

Southern California Edison Company INTERIM CALCULATION CHANGE NOTICE (ICCN)/ CALCULATION CHANGE NOTICE (CCN) COVER PAGE	CALC. NO. M-0050-017		ICCN NO./ PRELIM. CCN NO. N-3	PAGE 1	TOTAL NO. OF PAGES 24
	BASE CALC. REV. 2	UNIT 2&3	CCN CONVERSION : CCN NO. CCN- 3	CALC. REV. 2	
	CALCULATION SUBJECT : BTP RSB 5-1 Condensate Inventory				
CALCULATION CROSS-INDEX ☐ New/Updated index included ☒ Existing index is complete		ENGINEERING SYSTEM NUMBER / PRIMARY STATION SYSTEM DESIGNATOR 1305 / ADA		Q-CLASS II	
CONTROLLED PROGRAM OR DATABASE ACCORDING TO SO123-XXIV-5.1		PROGRAM / DATABASE NAME (S)		VERSION/RELEASE NO.(S)	
Site Programs/Procedure Impact? ☐ NO ☒ YES, AR No. AR960201089		☐ PROGRAM ☐ DATA BASE ☐ ALSO, LISTED BELOW			

1. BRIEF DESCRIPTION OF ICCN / CCN:

REVISE pages 10, 11, 12, 18, 20, 36, 37, 38, 39, 40, 42, 43, 47, 50, 63, 64, 68 and 87 of CCN N-2

due to the change of the isolation time for valve 2(3) -HV-5715 from 45 minutes to 90 minutes
and for the valve 2(3)-1414-MU-092 from 45 minutes to 30 minutes.

INITIATING DOCUMENT (DCP, FCN, OTHER) E-mail from operations REV. NA

2. OTHER AFFECTED DOCUMENTS (CHECK AS APPLICABLE FOR CCN ONLY):

☐ YES ☒ NO OTHER AFFECTED DOCUMENTS EXIST AND ARE IDENTIFIED ON ATTACHED FORM 26-503.

3. APPROVAL :

DISCIPLINE / ESC : NUC / MECH

Paul Biba

ORIGINATOR (Print name/sign/date)

David Brahms

IRE (Print name/sign/date)

FLS (Signature/date)

OTHER (Signature/date)

OTHER (Signature/date)

OTHER (Signature/date)

4. CONVERSION TO CCN DATE

11/2/98

SCE CDM - SONGS

9901190348 990111
PDR ADOCK 05000361
P PDR

T:\JETFORM\FORMS\GEN122 1 02 MDF Ver: 02 00 01 5/19/98
C:\CT1\CONFORM.DAT DevId: 1 0000 Printed: 10/30/98

Site File Copy

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Project or DCP/FCN N/A

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Subject BTP RSB 5-1 Condensate Inventory

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	10-30-98	D. Brahms		△					
△					△					

EC&FS DEPARTMENT CALCULATION SHEET

Project or DCP/FCN N/A

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Subject BTP RSB 5-1 Condensate Inventory

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	7-15-98	D. Brahms		△					
△					△					

INSERT C

2.0 RESULTS

The minimum required volume in T-120 above the tank's zero datum is 330,351 gallons, assuming operator action within 45 minutes after a OBE to isolate S2/3-1414-MU-092 and 2/3-HV-5715. The recommended Technical Specification (T.S.) volume is 360,000 gallons, which includes 29,649 gallons of available margin that can be allocated as required should a future inventory concern occur. These results are detailed in the Table 2-1 on the following sheet and are graphically illustrated on a schematic diagram on Figure 2-1.

Notes to Table 2-1:

- These flow losses are assumed isolatable in 45 minutes by operator action to close S2/3-1414-MU-092 following an OBE (or OBE).
Further, normal isolation of flows from T-120 via closure of MU-092 (with operators standing by when opened) would eliminate losses for both items 5 & 6. Under these conditions the margins identified in line 15 would increase in direct proportion to the reduction in flow losses.
- These flows are assumed isolatable in 45 minutes by operator action to close 2/3-HV-5715 following an OBE (or OBE).
Further, normal isolation of flow from T-120 via closure of isolation valve 1414-MU-048 upstream of the TPCW tank makeup valve LV-6936, (with operators standing by when opened) would eliminate losses for item 11. Under this condition the margins identified in line 15 would increase in direct proportion to the reduction in flow losses.
- These losses are assumed for the duration of 24 hours.

CALCULATION IMPACTS:

- This calculation affects Operating Procedure S023-13-3, which addresses the manual isolations of valves S2/3-1414-MU-092 and 2/3 HV-5715 post OBE (see Assumption E11 in Appendix E). The change involves extending the isolation time from the current 30 minutes to 45 minutes for both 2/3-HV-5715 and S2/3-1414-MU-092.
- This calculation will require a change of the Tech Spec 3.7.6, revising the existing Tech Spec T-120 volume from 280,000 gallons to a volume larger than 330,351 gallons (360,000 gallons is recommended per Table 2-1.). Following the approval of the new Tech Spec volume, this calculation (M-0050-017) would need to be revised to agree with the final Tech Spec Value.

*Replace
with
following
sheet*

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Sheet No. _____

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	10-30-98	D. Brahms		△					↓
△					△					↓

INSERT C

2.0 RESULTS

The minimum required volume in T-120 above the tank's zero datum is 327,384 gallons, assuming operator action within 30 minutes after a DBE to isolate S2(3)1414-MU-092 and 90 minutes after a DBE to isolate 2(3)HV-5715. The recommended Technical Specification (T.S.) volume is 360,000 gallons, which includes 32,616 gallons of available margin that can be allocated as required should a future inventory concern occur. These results are detailed in the Table 2-1 on the following sheet and are graphically illustrated on a schematic diagram on Figure 2-1.

Notes to Table 2-1:

- 1) These flow losses are assumed isolatable in 30 minutes by operator action to close S2(3)1414-MU-092 following an OBE (or DBE).

Further, normal isolation of flows from T-120 via closure of MU-092 (with operators standing by when opened) would eliminate losses for both items 5 & 6. Under these conditions the margins identified in line 15 would increase in direct proportion to the reduction in flow losses.
- 2) These flows are assumed isolatable in 90 minutes by operator action to close 2(3)HV-5715 following an OBE (or DBE).

