NRC Standard Review Plan.

## INCORPORATION OF NRC QUESTIONS TO FSAR SECTION 12

### QUESTION 12.1

This question deals with the availability of off-site support for Fort St. Vrain. Excerpts from this question have been included in the FSAR Update in Section 12.1.7. It is also important to note that a considerably more detailed response regarding availability of support was transmitted to the NRC in PSC letter dated 10-16-79 (P-79233), which has been included as Reference 11 for Section 12 of the Updated FSAR.

### QUESTION 12.2

This question deals with details of the start-up organization. Because that phase of plant operation was completed a long time ago, the only thing included in the updated FSAR are statements referring to the original FSAR. It is important to note that we have included discussion of responsibilities for the various positions which are comparable to those discussed in the response to Question 12.2.

### QUESTION 12.3

This question deals with a number of matters that concern the development and implementation of the emergency plan. It was agreed early in the FSAR update planning that the emergency plan would be summarized briefly in the Updated FSAR and that the radiological emergency response plan itself would simply be referenced since it also is a document that has been submitted to the NRC for their review and approval. Therefore, the material from the RERP has been condensed and incorporated into Sections 12.3.2, 12.3.2.1, 12.3.2.2, 12.3.2.3, and included in the updated FSAR. A description of the RERP implementing procedures has been included as Section 12.3.2.4. Excerpts from the Medical Emergency Plan have been included as Section 12.3.2.5 of the material from the responses to Question 12.3.

### QUESTION 12.4

This question deals with security. It was agreed that the Updated FSAR would not include any significant detail regarding plant security. Rather, the Security Plan would be referred to since it also is one of the documents which has been submitted to the NRC for review and approval.

Furthermore, it was agreed that, for security reasons, very little would be mentioned regarding equipment, facilities or procedures to avoid compromising any of the information. Therefore, nothing has been incorporated from Question 12.4 into the Updated FSAR on security. A new Section 12.6 has been added to provide a brief discussion of the security areas and the types of information covered by the Security Plan.

DRAFT 2  
REWRITE UNIT 11 - SECTION 12  
SUMMARY OF CHANGES

Unless otherwise indicated, all changes which have been made, were made in accordance with PSC's comments on the initial draft.

Section 12.1.1

line 173: Added the word "electric".

line 184: Added the word "electric".

Section 12.1.2

line 303: Deleted the word "conventional".

Section 12.1.3.2

lines 449-450: Changed "consultant" to be plural and changed the verb tense accordingly. This is slightly modified from the way PSC commented.

Section 12.1.3.3

line 468: Changed the title for Maintenance Quality Control Supervisor.

line 482: Added the words "technical services".

line 523: Changed the title for Maintenance Quality Control Supervisor.

Section 12.1.4.3

line 642: This sentence was rewritten in accordance with PSC's comments. However it was slightly modified without changing the intent.

Section 12.1.4.4

line 660: Added an apostrophe.

Section 12.1.4.5

line 677: Changed the word "or" to "of". (Not PSC comments).

Section 12.1.4.9

line 767: Capitalized the word "english".

Section 12.1.4.10 Deleted the Scheduling & Stores Supervisor and substituted Shift Supervisor - Administration. The entire write-up for this section was furnished by PSC.

Section 12.1.4.11

This is a new section to cover the Shift Supervisor - Training. The entire section was written and furnished by PSC.

Section 12.1.4.12

line 806: This section was renumbered.

Section 12.1.4.13

line 838: This section was renumbered.

Section 12.1.4.14

line 850: This section was renumbered.

line 856: The sentence relating to Navy Nuclear Power School was deleted.

Section 12.1.4.15

line 860: This section was renumbered.

Section 12.1.4.16

line 874: This section was renumbered.

Section 12.1.4.17

line 895: This section was renumbered.

Section 12.1.4.18

line 917: This section was renumbered.

lines 921-926: This information was furnished by Mr. Milt McBride to describe the background qualifications of the incumbent.

Section 12.1.4.19

line 930: This section was renumbered.

line 936: Added references 9, 10 and 15.

Section 12.1.4.20

The number of this section was changed.

Section 12.1.5

line 1017:

The word "of" was changed to "or". PSC had commented on this in a slightly different fashion but it is believed that this change adequately resolves PSC's comments.

Section 12.1.6

line 1073:

The spelling of the word "program" was corrected.

Section 12.1.7

line 1101:

Added the word "electric".

Figure 12.1-1:

Changed the title of "Vice President, Production" to "Vice President, Electric Production". Also deleted the solid line co-necting the block for NSSC and PORC (This was done in accordance with a comment made on December chart in Appendix B).

Figure 12.1-2:

Changed the title of "Ship Supervisor - Administrative" to "Ship Supervisor - Administration". Corrected the spelling for Senior Maintenance Supervisor. Added 4 each to the technical advisors block. Corrected the spelling for licensed operator.

Figure 12.1-3:

Changed the title from "Vice President - Production" to "Vice President - Electric Production".

Section 12.2.1

line 1217:

Added the word "by".

Section 12.2.2

line 1262:

Added the word "an".

Section 12.2.4

line 1343:

Edited in accordance with PSC's comments.

Section 12.2.4.1

line 1384:

Added the word "the" preceding each of the three on-site emergency teams.

Section 12.2.4.2

line 1480: Changed the title "Vice President, Production" to "Vice President, Electric Production".

Section 12.2.5

line 1499: Deleted the words "by the NRC".

Section 12.2.5.1

line 1520: Added references 8 and 12.

Section 12.3.1

line 1714: Added the word "for".

Section 12.3.2

line 1787: Corrected the spelling of the word "and".

Section 12.3.2.1

line 1807: Corrected the spelling of the word "the".

Section 12.3.2.2

line 1909: Corrected the spelling and spacing for the word "and".

line 1942: Added the word "of".

line 1954: Added the words "or up".

lines 1963,1964: Wrote out the words "Protective Action Guides".

Section 12.3.2.4

line 2010: Added the reference number.

line 2018: Deleted the word "For" at the beginning of the paragraph.

line 2026: Changed the word "insufficient" to "sufficient".

Section 12.3.3F.

line 2279: Changed the word "exposure" to "contamination".

Section 12.5.1

line 2381: Changed the word "is" to "it".

Section 12.5.3

line 2534: Added the word "Electric".

line 2547: Added the word "Electric".

Section 12.5.3.1

line 2557: Added the word "Electric".

Section 12.5.3.2

line 2594: Changed the word "did" to "do".

Section 12.5.3.3

line 2643: Changed "audit" from singular to plural and changed the verb accordingly.

line 2656: Deleted the words "for the fire protection audit".

Section 12.6

line 2708: Added the reference number.

References for Section 12

SPECIAL NOTE:

In PSC's comments at what had been reference 10 in the April 8, 1982 draft, PSC added P-80444 as that reference. This actually duplicates the letter that was reference 15 in the draft dated April 8, 1982. This duplication was not noticed until after the laser printout for the second draft had been completed. Corrections have been made to eliminate the duplication in the reference section; however, at the present time, references throughout the text may or may not be correct. A thorough check will be made before going final and all references will be correctly numbered and correctly referred to in the text.

lines 2746-2751: The information furnished by PSC for these references has been incorporated as supplied.

Summary of Changes  
Section 13  
Rewrite Unit 11

Section 13.1

line 141	Changed verb tense
lines 150-153	Changed verb tense
line 156	Verb tense
line 159	Deleted equal to or greater than sign and added the words "one percent power or less"
line 163	Put in the words "greater than" instead of the symbol
lines 163-164	Deleted the word "will" and added the word "tests": also added a coma after the word "power"
line 164	Added a coma after "levels"
line 165	Verb tense
line 167	Verb tense: added coma after the word "made"
line 172	Verb tense
line 174	Verb tense
lines 175- 177	Verb tense: also deleted the word "Gulf"

Section 13.2.1

line 189	Verb tense
line 191	Verb tense

Section 13.2.1.1

line 199	Inserted the word "those"
line 200	Deleted the words "will help" and inserted the words "were cleaned and flushed"
line 201	Verb tense
line 204	Added coma after the word "levels"

line 204                    Inserted the words "to reduce the time required for":  
Deleted the word "time"

Section 13.2.1.2

line 211                    Changed verb tense: inserted the words "was performed to"

lines 213-214              Verb tense

line 216                    Added the words " a leak test was also performed" to  
replace other words which indicated future plans.

line 217                    Verb tense

line 219                    Added the words "were conducted to" and deleted the  
word "will"

Section 13.2.1.3

line 230                    Changed verb tense

lines 230-231              Added the words "was performed on"

line 232                    Changed verb tense: deleted the word "thorough" and  
replaced it with the word "other"

line 236                    Verb tense

lines 239-240              Verb tense

line 243                    Verb tense

lines 252-254              Changed verb tense

line 255                    Deleted the words "by performing" and replaced with  
the words "in which "

line 257                    Added the words "were performed" at the end of this  
sentence: Also added the words "and integrity" in  
the beginning of the next sentence

line 259                    Change verb tense to indicate that the work was  
verified rather than to be ascertained

Section 13.2.1.5

lines 268-269              Verb was changed and the sentence was rearranged and  
edited to make better sense.

line 273                    Change verb tense to indicate that the work was per-  
formed: also added a coma between "by" and "Public"

line 274                    Added the words "those efforts were directed toward  
insuring" to make the sentence more meaningful

lines 277-279

Verb tense changed

Section 13.2.2

lines 288-291

Verb tenses were changed and minor editing was done to make the sentence read better.

lines 291-292

All of this information was added to document the historical events associated with preoperational testing.

lines 294-319

This material was added to incorporate most of the information which was contained in PSC's response to NRC question 13.1. It has been edited extensively to bring it up to date.

lines 322-331

These words were added to account for the fact that much of the material in the next four sections was originally in the FSAR indicating work that was to be performed. It has now been extensively edited to document the fact that those tests have been completed. In addition, the words in these lines introduce the separate sections for the outflow test discussions.

Section 13.2.2.1

lines 339-362

The major change here is to verb tenses. However, some words have been added in order to make sense. PSC should examine the sentence at lines 362 through 364 and advise how this sentence should be changed so that it makes sense.

line 369

Changed verb tense and added the word "tested".

lines 369-370

Changed verb tense

lines 371-373

The words "to demonstrate proper movement, sequencing, and control." were added. Also on line 373 verb tense was changed.

lines 373-375

The words "cooling system of the" were added. Also the words "flow tests" were added. The words "cooling system" were deleted following "fuel handling machine".

line 375

The words "were performed on" were added.

line 375

The words "on the" were added; also the words "will be flow tested" were deleted from the end of the sentence.

line 380

A coma was added after prerequisites.

lines 381-385

Changed verb tense.

line 326 Changed the word "the" to "that"

line 389 Verb tense was changed

lines 389-391 The words "with particular attention to conditions" were added.

lines 394-395 Verb tense changed

line 395 Added the word "tests" and changed verb tense

lines 397-399 The words "were tested to verify their capabilities" were added.

lines 400-401 The words "tests were also conducted to verify" were added. The words "will be determined" were deleted from the preceding sentence. Also on line 401, the word "capability" was added in place of the word "to".

line 402 The words "also will be tested " were deleted.

line 405 Verb tense changed

line 409 Verb tense changed

line 410 Deleted the word "of" and began the sentence with the word particular; also added the word "attention" in place of the word "interest"

line 410 Added the words "was given to" in the process of changing verb tense

lines 414-529 The changes here consist primarily of verb tense changes along with some minor editing to fit the meaning of the new verbs. Line 431, added a reference to new Section 13.2.2.5 where the hot flow test is discussed; deleted the word (below). Also on line 431, deleted the word "of" and began the sentence with "particular" and, again, substituted the word "attention" for the word "interest". Line 431, added the words "was given to". Line 432, shifted the word ability to a different place in the sentence to make it flow better. Line 434, added a comma after the word range; deleted the parenthesis and inserted the word "from" right after the comma.

Section 13.2.2.2

lines 442-445      Verb tense changed

line 445            Added the words "indepth tests were conducted on the"

line 447            Added the word "system" followed by a coma

line 447            Changed the word "plus" to "and"

line 449            Deleted the words "will be carried out in depth"

line 450            Verb tense changed

Section 13.2.2.3

lines 458-472      Verb tenses were changed and some editing was done to words and phrases to make the explanation more meaningful.

Section 13.2.2.4

Only verb tenses were changed in this section.

Section 13.2.2.5

line 493            The word "Procedure" was added to the section heading.

lines 497-501      Verb tenses were changed; the word "oversized" was added to describe the Pelton wheels used for heat up; and the words "pre-test" and "post-test" were edited to make the sentence read better.

lines 504-507      This material is added to provide some historical perspective and to tie in with the material which follows. The introductory paragraph which describes the systems under test in normal and abnormal modes along with the eight numbered paragraphs following the introductory sentence were deleted.

lines 510-637      All of the material here was taken from General Atomic Report GA-A13156 and Hot Functional Test dated February 21, 1975 which was transmitted to the NRC by PSCO letter dated March 5, 1975. There are many editorial changes to tie the material together and to rearrange it so that it fits more uniformly into the FSAR format. Some of the editorial changes also involve words which were added to tie the material together and to incorporate historical information which seems to be needed.

line 639            A new sub-heading was incorporated.

lines 642-675      The only changes here were to put the numbers of the paragraphs in parentheses to more uniformly fit the format being used.

line 675            The words "listed above" were deleted following "uses", and all of the words thereafter on that line were added.

lines 678-712 A minor change in item 10 which added the word "control"; Otherwise the only changes were to put the paragraph numbers in parentheses.

line 693 Added the word "other"

line 694 Changed the verb tense and added the words "as appropriate"

line 697 Deleted the words "which will" and added the word "to"

line 700 This is a new sub-paragraph heading.

line 707 Changed verb tense.

line 712 Changed verb tense.

line 719 This is a completely new subsection heading and a completely new subsection. The opening sentences were written to provide a proper lead in to material that was extracted from General Atomic Report GA-A13156 and a report dated February 21, 1975 which was submitted to the NRC via a PSC letter dated March 5, 1975, both reports concerning the results of the Hot Functional Test.

line 726 - 1061 All of the material was extracted from the two reports identified above. It is important to point out that some of the material was condensed and edited for inclusion here. However, it was not intended that any of the basic information be changed. However, certain portions of this new section should be examined carefully by GA and PSC to verify that the statements made are correct and acceptable for submittal to the NRC.

line 816 - 849 This section describes the results of the Liner Cooling System Test. PSC and GA should consider whether it is appropriate to say anything about the System 46 tube failure and the course support floor and the action that was taken to correct that particular problem.

line 969 - 994 PSC and GA should examine this material very carefully to make sure that it is consistent with current thinking regarding the moisture monitoring system. In particular the statement at lines 993 and 994 should be evaluated.

Table 13.2-1 This is a new table which was taken from the PSC response to NRC Question number 13.1. It is important to point out that we have not included all of the material that was submitted in that Question 13.1 response. However, we believe that we have included all that is necessary.

Reference for Section 13.2 All of these references have been added to identify material used in the preparation of the update for Section 13.2.

Section 13.3.1

lines 1114 - 1127

A number of verb tense changes have been made. In addition, at line 1114, 1116 and 1122, minor editorial changes were made for clarity and consistency with the new verb tenses.

Section 13.3.2

lines 1135 - 1140

This material was added to provide historical perspective and to identify the A-Series start-up test.

lines 1143 - 1219

All of this information is a combination of words from the original FSAR and words from the technical paper authored by Dr. Olsen and furnished to us as part of Mr. Larry Brey's comments on the suggestions for updating Section 13. An effort has been made to retain those parts of the FSAR material which are pertinent and to intergrade the results, as described by Dr. Olsen, in such a way that they blend in well together.

Section 13.3.3

As with the previous section, the material here is a combination of the original FSAR material and material from Dr. Olsen's paper. Verb tenses have been changed in some cases other editorial changes have been made to be consistent with the fact that we are reporting what has happened rather than what is planned to be done.

Section 13.3.4

line 1320

The time of initial criticality has been added for historical reference purposes.

line 1320 - 1326

Verb tenses have been changed.

lines 1322 - 1348

This material was taken from General Atomic Report GA-A13038.

References for Section 13.3

These references have been added. Note that Reference 4, General Atomic Report GA-A13522 has been added and was used as the reference for the information preceding line 1253.