Further, normal isolation of flow from T-120 via closure of isolation valve 1414-MU-048 upstream of the IPCW tank makeup valve LV-6936, (with operators standing by when opened) would eliminate losses for item 11. Under this condition the margins identified in line 15 would increase in direct proportion to the reduction in flow losses.
- 3) These losses are assumed for the duration of 24 hours.

CALCULATION IMPACTS:

- 1) This calculation affects Operating Procedure S023-13-3, which addresses the manual isolations of valves S2(3)1414-MU-092 and 2(3)HV-5715 post OBE (see Assumption E11 in Appendix E). The change involves extending the isolation time from the current 30 minutes to 90 minutes for 2(3)HV-5715 and keeping the current isolation time of 30 minutes for S2(3)1414-MU-092.
- 2) This calculation will require a change of the Tech Spec 3.7.6, revising the existing Tech Spec T-120 volume from 280,000 gallons to a volume larger than 330,351 gallons (360,000 gallons is recommended per Table 2-1.). Following the approval of the new Tech Spec volume, this calculation (M-0050-017) would need to be revised to agree with the final Tech Spec Value.

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Subject BTP RSB 5-1 Condensate Inventory

Sheet No. 8A

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
△	Paul Biba	10-30-98	D. Brahms		△				
△					△				

EC&FS DEPARTMENT CALCULATION SHEET

Project or DCP/FCN N/A

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Subject BTP RSB 5-1 Condensate Inventory

Sheet No. 8A

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
△	Paul Biba	5-21-98			△				
△					△				

TABLE 2-1

Description	Gallons	Note	Com.
1. Useable volume in T-120 req'd for shutdown	200,000		Section 8.0, Sht. 22
2. Losses through T-120 concrete enclosure	3,000	3	Input 4.1
3. System valve leakage	8,380	3	Section 8.0, Sht. 22
4. Net 5/3 shrinkage loss	9,052		Section 8.0, Sht. 32
5. Line 1414-014-8" ... loss due to the condenser hotwell makeup	109,388	1	See Appendix F and Appendix E, Section 8.7
6. Loss through Emergency Spray Pump P-145	6,815	1	Due to relay chatter. See Appx. F Appendix E, Section 8.5
7. Loss due to critical crack	2,975	2	Tables 8-1.8-2, sht. 34 & 35
8. Loss due to the Separator Tank T-132 makeup	225	2	Appendix E, Section 8.6
9. Loss due to the AFW pumps packing	1,080	3	Section 8.0, Sht. 37
10. Unrecoverable volume in T-120 enclosure	2,960		Input 4.2
11. Loss due to makeup to TPDW Tank T-030	31,587	2	Appendix E, Section 8.4
12. Losses to the water seals	450	2	Section 8.0, Sht. 37
13. Recoverable volume below T-120 zero datum	(45,316)		Section 8.0, Sht. 26, (CCN N-1)
14. Total required volume above zero datum	330,351		
15. RECOMMENDED T.S. VOLUME ABOVE T-120 ZERO DATUM	380,000		Includes 29,649 gallons margin.

Notes: See previous sheet

Replace with following sheet

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REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
△	Paul Biba	10-30-98	D. Brahms		△					△
△					△					△

TABLE 2-1

Description	Gallons	Note	Comment
1. Useable volume in T-120 req'd for shutdown	200,000		Section 8.0, Sht. 21
2. Losses through T-120 concrete enclosure	3,000	3	Input 4.1
3. System valve leakage	8,360	3	Section 8.0, Sht. 22
4. Net SG shrinkage loss	9,052		Section 8.0, Sht. 32
5. Line 1414-014-8" ... loss due to the condenser hotwell makeup	73,558	1	See Appendix F and Appendix E, Section 8.7
6. Loss through Emergency Spray Pump P-145	4,410	1	Due to relay chatter. See Appx. F Appendix E, Section 8.5
7. Loss due to critical crack	5,950	2	Tables 8-1, 8-2, sht. 34 & 35
8. Loss due to the Separator Tank T-132 makeup	450	2	Appendix E, Section 8.6
9. Loss due to the AFW pumps packing	1,080	3	Section 8.0, Sht. 37
10. Unrecoverable volume in T-120 enclosure	2,960		Input 4.2
11. Loss due to makeup to TPCW Tank T-050	62,980	2	Appendix E, Section 8.4
12. Losses to the water seals	900	2	Section 8.0, Sht. 37
13. Recoverable volume below T-120 zero datum	(45,316)		Section 8.0, Sht. 28, (CCN N-1)
14. Total required volume above zero datum	327,384		
15. RECOMMENDED T.S. VOLUME ABOVE T-120 ZERO DATUM	360,000		Includes 32,616 gallons margin.

Notes: See previous sheet

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Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
△	Paul Biba	10-30-98	D. Brahms		△				
△					△				

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Subject HTP FSB 5-1 Condensate Inventory

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
X	Paul Biba	7-15-68	D. Brahms		X					
X					X					

replace
with
following
sheet

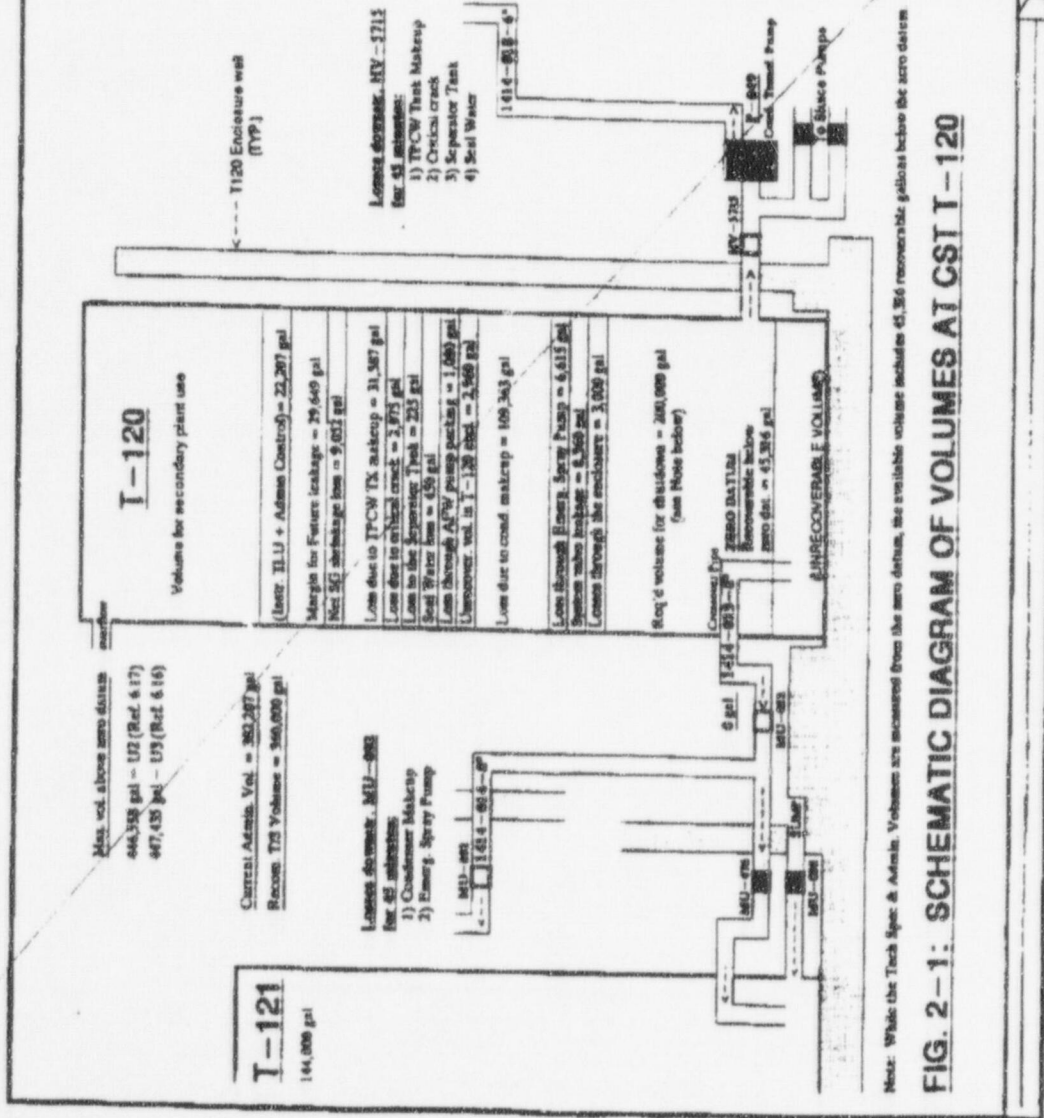


FIG. 2-1: SCHEMATIC DIAGRAM OF VOLUMES AT CST T-120

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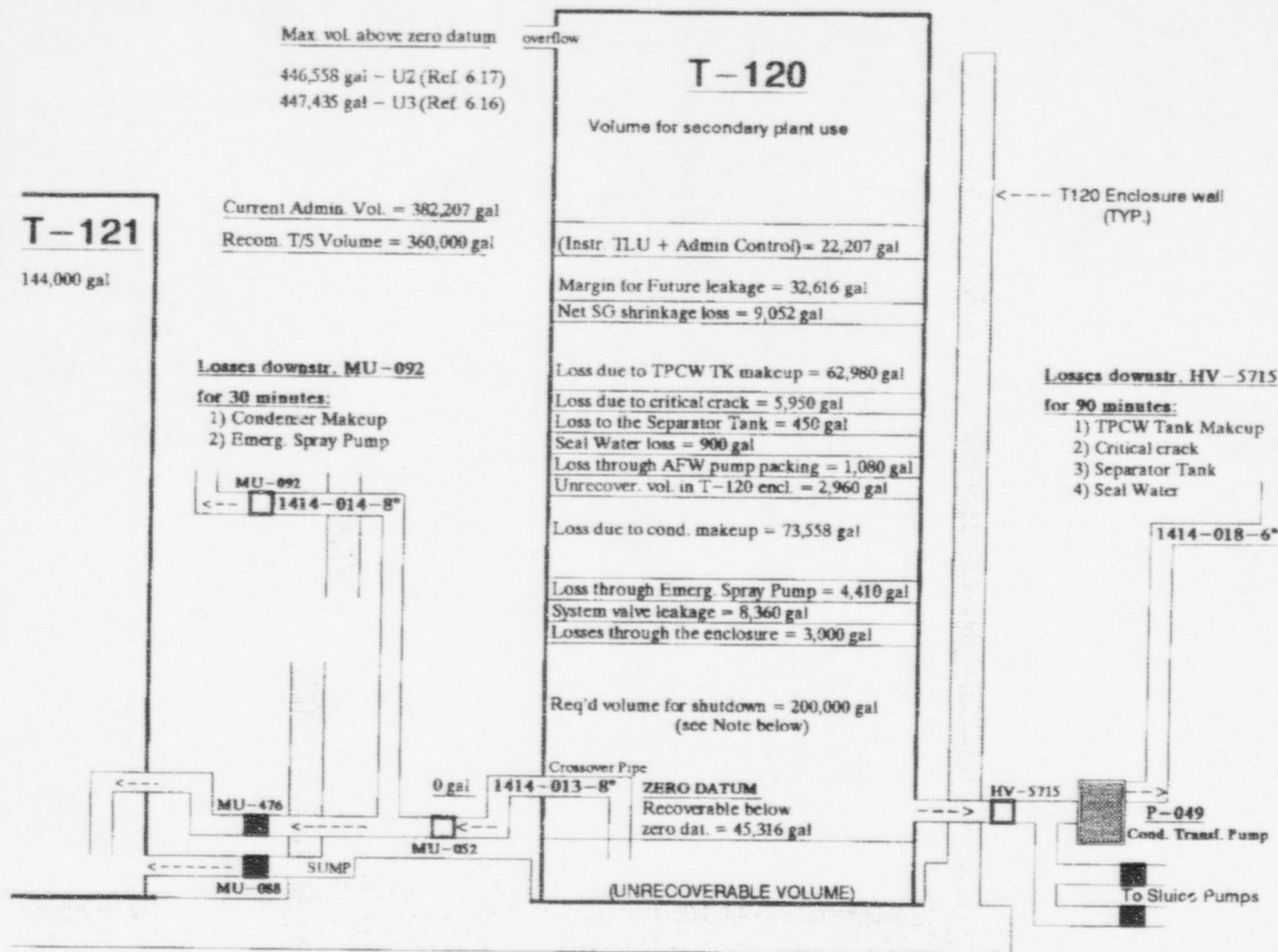
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Sheet No. 3

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
	Paul Biba	10-30-98	D. Brahms						



Note: While the Tech Spec & Admin. Volumes are measured from the zero datum, the available volume includes 45,316 recoverable gallons below the zero datum.