*GA comments, yay?*

Section 13.4

lines 1376 - 1381

This information was added to provide historical perspective and to explain the plan for testing. Some of the information was presented in PSC's response to NRC Question 13.2.

lines 1384 - 1440

This information was added to again provide some historical perspective and to explain the basis for the various operating restrictions that have been placed from time to time by the NRC.

lines 1397- 1401

This information was derived from pre-P letter dated October 16, 1973 and pre-G letter dated July 12, 1974.

lines 1404- 1418

This information was derived from PSC letter P-75024 dated 12-15-75.

lines 1421- 1425

This information was derived from PSC letter P-78189.

lines 1428 - 1435

This material was derived from PSC letter P-78087.

lines 1438- 1444

This material was added to clarify how the power restrictions were dealt with in the test program. In addition, the chronology of start-up testing events is introduced here in the form of Table 13.4-2. It is important to point out that there may be other important events which PSC would like to include in this Table; or there may be things in the Table that PSC wants to delete. In either case, PSC and GA should review the Table carefully and add or delete events as appropriate.

Section 13.4.1

lines 1452 - 1463

This is original FSAR material, but the verb tenses have been changed. In addition, there are some editorial changes to improve punctuation and general clarity. Also, a reference is made to Table 13.4-1 for a listing of the A-series start-up test.

lines 1466 - 1467

This sentence was added to tie in with the information which follows that sentence.

line 1471 - 1689

New sub-paragraph numbers have been assigned to each of the A-series start-up tests. This was done for ease in referring to the sections and also to make the titles more prominent in the text for easier reading.

Section 13.4.1.1

This material is basically what is already in the FSAR. Verb tenses have been changed and some editing done to improve clarity. The last sentence was added to indicate that the result was discussed in Section 13.3.3.

Section 13.4.1.2

The same comments apply as those for Section for 13.4.1.1.

Section 13.4.1.3

This material is from Dr. Olsen's paper which was furnished to us as part of Mr. Larry Brey's comments on the updates for Section 13.

Section 13.4.1.4

The material here is a combination of original FSAR material and information from Dr. Olsen's paper. Some editorial changes have been made and some words and phrases rearranged for better integration of the different styles of writing. Note that the title of SUT A-7 has had the word axial added. Also note that General Atomic Report GA-A13176 was also used in the preparation of this material and in verifying some of the statements made.

Section 13.4.1.5

This material is also a combination of original FSAR material and information from Dr. Olsen's paper on low power physics testing. Verb tenses have been changed and other editorial changes have been made to make the two different writing styles blend better. The reference used by Dr. Olsen is an internal GA document which probably should not be used as a reference. Therefore, we need a valid reference in place of that document to include in this Section as Reference 15. PSC or GA should supply the information needed for that Reference.

Section 13.4.1.6

Information here was derived from General Atomic Report GA-A13522.

Section 13.4.1.7

Information in this section was derived from PSC Semi-Annual Report which was submitted with pre-P letter dated February 28, 1975.

Section 13.4.1.8

line 1654 - 1656

There were virtually no changes here other than punctuation and verb tense changes. If PSC or GA wants additional information included for the low power helium purification system test, it should be furnished to us promptly.

Section 13.4.1.9

lines 1665 - 1678

The material here was in the original FSAR and has not been edited to change verb tense. In addition, use of the term "small Pelton wheel" and "normal Pelton wheel" has been changed to "the new forged Pelton wheel".

lines 1681 - 1689

The information here was derived from material discussed in NRC letter dated 8/19/80, G-80139. PSC should examine this material carefully to determine if it is correct and if this is what PSC really wants to submit to the NRC.

Section 13.4.2

line 1693

The title of this section has been changed by adding in parentheses 0 to 70 percent. The purpose of this change is to make a distinction between those tests that were conducted up to 70 percent and the manner of conducting the B-series start-up test from 70 to 100 percent power. This latter category is covered in a new section 13.4.4.

lines 1697 - 1698

The phrase pertaining to removal of the restrictions on power operation was added.

lines 1701 - 1704

This is new material to indicate what the original plans for B-series testing was, and to introduce the temperature fluctuation problem and its effect on the test sequence.

lines 1707 - 1784

This material is basically what was already in the FSAR, with changes made to verb tense and some editorial changes for clarity and to improve the readability. In addition, notations have been made where appropriate to limit the discussion to those tests performed up to 70 percent power. In addition, other editorial changes have been made to make the wording consistent with the verb tense changes.

line 1757

11 percent power was changed to 13 percent power.

lines 1763 - 1764

PSC should check this sentence very carefully and should verify that it is a correct statement and one that PSC wants to make to the NRC.

lines 1767- 1770

PSC should examine this statement and make sure that it is correct. In addition, PSC should be sure they want to make this statement to the NRC.

line 1774

100 percent power was changed to 70 percent power.

In the original FSAR, the titles to the B-series tests were listed and underlined, and there was a discussion of what was intended to be done for each test. In this updated FSAR, new sub-paragraph numbers have been assigned to each of the B-series start-up tests for ease in referring to the information on those tests as well as to set the paragraph headings out from the text to make things easier to find. This applies to Sections 13.4.2.1 through Section 13.4.2.13 "lines 1788 through 2184". Also note that the startup test numbers, B1 through B13, have been incorporated into the paragraph headings.

Section 13.4.2.1

The information here in the first paragraph is from the original FSAR, edited to incorporate verb changes. In addition, at line 1797, the power level was changed from 26 percent to read 26% to 28%. The information in the remaining part of this new sub-section was derived from General Atomic Report GA-D14253 and D-15629.

Section 13.4.2.2

lines 1835 - 1840

The material from the original FSAR has been edited to change verb tense and improve clarity.

lines 1843 - 1859

This information was added to provide accurate information about the real problems experienced with the power system. PSC should examine this material very carefully and determine that it is correct. PSC should also make a determination as to whether this material they want to submit to the NRC.

*Delete  
1858-59*

Section 13.4.2.3

lines 1867 - 1871

Material from the FSAR was edited to change verb tense.

lines 1874 - 1879

These words were added to introduce the problem of excessive heat loads in the control rod drive penetrations.

lines 1882 - 1897

This information was derived from General Atomic Report GA-D15629.

lines 1897 - 1898

PSC should examine this statement to make sure that it is correct and that they really want to say this to the NRC.

line 1900 - 1904

This information was derived from General Atomic Report GA-D14341. PSC should examine this material to make sure that they want to include it in the FSAR.

Section 13.4.2.4

lines 1912 - 1918

This material from the original FSAR was edited to change verb tense.

line 1918

PSC should examine the statement regarding calibration at 100% power. If this statement is not correct, PSC should advise us how to modify the information.

lines 1921 - 1924

This material was derived from General Atomic Report GA-D14886.

lines 1927 - 1938

This material was derived from General Atomic Report GA-D14260 and GA-D14141.

lines 1941 - 1944

This information was derived from General Atomic Report GA-D 15629.

Section 13.4.2.5

lines 1952 - 1960

This material from the original FSAR was edited to change verb tense. PSC should examine line 1960 with regard to the reference to 100% power. If this should be changed, PSC should advise us what modifications to make.

lines 1963 - 1966

This information was derived from General Atomic Report GA-D14934.

line 1969

This information was derived from PSC letter P-77076.

lines 1972 - 1985

This material was derived from PSC letter P-77231.

Section 13.4.2.6

lines 1993 - 2001

This material from the original FSAR has been edited to change verb tense and to improve punctuation.

line 2000

80% reactor power was changed to 70% reactor power. We request that PSC provide information on the results of startup test B-6. We have been unable to locate any report material which gives a clear picture of plant transient performance tests completed to date.

Section 13.4.2.7

lines 2010 - 2016

This material from the original FSAR has been edited to change verb tense. PSC should examine the sentence at line 2015 through 2016 to determine if that is still intended to be done. If it is to be deleted or changed, PSC must advise us how to change it.

lines 2019 - 2030

This material was derived from General Atomic Report GA-D15629.

line 2029

The use of the word "module" does not make any sense. PSC should advise what the correct terminology should be.

Section 13.4.2.8

line 2038 - 2041

This sentence is from the original FSAR with the verb tense changed.

line 2041 - 2057

This material was derived from General Atomic Reports GA-D15078 and D15629. At line 2049, we question the use of 100 effective full power days. PSC should verify that this is a correct number or should furnish us with the correct number if it is to be changed. The same comment applies to 2051 as well. 2056 and 2057, PSC should verify that this statement is correct and that it is intended that these additional measurements be made through 100% power.

Section 13.4.2.9

2056 - 2068

These words are from the original FSAR, with verb tense changed.

2071 - 2106

This information was derived from General Atomic Report GA-D15084 as well as from GA-A12822. PSC and GA should check this material carefully to make sure that it is correct and appropriate for transmittal to the NRC.

Section 13.4.2.10

lines 2114 - 2118

The first sentence of this section is from the original FSAR, edited to change verb tense. The last sentence, lines 2117 and 18, was derived from General Atomic Report GA-D14141. If PSC or GA wants any additional information included here on the results of the Xenon buildup and decay measurements, they should indicate what additions are to be made.

Section 13.4.2.11

lines 2126 - 2131

The material here is exactly as it appears in the original FSAR. No changes have been made because we have been unable to find a summary report for this particular test. We request that GA or PSC furnish us information to include in this section.

Section 13.4.2.12

lines 2139 - 2143

This material is from the original FSAR, edited to change verb tense. PSC should verify that the statements made are in fact correct. If they are not correct PSC should advise us as to what modifications are needed.

lines 2146 - 2161

This information was derived from General Atomic Report GA-D14258. PSC should examine this material carefully, particularly the third sentence of the second paragraph at lines 2149 and 2150.

Section 13.4.2.13

lines 2170-2175

This material from the original FSAR has been edited to change verb tense and clarify word usage in line 2172.

lines 2178 - 2184

This material was derived from General Atomic Report GA- D15109.

Section 13.4.3

This is a new section which has been added to summarize the fluctuation testing and to make the tie in between completion of start-up tests below 70% power and the plans to complete the start-up testing above 70% power. The information included here was derived from PSC letter P-82036 dated February 9, 1982 (pertaining to RT-500 testing).

Section 13.4.4

This is a new section which has been added to discuss the continuing rise to power testing above 70% power.

lines 2248 - 2249

This first sentence was derived from PSC letter P-82036.

lines 2252-2257

PSC should examine these statements to make sure they are correct and they are appropriate for transmittal to the NRC.

There is a reference to a Figure 13.4-4 which is supposed to show the test schedule for transient tests above 70% power. We did not have any information on this subject. We request that PSC furnish us the information needed to create Figure 13.4-4. References for Section 13.4: All of the references here are new additions to the FSAR. Copies of these letters are enclosed for PSC's use in reviewing Section 13.

Table 13.4-1

This table is included because the material was part of PSC's response to NRC question 13.2.

Table 13.4-2

An effort has been made to construct this table based in part on the technical paper by Messrs. Olsen, Brey, and Schwart, entitled "Rise to Power Test Program" which Mr. Brey furnished as part of his comments on the update for Section 13. Other information is included which has been derived from other sources and which was considered important to present a complete picture of the test program. It is important for PSC and GA to note that there are large gaps in this table. GA and PSC both should review the contents of this table carefully and make whatever recommendations they have regarding additions or deletions.

Figure 13.4-1

This figure is basically the same as the one that appeared in the original FSAR. The title has been changed for clarity, and two footnotes have been added, also for clarity. PSC should examine footnote 2 and make sure that this statement is correct. Start up numbers have been added to the figure, again for clarity and to tie in the information with the "A" Series Test Program identifying numbers.

Figure 13.4-2

The title of this figure has been changed to indicate that the test sequence was to 70% power. In addition, the 100% power column has been deleted from the table and the 80% power column has been changed to 70% power. The B-Series start up test numbers have been added to the table to tie in with the test program identification numbering scheme.

Figure 13.4-3

This is a new figure which has been included to document the Steady State B-Series Start Up Tests which were performed between 70% and 100 % power released from the 70% power limitation. This information for the table was derived from T164.

Figure 13.4-4

This figure has been added to identify the additional B-Series Start Up Testing which will be performed between 70% and 100% power after release of the 70% power limitation. We do not have the information needed to complete this table. Therefore, PSC should furnish the information they would like to be included in this figure.

Section 13.5

This is a completely new section which has been included to introduce the in-service inspection program which had not previously been there. The material included here was derived from Los Alamos National Laboratory letter G-82014. The material was taken from that letter because it was packaged in a convenient form. The information was from three PSC letters which originally submitted the proposed in-service inspection program segments to the NRC: PSC letters P-80014 dated February 8, 1980, P-80034 dated March 3, 1980, P-80064 dated March 31, 1980. Table 13.5-1 was taken from G-82014, but the actual information derives from the three PSC letters mentioned previously. This is all new material pertaining to PSC submittal of the in-service inspection program to the NRC and the NRC's consultants' evaluation of the in-service inspection program. These comments are for PSC and GA information and may result in suggestions or recommendations from Section 13.

~~Item 1: We have not incorporated anything from PSC's responses to ~~Sections~~ 13.3 and 13.4. We do not believe that it is necessary to put any of this information into the FSAR. If GA or PSC feels that something must be done, we await further instructions.~~

~~Item 2: There is information in PSC question 14 dealing with axial xenon stability. We have not included anything in Section 13 for the same reasons we did not provide any information on results in Section 13.4.2.11. We await further instructions from PSC on this matter. Our difficulty in providing any results for the discussion in Section 13.4.2.6 on Plant Transient Performance Testing results from a lack of a good summary of the plant transient test performed at 100% power. PSC letter P-77189 provides some information but we do not have enough information to complete the discussion in Section 13.4.2.6. We await further instructions from PSC.~~

REWRITE UNIT 12 SUMMARY OF CHANGES

FSAR SECTION 14

SECTION 14.1.1.1

line 646: "OBE" added  
line 650: "DBE" added  
line 680: "OBE" replaced "Operating Basis Earthquake"  
line 689: "DBE" replaced "Design Basis Earthquake"  
line 703: "OBE" replaced "Operating Basis Earthquake"  
"DBE" replaced "Design Basis Earthquake"

SECTION 14.1.1.2

line 736: "DBE" replaced "Design Basis Earthquake"  
line 739: "OBE" replaced "Operating Basis Earthquake"  
line 742: "OBE" replaced "Operating Basis Earthquake"  
line 779: "safe shutdown earthquake" defined as "design basis earthquake"  
lines 804-805: "OBE" added  
"any increase in" replaced with "exceeding the" per PSC comments.  
line 809: "DBE" added  
line 842: "Reactor Protection" changed to "Plant Protective"  
line 915: "DBE" replaced "Design Basis Earthquake"  
lines 919-920: "OBE" added  
"DBE" added  
line 941: "°C" changed to "°F" per PSC comments.  
line 953: "safe shutdown earthquake" defined as "design basis earthquake"  
lines 964 & 967: "DBE" added

SECTION 14.1.1.2 (Continued)

line 969: "of the FSAR" deleted for consistency  
line 978: "safe shutdown" replaced with "DBE"  
line 982-983: "this ("weakest")" replaced with "the weakest",  
"(Barrel to liner keys)" added per PSC comments.  
line 989: "safe shutdown" replaced with "DBE"  
line 1032: "DBE" added  
lines 1047-1048 "operational" replaced by "operating".  
"DBE" and "OBE" added.  
lines 1056-1057 "operational" replaced by "operating".  
"DBE" and "OBE" added.  
lines 1077,  
1080, 1087,  
1099 "Design Basis Earthquake" replaced by "DBE"  
line 1109: "operational earthquake" replaced by "OBE"  
line 1124: "DBE" added  
line 1155: Parenthesis deleted per PSC comments.

SECTION 14.1.2

lines 1237-1245: Format changed to allow input into word processing  
system.  
lines 1266-1270: Added per PSC comments.

SECTION 14.1.4

line 1312: Remainder of this section deleted per PSC comments.

SECTION 14.2.1.3

line 1548: "OF" changed to "OC" per PSC comments.

SECTION 14.2.2.1

line 1718: "with the interlock ....." added per PSC  
comments.  
line 1722: Parenthetical expression deleted per PSC comments.

SECTION 14.2.2.7

line 1979:

"300°F" changed to "540°C" per PSC comments

SECTION 14.4.1

lines 2435-2436:

Footnote incorporated into title.

SECTION 14.4.2.1

line 2538:

Title modified per PSC comments.

lines 2544-2545:

"boosted firewater pump" changed to "emergency water booster pump".

line 2589:

Footnote deleted.

SECTION 14.4.2.2

line 2640:

"safety limit" changed to "temperature limit" per PSC comments.

line 2657:

"reverses" changed to "experience flow reversal" per PSC comments.

SECTION 14.4.3.1

lines 2683-2685:

Footnote incorporated into text.

line 2704:

"to maintain steam temperatures" added per PSC comments.

*Section 14.4.4.1*

line 2798:

Procedure for loop dump modified per PSC comments.

SECTION 14.5.2.2

line 3035:

"(P<sub>H<sub>2</sub>O</sub>)" & "(P<sub>H<sub>2</sub></sub>)" deleted because of incompatibility with word processing system.

lines 3044-3050:  
3060-3064

Modified format of equation to be compatible with word processing system.

line 3101:

This section, originally to be included at a later date, will be restored to the original version per conversation between J. Phelps/NPC and D. Alberstein/GA.

line 3143-3145:

Table number changed and "noble" added per PSC comments.

SECTION 14.5.2.2 (Continued)

line 3180: Footnote deleted.

SECTION 14.5.2.3

line 3468: "steam water" added per PSC comments.

line 3472: "2000 ppm" changed to "500 ppm" per PSC comments.

Section 14.5.33

lines 3685-3686: "moisture detector" changed to "loop moisture detector" per PSC comments.

"500 vpm" changed to "100 vpm" per PSC comments.

SECTION 14.5.3.4

lines 3771-3772: "and depressurization of the other steam loop" added per PSC comments.

SECTION 14.5.3.5

line 3825: "106 psi" changed to "758 psi" per PSC comments.

Section 14.5.4

line 3848: "limit of the" added per PSC comments.

SECTION 14.5.4.2

line 3967: "lowest" changed to "lower limit of the".

"805 psi" changed to "804 psi" per PSC comments.

SECTION 14.5.4.3

line 4008: "lowest" changed to "lower limit of the".

SECTION 14.6.1.1

line 4075: "short" and "(about one day per year)" deleted per PSC comments.

SECTION 14.6.3.1

line 4217: "cask" changed to "machine" per PSC comments.

SECTION 14.6.3.2

line 4368: "7.5 gpm" changed to "about 7.5 gpm" per PSC comments.

SECTION 14.10.2

line 4839:

"three" changed to "the" per PSC comments.

SECTION 14.10.3.3

line 5203:

"net core reactivity" changed to "K-effective"

SECTION 14.10.3.4

line 5248:

"5 psig" changed to "5 psi" per PSC comments.

SECTIONS 14.11.1.1 - 14.11.1.3

lines 5435, 5460:  
5484

Section numbers added per PSC comments.

SECTION 14.11.2.1.1

line 5751:

"summation is over" was added to replace the capital sigma.

line 5764:

equation corrected; this was an error in the original FSAR

line 5795:

equation corrected; this was an error in the original FSAR

line 5837:

"P<sub>CR</sub>" changed to "P subscript 'CR'" to accommodate word processing system.

SECTION 14.11.2.1.3

line 5997:

"limitation" changed to "levitation" per PSC comments.

SECTION 14.11.2.3.1

line 6241:

"STP" changed to "standard temperature and pressure" and footnote deleted.

SECTION 14.11.2.3.2

line 6343:

Footnote moved from bottom of page to bottom of table.

SECTION 14.11.2.7.1

line 6675:

"potentially" changed to "potential" per PSC comments.

SECTION 14.11.3

line 6842: "conductive" changed to "conductive"

SECTION 14.12.8.2

lines 7121-7122: Minor editorial changes to facilitate word processing.

SECTION 14.12.9

lines 7224-7226, 7228, 7246 "MPC<sub>a</sub>" changed to "MPC for air" to facilitate word processing.

FIGURES AND TABLES

SECTION 14

Figure 14.1-2 Added "Typical" to title  
Figure 14.4-3 Added "boosted" to title  
Table 14.1-1 Source added

DRAFT 1  
REWRITE UNIT 2 SUMMARY OF CHANGES  
FSAR APPENDIX A

SECTION A.0

- lines 376 - 381: These last two sentences in the paragraph were added to indicate that the R&D programs were completed and point out the fact that graphite and fuel component testing is continuing in the operating reactor.
- lines 383 - 387: This was made a separate paragraph.
- line 417: Changed "who" to "which".
- line 420: Change "the Appendix" to "this Appendix".
- lines 422 - 425: Wording was changed to put the R&D program into proper perspective with respect to issuance of the operating license and performance of full power operation.
- line 428: Changed to eliminate reference to continuing coated fuel particle development.
- lines 430 - 432: This sentence was added to refer to completion of the fuel element irradiation program.

SECTION A.1.1.1

- line 450: Changed verb tense.
- line 461: Changed verb tense.
- line 467: Changed verb tense.
- line 469: Deleted the word "Gulf".
- line 480: Changed verb tense and referred directly to Reference 2 rather than "a recent report".
- line 483: Changed verb tense.
- line 494: Deleted the words "to date" and capitalized the word "approximately".
- line 496: Deleted the word "Gulf".
- line 502: Deleted the word "Gulf".
- lines 507 - 525: This entire paragraph was added in response to the GA comment to add the experience from the F-30 capsule. It is consistent with new material taken from a variety of references and added to Section A.1.1.6.
- line 531: Deleted the word "planned".

SECTION A.1.1.2

- line 541: Deleted the words "best current".
- lines 544 - 547: This sentence was added to refer to new Table A.1.1-17.

SECTION A.1.1.3.1

- line 621: Deleted the word "Gulf" and also the words "during the past several years".

SECTION A.1.1.3.2

- lines 662 - 664: Changes were made per GA comments. In particular, 900 was changed to 1200, 2200 was changed to 1400, and 1400 was changed to 1500 degrees Centigrade.
- lines 706 - 707: Hyphens were added.
- line 711: A hyphen was added.
- line 742: Deleted the words " up-to-date".
- line 743: Reference 4 added.
- line 757: Changed per GA comments, specifically, 1400 was changed to 1450, and 1800 was changed to 1700 degrees Centigrade.
- lines 793 - 815: A discussion was added on the outer pyrolytic carbon coating failure due to microporosity. The primary reference for this section was G-80026. The background information came from conversations with Messrs. Mike Holmes (PSC) and Dave Alberstein (GA). The new microporosity specification is also taken from G-80026. (Ref. 36).

SECTION A.1.1.3.3

- line 821: Deleted the words "several years ago".
- line 829: Changed the reference numbers to refer to the correct reference number, i.e., 5 was changed to 6, and 6 was changed to 7.
- line 842: Deleted the word "recently".
- line 846: Deleted "Gulf".

line 848: Changed the reference numbers to refer to the correct reference, i.e., 7 was changed to 8, and 8 was changed to 9.

line 853: Hyphen added.

line 855: Hyphen added.

line 860: References were changed to refer to the correct numbers, i.e., 7 was changed to 8, and 8 was changed to 9.

line 875: Reference number was changed to refer to the correct reference, i.e., 9 was changed to 10.

line 890: Hyphen added.

line 894: Hyphen added.

line 898: Hyphen added.

line 904: Hyphen added.

line 913: Changed the verb tense.

line 921: Deleted the word "planned".

lines 923 - 925: Material added per GA comment and marked up page.

lines 927 - 937: As suggested by GA, this material was added to identify the fact that the ongoing fuel development program for the large HTGR is a continuation of the work done on Fort St. Vrain and that the program generates information useful in confirming the design of Fort St. Vrain fuel.

#### SECTION A.1.1.4.1

line 958: The reference numbers were changed to refer to the correct reference, i.e., 10 was changed to 11, and 12 was changed to 13.

line 1011: Changed "has" to "have".

#### SECTION A.1.1.4.3

line 1084: Deleted "Gulf".

line 1094: Changed "29" to "30".

line 1096: Deleted "Gulf".

lines 1102 - 1103: Changed "150 samples" to "190 samples" and changed "12 capsule experiments" to "13 capsule experiments".

- line 1124: Added the words "in addition to the TRISO tests".
- lines 1136 - 1174: As suggested by GA, all of this material was added to reflect the results from the F-30 capsule, as described in Reference 28, GA-A13208.
- line 1177: Deleted the words "completed Gulf".
- lines 1181 - 1182: Changed the figure number from A.1.1-6a to Figure A.1.1-7.
- line 1189: Deleted the word "calculated".
- lines 1191 - 1196: The comments previously made by GA on page A.1.1-19 were discussed later with Mr. Dave Alberstein and agreement was reached on a different approach to dealing with old Figure A.1.1-7 (now Figure A.1.1-8). The wording changes on these lines reflect that new agreement. We need verification of the reference number here.

#### SECTION A.1.1.5

- line 1217: Verb tense changed.
- line 1234: The figure number was changed from A.1.1-8 to A.1.1-9.
- line 1238: Verb tense was changed.
- line 1248: Figure number was changed from A.1.1-8 to A.1.1-9.
- line 1248: The words "and graphite shim particles" were added per the GA comments.
- lines 1253 - 1268: This material was added per GA comments. The bulk of the material is quoted directly from the Safety Analysis Report for Fuel Reload 2. (Ref. 35.)

#### SECTION A.1.1.6.1

- lines 1285 - 1291: Material was added here to distinguish between the use of coal tar pitch as the binder in the initial core and first reload segment vs. the use of petroleum derived pitch and shim particles in the fuel manufactured for the second reload segments.

SECTION A.1.1.5.2

- line 1302: Changed to indicate approximately 65 volume percent.
- lines 1305 - 1314: Changes made here were for the purpose of distinguishing between the coal tar pitch in the initial core and first reload segment vs. the petroleum derived pitch used for the second reload segment.

SECTION A.1.1.5.3

- line 1335: Deleted the words "current design".
- line 1336: Deleted the word "earlier" and added the words "injection molded".
- lines 1339 - 1340: This last sentence was added to reflect new information shown in Table A.1.1-13. (GA must furnish the new data on thermal conductivity for the Table and verify this statement.) \*

SECTION A.1.1.5.4

- line 1349: Deleted the word "recent".
- line 1373: Changed the figure number from A.1.1-8a to Figure A.1.1-10.
- lines 1393 - 1397: This material was added per GA comments. GA must supply a correct reference for the source of the material. \*
- line 1400: The word "present" was deleted.
- line 1418: Changed the words "the present successful irradiation test" to "later successful irradiation test".
- line 1427 - 1428: Added the words "the initial".
- line 1430: Deleted the word "being" and changed the word "current" to indicate "F-29 and F-30".

line 1444: Added the words "up through capsule F-28".

lines 1448 - 1501: As suggested by GA, information was added here to reflect the results of irradiation testing in capsules F-29 and F-30. The design changes to the matrix for segment 8 is mentioned. Tables A.1.1-17, -18, and -19 were added. The material is based on References 28, 33, and 35.

#### SECTION A.1.1.7

line 1505: The title of the section was changed to "Accelerated Irradiation Tests".

#### SECTION A.1.1.7.1

line 1509: The title was changed to "Accelerated Irradiation Test Program".

lines 1512 - 1626: This entire section is all new material. It has been added to try to provide an overview of the capsule irradiation test program for the Fort St. Vrain fuel. It should be checked very carefully by both PSC and GA to be sure that we have correctly interpreted and condensed the large amount of information from the various reports referenced here and listed in the list of references at the end of Section A.1.1.

#### SECTION A.1.1.7.2

lines 1635 - 1674: This section was changed extensively to delete references to future testing and to changed verb tenses to reflect the fact that all of the events have already occurred. Also, references to Figure A.1.1-9 have been deleted because Figure A.1.1-9 has been deleted. The primary reasons for leaving this paragraph in is to document the fact that the capsule irradiation program was coordinated with the production schedule so that the results from the capsule irradiation testing could be incorporated into the design early enough in the production process to be useful.

#### SECTION A.1.1.7.3

line 1678: This is a new numbered paragraph.

lines 1682 - 1690: This is new material extracted from Reference 28 to put the fuel rod irradiation program into perspective as to its purpose.

lines 1692 - 1700: This material already exists in the FSAR, but was moved from its present location as a part of paragraph A.1.1.7.2 to this location.

lines 1703 - 1713: This material was added from Reference 28 to summarize the conclusions which could be drawn from the results of the F-30 capsule irradiation test. A sentence has been added to indicate that the irradiation testing of full scale fuel elements is covered in Section A.1.6.

#### REFERENCES FOR APPENDIX A.1.1

All references to "Gulf General Atomic" in Appendix A were changed to "General Atomic".

lines 1823 - 1855: References 28 through 36 were added per comments by GA and in accordance with material used to extract information for the new and updated sections in A.1.1. Because of the manner in which GA furnished references with their comments, GA should check these carefully.

#### TABLE A.1.1-1

Changes have been made per GA comments from the September, 1981, meeting. In addition, a typographical error in the title has been corrected. As noted on the table, Peach Bottom test element experience is to be added after the data is discussed with GA.

#### TABLE A.1.1-11

Data from the F-30 capsule has been added in accordance with GA's comments from the September, 1981, meeting. In addition, the word "Gulf" has been deleted from the title.

#### TABLE A.1.1-12

Additions have been made per GA's comments at the September, 1981, meeting. GA should fill in the blanks.

#### TABLE A.1.1-13

Information on segment 8 has been added. GA must furnish the value of thermal conductivity to be used in the table in connection with footnote C.

#### TABLE A.1.1-14

GA had suggested adding information to this table. However, we have decided to add a new table to incorporate the results from capsule F-30 rather than change this table.

TABLE A.1.1-16

This table has been extensively revised to incorporate information from irradiation test capsules F-27, F-28, and F-30. There are some dates missing which GA should furnish. In addition, GA should check all numbers in the table to assure that they are correct.

TABLE A.1.1-17

This is a new table which appears as Table 18 in General Atomic Report GA-A13208.

TABLE A.1.1-18

This is a new table which appears as Table 3 in General Atomic Report GA-A13208.

TABLE A.1.1-19

This is a completely new table which combines information from Tables 6 and 7 from General Atomic Report GA-A13208. GA should check this information carefully to assure that it is correct.

FIGURE A.1.1-6a

This figure number has been changed to A.1.1-7.

FIGURE A.1.1-7

This figure number has been changed to A.1.1-8. The figure itself has been changed to indicate that the limits shown are comparative only.

FIGURE A.1.1-9

This figure has been deleted at GA's suggestion, in that it is incomplete and does not serve any useful purpose at this time.

FIGURE A.1.1-8

This figure number has been changed to A.1.1-9.

FIGURE A.1.1-8a

This figure number has been changed to Figure A.1.1-10.

SECTION A.1.2

At the September, 1987, meeting, GA suggested that this section not be changed.

lines 1914 - 1915: Deleted the words "in fact" and changed the verb tense.

### SECTION A.1.3

At the September, 1981, meeting, GA suggested that this section not be changed.

- line 2064: Deleted the words "several years ago".
- line 2069: Deleted the underlining of the term "et. al.".
- line 2070: Deleted "Gulf".
- line 2071: Deleted the underlining of the term "et. al.".
- line 2077: Deleted "Gulf".
- line 2077: Deleted the words "in past years have".
- line 2085: Changed the verb tense.
- line 2088: Eliminated the asterisk for the footnote.
- lines 2088 - 2094: Incorporated the footnote directly into the text.
- line 2094: Deleted the word "recent".
- line 2101: Changed the words "more recent" to "later".

### SECTION A.1.5.1

- lines 2289 - 2296: This material was added to incorporate information resulting from the investigation of the temperature fluctuation problem. Reevaluation of stress caused by core blocks impacting during temperature fluctuations is discussed, with particular reference to the additional analysis done on the strength of the dowel/socket region of the fuel blocks.

#### SECTION A.1.5.2

- line 2306: The asterisk for the footnote was deleted and the reference formerly located as a footnote was moved to a new list of references for Section A.1.5.
- line 2317: Verb tense changed.
- lines 2320 - 2326: Material has been introduced here concerning the results of strength testing of graphite fuel blocks. Reference is made to a new Table A.1.5-1 which shows comparisons between expected loads and load capability of the graphite blocks.
- line 2330: "These tests" was changed to "the earlier tests" and the verb tense was changed.
- lines 2337 - 2343: This is new material which refers to the analysis and evaluation following occurrence of temperature fluctuation. This paragraph likewise refers to new Table A.1.5-1. In addition, it brings in the statements from Reference 2 that irradiated graphite should be somewhat stronger than the unirradiated graphite used in the test. (P-78137).

#### REFERENCES FOR APPENDIX A.1.5

- lines 2347 - 2358: The existing reference and one new reference have been combined into a new section of references for Appendix A.1.5.

#### TABLE A.1.5-1

This is a completely new table which was developed from information in PSC's letter P-78137, dated 8/11/78.

#### SECTION A.1.6.1

- lines 2369 - 2371: This new paragraph was added to introduce the fact that a number of complete fuel elements were irradiated in several reactors to proof test the full size element.
- line 2375: Changed "is presently being" to "was".
- line 2383: Deleted "Gulf".

- line 2390: Deleted "has".
- lines 2395 - 2398: The four Peach Bottom fuel test elements are discussed.
- lines 2401 - 2402: The surveillance elements for the PIE program are discussed.
- lines 2404 - 2410: The eight fuel test elements installed in Fort St. Vrain are discussed.
- lines 2412 - 2440: Additional explanatory material is included here to try to put the entire irradiation test program for fuel rods and fuel elements into perspective and provide an overview of the entire test program. (Again, GA and PSC should check this description very carefully to make sure that we have correctly interpreted the material from the references used for the write-up.)