FIG. 2-1: SCHEMATIC DIAGRAM OF VOLUMES AT CST T-120

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△	Paul Biba	10-30-98	D. Brahms		△					↓
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REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	7-15-98	D. Brahms		△					↓
△					△					

INSERT E

- 3.11 (or more than the gross leakage allowed for these valves closure test, which ever is worse)

INSERT F

- 3.14 One worst case moderate energy non-seismic piping system is postulated to fail outside of the seismic wall enclosure around 2(3)T-120. It should be noted that the loss due to this MELB is assumed on a voluntary conservative basis, as further explained in Assumption 3.22.

Per Appendix A, the worst case failure is downstream of an isolation valve HV-5715. Although, the lines through the seismic wall have been analyzed to either seismic I or seismic II/I criteria (see Assumption 3.19 for the stress level discussion), portions of the line downstream of the isolation valve have not. The leakage through the critical crack for a 45 minute period will be added to the loss of inventory, based on the operator action (closing HV-5715 and shutting down pump P049) in this time period, as identified in the post seismic procedure (S023-13-3).

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Subject BTP RSB 5-1 Condensate Inventory

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
△	Paul Biba	10-30-98	D. Brahms		△					REV
△					△					↓

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Subject BTP RSB 5-1 Condensate Inventory

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REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
△	Paul Biba	7-15-98	D. Brahms		△					REV
△					△					↓

INSERT G

- 3.16 Condensate Transfer Pump 2(3) P-049 is normally always running and Blowdown Processing System Sluice Water Pumps 2(3) P-431 and 2(3) P-461 are normally isolated with a manually closed isolation valve. Operator action to ensure isolation of the lines or shutoff of the pumps is assumed to occur within 15 minutes of initiation of a seismic event by closing the isolation valve HV-5715.

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Subject BTP RSB 5-1 Condensate Inventory

Sheet No. 3

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	10-30-98	D. Brahms		△					↓
△					△					

NE&L DEPARTMENT CALCULATION SHEET

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Project or DCP/FCN SORGE 243

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Subject BTP RSB 5-1 Condensate Inventory

Sheet No. 32

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. D. LUNA	9-23-94	D. Brahms	9-23-94					
2	P. D. LUNA	11-29-93							

D. Determine the net steam generator shrinkage loss.

Net steam generator shrinkage is

$$11,708 - 2,656 = 9,052 \text{ Gallons.}$$

Non-Seismic Pipe Break Losses

This section will determine the loss inventory to 2(3)T120 due to a moderate energy line break of a non-seismic pipe penetrating the seismic enclosure wall around 2(3)T120. The Standard Review Plan (Reference 6.67) definition for a moderate energy pipe failure is used to calculate the break cross sectional area that is used in determining inventory losses. A critical crack is assumed down stream of an isolation valve (see Assumptions 3.14 and 3.15). The critical crack is taken to be 1/2 the nominal pipe diameter in length and 1/2 the wall thickness in width. The cross sectional area is converted to an equivalent circular cross section and the Darcy equation is used to calculate a flow rate. The computations are performed with Quattro Pro spreadsheet software, see Appendix A for a sample calculation. The spreadsheet lists all the lines penetrating the 2(3)T120 seismic wall enclosure and selected lines downstream of these lines. For critical cracks, assuming gravity flow only (no pump running), the low point elevation is conservatively assumed to be 7 Ft. elevation per Assumption 3.18. A critical crack is also postulated to occur down stream of pumps P049, P431, and P461 (see Assumption 3.16). Since the motor starter contacts for the pumps are non-IE, the contact can be made by the relays, during a seismic event, thereby starting a pump. The flow rate from a critical crack down stream of a pump is shown in Table 1 (Unit 2) and Table 2 (Unit 3). The lost inventory will be calculated based on the maximum flow rate over a ^{4.5 minute} ~~2.5 minute~~ duration. An Operator should be able to secure the pump and isolate the break by closing the isolation valve within ^{4.5 minutes} ~~10 minutes~~ (Assumption 3.14 & 3.16). From Tables 1, the inventory loss is ~~12,002~~ gallons.

2915
5950

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Subject BTP RSB 5-1 Condensate Inventory

Sheet No. 33

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
△	Paul Biba	10-30-98	D. Brahms		△					△
△					△					△

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Project or DCP/FCN SONGS 283

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Subject BTP RSB 5-1 Condensate Inventory

Sheet No. 33

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	F. D. LUNA	9-23-94	D. Brahms	9-23-94					
2	F. D. LUNA	11-29-95							

Leakage Isolation Evaluation 8-1 and 8-2

The lines listed in Tables ~~8-1 and 8-2~~ are evaluated to determine the ability to isolate a critical crack in ~~four hours~~ 45 minutes.

90

LINE NO.	EVALUATION
1414-035-2"-W-LL0	Seismic I line, pipe failure not postulated. This section of pipe is in line with the pipe below. The same evaluation applies.
1414-035-2"-R-LL0	Mini-flow line off P049 which can be isolated by HV-5715 at one end. The other end connects to line 015-8"-R-LL0 which connects to line 031-8"-R-LL0 which is connected to the T120 tank at the 61 foot elevation. Also, the line is seismically design to II/I and a postulated pipe failure is not required (assumption 3.19).
1414-015-8"-R-LL0	This line can be isolated by HV-5715 on one end and is connected to the T120 tank at the 61 foot elevation on the other end. Also, the line is seismically design to II/I and a postulated pipe failure is not required (assumption 3.19).
1414-023-8"-R-LL0	This line can be isolated by HV-5715.
1318-012-6"-T-LL0	This line can be isolated by HV-5715.
1414-018-6"-R-LL1	This line can be isolated by HV-5715.
1305-180-3"-W-LL1	This line can be isolated by 1305-MU-531. The valve is normally closed.
2423-022-1"-R-LL8	This line penetrates T120 enclosure at 59.5 foot elevation. There is no pressure head to drive fluid per this analysis above 52.7 foot elevation. Also, the line is not connected to T120.
1415-136-1"-R-LL4	This line penetrates T120 enclosure at 58.75 foot elevation. There is no pressure head to drive fluid per this analysis above 52.7 foot elevation. Also, the line is not connected to T120.
1219-046-24"-D-LL0	Seismic I line, pipe failure not postulated. Also, the line is not connected to T120. The line is a cross tie to the RWST T-005 and T-006. Does not branch to other lines.
1305-047-8"-D-LL0	Seismic I line, pipe failure not postulated. Also, the line is not connected to T120. This line is the suction to AFW Pump P-141.
1305-048-2"-D-GBO	Seismic I line, pipe failure not postulated. Also, the line is not connected to T120. The line is the AFW Pump mini-flow return to T-121.
1414-014-8"-R-LL0	This line can be isolated by 8"-092-W-212 which is located in the seismic I portion that penetrates the enclosure. The valve is in the IST Program and is tested quarterly. This valve is located outside of the T120 enclosure.

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Sheet No. 12

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	10-30-98	D. Brahms		△					
△					△					

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Project or DCP/FCN SDMS 2A1 Calc. No. M-0050-017

Subject BTP RSB 5-1 Condensate Inventory

Sheet No. 14

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	F. D. LUNA	9-23-94	D. Brahms	9-23-94					
2	F. D. LUNA	11-29-95							

1414-013-8"-R-LLD	This line runs from T121 to T120 and branches to line 014-8"-R-LLD. This line is seismically design to 11/1 and a postulated pipe failure is not required (assumption 3.19). The line can be isolated with valve 8"-092-W-212.
1414-031-8"-R-LLD	This line is connected to T120 at the 61 foot elevation and T121 at 60.5 foot elevation. There is no pressure head to drive fluid per this analysis above 52.7 foot elevation. The other end of the line can be isolated by HV-5715.
1305-144-8"-D-LLD	Seismic I line, pipe failure not postulated. The line is from T-121 to T-120 sump in the enclosure. Valve 8"-088-D-212 is in line and normally closed. Valve leakage is not an issue.
Additional Lines Downstream of Penetration (T120 Ref.). These lines are not included in tables 1 and 2, since they do not penetrate the enclosure structure around T-120.	
1414-028-6"-R-LLD	The line can be isolated by 1414-6"-797-R-212.
1414-011-8"-R-LLD	This line can be isolated by HV-5715.
1414-024-8"-R-LLD	This line connects to the tank at the 61 Foot elevation, above the enclosure wall.
1417-188-8"-R-LLI	This line branches from 1414-024-8"-R-LLD, which connects to the tank at 61 Foot elevation. No loss of T-120 inventory possible by a pipe failure.
2418-334-2"-R-LLI	Nitrogen gas system connected at top of tank.
1305-309-3"-T-KKI	This line can be isolated by 1305-MU-531.
1305-1027-3"-T-LLI	This line can be isolated by 1305-MU-531.
2418-208-3"-R-LLI	Nitrogen gas system connected at top of tank.
1305-053-8"-D-LLD	Seismic I line, pipe failure not postulated. In line valve 8"-476-D-212 is a seismic cut valve and in the normally closed position. The line is a cross connect between the T-121 and T-120 tanks. The valve is not required to be tested since normally closed. Valve leakage is not an issue since the line is a cross connect between the two tanks.
1305-180-3"-T-LLI	This line can be isolated by 1305-MU-531.

The evaluation above determined that the lines passing through the 2(3)T120 enclosure can be isolated ~~with the 10-minute time frame~~ or does not require a critical crack to be postulated. Valves HV-5715 and 8"-092-W-212 would require to be closed within ~~four hours~~ ^{10 minutes} if the T-120 inventory losses through a pipe break failure downstream of the two valves are determine.

and valve 52(3)-1414-MU-092 requires to be closed within 30 minutes post OBE.

EC&FS DEPARTMENT CALCULATION SHEET

Project or DCP/FCN N/A

Calc. No. M-0050-017

Subject BTP RSB 5-1 Condensate Inventory

Sheet No. 3

ICCN NO. /
PRELIM. CCN NO. **N-3**

CCN CONVERSION:
CCN NO. 3

PAGE 13 OF 24

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
	Paul Biba	10-30-98	D. Brahms						

CCN N2 Page 39 of
CCN.2
TABLE # 8-1
UNIT 2

BY: F.D. LUNA DATE: 11-29-95
JMT. NO. 35

T120 NON-SEISMIC LINE LOSSES, 4/13/94
Water level elevation (Ft) at 280,000 gallons is 62.7
Maximum low point elevation (Ft) is 7