#### SECTION A.1.6.2

- lines 2447 - 2505: This material is substantially as it now appears in the FSAR. All of the proofmarks indicate places where verb tenses were changed.
- line 2506: Added the words "until its removal in \_\_\_\_\_". (GA should supply a date to enter at this line to make the sentence complete.)
- lines 2545 - 2558: The proof test elements irradiated in Peach Bottom are described, based on material extracted from the references indicated.

#### SECTION A.1.6.3

- line 2566: Deleted "Gulf".
- lines 2602 - 2603: Deleted the words "in addition"; changed the verb tense; and added the word "Reactor" at the end of the sentence.

#### SECTION A.1.6.4

lines 2607 - 2626: Section A.1.6.4 is an entirely new section which was added to incorporate information about the fuel test elements and their irradiation testing in Peach Bottom and Fort St. Vrain. The purpose of this Section A.1.6.4 is to briefly describe the various portions of the fuel test element program, including the Peach Bottom FTE's, the Fort St. Vrain FTE's and the Fort St. Vrain Surveillance Test Elements. Then, in Section A.1.6.5, we describe fuel test element program objectives, and in Section A.1.6.6, we describe the fuel test element program results up to the present time. Like other new material which has been drawn from various references and condensed for incorporation into the FSAR, PSC and GA should check it very carefully to be sure that we have correctly interpreted the information in the various documents used for the update. The material for these lines provides an introduction to the fuel test element program. \*

#### SECTION A.1.6.4.1

lines 2630 - 2657: The concept and configuration of the Peach Bottom fuel test element is described briefly in this entirely new section.

line 2657: It will be necessary for GA to furnish material for inclusion here to describe or identify the fuel types which were included in Peach Bottom FTE-5. \*

#### SECTION A.1.6.4.2

lines 2662 - 2726: This is an entirely new section which contains a discussion of the fuel test element neutronics and the details of the fuel particles. The material was extracted directly from GLP-5494, Amendment 3 which was transmitted to the NRC by P-79031. Some editorial changes were made with regard to verb tense, punctuation and sentence division.

#### SECTION A.1.6.4.3

lines 2726 - 2747: This provides a brief description of the FSV surveillance test elements and the relationship between them and the R&D work sponsored by the Department of Energy.

SECTION A.1.6.5

line 2751: A new numbered paragraph and paragraph heading has been added here.

SECTION A.1.6.5.1

lines 2756 - 2783: A new numbered paragraph has been added here and the new material was extracted from Reference 9.

SECTION A.1.6.5.2

lines 2787 - 2875: This is a completely new numbered paragraph and paragraph heading. The material for this section was extracted from the Safety Analysis Report for the fuel test elements, GLP-5494.

SECTION A.1.6.5.3

lines 2879 - 2887: This is a completely new numbered paragraph which describes the objective of the Fort St. Vrain surveillance test elements. The specific objectives are extracted from Reference 10 (GA-A16258) and have been included in a new Table A.1.6-4.

SECTION A.1.6.6

line 2891: This is a completely-new numbered paragraph and heading.

SECTION A.1.6.6.1

lines 2895 - 2948: The results of the Peach Bottom fuel test element irradiation program have been extracted from References 7, 8 and 9 (GA-A13004, GA-A13452, and GA-A13943, respectively). PSC and GA should check this material carefully to assure that we have correctly interpreted the information taken from those references. \*

lines 2924 - 2926: We did not find any reference which adequately describes Peach Bottom fuel test element 5. GA should furnish material for this segment of the report which is consistent with the same type of material included for the other three Peach Bottom FTE's. \*

SECTION A.1.6.6.2

lines 2950 - 2994: This is a completely new section, the material for which was extracted from the FTE Safety Analysis Report (GLP-5494) which was originally transmitted to NRC by P-78004. Amendment 3 to this report was transmitted to NRC via P-79031. P-77170 and P-78102 were also used as background materials for preparation of this section.

SECTION A.1.6.6.3

lines 2999 - 3051: The results from the post-irradiation examination of surveillance fuel elements were extracted from References 10 and 11 (GA-A16258 and GA-A16000, respectively) and included here. GA and PSC should check carefully to make sure that we have correctly summarized the data. \*

REFERENCES FOR APPENDIX A.1.6

lines 3083 - 3130 References 6 through 17 were added.

TABLE A.1.6-2

This is a complete, new table taken from the Safety Analysis Report for the Fuel Test Elements (GLP-5494, Amendment 3). It is to be updated to be compatible with Table 6.1-1 in the Technical Specifications.

TABLE A.1.6-3

This is completely new table taken from the Safety Analysis Report for the Fuel Test Elements (GLP-5494, Amendment 3).

TABLE A.1.6-4

This is a completely new table taken from General Atomic Report GA-A16258.

TABLE A.1.6-5

This is a completely new table which was made up from information from General Atomic Reports GA-A13004, 13452, 13907, and 13943. Some information is missing for FTE-5. GA should furnish the missing information and verify that all of the other information is correct.

### SECTION A.1.7

The entire organization of Section A.1.7 was changed in an effort to improve the organization and make the presentation of data easier to follow. Several new numbered paragraph headings have been added and some titles have been changed to more accurately reflect the contents of the paragraphs that existed before. In addition, new sections have been added to discuss the results of the hot flow test and the evaluation of the core fluctuations as they pertain to vibration of core components and the effect of flow and pressure differential on the vibrational behavior of the core.

#### SECTION A.1.7.1

line 3138: The title of this Section A.1.7.1 has been changed.

#### SECTION A.1.7.2

line 3165: The title of this Section A.1.7.2 has been changed.

#### SECTION A.1.7.3

line 3262: The title of this Section A.1.7.3 has been changed.

#### SECTION A.1.7.3.1

lines 3375 - 3385: This is a new numbered paragraph; however, the content is essentially the same as it was before except for the addition of the statement in parenthesis at the end of the paragraph which refers to Section A.1.7.6 for later information on flow-induced core movements.

#### SECTION A.1.7.4

lines 3389 - 3528: This material was extracted from PSC's response to NRC Question 3.10. It has been edited to delete some extraneous or irrelevant material; to change verb tense; and to break it down into several numbered paragraphs for better readability.

#### SECTION A.1.7.4.4

lines 3530 - 3555: This new material was extracted from a draft of Sections of the hot flow test reports which were transmitted to the NRC via PSC letter (Pre-P) dated 1/20/75. We have not yet obtained a copy of the final hot flow test reports which should be used as the correct reference for this section. PSC or GA should furnish a copy of this report as this report as soon as possible so that we will have time to review it and incorporate the necessary changes. \*

#### SECTION A.1.7.5

lines 3569 - 3592: This is an entirely new section and the information included here has been taken from several of the references listed. This is another section GA and PSC should check very carefully to make sure that we have correctly interpreted the data available to us and have correctly stated the various tests that were performed. We are particularly concerned about the reference to the 1/14 scale model test because we had no reference on that test. GA or PSC should furnish the necessary reference material so that we can properly incorporate this information. \*

#### REFERENCES FOR APPENDIX A.1.7

lines 3620 - 3633: New References 5 through 8 were added. I want to suggest that Reference 7 is probably GA-A13156, but we have been unable to find where this was transmitted to the NRC. When identified, the appropriate information must be added to Reference 7. \*

#### FIGURE A.1.7-1

This is a new figure which was taken from the response to NRC Question 3.10 (Figure 3.10.1).

#### FIGURES A.1.7-2 through A.1.7-5

These figures have been added on a tentative basis only. They were a part of a response to NRC Question 3.10. If PSC agrees, we would prefer to reference these figures since they are actual project drawings which are available when needed (See Reference 8 for Appendix A.1.7). \*

#### SECTION A.1.8.2.2

- line 3958: Deleted the word "has".
- line 3965: Corrected the diction for correct usage of the word "comprised".
- lines 3970 - 3973: There is a commitment to rotate the rod drives out of regulating rod duty as that they have no more than one year in that service. PSC should verify that this is being done.
- line 3972: Deleted the words "high activity".
- lines 3986 - 3991: The wording remains essentially the same as it was before. Some editing has been done to change verb tense, change punctuation, and make it read more smoothly.
- lines 3993 - 4010: Information has been added on the higher than anticipated temperatures being experienced by the drive mechanism during operation. Note that there is a commitment in the last sentence to further evaluation of data which is to be collected during operation at 100% power. Again, depending upon PSC's intentions for future updates, this may or may not indicate that such material need be included in this Appendix A.1.8.2.2.

#### FIGURE A.1.8-2

The caption on this figure has been changed to add the words "as used in the test". This clarification is needed because the configuration shown in the figure is not the final configuration used on the control rods. (See FSAR Figure 3.8.4 for comparison).

#### SECTION A.1.9

This section on reserve shutdown system tests has been extensively revised to clarify the purpose of the testing, to incorporate information from PSC's response to NRC Question 6.5, and to incorporate results of tests performed on the actual ball configurations used in Fort St. Vrain.

SECTION A.1.9.1

- lines 4039 - 4051: This material was added to clarify the purpose of the testing.
- lines 4054 - 4055: Several words were deleted to make the sentence read better.
- lines 4059 - 4062: This paragraph was added to introduce the fact that confirmatory tests were performed on the type of balls actually installed in the plant (7/16 and 9/16 in. dia.).

SECTION A.1.9.2

- lines 4070 - 4131: This material was extracted directly from PSC's response to NRC Questions 6.5 and 6.8. Some editing was done to correct punctuation, and to make the sentences flow together better when extraneous materials were deleted. The final paragraph in this section was added to summarize the conclusions regarding the product specification for the reserve shutdown materials. We need a reference for the source of Table 6.8-1 of the response to NRC Question 6.8 because it may be appropriate to include it as part of the "Impact Resistance" paragraph.
- line 4133: This sentence was edited to properly introduce three phases of the test program rather than two parts as previously stated.
- line 4142: Changed verb tense. — *no change?*
- line 4152: Added the words "temperature and pressure".
- lines 4154 - 4155: Added the last sentence to clarify that phase two tests were done using balls primarily 1/2 inch in diameter.
- lines 4158 - 4167: This is new material which was extracted from GA's report on the follow-up tests performed in 1972 (Reference 5, Gulf-P-909-6).

## REFERENCES FOR APPENDIX A.1.9

lines 4171 - 4189: All of the references were pulled together and this new section of references for Appendix A.1.9 was added.

## SECTION A.1.10.2

line 4297:

This material existed in the original FSAR but it has been recreated here as a separate numbered paragraph A.1.10.2 primarily to account for the fact that there is a sub-paragraph A.1.10.1. The contents of this new paragraph have not been changed.

## SECTION A.1.11.2

line 4454:

"Gulf" was deleted.

line 4466:

The appropriate equation will be incorporated in the final version.

## SECTION A.1.11.4

lines 4666 - 4674: Words have been added to clarify that the conclusions pertain to reactor fuel elements, reflector blocks and the graphites used in the manufacture of those elements.

lines 4679 - 4697: This discussion of PGX graphite oxidation rates was added to introduce in this conclusion section, the fact that problems had arisen concerning PGX graphite because of its higher rate of oxidation. In the last sentence, ~~reference is made to a new Appendix A.1.11.5 which discusses PGX graphite in more detail.~~ The material is based on information from References 10 through 13 for this section A.1.11.

## SECTION A.1.11.5

lines 4701 - 4872: All of the material is new to the FSAR. It is based on References 10 through 14 which discuss the continuing PGX graphite testing and surveillance program. It is important to note that PSC has committed to include the PGX graphite surveillance program for Fort St. Vrain in the In Service Inspection Program specified by the technical specifications. In addition, there is a commitment in Section A.1.11.5.4 and A.1.11.5.5 to evaluate the PGX specimen withdrawal rate and adjust it to remove specimens at a faster rate if burn-off differs significantly from predicted values. The

lines 4701 - 4872: (Cont'd.)

commitment also implies that burnoff rates higher than expected will also require reconsideration of the useful life of the core support blocks. Both GA and PSC should examine these sections carefully to be sure that we correctly interpreted the information from the references used.

REFERENCE FOR APPENDIX A.1.11

lines 4921 - 4938: References 10 through 14 were added.

TABLE OF CONTENTS A.1.12

Inclusion of a Table of Contents at this particular location in the FSAR is somewhat of an anomaly. In the final version, we expect to move this table of contents back to the Table of Contents for the entire Appendix and to generally improve the Table of Contents to be more useful in finding particular sections within this rather large section.

SECTION A.1.12.0

lines 5029 - 5034: This paragraph was edited to indicate that all pre-installation and out-of-plant tests were completed before operation of the plant commenced. It further points out that tests completed after plant operation were of a confirmatory nature.

SECTION A.1.12.1

line 5044:

Deleted "Gulf".

line 5085:

Fig. A.1.12-2 has been changed to A.1.12.1-2

SECTION A.1.12.4

line 5284:

Added "(See Fig. A.1.12.4-2)".

lines 5285 - 5288:

This sentence was added to point out the fact that a very small number of sleeve wedges were found to be loose following the steam generator air flow test. NRC I&E Inspectors were present for the inspection of this unit and were well aware of the loose sleeve wedges found. At the meeting with GA in September, 1981, GA indicated that they would discuss this particular matter with Steve Kaufman to determine if there was any final report written up on this.

lines 5286 - 5288: (Cont'd.)

We have been trying to locate any I&E Inspection Reports that may have been made but have been unable to do so to date. GA and PSC should give serious consideration to this particular matter and provide us with advice on whether to include it, and if so, how to complete the statement to correctly reflect PSC's position on the adequacy of the sleeve wedges. (See excerpts from JVN-0319 dated 6/19/72 and JVN-0348 dated 8/11/72 for more info. Note that copies of these excerpts are included in the packages of supporting correspondence for PSC's use. Copies are also being forwarded to GA.)

SECTION A.1.12.5

line 5345: Added "(See Fig. A.1.12.5-1)."

SECTION A.1.12.6

line 5395: The term "will be more adequately" was changed to "were further".

line 5482: Added the word "versus".

line 5525: Verb tense changed.

line 5541: The tabulation of water quality used for the test was changed to agree with that given in GA-A10833 (Reference 1 for Section A.1.12).

lines 5587 - 5597: This material completely replaced the material previously included in the FSAR. The older FSAR material indicated tentative conclusions and promised that a topical report would be issued at some time in the future. The material which replaces it was taken from GA-A10833 (Reference 1 for Section A.1.12).

SECTION A.1.12.7

5611 ?  
5612 ?

lines 5620 - 5623: This sentence was added to document the fact that a single circulator was operated for some parts of the test.

line 5624: Verb tense was changed and the write-up now indicates that two of the six steam generator modules were blanked off.

line 5627: This sentence was changed to reflect what was apparently done during the test.

lines 5630 - 5659: This material was added to document the results of the hot flow test as it pertained to steam generator vibrations. The material was extracted from References 5 and 6 (GA-A12764 and the draft copy of the hot flow test reports which was submitted to the NRC via letter dated January 20, 1975. As indicated in earlier comments about the hot flow tests, we still need a copy of General Atomic report GA-A13156, which is apparently the final report on the hot flow test. \*

SECTION A.1.12.8

- line 5667: Verb tense was changed.
- line 5689: Changed verb tense.
- line 5710: Verb tense changed.
- line 5717: Verb tense changed.
- lines 5729 - 5822: The material in this section remains essentially as it was in the old FSAR except for changes in the verb tense.
- line 5827: Deleted "Gulf".
- line 5828: Added "(Ref. 2)".
- lines 5832 - 5833: The verb tense was changed and specific reference to General Atomic quarterlies was deleted in favor of simply showing References 2 and 3 at the end of the sentence.
- line 5862: Changed "GGA" to "GA".
- lines 5872 - 5917: The material here is essentially the same as it now appears in the FSAR except for changes in verb tense.

SECTION A.12.10

line 6197: The appropriate equation will be included in the final version.  
line 6218: The appropriate equation will be included in the final version.

SECTION A.1.12.12

line 6319: The reference needed should be furnished by GA. \*  
line 6331: Deleted the words "so far".

SECTION A.1.12.14

line 6431: Deleted "Gulf".  
line 6442: Deleted "Gulf".

line 6512: The words "at the latter" were changed to "near the".  
lines 6516 - 6517: Verb tenses were changed.  
lines 6518 - 6522: This statement was extracted from General Atomic internal memorandum dated 9/24/81 from A. D. Smith. GA indicated during the meeting with them in September, 1981, that this insertion was appropriate.

SECTION A.1.12.15

line 6567: Deleted "Gulf".