Well	Sys	Line	Sch	Tk Elev	Pen Elev	Rel	I	D	Re	H	Q	Seis. Cntrl.	Iso Valve	Post.	Notes
N-E	1414	035-2-W-LLO	40	N/A	38	40418	0.154	2	1.3E+04	45.70	7.8	1	N/A	N/A	
N	1414	035-2-R-LLO	40	N/A	38	40418	0.154	2	1.3E+04	45.70	7.8	2/1	2-008-R-108	O	Outside, N of T120
N	1414	015-8-R-LLO	10	N/A	37	40418	0.148	8	1.3E+04	45.70	30.0	2/1	HV-5715	O	Inside, N-E of T120
N	1414	023-8-R-LLO	10	31	31	40418	0.148	8	1.3E+04	45.70	30.0	2/1	HV-5715	O	Outside, N of T120
N	1318	012-6-T-LLO	10	N/A	39	40418	0.134	8	1.2E+04	45.70	20.4	2/1	HV-5715	O	Piping inside RWST 006 Rm.
N	1414	018-8-R-LLO	40	N/A	34.5	40418	0.28	8	2.4E+04	45.70	42.8	2/1	HV-5715	O	Piping inside RWST 006 Rm.
S	1318	012-6-T-LLO	10	N/A	39	40413	0.134	8	1.2E+04	45.70	20.4	2/1	HV-5715	O	Piping inside RWST 006 Rm.
S	1305	180-3-W-LLO	40	60.5	38.75	40413	0.218	3	1.9E+04	45.70	16.4	1	HV-5715	O	Piping inside RWST 006 Rm.
S	1414	018-8-R-LLO	40	N/A	34.5	40413	0.28	8	2.4E+04	45.70	42.8	2/1	HV-5715	O	Piping inside RWST 006 Rm.
S	2423	022-1-R-LLO	80	N/A	59.5	40413	0.179	1	N/A	45.70	N/A	2/1	N/A	N/A	
S	1415	138-1-R-LLO	40	N/A	58.75	40413	0.133	1	N/A	45.70	N/A	2/1	N/A	N/A	
S	1219	068-24-D-LLO	10	N/A	32	40458	0.25	24	2.2E+04	45.70	152.2	1	N/A	N/A	
S	1305	047-8-D-LLO	10	N/A	29.67	40414	0.148	8	1.3E+04	45.70	30.0	1	N/A	N/A	
S	1305	048-2-D-GEO	80	N/A	57.5	40415	0.218	2	N/A	45.70	N/A	1	N/A	N/A	
S	1414	014-8-R-LLO	10	N/A	34	40458	0.148	8	1.3E+04	45.70	30.0	2/1	8-082-W-212	O	Inside RWST 005 Rm.
E	1414	013-8-R-LLO	10	34	31.302	40458	0.148	8	1.3E+04	45.70	30.0	2/1	8-082-W-212	O	Inside T121 Rm.
E	1414	031-8-R-LLO	10	61	32	40458	0.148	8	1.3E+04	45.70	30.0	2/1	HV-5715	O	Inside T121 Rm.
E	1306	048-2-D-GEO	80	N/A	58.5	40458	0.218	2	N/A	45.70	N/A	1	N/A	N/A	
E	1305	047-8-D-LLO	10	N/A	29.67	40458	0.148	8	1.3E+04	45.70	30.0	1	N/A	N/A	
E	1305	144-8-D-LLO	10	N/A	29.67	40458	0.148	8	1.3E+04	45.70	30.0	1	8-088-D-212	C	
S	2426	520-3-J-YY8	10	N/A	N/A	40239	0.12	3	1.0E+04	45.70	9.1	1	N/A	N/A	13104 gals. loss in 24 hrs. Drain line to sump

4 Hrs Loss 7209 gals
* 24 Hrs Loss 13104 gals

Pump	Disch Line	Sch	Hp	Elev	Rel	I	D	Re	H	Q
P048	010-8-R-LLO	10	170	34	40418	0.148	8	2.8E+04	215.70	85.3
P431	011-8-R-LLO	10	320	34	40418	0.134	8	3.3E+04	385.70	67.7
P481	038-8-R-LLO	10	300	34	40418	0.134	8	3.2E+04	345.70	58.1

All pumps can be isolated by HV-5715

* See note on following sheet

90 gals
Pump Discharge
5,950

EC&FS DEPARTMENT CALCULATION SHEET

Project or DCP/FCN N/A

Calc. No. M-0050-017

ICCN NO. /

N-3

PRELIM. CCN NO.

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CCN CONVERSION:
CCN NO. 3

Subject BTP RSB 5-1 Condensate Inventory

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	10-30-98	D. Brahnis		△					
△					△					

M-0050-017 REV, L
BY: F. D. LUNA DATE: 11-28-95
IRE;
DATE;
SMT, 11.1, 3.6

CCN N-2 pag 40 of
CCN 2
TABLE 8-2
LIMIT 3

52.7
7

T120 NON-SEISMIC LINE LOSSES, 4/13/94
Water level elevation (ft) at 250,000 gallons is
Maximum low point elevation (ft) is

Well	Sys	Line	Sch	Tk	Elev	Pen	Ref	t	D	Re	H	Q	Qual	Isa	Valve	Post.	Notes
N/A	1414	018-R-LLO	10	N/A	37	N/A	41950	0.148	8	1.3E+04	45.70	30.0	2/1	N/A	N/A	O	Lines connected
W	1414	023-R-LLO	10	31	31	31	41955	0.148	8	1.3E+04	45.70	30.0	2/1	N/A	N/A	O	1121 Rim
N	1305	180-3-W-LLO	40	60.5	36.75	N/A	41912	0.216	3	1.3E+04	45.70	18.4	1	N/A	N/A	O	1003 HWST Rim
N	2423	022-R-LLO	80	N/A	58.5	N/A	41917	0.179	1	N/A	45.70	N/A	2/1	N/A	N/A	N/A	
N	1415	136-1-R-LLO	40	N/A	58.75	N/A	41917	0.153	1	N/A	45.70	N/A	2/1	N/A	N/A	N/A	
N	1219	058-24-D-LLO	10	N/A	32	32	41955	0.25	24	2.2E+04	45.70	152.2	1	N/A	N/A	N/A	
N	1305	047-9-D-LLO	10	28.87	28.87	N/A	41917	0.148	8	1.3E+04	45.70	30.0	1	N/A	N/A	N/A	
N	1305	048-1-2-GEO	80	N/A	57.5	N/A	41917	0.218	2	N/A	45.70	N/A	1	N/A	N/A	N/A	
N	1414	014-R-LLO	10	N/A	34	34	41950	0.148	8	1.3E+04	45.70	30.0	2/1	N/A	N/A	O	HWST Rim 1005
W	1414	013-R-LLO	10	34	31.302	N/A	41955	0.148	8	1.3E+04	45.70	30.0	2/1	N/A	N/A	O	1121 Rim
W	1414	031-R-LLO	10	61	32	32	41955	0.148	8	1.3E+04	45.70	30.0	2/1	N/A	N/A	O	1121 Rim
W	1305	048-2-D-GEO	80	N/A	68.5	N/A	41955	0.218	2	N/A	45.70	N/A	1	N/A	N/A	N/A	
W	1305	047-8-D-LLO	10	N/A	28.87	N/A	41955	0.148	8	1.3E+04	45.70	30.0	1	N/A	N/A	O	1121 Rim
W	1305	144-R-LLO	10	N/A	28.87	N/A	41955	0.148	8	1.3E+04	45.70	30.0	1	N/A	N/A	O	1121 Rim
N/A	2423	520-3-J-VV5	1	N/A	N/A	N/A	40738	0.12	3	1.0E+04	45.70	9.1	1	N/A	N/A	N/A	113104 gals. loss in 24 hrs.