SECTION A.1.12.18

REFERENCES FOR APPENDIX A.1.12

lines 7308 - 7335: This is a new section which lists the appropriate references for Appendix A.1.12. It should be noted that Reference 6 is actually a draft copy of sections of the hot flow tests reports. Reference 7 is intended to be the final version of the hot flow tests reports. Any assistance in locating this report either at PSC or GA would be appreciated. \*

FIGURE A.1.12.3-1

This figure will be slightly different in the updated FSAR, only because the exact photograph could not be located. However, the photograph which was located adequately shows all the necessary information.

FIGURE A.1.12.4-2

The photograph to be used for this figure is to be cropped to eliminate the .004 DIA. It is obvious that this number is the tolerance on a larger dimension and as such serves no useful purpose in this figure. In addition, the word sleeve has been added to identify the outer part of the sleeve/wedge tube support.

FIGURE A.1.12.8-4

This figure was not found in NPC's copies of the FSAR.

FIGURE A.1.12.8-5

This figure was not found in NPC's copies of the FSAR.

FIGURE A.1.12.19-1

The photograph furnished by GA for this figure is larger than the one in the original FSAR. It will be used at approximately actual size.

FIGURE A.1.12.20-2

An effort will be made in reproducing these photographs to highlight, if possible, the "flow lines" in the forging.

FIGURES A.1.12.22-3 through A.1.12.23-4

GA was unable to locate original photographs for these sixteen figures. The quality of reproduction achievable in attempting to make half-tones from copies of half-tones is very poor. If PSC agrees, we suggest that money not be spent to reproduce poor quality figures. Rather, we should simply refer to the figures in the original FSAR. \*

SECTION A.1.13

Subsections have been numbered A.1.13.1 through A.1.13.7 for ease of reference.

line 7347: Deleted the word "since" and added the words "beginning in".

line 7354: Deleted "Gulf".

SECTION A.1.13.1

line 7360: This is a new numbered Section A.1.13.1, but the information following this heading is essentially the same as it appeared in the original FSAR.

line 7378: Deleted the words "more recently" and replaced it with the word "later".

SECTION A.1.13.2

line 7435: This is a new numbered Section A.1.13.2. However, the material which is included in this Section is essentially the same as that in the original FSAR except as noted below.

line 7448: The paragraph about Mark II prototype bearing housing improvements was deleted in favor of supplying the same information at another location.

line 7485: Verb tense was changed.

line 7499: Verb tense was changed.

SECTION A.1.13.3

New subsection numbers were assigned for ease of locating information (A.1.13.3.1 through A.1.13.1.6).

line 7305: This is a new numbered Section A.1.13.3. However, the information which follows is the same as that in the original FSAR.

SECTION A.1.13.3.1

line 7526: This is a new numbered Section A.1.13.3.1. However, the information contained here is the same as that in the original FSAR.

SECTION A.1.13.3.2

line 7554: - This is a new numbered Section A.1.13.3.2. However, the information is essentially the same as contained in the original FSAR except as noted below.

lines 7562 - 7565: This new sentence was added to conform to the answer to NRC Question 4.5 which was not fully incorporated into Amendment 18.

lines 7593 - 7597: This new paragraph was added to tie in the pitting observed on the pelton wheels with the major problem subsequently experienced during the hot flow test. Reference is also made to Section 13.2 of the main FSAR where the hot flow test is to be discussed in more detail.

SECTION A.1.13.3.3

line 7601: This is a new numbered subsection A.1.13.3.3. The information which is contained in this subsection is essentially the same as in the original FSAR.

SECTION A.1.13.3.4

line 7626: This is a new subsection A.1 13.3.4.

line 7636: The word "they" was changed to "the tests".

lines 7640 - 7652: Statements have been added concerning the shutdown seal bellows failures as discussed with GA at the September, 1981, meeting.

SECTION A.1.13.3.5

line 7656: This is a new subsection A.1.13.3.5. The information in that section is essentially the same as that in the original FSAR.

SECTION A.1.13.3.6

- line 7683: This is an entirely new Section A.1.13.3.6. However, the information contained in the section is essentially the same as in the original FSAR except as noted below.
- line 7702: Deleted Greek letter reference.
- line 7708: Deleted Greek letter reference and substituted differential pressure.
- line 7710: Deleted Greek letters and substituted differential pressure. Also, material which was inadvertently deleted in an earlier draft was reinserted.
- lines 7723 - 7806: The material in this section was significantly rearranged and re-written to conform to PSC's response to NRC Question 4.5. This portion of the write-up from the original FSAR does not seem to make sense when compared to Specification X-21-U-25 and the answer to Question 4.5. PSC and GA should examine this section carefully to verify that we have interpreted all of the reference material correctly and that the section as written is factual.

SECTION A.1.13.4

- line 7808: This is a new numbered Section A.1.13.4. However, the information contained in the section is essentially the same as that contained in the original FSAR except as noted below. Minor editorial changes were made to conform to the response to NRC Question 4.5.
- lines 7817 - 7820: The sentence was edited to make it flow more smoothly.
- lines 7829 - 7830: This sentence was edited to make it flow more smoothly.
- line 7840: The words "the valve " were added.
- line 7843: The word "production" was added.

#### SECTION A.1.13.5

lines 7850 - 7908: This is a new numbered Section A.1.13.5.

The material in this section has been extensively revised to incorporate PSC's response to NRC Question 4.1. Some editing has been done to the material from the Question response and some material has been retained from the original FSAR.

#### SECTION A.1.13.6

line 7912: This is a new numbered Section A.1.13.6.

lines 7914 - 7957: This section was revised to change verb tenses as appropriate and to incorporate information about pelton wheel failures during the hot flow tests. A reference is made to Section 13.2 for further discussion of the hot flow tests. This applies to line 7908 through 7937. Reference is made to PSC letter dated January 16, 1975.

#### SECTION A.1.13.7

lines 7961 - 7978: This is a new numbered Section A.1.13.7. The material here has been extensively edited and new material added to provide a brief summary of the results of the hot flow tests, modifications made to the pelton wheel, and the results of the detailed inspection of the circulator following operation for the first specified surveillance interval.

#### REFERENCES FOR APPENDIX A.1.13

line 7982: This is a new section incorporating all references for Appendix A.1.13.

lines 7986 - 7999: References 1 through 5 were added. It is important to note that additional information is needed on General Atomic report GA-C15847 for incorporation into this section.

#### SECTION A.1.14

line 8003: No significant changes have been made to Appendix A.1.14, pending receipt of GA's revisions to the moisture monitors which are included in their responsibilities under Section 7 of the FSAR.

#### SECTION A.1.14.1

lines 8030 - 8031: Verb tense was changed

SECTION A.1.15.1

- line 8328: Deleted "Gulf".
- line 8332: Change the verb tense.

SECTION A.1.15.2

- lines 8370 - 8376: Edited the wording for better readability as well as change verb tense,

SECTION A.1.15.3.1

- line 8404: Changed the words "whilst explanations" to read "while expansions".

SECTION A.1.15.3.2

- line 8443: Deleted the words "to date".

- lines 8468 - 8469: Edited to change verb tense.

SECTION A.2.1.1.1

After update of Section 9 on purification system operation, Appendix A, Section A.2.1.1 will be re-examined to determine if changes are needed. (See Attachment C).

- lines 8545 - 8546: Corrected spelling of "adsorbent". Changed verb tense. PSC's attention is directed to the statement at line 8535. PSC should verify that type 582 charcoal is, in fact, employed at Fort St. Vrain. \*

SECTION A.2.1.1.4

- line 8628: Changed verb tense. PSC's attention is directed to this particular sentence. PSC should verify that this is, in fact, the material used at Fort St. Vrain. \*

SECTION A.2.1.2

- lines 8650 - 8654: "Will be" was changed to "should be" and "can be". PSC should re-examine this sentence and make sure that's what they want to say. \*

SECTION A.2.1.3

line 8663: Deleted "Gulf".

line 8664: Added (Ref. 1).

SECTION A.2.1.4

line 8700: Added (Ref. 2, 3 and 4); deleted the listing of reports; and moved them to the new Reference section for A.2.1.

SECTION A.2.1.5

line 8793: Deleted the words "merits of".

lines 8799 - 8819: References for Appendix A.2.1 added;

SECTION A.2.2.1

lines 8832 - 8848: Changed verb tense.

SECTION A.2.2.2

line 8876: Changed verb tense.

lines 8883 - 8884: Changed verb tense. Added (at line 8887) the words "capability for".

SECTION A.2.4.1

line 8976: Changed verb tense.

line 8978: PSC and GA must examine the statement about location of records and correct it if necessary.

line 8978: Deleted "Gulf".

lines 8982 - 9020: Verb tenses changed.

SECTION A.2.6.1

line 9137:

Verb-tense changed. The words "in the shop" were added.

SECTION A.2.7.1

lines 9211 - 9228:

GA and PSC should advise NPC on the status and outcome of these tests if they have been completed. \*

SECTION A.2.7.3

lines 9245 - 9260:

The results of the vacuuming operation following the unintended release of RSD material into the core will be incorporated in this section in the second draft update. Meanwhile PSC should provide any guidance they wish to give. \*

SECTION A.2.8.1

lines 9268 - 9287:

If any of these thermocouples have failed in service, it would be appropriate to document that fact here. \*

DRAFT 2

SUMMARY OF CHANGES FOR REWRITE UNIT 2

APPENDIX A

SECTION A.0

- Line 671: "Attachment" changed to "Appendix".  
Line 677: "appendix" changed to "Appendix".

SECTION A.1.1.1

- Line 768: "General Atomic Incorporated" changed to "General Atomic Company".  
Lines 805-807: Sentence added per GA comments.  
Line 810: "(F-30)" added per GA comments.  
Line 821: "design valves" changed to "design values" per PSC comments.  
Line 824: "failure fraction" added per GA comments.  
Lines 830-836: Moved from Section A.1.1.3.3, Line numbers 927-932 of January 29, 1982 draft per GA comments.

SECTION A.1.1.2

- Line 850: Words "initial core" added per GA comments.  
Line 855: "service" changed to "design service".  
Line 857: "final" changed to "F-30"

SECTION A.1.1.2.1

- Line 869-870: Sentence added per GA comments.

SECTION A.1.1.2.4

- Line 907: "20%" changed to "22.4%" per GA comments.

SECTION A.1.1.3.2

- Line 973: "1200<sup>o</sup>" changed to "1200<sup>o</sup> C" per PSC comments.  
Line 1054: Reference "4" changed to reference "29" per GA comments.

SECTION A.1.1.3.2 (Continued)

- Line 1102: Reference "2" changed to "4 and 5"
- Lines 1113-1115: "hydrolysis of the fuel particles" changed to "significant hydrolysis". NPC modification to PSC comments.
- Lines 1115-1119: Last two sentences of this paragraph modified per PSC comments (See lines 803-808 of January 29, 1982 draft).
- Line 1122: "the General Atomic Corporation" changed to "General Atomic Company" per GA comments.

SECTION A.1.1.3.3

- Line 1164-1164: Hyphens added per PSC comments.
- Line 1201: Hyphen added per GA comments.
- Lines 1205-1221: Hyphens added per GA comments.
- Line 1224: Verb tense changed per GA comments.
- Line 1236: "stress" changed to "calculated stress".  
"beyond" changed to "above" per GA comments.
- After line 1237: Last sentence of last paragraph deleted.

SECTION A.1.1.4.1

- Line 1256: "stability to" changed to "stability at".
- Line 1312: Verb tense changed per GA comments.

SECTION A.1.1.4.3

- Line 1395: Beginning of sentence added per GA comments.
- Line 1397: Verb tense changed per GA comments.
- Lines 1398-1399: "in the Engineering Test . . ." added per PSC comments.
- Line 1405: "190" changed to "170" per PSC comments.
- Line 1410: "20%" changed to "22.4%" per GA comments.
- Line 1414: "micron" spelled out.
- Line 1427: "180" changed to "160". This was an error in the original FSAR. Per discussion with D. Alberstein, GA.
- Line 1439: "(F-30)" inserted per GA comments.

Lines 1482-1483: "in support of ... particle design" added per GA comments.

Lines 1496-1497 "were calculated and then plotted" changed to "are shown"; next sentence deleted (see lines 1192-1194 of January 29, 1982 draft). Per GA comments.

#### SECTION A.1.1.5

Line 1563: "A.1.1.-8" changed to "A.1.1.-9" per GA comments.

Line 1567: "(equi-axed)" deleted per PSC comments.

#### SECTION A.1.1.6.1

Line 1588: Comma added; verb tense changed per GA comments.

Line 1592: "Equi-axed," deleted per PSC comments.

Line 1593: Verb tense changed per GA comments.

#### SECTION A.1.1.6.2

Line 1604: "65" changed to "60" per GA comments.

Line 1609: "30 wt-%" changed to "40 wt-%" per GA comments.

Line 1615: "approx. 1800°C" changed to "between 1600-1800°C", per GA comments.

Line 1624: "30 wt-%" changed to "40 wt-%" per GA comments.

#### SECTION A.1.1.6.3

Line 1640-1642: Last two sentences of this paragraph reworded per PSC/GA comments. See lines 1339-1340 of January 29, 1982 draft.

#### SECTION A.1.1.6.4

Line 1679: "current matrix" changed to "matrix" per GA comments.

Lines 1718-1723: These two sentences were moved per GA comments (see lines 1393-1397 of January 29, 1982 draft).

Lines 1718-1719: "As discussed in Section A.1.1.3.2," added at beginning of sentence per GA comments.

Line 1720: "an" changed to "a new" per GA comments. Ref. 36 added per GA comments.

SECTION A.1.1.6.4 (Continued)

- Lines 1744-1748: This paragraph reworded per GA comments.
- Line 1766: "to demonstrate ..... fuel rods" deleted per GA comments.
- Line 1769: "service" changed to "design service".
- After line 1771: Paragraph deleted per GA comments. (See lines 1473-1475 of January 29, 1982 draft).
- Line 1775: "A.1.1.-19" changed to "A.1.1-18" per GA comments.
- Line 1791: "Subsequently," added at beginning of sentence per GA comments.

SECTION A.1.1.7.1

- Lines 1809-1817: Paragraph moved from January 29, 1982 draft lines 1682-1690 per JVN comments.
- Line 1822: "tests" changed to "test capsules"; "(F-25 through F-30) added; next sentence deleted.
- Line 1823: Reworded sentence per GA comments
- Lines 1827-1847: These two paragraphs were moved from lines 1635-1664 of January 29, draft. Some rewording also made to text. Lines 1667-1674 of January 29, draft deleted.

SECTION A.1.1.7.2

- Line 1851: New subsection title added; the material now in this subsection was previously part of section A.1.1.7.1 (see lines 1522-1626 of January 29, 1982 draft.
- Line 1872, 1981: Verb tense changed per GA comments.
- Line 1907: Corrected spelling of "TRISO-LTI" per GA comments.
- Line 1913: Comma added per GA comments.
- Line 1927: "BAF" spelled out per GA comments.
- Line 1950: deleted "service limit fuel particles," per GA comments.
- Line 1958: "leaking" changed to "leaching" per PSC comments.

SECTION A.1.1.7.3

- Line 1968: "HTGR" changed to "the HTGR" per GA comments.  
Line 1981: "Other results" changed to "Results" per GA comments.

References For Appendix A.1.1

Fixed references to "Gulf General Atomic" where necessary per GA comments.

For references 11-35 changed format.

- Line 2123-2124: "Swart to Kuzmycz (NRC)." added.
- Table A.1.1-1: "in support of FSU Fuel Design" added to title, per GA comments.
- Table A.1.1-7: changed "From Ref. 4" to "From Refs. 3,4, and 5"
- Table A.1.1-11: Deleted "Gulf" from title, per GA comments. Last entry in Test Number column changed from "FR-3" to "F-30"; Test Totals for TRISO and Total changed per GA comments.
- Table A.1.1-12: Changes to numbers and footnotes made per GA/PSC comments.
- Table A.1.1-13: Changes to numbers and footnotes made per GA/PSC comments.
- Table A.1.1-16: GA provided missing dates as requested in January 29 draft.
- Table A.1.1-17: Minor change to table heading per GA comments.
- Table A.1.1-18: Deleted per GA comments; and all other tables renumbered.
- Figure A.1.1-8: "PyC" changed to "SiC" and "SiC" changed to "PyC" per GA comments.
- Figure A.1.1-11: Deleted per GA comments.

SECTION A.1.2

- Lines 2147,2151: Verb tense changes.
- Lines 2150-2151: Reworded sentence for clarity.
- Lines 2241-2253: Format of equation changed to account for subscripted letters.
- Line 2251: "The following table" changed to "Table A.1.2-2" per GA comments

REFERENCES FOR APPENDIX A.1.2

- Lines 2283-2297: Format of references changed and Gulf General Atomic references changed as requested by PSC.