Drain line to sump

4 Hr Loss	7209 gals
24 Hr Loss	13104 gals

4 Hr Loss
24 Hr Loss

Pump	Disch	Line	Sch	Hp	Elev	Ref	t	D	Re	H	Q
P048	010-R-LLO	10	170	34	40418	0.148	8	2.8E+04	215.70	65.3	
P431	011-R-LLO	10	320	34	40418	0.134	8	3.3E+04	395.70	57.7	
P461	030-R-LLO	10	300	34	40418	0.134	8	3.2E+04	345.70	56.1	

24 Hrs Loss

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All pumps can be isolated for HV-5715

* See note on following sheet

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24 Hr Loss	13104 gals

4 Hr Loss
24 Hr Loss

4 Hr Loss	7209 gals
24 Hr Loss	13104 gals

4 Hr Loss
24 Hr Loss

4 Hr Loss	7209 gals
24 Hr Loss	13104 gals

4 Hr Loss
24 Hr Loss

4 Hr Loss	7209 gals
24 Hr Loss	1

EC&FS DEPARTMENT CALCULATION SHEET

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CCN NO.		

Subject BTP RSB 5-1 Condensate Inventory

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	10-30-98	D. Brahms		△					
△					△					

EC&FS DEPARTMENT CALCULATION SHEET

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PRELIM. CCN NO.		
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CCN NO.		

Subject BTP RSB 5-1 Condensate Inventory

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	7-15-98	D. Brahms		△					
△					△					

INSERT K1

Note to Tables B-1 and B-2.

The values per Table B-1 and B-2 are based on a Tech Spec initial volume of 280,000 gallons. The "worst case" leakage of ~~2975~~ ⁵⁹⁵⁰ gallons in ~~45~~ ⁹⁰ minutes reflects the correction for the initial tank volume of 360,000 gallons, using the methodology per Appendix A, applied to line 010-B-R-LLO.

INSERT L

Non-IE And/Or Mechanical Control Seismic Interactions

The impact of Non-IE electrical and/or mechanical control seismic interactions are evaluated in Appendix F. This Appendix concluded the following:

- 30 A seismic event could potentially cause the condenser hot well level to be reduced and thus indirectly cause the makeup valves to open. It is postulated that this would occur due to chattering of non IE relays in the condensate over boarding control system (COCS) activating the system and drain down of one or more hotwells. The total flow in ~~45~~ ³⁰ minutes through the makeup valves is the same as that which would occur if the valves were to be induced to open. The total loss in ~~45~~ ³⁰ minutes per Appendix E is ~~496,000~~ ^{73,558} gallons.

NOTE: A OBE could also create a crack in the condenser itself. Such a crack would be outside the scope of MELB assumptions for piping. Since no analysis has been performed on the condenser, the size of the crack is unknown. However, the impact would be bounded by the above opening of the makeup valves.
- 30 Relay chatter combined with loss of air supply to TV-2819 could potentially cause the spray water emergency pump P-145 to activate resulting in a flow path from T-120 to the turbine spray system until S21414HU092 is isolated in ~~45~~ ³⁰ minutes. The total flow due to this potential flow path for ~~45~~ ³⁰ minutes until operator action is credited to close S21414HU092 has been evaluated to be ~~4,410~~ ⁴⁵⁰ gallons.
- 30 Out of the systems leading from HV-5715, non IE seismic interactions may cause opening of the makeup valve to separator tank T-132. The total flow due to this potential flow path for ~~45~~ ⁹⁰ minutes until operator action is credited to close 2/3HV-5715 has been evaluated to be ~~4,410~~ ⁴⁵⁰ gallons.

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Subject BTP RSB 5-1 Condensate Inventory

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
△	Paul Biba	10-30-98	D. Brahms		△					
△					△					

EC&FS DEPARTMENT CALCULATION SHEET

Project or DCP/FCN N/A

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CCN NO.		2

Subject BTP RSB 5-1 Condensate Inventory

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
△	Paul Biba	7-15-98	D. Brahms		△					
△					△					

INSERT L ... continued:

Loss due to makeup to TPCW tank T-050

This loss is based on the postulated seismically induced cracking of T-050, and subsequent opening of the makeup valve LV-6936 for 90 minutes, until operator action is credited to close 2/3 HV-5715. This loss has been evaluated to be 62,980 gallons.

Seal Water Loss

This loss is caused by minor leakage of valve packings for valves with seal water supplied by the Cond. Transfer Pump P-049 from T-120. The supply line is only 1 inch diameter and normally, with properly maintained valve packings, zero leakage would be expected. However, to conservatively envelope this potential leakage, 10 gpm is assumed for the duration of 90 minutes per Assumption 3.24, until operator action is credited to close 2/3 HV-5715. For the 90 minute duration, this loss will amount to 900 gallons.

Losses through the AFW pump packing

The normal auxiliary feedpump packing leakage has been identified by the Station Technical personnel to be 0.25 gpm (see Appx. G), based on the full tank T-120. As the RSB 5-1 scenario is based on the "normal" operation of the plant, the use of this leakage is appropriate. Also, as the tank water level is reduced, this leakage would be also reduced, thus the use of the 0.25 gpm leakage is conservative.

The total leakage for 3 pumps in 24 hours:

$$3 * 0.25 * 60 * 24 = 1,080 \text{ gallons}$$

Total Required Volume in T-120:

A summary of the water requirements for T-120 to support the RSB 5-1 cooldown including an accounting of this calculation is provided in Table 2-1 in Section 2 of this calculation.

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Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	10-30-98	D. Brahms		△					
△					△					

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Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

Sheet No. E 2

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	5-21-98			△					
△					△					

APPX. E. SECTION 1. PURPOSE

The purpose of this Appendix E is to derive various outflows from the condensate storage tank T-120, such as losses due to the operation of the pump P-145, makeup to the Separator Tank T-132 and the makeup into the condenser hotwells. Flow paths that are evaluated in this appendix were identified as potential flow paths in Appendix F.