SECTION A.1.3

- Line 2382: "De Nordwall" changed to "de Nordwall" per GA comments

REFERENCES FOR APPENDIX A.1.3

- Lines 2412-2424: Format of references changed; references to Gulf General Atomic changed as requested by PSC.

SECTION A.1.4

- Line 2447: " $10^3 D/T$ " changed to " $10^3 /T$ " per GA comments.
- Lines 2450-2463: Converted text to equation form to handle subscripted letters.
- Line 2514: Hypens added.

REFERENCES FOR APPENDIX A.1.4

- Lines 2536-2549: Changed format of references and changed references to Gulf General Atomic as requested by PSC.

SECTION A.1.5

- Lines 2566-2581, 2593-2599: Formerly Section A.1.5.2, this has been incorporated into Section A.1.5.1 per PSC comments.
- Lines 2583-2591: Paragraph has been moved from beginning of this section per PSC comments (see lines 2289 - 2296 of January 29 draft).
- Line 2577: "elements" changed to "element" per GA comments.
- Line 2584: "analyses" changed to "analyses and tests", per PSC comments.

- Line 2603: Section A.1.5.2 title moved to this line per PSC comments.
- Line 2613: "core block shifting" changed to "fuel element movement" per GA comments.

#### REFERENCES FOR APPENDIX A.1.5

- Line 2629-2630: "General Dynamics Corporation" added per GA comments.

#### SECTION A.1.6.1

- Line 2647: "radiation" changed to "service" per PSC comments.
- Lines 2649-2655: This paragraph reworded per GA comments.
- Line 2654: "TRISO-II" changed to "TRISO".
- Line 2655: References 1, 6, 12, 14 and 15 added per GA comments.
- Line 2659: "General Atomic Incorporated" changed to "General Atomic" per GA comments.
- Line 2672: "FSV fuel" changed to "FSV-type fuel"; and deleted remainder of sentence (see lines 2397 through 2398 January 29, draft, per GA comments).
- Line 2676: "Ref. 11" changed to "Ref. 16 and 17" per GA comments.
- Lines 2679-2683: "special elements" changed to "fuel elements" and remainder of paragraph rewritten per GA comments. See lines 2404 to 2409 January 29, draft.
- Lines 2690-2699: Verb tense and other minor editorial changes made per GA comments.
- "fuel element proof test irradiation" changed to "non-accelerated irradiation" per GA comments.

#### SECTION A.1.6.2

- Line 2719: "Element" changed to "Elements" per GA comments.
- Lines 2724-2725: Verb tense and minor editorial changes made per GA comments.
- After line 2727: Last sentence of paragraph deleted. See lines 2453-2455 January 29, draft.
- Lines 2729-2744: Verb tense and minor editorial changes made per GA comments.

- After Line 2748: Lines 2478-2542 from January 29 draft deleted per GA comments.
- Line 2751: "Core" capitalized.
- Line 2761-2763: Minor editorial changes and references to "FTE-16" added per GA comments.

#### SECTION A.1.6.4

- Line 2813: "and Surveillance Elements" added per GA comments.
- Line 2816: "and Surveillance Elements" added per GA comments.
- Lines 2824-2831: Wording changed per GA comments.
- Lines 2835: "and Surveillance Elements" added per GA comments.
- Lines 2836: "Section A.1.6.6" changed to "A.1.6.5" per GA comments.

#### SECTION A.1.6.4.1

- Line 2844: "FTE-3, 4, 5 and 6, added per GA comments.
- Line 2847: changed "they contained" to "contained" per GA comments.
- Lines 2860-2861: Sentence added per GA comments.
- Lines 2863-2865: This paragraph replaces lines 2652-2653 of January 29 draft per GA comments.

#### SECTION A.1.6.4.2

- Line 2874: "Table A.1.6-2" changed to "A.1.6-1" per GA comments.
- Line 2875: "blocks without" changed to "elements without" per GA comments.
- Lines 2898-2899: Punctuation changed per PSC comments.
- Lines 2902: "and WAR/ThO<sub>2</sub> fuel particle systems" changed to "fuel particle system" per GA comments.
- Lines 2915-2917: Verb tense and minor changes per GA.
- Line 2919: "FTE-6" changed to "FTE-8" per GA comments.
- Lines 2924-2925: Sentence added per GA comments. This sentence was previously lines 2722-2724 in January 29 draft.

SECTION A.1.6.4.3

Line 2930 "Test Elements" changed to "Elements" per GA comments.  
Lines 2940-2946: Paragraph reworded per GA comments.  
After Line 2998: Sentence deleted per GA comments. (See lines 2795-2797 January 29 draft).

SECTION A.1.6.5.2

After line 2998: Last sentence deleted.

SECTION A.1.6.5.3

Line 3080: "Test Elements" changed to "Elements" per GA comments.  
Line 3088: "Table A.1.6-4" changed to "Table A.1.6-3"

SECTION A.1.6.6.1

Lines 3099-3101: Opening sentence of paragraph reworded by GA.  
Lines 3127-3130: Paragraph added by GA.  
Line 3139: Percent signs added per GA comments.  
Line 3146: "Confirmation" changed to "Confirmation of" per PSC comments.

SECTION A.1.6.6.2

After line 3155: Except for the last sentence, this entire section was deleted per GA comments. See lines (2962-2991 of January 29, draft).  
Line 3159: "reported" was changed to "obtained" per GA comments.

SECTION A.1.6.6.3

Line 3164: "Test Element" changed to "Element" per GA comments.  
Line 3170: References 11 and 10 added per GA comments.  
Lines 3176-3177: "10<sup>25</sup>" changed to "10<sup>21</sup>" per GA comments.  
Lines 3182-3184: End of paragraph rewritten per GA comments. See lines (3017-3023 of January 29, draft).

- Lines 3190-3191: "being loaded and irradiated," changed to "the fuel element was loaded," per GA comments.
- Line 3194: "10<sup>25</sup>" changed to "10<sup>21</sup>"
- Lines 3195-3196: "temperature" changed to "fuel temperature"; "650" changed to "680" remainder of sentence revised per GA comments.
- After 3196: Two paragraphs were deleted per GA comments. (See lines 3038-3051 of January 29 draft)
- Lines 3198-3208: Inserted per GA comments.

#### REFERENCES FOR APPENDIX A.1.6

Lines 3218 & 3224: Reference to Gulf General Atomic fixed per GA comments.

Lines 3228, 3233, 3238: Fixed references to Gulf General Atomic.

References 6-18: Format changes.

Table A.1.6-1: Deleted per GA comments.

Table A.1.6-2: Table # changed to A.1.6-1 and Tech Specs Table 6.1-1 used here, per GA comments.

Table A.1.6-4: Major changes and new information added by GA.

#### SECTION A.1.7.3.2

Lines 3516-3517: Verb tense changes per PSC comments.

#### SECTION A.1.7.3.3

Line 3536-3537: "flow-induced" changed to "thermal/flow-induced" per GA comments.

#### SECTION A.1.7

Line 3550, 3557, 3646, 3689, 3698: "Wyle" corrected spelling.

#### SECTION A.1.7.4.1

Line 3563: "40 dB at 20 KHz" changed to "140dB at 12KHz" per PSC comments.

Line 3575-3576: This sentence was reworded per PSC comments.

Line 3589: Changed "so no longer" to "no longer" per PSC comments.

After line 3590: Deleted last two sentences of paragraph per PSC comments.

Line 3599: "even" changed to "an even" per GA comments.

Line 3610: Inserted the word "(window)" per GA comments.

Line 3635: Corrected spelling of "diaphragm" per PSC comments.

SECTION A.1.7.4.3

Line 3646- 3649: Corrected punctuation per PSC comments.

SECTION A.1.7.4.4

Line 3685: "they were" changed to "the noise levels were" per PSC comments.

Line 3687: "expected at full" changed to "predicted for full" per PSC comments.

Line 3704: "Ref. 7" changed to "Ref. 6" per GA comments.

SECTION A.1.7.5

Lines 3714-3716,  
3718-3719,  
3723,3724,  
3726, 3729-  
3731, 3734-  
3737, 3740,  
3743-3744

This entire section was revised per GA comments.  
(See lines 3565-3592 January 29 draft).

REFERENCES FOR APPENDIX A.1.7

New Reference 6 added, and data added to Reference 7, per PSC comments.

Lines 3755,3760,  
3770: Fixed references to Gulf General Atomic.

Figures A.1.7-2:  
through A.1.7-5 Deleted per PSC comments.

SECTION A.1.8.2.1

Line 4081: "ppv" changed to "vpm" per PSC comments.

SECTION A.1.8.2.2

Line 4120: "has successfully" changed to "successfully" per GA comments.

Line 4122: Fixed punctuation per PSC comments.

Line 4124: "one year" changed to "one fuel cycle"

Lines 4125-4129: Verb tense changes and rewording for clarity per GA comments.

Line 4144-4150: This paragraph rewritten by GA with one modification by PSC.

Line 4139: "years" changed to "simulated years" per GA comments.

Line 4142: Verb tense changed per GA comments.

Lines 4152-4156: This paragraph modified to correct verb tenses per PSC comments.

After line 4157: Paragraph deleted per PSC comments. (See lines 4008-4010 of January 29 draft.)

SECTION A.1.9.1

Line 4171 "Section 6.7" changed to "Section 3.8.3" per GA comments.

Lines 4171-4173: Description of neutron absorbing material per PSC comments.

Line 4192: "shutdown material" changed to "reserve shutdown material".

Line 4200: "poison balls" changed to "balls" per PSC comments

Line 4211: "also performed" changed to "performed"; "cylindrospherical balls" changed to "balls" per PSC comments.

Line 4221: "poison ball" changed to "reserve shutdown ball" per PSC comments.

Lines 4234-4242: References to "rupture disc" and "reserve shut-down balls" were incorporated in this paragraph, per GA/PSC comments.

Line 4270-4272: More detailed description of reserve shutdown balls added per PSC comments.

Line 4276: "1.7g" changed to "1.8g" per PSC comments.

Lines 4278-4279: Wording and punctuation changed per GA comments.

Line 4279: "(Ref. 4)" deleted per GA comments.

Line 4300: Verb tense change per GA comments.

Line 4315: "(Ref. 5)" deleted per GA comments.

#### REFERENCES FOR APPENDIX A.1.9

References 4 and 5 were deleted per GA comments.

#### SECTION A.1.10.1

Line 4370: "reactor steam" changed to "steam" per PSC comments.

Line 4394: Format of notation changed for word processing.

#### REFERENCES FOR SECTION A.1.10

Line 4473: Reference to Gulf General Atomic corrected per PSC comments.

#### SECTION A.1.11.3

Lines 4702-4703: "micron" used in place of the symbol.

#### SECTION A.1.11.4

Lines 4823-4860: All previous material (lines 4679-4697 of January 29 draft) replaced with material provided by GA.

#### SECTION A.1.11.5

Lines 4867-4874: All previous material (lines 4703-4734 of January 29 draft) replaced with material provided by GA.

SECTION A.1.11.5.2

Line 4927-4923: "virtue of" changed to "a cemented graphite cap and by" per PSC comments.

SECTION A.1.11.5.3

After line 4966: Sentence deleted per PSC comments. See lines 4824-4825 of January 29, draft.

REFERENCES FOR APPENDIX A.1.11

Line 5036: Corrected reference to Gulf General Atomic.

Lines 5075 & 5079: "Fuller to Gammill (NRC) added.

New Reference 15 added.

SECTION A.1.12.4

Lines 5359-5360: Punctuation changed.

After line 5361: Paragraph deleted (see lines 5286-5288 of January 29 draft.)

SECTION A.1.12.6

Line 5554: "predicted" changed to "calculated".

Line 5597: "Conclusions" heading added.

Lines 5606-5622: Post-Test Inspection material inserted by GA.

SECTION A.1.12.7

Lines 5706-5711: Minor editorial changes per PSC comments.

Line 5730: "(Ref. 5)" changed to "(Ref. 4)"

Line 5732: "monitors" changed to "monitored"

Line 5745: "14,000 allowable" changed to "14,000 psi" per PSC comments.

Line 5749: Ref. 4 added.

SECTION A.1.12.8

- Line 5916: Reference deleted from text and moved to reference section.
- After line 5936: Two paragraphs deleted per telephone conversation with GA. See lines 5850-5859 of January 29 draft. Paragraphs deleted to eliminate reference to figures A.1.12.8-4 & A.1.12.8-5 which have never existed in the FSAR.
- Lines 5978-5980: More editorial changes to deleted reference to missing figures A.1.12.8-4 and A.1.12.8-5

SECTION A.1.12.10

- Lines 6249-6256: Equation and text reformatted for word processing.
- Lines 6288, : Equation and text reformatted for word processing.  
6292-6293,  
6305-6312,  
6336-6345

SECTION A.1.12.14

- Line 6627: "anything from" changed to "from" per PSC comments.
- Line 6634: "Ref 4" deleted.

SECTION A.1.12.16

- After line 6721: Paragraph deleted due to duplication of information. See lines 6612-6621 of Jan. 29, draft.

References for Appendix A.1.12

- Lines 7412,7416,: Fixed references to Gulf General Atomic.  
7421,7424,  
7425
- Reference 4 was deleted; author and title added for reference 6.
- Table A.1.12.15-1: "Fe-Ni-Cr" changed to "Ni-Fe-Cr" per PSC comments.
- Figures A.1.12.1-1, A.1.12.1-2, A.1.12.2-5, A.1.12.2-6, A.1.12.3-1, A.1.12.4-1, A.1.12.4-2, A.1.12.8-1, A.1.12.8-3, A.1.12.9-1, A.1.12.9-5, A.1.12.5-7, A.1.12.10-1, A.1.12.12-1, A.1.12.15-1, A.1.12.25-1, A.1.12.25-2:  
Minor changes to figure titles.

Figures A.1.12.8-4:  
and A.1.12.8-5: Deleted from FSAR -- have never existed.

Figures A.1.12.23-1:  
thru A.1.12.23-4: Original photos cannot be found for these figures;  
refer to original FSAR.

SECTION A.1.13.3.2

After line 7686: Paragraph deleted per GA comments. See lines 7593-  
7597 of Jan. 29 draft.

SECTION A.1.13.3.4

Lines 7726-7728: Sentence on brake shoes added per GA comments.

Lines 7730-7732: Minor editorial changes per PSC comments.

SECTION A.1.13.3.6

Lines 7837-7838: "5 psid" changed to "35 psid" per PSC comments.

SECTION A.1.13.5

- Lines 7964-7965: New paragraph was made in place of d) -- same information (See lines 7874-7876 of Jan. 29 draft).
- Lines 7974-7976: This sentence used to be e) from the above list. (See lines 7879-7880 of Jan. 29 draft).

SECTION A.1.13.6

- Line 8007: "2340-HP Pelton" changed to "pre-nuclear Pelton" per GA comments.
- Line 8016: "reactor at" changed to "reactor with helium" per GA comments.
- After line 8024: Last sentence deleted per GA comments. (See lines 7936-7937 of Jan. 29 draft).
- Lines 8026-8044: Text format changed and minor editorial changes per GA comments.
- Lines 8032-8037: Material added per GA comments.
- Line 8047: "Ref. 6" deleted.

SECTION A.1.13.7

- Line 8058: "and subsequent startup tests." added to end of sentence per GA comments.

References for Appendix A.1.13

- Line 8079: "(Pre-P)" deleted per PSC comments.
- Lines 8081-8082,  
and 8088-8089: References completed.
- Line 8092: "(Pre-P)" deleted per PSC comments.
- Lines 8094-8096: Reference 6 added.

SECTION A.1.14.1

- Line 8112: Footnote incorporated into text.
- Lines 8145-8147: "114<sup>0</sup>" changed to "67<sup>0</sup>"; "2000" changed to "500" per PSC comments.
- Lines 8156, 8158,  
8198: "(preferably) better" changed to "better" per PSC comments.

SECTION A.1.14.2

Lines 8273,8281-  
8283: Changed footnote format.

SECTION A.1.15.1

Lines 8426-8429: Punctuation changed per GA comments.

SECTION A.1.15.3.2

Line: 8538: "approximately" added twice.

Lines 8562-8563: Verb tense changed.

SECTION A.2.1.1.1

Line 8622: Verb tense changed.

SECTION A.2.1.1.2

Line 8647: Verb tense changed.

SECTION A.2.1.1.3

Lines 8678-8679: Verb tense and minor editorial changes per GA comments.

SECTION A.2.1.2

Line 8734: Verb tense changed.

After line 8746: Last sentence deleted per PSC comments.

References for Appendix A.2.1

Lines 8900-8901, 8905-8906,  
8910-8911 Corrected references to Gulf General Atomic per  
PSC comments.

SECTION A.2.2.1

Lines 8937-8938: "10 vpm" changed to "10 parts per million by volume  
(vpm)" per PSC comments.

SECTION A.2.4.2

Lines 9113,9116: "Remote" changed to "Remotely".

SECTION A.2.5

After line 9192: Two sentences deleted per GA comments. (See lines  
9108-9112 of Jan. 29 draft).

SECTION A.2.7.1

Lines 9291,9294: Verb tense changed.

SECTION A.2.7.3

Lines 9334-9339: Verb tense changes and text changes to incorporate test results per GA comments. (See lines 9255-9258 of Jan. 29 draft).

SECTION A.2.8.3

Lines 9409,9413: Verb tense changes and minor changes to wording per GA comments.

# DRAFT 1

## DESCRIPTION OF CHANGES FOR APPENDIX B

### INTRODUCTION

This introductory section has been added to provide some historical perspective and continuity between the QA program described in the original FSAR and that described in the FSAR update.

#### SECTION B.1

This general description of the program was retained as a major heading and material from the original FSAR has been condensed and edited. It is considered important to retain some of this type of information in the FSAR for historical purposes and to provide some indication, for reference, as to how the QA program evolved from the construction phase into the operating phase.

#### SECTION B.2

The title of this section has been changed to Initial Program Organization and Responsibility. The material remaining came from the original FSAR but has been significantly condensed and edited. The QA role in construction QA is discussed but reference is made to the original FSAR for details of organization and for the organization charts that were in use at the time. It is considered important to retain this section for historical and reference purposes.

#### SECTION B.3.1

The material remaining here also came from the original FSAR but has been significantly condensed and edited. This material is considered important to retain for reference purpose. It describes the roles of the various contractors and subcontractors during the construction phase. It also describes the manner in which PSC personnel participated in the QA program during that phase.

#### SECTION B.3.2

This material came from the original FSAR but has been condensed considerably. The material retained provides historical and reference materials to show how QA was performed during the preconstruction phase. The organizations with responsibility for QA are described briefly along with their roles and responsibilities.

### SECTION B.3.3

Again, the material remaining in this section came from the original FSAR and is edited and retained here to provide historical perspective.

### SECTION B.4

It was not considered necessary to retain the tabular comparison between the criteria of 10CFR50, Appendix B and the QA program as it existed at the time the construction permit was granted. However, this section number has been retained and reference has been made to the original FSAR for that information.

### SECTION B.5

This section contains the complete description of the QA program for operation. Some material from the original FSAR has been retained but it has been extensively edited and condensed. The primary purpose of this introductory section is to identify the fact that policy statements have been issued by the responsible executives which commit PSC to a QA program and which set forth definite policies regarding implementation of that QA program.

For Sections B.5.1 through B.5.18, all of the material from the original FSAR has been deleted. The material currently included was taken from the writeup furnished by the QA department. This writeup was prepared by Rusty Hendrickson during the time that the new, multi-organizational administrative procedures were being prepared and issued for implementation. The version of the document furnished to us was marked up with comments, changes and question marks by members of the QA department staff. That material has been edited to deal with those comments and questions.

In the following discussion, the description of changes deals with those sections where significant changes were made to the writeup furnished by the QA department, rather than to the changes made from the original FSAR. We have not provided a line-by-line description of changes to position titles or procedure titles; nor have we identified minor editorial changes. Since all of the material is new to the FSAR, it should be reviewed carefully by PSC to be sure it accurately reflects the commitments PSC wants to make in describing the QA Program.

### SECTION 3.5.1

Program organizational responsibilities and titles were changed to reflect the current organizational structure. The corporate organization chart is shown in Figure 3.5-1. The organization chart for the Quality Assurance Department is shown in Figure 3.5-2. However, the organization charts for Nuclear Engineering Division and Nuclear Production Division are referred to as they appear in Figures 12.1-2 and 12.1-3 respectively. The organizational responsibilities for each of the three divisions are given in Tables 3.5-2, 3.5-3 and 3.5-4.

### SECTION 3.5.1.3

For Item (b), the table identifying the qualifications for the QA Manager has been retained because it is a significant element which is considered by the NRC in the Standard Review Plan.

For Items (c) and (d), some changes were made to the division of responsibilities between the Superintendent, QA Services and the Superintendent, QA Operations. These should again be reviewed carefully by PSC QA people to make sure that they are in fact correct.

In Item (i), the Radiation Protection Manager has been substituted for Health Physics Supervisor.

In Item (k), the Technical/Administrative Services Manager has been substituted for the Administrative Services Manager and those new responsibilities are appropriately listed.

In Item (n), the Maintenance Quality Control Supervisor is now included to reflect the change in title and the split up of responsibilities previously held by one person. The title of Plant Engineering Supervisor has been added to Item (o).

In Items (p), (q) and (r), changes were made to reflect the new division status of the engineering group as well as to change the titles of the managers involved.

### SECTION 3.5.2

The statement that QA department representatives are located at the site has been deleted. A new writeup has been inserted to indicate the scope of the Quality Assurance program. Basically this material is taken from the Administrative Procedures. The three-level approach to the Quality Assurance program structure is briefly discussed and reference is made to a revised Table 3.5-6 which compares operational QA functions with those previously structured for construction. The description of the scope of the QA program is discussed in more detail in Section 3.5.2.7.

SECTION 3.5.3.4

A new Item (c) has been added to avoid referring to old FSAR Table B.1-1. What had been Item (c) on a previous draft is now Item (d). A new Item (e) has been added, also to avoid referring to old FSAR Table B.1-1. What had been Items (e), (f) and (g) are now identified as Items (f), (g) and (h).

SECTION 3.5.3.7

We have reviewed this particular sentence carefully and do not really understand what it means or why it is here. We request PSC examine it and clarify it.

SECTION 3.5.5.1

A sentence has been added indicating that the procedure system conforms to the intent of Reg Guide 1.33 and ANSI N18.7. In addition, there is some new discussion which refers to Figure 3.5-3 and Figure 3.5-4 to show the most important procedures and their interrelationships.

SECTION 3.5.8.2

A change has been made to indicate that a copy of the identification tag or direct charge requisition identifying the item is included in the maintenance or modification work package for transmittal to the Records Center. It is important to point out that this has been a commitment for some time, but apparently plant maintenance personnel do not always comply with this requirement.

SECTION 3.5.10.3

This section had been included in the earlier draft but was deleted at the suggestion of the QA people. Instead, this type of information appears in 3.5.18.

SECTION 3.5.12.4

The title of this subsection has been changed to Calibration Accuracy because that title appears to be more appropriate to the information given in the subsequent paragraph. The second paragraph under this heading was deleted in favor of including this type of information as a general note under Section 3.5.18.

#### SECTION 8.5.16.3

This section was edited and rewritten to try to define what we believe is current practice at Fort St. Vrain. PSC should examine this carefully to be sure that it is in fact acceptable.

#### SECTION 8.5.18.4

The first paragraph here is new, and is intended to convey general information about the QA monitoring program.

#### SECTION 8.5.19

The material in Section 8.5.19 is all in the original FSAR and it has been retained here because it is considered still appropriate for inclusion in the QA Program for Operations. PSC never did fully commit to the "Rainbow Books" because of the nature of the Fort St. Vrain plant as well as the difficulty of backfitting some of the "Rainbow Book" requirements to a plant that was already mostly built before the "Rainbow Books" were issued..

The original FSAR material has been edited to change verb tense and to accommodate the fact that some promised actions are now completed and implemented. In the original FSAR, the discussion of each of the ANSI Standards contained a subsection entitled "Implementation". All of those subsections have been deleted because all of the commitments should have been implemented by now.

Because the material in this section is important in explaining PSC's commitments and exceptions taken to the ANSI Standards (and "Rainbow Books"), a line-by-line description of changes follows:

### Section 3.5.19

- line 2188: The words "it is intended that" have been deleted.
- line 2189: Changed verb tense.
- line 2194: Added references 9, 10, and 11.
- line 2198: Changed a period to a comma.
- line 2198: Deleted the words "restructuring ... an effort,".
- line 2201: Deleted the sentence beginning with "Various phases" and ending with "December 1977".
- line 2202: This material was deleted.
- lines 2208-2210: Changes were made to put the statement into the proper time perspective. In addition it was edited to delete any implications that there were requirements yet to be implemented.

### Section 3.5.19.1

- line 2212: The words "at Fort St. Vrain (see Table 3.5-7)" are added.
- lines 2224-2225: Grammatical changes.
- line 2233: Changed the order of words for better grammar.
- lines 2247-2253: Incorporated the provisions that inspection of routine preventive maintenance activities has been assigned to plant personnel. Deleted the statement regarding inspection personnel not reporting to the same immediate supervisor as those who did the work. Deleted the word "our" and began a new sentence with the word "The" and deleted the word "only".
- line 2266: Deleted the entire section on implementation.

### Section 3.5.19.2

- line 2277: Changed the order of words for better grammar.
- line 2297: Changed the order of words for better grammar.
- line 2310: Changed order of words.
- line 2316: Changed cleanness to cleanliness.
- line 2320: Changed cleanness to cleanliness.

line 2324: Changed cleanness to cleanliness.  
line 2325: Changed cleanness to cleanliness.  
line 2329: Changed cleanness to cleanliness.  
line 2331: Changed cleanness to cleanliness.  
line 2331: Changed order of words.  
line 2333: Changed cleanness to cleanliness.  
line 2334: Changed order of words for better grammar.  
line 2336: Changed cleanness to cleanliness.  
line 2337: Deleted the words "by July 1977".  
line 2349: Changed cleanness to cleanliness.  
line 2356: Deleted entire section regarding implementation.

#### Section 3.5.19.3

line 2400: Changed order of words.  
line 2405: Changed the title of paragraph (b) to read "Specific Exceptions".  
lines 2431-  
2433: Deleted words to make the statement current and make it read better.  
line 2437: Changed order of words.  
line 2439: Last paragraph of Specific Exceptions deleted in its entirety.  
line 2440: Deleted the entire section on implementation.

#### Section 3.5.19.4

line 2462: Changed the order of words.  
lines 2472-  
2473: Changed the order of words.  
line 2483: Changed references.  
line 2487: Deleted the entire section on implementation.

#### Section 3.5.19.5

line 2520: Changed the order of words.  
line 2539: Changed "included" to "described".

lines 2540-  
2541: Changed the order of words.

line 2583: Deleted the entire section on implementation.

Section 8.5.19.6

line 2615: Changed the order of words.

line 2634: Changed the order of words.

line 2637: The exceptions taken to the section on personnel qualifications has been deleted. Personnel qualification requirements are now in conformance with ANSI N45.2.6.

line 2674: Changed the order of words.

line 2676: Changed the order of words.

line 2715: The entire section on implementation has been deleted.

Section 8.5.19.7

line 2746: Changed the order of words.

line 2755: Changed the order of words.

line 2874: The entire section on implementation has been deleted.

Section 8.5.19.8

line 2907: Changed the order of words.

line 2950: The entire section on implementation has been deleted.

Section 8.5.19.9

lines 2968-  
2969: Changed the order of words.

line 2991: Changed the words "with respect to" to read "to prevent".

line 2993: The entire section on implementation has been deleted.

Section 8.5.19.10

line 2999: Deleted the heading for paragraph (a).

line 3004: Deleted the heading for paragraph (b).

Section 8.5.19.11

line 3029: Changed the order of words.

Section 8.5.19.11 (Cont'd)

Line 3032: Deleted the heading and first paragraph of the implementation section. Retained a portion of the last paragraph

Section 8.5.19.12

Lines 3060-

3061: Changed "surveillance" to "monitoring activities" and deleted the words "of the GA Program ... activities and". Changed "surveillance" to "monitoring" in the last sentence.

Lines 3084-

3086: Changed director of quality assurance to quality assurance manager; added the words "for approval ... Vice President, Production." Deleted the last two paragraphs.

Line 3087: Deleted the entire section on implementation.

Section 8.5.19.13

Line 3110: Changed the order of words.

Line 3140: Corrected spelling.

Line 3154: Changed the order of words.

Line 3156: Deleted the entire section on implementation.

Section 8.5.19.14

Line 3161: Deleted the heading for paragraph (a).

Section 8.5.19.15

Line 3174: Deleted the heading for paragraph (a).

Line 3184: Changed the order of words.

Summary of Changes - Appendix B Tables

OLD TABLES DELETED

- 8.1-1 }  
8.1-2 } These Tables were deleted because they no longer serve any  
8.2-1 } useful purpose the way the QA program description is now  
8.5-1 } structured. (Note that they were originally put into the  
8.5-4 } program description because requirements of NRC and ANSI were  
not very clear or as well understood as they are now.)
- 8.5-5 This Table was deleted in favor of referring to Section 1.  
This will avoid any possibility of conflicts if changes are  
made later.
- 8.5-6 This Table was deleted because these documents no longer  
exist.
- 8.5-7 This Table was deleted because Figure B.5-3 now contains a  
note indicating that the important plant documents are on  
controlled distribution.

OLD TABLES RENUMBERED

Table B.5-2 was changed to Table B.5-6.

The right side of the table was changed to reflect new inspection responsibilities and to substitute "QA Monitoring" for "QA Surveillance".

Table B.5-3 was changed to Table B.5-5.

The content was updated to agree with the material from PSC's Draft of section B.5 (see page 3 of that draft).

NEW TABLES

- 8.5-1 Was added to document the fact that policies do exist (in lieu  
of repeating the policies in the FSAR).
- 8.5-2 }  
8.5-3 } These tables were created from the material in PSC's draft  
8.5-4 } of Section B.5 (see Attachments B.5B, B.5C and B.5D of that  
draft).
- 8.5-7 This table was created from the material in Attachment B.5E  
of PSC's draft of Section B.5 (see pages 27 and 28 of that  
draft).

Summary of Changes - Appendix B Figures

OLD FIGURES DELETED

- B.2-1 } These figures were deleted because the FSAR update now contains only a summary description of the QA Program as it existed for GA and PSC during construction. (These figures are referenced in the updated version of Section 8.2.)  
B.2-2 }  
B.2-3 }
- B.5-3 This figure was deleted because GA no longer has a role in QA for FSV.
- B.5-1 The same type of information, greatly simplified, is now shown on new Figures 8.5-1 and 8.5-2. Note that reference is made to Figures 12.1-2 and 12.1-3 for the more detailed charts for Nuclear Production and Nuclear Engineering respectively. The Maintenance QC Group is shown on Figure 12.1-2. Figure 8.5-1 was taken from Technical Specification Figure 7.1-1.  
B.5-4

OLD FIGURES RENUMBERED

- Figure 8.5-5 was renumbered as Figure 8.5-4 and was modified to conform to the current QA Department Procedures.
- Figure 8.5-6 was renumbered as Figure 8.5-3 and was modified to conform to new Administrative Procedure G-2.
- Figure 8.5-2 was modified to show the QA Department as it is presently structured.

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END OF DRAFT 1

SUMMARY OF CHANGES FOR APPENDIX B

SECTION B.1

Line 327: "the radioactive waste disposal systems,"  
deleted per PSC comments (See line 322,  
April 1 draft).

SECTION B.2

Lines 397 & 404: PSCO changed to PSCo per PSC comments.

SECTION B.3.1

Line 483: Vendor changed to Seller per PSC comments.

SECTION B.5

Line 583: "Vice President, Production" changed to  
"Vice President, Electric Production" per PSC  
comments.

Line 618: "NRC operating license" changed to "operating  
license" per PSC comments.

Line 639: "and environmental protection." changed to  
"environmental protection, and nuclear plant  
procedures." per PSC comments.

SECTION B.5.1.1

Lines 659 & 664: "Vice President, Production" changed to "Vice  
President, Electric Production" per PSC comments.

SECTION B.5.1.2

Lines 675-687: Additional information incorporated pertaining  
to Division responsibilities, per PSC comments  
(See lines 670-677, April 1 draft).

SECTION B.5.1.3

Lines 703, 706, : "Vice President, Production" changed to "Vice  
721 President, Electric Production" per PSC comments.

Line 746: "Table B.5-5" changed to "Table B.5-2" per PSC  
comments.

SECTION B.5.1.3 (Continued)

Lines 795-798: This previously was located at a later part of the same section, but was moved per PSC comments (See lines 872-875, April 1 draft).

Lines 801-852: Numbers changed due to text insertions.

Line 812: "Supplies" changed to "Supplier" per PSC comments.

Lines 829-831: Inserted from later part of this section, per PSC comments (See lines 854-857, April 1 draft).

Line 865: "quality assurance procedures" changed to "quality assurance operations procedures" per PSC comments.

Lines 875-883: Numbers changed due to text deletions.

After Line 880: Subsection deleted per PSC comments (See lines 867-869, April 1 draft).

Line 891: "Vice President, Production" changed to "Vice President, Electric Production" per PSC comments.

After Line 915: Subsection deleted per PSC comments (See lines 913-915, April 1 draft).

Lines 940-945: Inserted from later part of this section, per PSC comments (See lines 973-978, April 1 draft).

Lines 961-963: Minor editorial changes made per PSC comments.

Lines 974-991: Letters changed due to insertion and deletion of text.

Line 979: "performing inspections" changed to "performing and documenting inspections" per PSC comments.

Line 982-984: "Plant Engineering Supervisor" changed to "Technical Services Engineering Supervisor" per PSC comments.

Lines 991-996: Inserted from earlier part of this section, per PSC comments (See lines 940-945, April 1 draft).

SECTION B.5.1.3 (Continued)

- Line 1002: "Vice President, Production" changed to "Vice President, Electric Production" per PSC comments.
- Line 1010: "Assuring Engineering" changed to "Assuring prior Engineering" per PSC comments.

SECTION B.5.2.1

- Line 1079: "safe shutdown items" changed to "Safe Shutdown items" per PSC comments.
- Line 1081: Sentence deleted per PSC comments (See lines 1080-1081, April 1 draft).
- Line 1089: Minor editorial change; end of sentence deleted per PSC comments (See lines 1089-1091, April 1 draft).
- Line 1092: "As described in the original FSAR, Amendment 32," deleted per PSC comments (See line 1093, April 1 draft).
- Lines 1096-1098: "Table B.5-6" changed to "Table B.5-3" and following information was made a separate paragraph, per PSC comments.

SECTION B.5.2.2

- Line 1117: Verb tense change per PSC comments.
- Line 1121: "FSV personnel" changed to "personnel" per PSC comments.

SECTION B.5.2.3

- Line 1135: "Vice President, Production" changed to "Vice President, Electric Production" per PSC comments.

SECTION B.5.2.4

- Lines 1148-1149: "A form" changed to "A design control system" per PSC comments.

SECTION B.5.2.5

- Line 1166: "Table B.5-7" changed to "Table B.5-4" per PSC comments.

SECTION 8.5.2.7

Lines 1195-1201: References to Sections 1.2.2.5, 1.4.5.1, 1.4.5.3 and 6 replaced former FSAR references per PSC comments (See lines 1196-1204, April 1 draft).

SECTION 8.5.2.8

Line 1227: "maintained in the QA Records Center" changed to "maintained on file" per PSC comments.

SECTION 8.5.2.9

Line 1244: "personnel." changed to "personnel involved in nuclear activities." per PSC comments.

Line 1266: Minor wording changes made per PSC comments (See lines 1270-1271, April 1 draft).

Line 1278: "maintained in QA Records Center" changed to "maintained on file" per PSC comments.

SECTION 8.5.2.11

Line 1306: "Vice President, Production" changed to "Vice President, Electric Production" per PSC comments.

SECTION 8.5.3.3

Line 1345: "Form" changed to "System" per PSC comments.

Line 1348: Sentence about Change Notice System changed per PSC comments (See lines 1351-1353, April 1 draft).

SECTION 8.5.3.4

Line 1399: "emergency field changes" changed to "emergency changes" per PSC comments.

SECTION 8.5.3.7

Line 1434-1435: Sentence about Change Notice System reworded per PSC comments (See lines 1438-1441).

SECTION 8.5.3.9

Line 1456: Minor rewording per PSC comments (See line 1461, April 1 draft).

SECTION B.5.4.1

After Line 1464: Section B.5.4.1 material deleted and this heading is now for Section B.5.4.2 material, per PSC comments (See lines 1472-1483, April 1 draft).

SECTION B.5.4.2

Line 1479: Section renumbered due to previous deletion of material.

Lines 1483-1485: Editorial changes per PSC comments (See lines 1501-1503, April 1 draft).

SECTION B.5.4.3

Line 1523: Section renumbered due to previous deletion of material.

Line 1532: "for the Quality Assurance Records file" changed to "for record purposes" per PSC comments.

SECTION B.5.4.4

Line 1536: Section renumbered due to previous deletion of material.

SECTION B.5.5.1

Line 1562: "intents" changed to "intent" per JVN comments.

Lines 1565-1568: Paragraph modified slightly per PSC comments (See lines 1585-1591, April 1 draft).

SECTION B.5.7.1

Line 1622: "Existing procedures required" changed to "Procedures require" per PSC comments.

Line 1625: "technical personnel" changed to "personnel" per PSC comments.

SECTION B.5.8.2

Lines 1692-1695: Some information about Change Notices deleted, per PSC comments (See lines 1715-1720, April 1 draft).

SECTION B.5.9.1

- Line 1703: "Existing Requirements" changed to "Procedures" per PSC comments.
- Line 1707: "Existing procedures" changed to "Procedures" per PSC comments.
- Line 1713: "weld filler material control" added per PSC comments.

SECTION B.5.9.2

- Line 1727: End of sentence deleted per PSC comments (See lines 1749-1750, April 1 draft).

SECTION B.5.10.2

- Line 1754: "Existing procedures" changed to "Procedures" per PSC comments.
- Line 1756: "be performed" changed to "are performed" per PSC comments.
- Lines 1772-1781: Minor editorial changes made per PSC comments.

SECTION B.5.12.1

- Line 1845: "calibration and their calibration frequencies" changed to "calibration" per PSC comments.
- Line 1849: "regularly scheduled" changed to "scheduled" per PSC comments.

SECTION B.5.12.3

- Line 1871: Spelling correction made per PSC comments.

SECTION B.5.12.4

- Line 1882: "Individual calibration" changed to "Calibration" per PSC comments.

SECTION 8.5.14.1

Line 1914: Punctuation added per PSC comments.  
Line 1918: Sentence deleted; minor wording changes made per PSC comments (See lines 1940-1942, April 1 draft).

SECTION 8.5.15.1

Line 1969: "If practical" changed to "Nonconforming items are tagged, and if practical" per PSC comments.

SECTION 8.5.15.2

Line 1980: "approved by qualified" changed to "approved by Quality Assurance and qualified" per PSC comments.

SECTION 8.5.16.1

Lines 1995-1998: Editorial changes made per PSC comments (See lines 2017-2021, April 1 draft).

SECTION 8.5.16.2

Line 2014: Editorial change per PSC comments (See line 2038, April 1 draft).

SECTION 8.5.16.3

Line 2032: Sentence deleted per PSC comments (See lines 2056-2060, April 1 draft).

Line 2033: "Technical Specifications" changed to "Regulations" per PSC comments.

SECTION 8.5.18.2

Line 2118: "conducted" changed to "are conducted" per PSC comments.

Line 2124: Paragraph added per PSC comments.

SECTION 8.5.18.3

Line 2133: "Vice President, Production" changed to "Vice President, Electric Production" per PSC comments.

SECTION 8.5.18.3 (Continued)

Lines 2137-2138: "on evaluation of completed audit and monitoring results" changed to "for evaluation of completed QA audits and QA monitoring results" per PSC comments.

SECTION 8.5.18.4

Line 2146: Verb tense change.

SECTION 8.5.19

Line 2178: Verb tense change per PSC comments.

SECTION 8.5.19.3

Line 2354: First paragraph deleted and beginning of second paragraph deleted per PSC comments (See lines 2377-2389, April 1 draft).

Lines 2373-2374: Verb tense, minor editing per PSC comments.

SECTION 8.5.19.5

Lines 2467-2468: "on the construction situation." changed to "on initial construction." per PSC comments.

SECTION 8.5.19.7

Lines 2696-2697: "occurring during" changed to "that occurred during" per PSC comments.

Line 2702: "to either ANSI" changed to "to ANSI" per PSC comments.

Line 2829: "at least bi-annually" changed to "at least annually" per PSC comments.

SECTION 8.5.19.9

Lines 2930-2938: Verb tense changes made per PSC comments (See lines 2965-2973, April 1 draft).

SECTION 8.5.19.12

Line 3051: "Vice President, Production" changed to "Vice President, Electric Production" per PSC comments.

SECTION 8.5.19.13

Lines 3073 & 3080: "vendor" changed to "seller" per PSC comments.

SECTION 8.5.19.14

Line 3132: End of sentence deleted per PSC comments (See line 3167, April 1 draft).

REFERENCES FOR APPENDIX B

Line 3167: GA changed to QA.  
Lines 3170-3181: Punctuation changes.  
Line 3201: "and Holders" changed to "to Holders"  
Line 3204: Punctuation change.  
Lines 3209-3217: References 14, 15, and 16 added.

Appendix C, Criterion 11

DRAFT 1

lines 5288-5292 This response is modified to incorporate the discussion that is deleted from Section 7.4.

Figure 7.4-1 This figure is added from the answer to NRC Question 7.14. This figure will require updating based upon the updated Section 9.8.3.

Appendix C, Criterion 11

DRAFT 2

lines 5288-5292 This response is modified to incorporate the discussion that is deleted from Section 7.4.

Criterion 24

DRAFT 1

- line 2619: Changed "1400" to "1210" per PSC comments.
- line 2625: Added "AC" per PSC comments.
- line 2631: Changed "Two" to "Three" per PSC comments.
- line 2649: Changed "system functions" to "systems function" per PSC comments.

Criterion 24

DRAFT 2

lines 2844, 2845, 2854-2856, 2863, 2864, 2867 Text is modified to reflect the addition of Instrument Bus No. 1C. (P-76104)

CRITERION 32

lines 7470 - 7471: Verb tense change

Criterion 39

DRAFT 1

- line 2903 Reference is made to the fifth 230Kv transmission line. (P-80373, CN-633)
- lines 2931-2934 ACM is mentioned as a potential source of power to maintain the reactor shutdown in a safe condition. (Section 8.2.8)
- line 2952 Reference is made to the fifth 230Kv transmission line. (P-80373, CN-633)
- line 2966 The addition of Instrument Bus No. 1C is reflected. (P-76104)
- line 2972 The addition of the PPS battery and battery charger is reflected. (P-76104)

# APPENDIX C

## DRAFT 1

### Criterion 1

- lines 2107-2109: Added dates for ASME code.
- line 2175: Changed "experiences" to "could experience" per PSC comments.
- lines 2241-2242: Added dates for ASME code.

## DRAFT 2

### CRITERION 1

- line 1881: Made wording more current.

### Criterion 2

## DRAFT 1

- lines 2388-2390: Reworded sentences to avoid indicating that all safe shutdown systems are in the reactor or turbine building.

### Criterion 3

- lines 5603 - 5664 To be updated by Proto-Power?

### CRITERIA 4

- line 2112: Made wording more current.

### Summary of Changes to Criteria 5

- lines 3253-3270: This part was changed to reflect the fact that PSC will retain the necessary records rather than General Atomic. References also made to Quality-Related records as well as to Design Analytical records.
- lines 3273-3277: Added reference to Quality-Related records and indicated that after commercial operations inspection, records will be retained by PSC for the life of the plant.
- lines 3280-3283: Added words from "and other... and components."

### CRITERION 6

- lines 7173 - 7175: Verb tense change

Criterion 39

- line 2693: Changed the sentence, per PSC comments, to indicate that the removable link connections are at the generators' terminals.
- line 2702: Added "AC" per PSC comments.
- line 2705: Added reference to Section 8.2.2.4.
- line 2720: Changed "Essential" to "essential" per PSC comments.
- line 2735: Corrected reference to Section 8.2.5.2.
- line 2745: Added "AC" per PSC comments.

CRITERION 41

- Line 2509: Deleted "within 90 minutes" after "supplied" per PSC comments. Reflected the backup auxiliary boiler.
- Line 2515: Reflected the backup auxiliary boiler.
- Lines 2544-2546: Corrected description of logic per PSC comments.
- Lines 2579-2581: Reworded these sentences to correspond with Section 6.3.2.1

CRITERION 42

- Lines 2701-2704: Replaced "an associated economizer-evaporator-superheater" with "the economizer-evaporator-superheater", and changed "of a steam generator" to "or the reheat bundle section of the associated steam generator" per PSC comments.

Criterion 58

lines 5695 - 5696 Referred to Appendix D for discussion of depressurization following LOFC.

Criterion 58 (Cont'd)

line 5707 Deleted sentence relating the helium purification system to emergency depressurization.

Criterion 59

line 5741 Changed reference to Section 6.9.

lines 5745 - 5748 Referred to Appendix D for discussion of depressurization following LOFC. Revised summary of procedure involved.

lines 5756 - 5757 Deleted statements relating to use of the helium  
5760 purification system for emergency depressurization.

Criterion 61

line 5806 Changed reference to Section 6.9.

lines 5810 - 5811 Referred to Appendix D for discussion of depressurization following LOFC. Deleted statements relating to use of the helium purification system for emergency depressurization.

lines 5816 - 5817 Deleted statement relating to use of the helium purification system for emergency depressurization.

lines 5825 - 5828 Statement modified to reflect procedure used. Reference changed to 6.2.3.2.

Criteria 66

lines 2902 - 2904 Modified for clarity and to remove ".98" number, which was somewhat ambiguous. (see Notes)

Criterion 67

line 5888 Changed verb tense.

lines 5892 - 5899 Modified text to reflect discharge of tritiated water. (Section 11)

lines 5905 - 5906 Modified statement to reflect use of a compactor for low level waste. (Section 9.2.9.2)

Criteria 58

lines 2934 - 2940 "controlled access" changed to "radiation".  
(see Notes)

Criteria 69

line 2965 Verb tense changed.

CRITERION 70 - DRAFT 1

line 3101: "about" changed to "below"  
line 3108: "10<sup>-5</sup>" changed to "2 x 10<sup>-6</sup>"  
lines 3101, 3108: "uCi" changed to "micro-Ci"  
line 3109: "is" changed to "can be"

Criteria 70 DRAFT 2

lines 3058 - 3059 "planned release of tritiated water" added.  
line 3082 - 3085 These lines were rewritten to reflect the fact  
that no radioactive solid wastes have been  
shipped off site.



SECTION D.2.2.3 (Continued)

lines 4534-4536: footnote incorporated into text

lines 4565-4567: subscripted variables rewritten as subscript " "  
to facilitate word processing

SECTION D.2.3.3

lines 4916-4921: subscripted variables rewritten as subscript " "  
to facilitate word processing

SECTION D.3.1.2.1

lines 5634-5638: footnote incorporated into text to facilitate  
word processing

Section D.3.1.2.2

lines 5663-5665: footnote incorporated into text

SECTION D.3.1.4.2

lines 6244-6250: footnote incorporated into text

SECTION D.3.2.1.1

lines 6627-6629: changed to facilitate word processing

line 6708: subscripts modified to facilitate word processing

lines ~~6672-6674~~: subscripts modified to facilitate word processing

line 6789: subscripts modified to facilitate word processing

SECTION D.3.2.2.2

lines 7029-7043: equations and text modified to facilitate word  
7056-7091 processing

lines 7111,7127: subscripted variables rewritten as subscript " "  
7134,7153, to facilitate word processing  
7154

lines 7138-7141: text modified to facilitate word processing

lines 7153-7154: subscripts modified to facilitate word processing

line 7201: modified to facilitate word processing

lines 7219-7225: modified to facilitate word processing

SECTION D.3.4.2.1

lines 7565,7566: modified to facilitate word processing  
7601,7604

SECTION D.3.4.2.4

line 7919:           subscripts modified to facilitate word processing

SECTION D.3.4.3.1

line 8075:           subscripts modified to facilitate word processing

line 8123:           subscripts modified to facilitate word processing

lines 8147-8149:    subscripts modified to facilitate word processing

lines 8173-8175:    format of equation modified to facilitate word  
8188                 processing

lines 8203-8205:    subscripts modified to facilitate word processing  
8224

APPENDIX E - DRAFT 1

Ex 11.2 Comments on Appendix E will  
be forthcoming.

Page 5

- o Line 59 - "(240)\* is out of place.

Page 14

- o Line 404 - "30" should be "3089".
- o Additional details are forthcoming.

Page 34 thru 39

- o Sketches should be figures - Text must also be modified.

Summary of Changes to Final Draft of Appendix E

Section E.1.2.

lines 1570, 1620-1621      Incorporated Footnote.

Section E.11.2.2.2.

line 6822      Corrected equation per PSC comment.

line 7160      Corrected equation per PSC comment.

Aside from grammatical and verb tense changes no other modifications have been made to this Appendix.

It is requested that PSC verify that no further modifications are required to this section.

REWRITE UNIT 12 SUMMARY OF CHANGES

APPENDIX H

SECTION H.4.1.1

lines 318,321: " $\ddot{Y}(t)$ ", " $\dot{X}(t)$ ", and " $\ddot{X}(t)$ " changed to " $d^2Y(t)/dt^2$ ", " $dX(t)/dt$ ", and " $d^2X(t)/dt^2$ " to facilitate word processing.