This calculation is done as part of the resolution of NCR 960201089.

APPX. E. SECTION 2. RESULTS / CONCLUSIONS AND RECOMMENDATIONS

APPX. E. 2.1 MISCELLANEOUS OUTFLOW RESULTS

The following conclusions are based on the evaluation documented in this Appendix. The outflows for the evaluated cases are as follows:

Case 1:

Flow to the TPCW tank T-050: 62,980 gal total during 90 minutes. This volume is associated with opening of the tank's makeup valve after postulated seismically induced tank cracking.

Case 2:

Loss due to start and operation of Emergency Spray Pump P-145, caused by postulated non 1E seismic interactions, for 30 minutes prior to isolation from the control room is 4,410 gal total.

Case 3:

Loss due to the makeup into the Separator Tank T-132, due to the malfunction of the level control valve LCV-3321 float due to seismic interaction is 450 gal total during 90 minutes.

Case 4:

Loss due to the makeup into the Condenser hotwells, due to the malfunction of the Condenser overboard valve in open condition due to seismic interaction, or due to seismically induced condenser cracking, is 73,558 gal total during 30 minutes.

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Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
<u>△</u>	Paul Biba	10-30-98	D. Brahms		<u>△</u>					
<u>△</u>					<u>△</u>					

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Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

Sheet No. E-5

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
<u>△</u>	Paul Biba	5-21-98			<u>△</u>					
<u>△</u>					<u>△</u>					

Appx. E. SECTION 3. ASSUMPTIONS

- E8. The hotwell makeup will be derived for simplification only for one path out of 4 paths to the condenser. The selected path is associated with the makeup valve LV-3259. This assumption is reasonable, as the condenser makeup system is symmetrical and the selected routing is more conservative than the routing to the second valve LV-3248, thus resulting in somewhat larger total flow.
- E9. Based on above assumption the K factor for the pipes which will pass half or quarter of the total flow will be assumed to be one quarter or one sixteenth of its value in respect to the common header. This assumption is reasonable, as the flow will be fully turbulent and thus it will be possible to draw quadratic relationships between various flow regimes.
- E10. The N2 blanket pressure in the T-120, which is normally maintained at 1/2 inch H2O is disregarded in this calculation, as the water level in the tank is conservatively assumed at 58.2 ft per Assumption E2.
- E11. This evaluation will assume the following manual isolation times for T-120 isolation valves for both Units 2 & 3, and will assume that the applicable Operating Procedures will be revised accordingly:
- Manual isolation valves S2(3) 1414-MU-092 are assumed to be closed by the operator within 30 minutes post OBE. This assumption is reasonable and backed by plant walkdown as documented by an e-mail from operations in Appendix G (the current procedure SO23-13-3 specifies 30 minutes isolation).
 - Manual isolation valves 2(3) HV-5715 are assumed to be closed by the operator within 90 minutes post OBE. This assumption is reasonable and backed by plant walkdown as documented by an e-mail from operations in Appendix G (the current procedure SO23-13-3 specifies 30 minutes isolation).
- E12. This evaluation assumes seismically induced cracking of the condenser, and subsequent opening of the condenser hot well makeup valves.

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Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	10-30-98	D. Brahms		△					↓
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Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

Sheet No. E18

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	5-21-98			△					↓
△					△					

Replace with following sheet

TABLE E8-3: DISCHARGE FROM T-120 TO TPCW TANK T-050 W/ P040 RUNNING

1000.000 m³ of water over head of T-120

Time	Start	EST	Hour	Sec	and
Unit	min	FLSW	Unit	Unit	min
1	58.20	704	704	0.05	58.15
2	58.15	704	704	0.05	58.10
3	58.10	704	704	0.05	58.05
4	58.05	704	704	0.05	58.01
5	58.01	704	704	0.05	57.96
6	57.96	704	704	0.05	57.91
7	57.91	703	703	0.05	57.86
8	57.86	703	703	0.05	57.81
9	57.81	703	703	0.05	57.77
10	57.77	703	703	0.05	57.72
11	57.72	703	703	0.05	57.67
12	57.67	703	703	0.05	57.62
13	57.62	703	703	0.05	57.58
14	57.58	703	703	0.05	57.53
15	57.53	703	703	0.05	57.48
16	57.48	703	703	0.05	57.43
17	57.43	703	703	0.05	57.39
18	57.39	703	703	0.05	57.34
19	57.34	703	703	0.05	57.29
20	57.29	703	703	0.05	57.24
21	57.24	703	703	0.05	57.19
22	57.19	703	703	0.05	57.14
23	57.14	703	703	0.05	57.10
24	57.10	703	703	0.05	57.05
25	57.05	703	703	0.05	57.00
26	57.00	703	703	0.05	56.95
27	56.95	703	703	0.05	56.91
28	56.91	701	701	0.05	56.86
29	56.86	701	701	0.05	56.81
30	56.81	701	701	0.05	56.76
31	56.76	701	701	0.05	56.72
32	56.72	701	701	0.05	56.67
33	56.67	701	701	0.05	56.62
34	56.62	701	701	0.05	56.57
35	56.57	701	701	0.05	56.53
36	56.53	701	701	0.05	56.48
37	56.48	701	701	0.05	56.42
38	56.42	700	700	0.05	56.38
39	56.38	700	700	0.05	56.34
40	56.34	700	700	0.05	56.29
41	56.29	700	700	0.05	56.24
42	56.24	700	700	0.05	56.19
43	56.19	700	700	0.05	56.14
44	56.14	700	700	0.05	56.10
45	56.10	700	700	0.05	56.05

Total elapsed, vol. 21957 GSI

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Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

Sheet No. _____

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	10-30-98	D. Brahms		△					↓
△					△					

TABLE E8-3: DISCHARGE FROM T-120 TO TPCW TANK T-050 W/ P049 RUNNING

1963.5 cuft of water per foot of T-120						
Time	Tank	EST	flow	Elev.	end	
(min)	water	FLOW		data	elev.	
	elev.					
	(ft)	(gpm)	(gpm)	(ft)	(ft)	
1	58.20	704	704	0.05	58.15	
2	58.15	704	704	0.05	58.10	
3	58.10	704	704	0.05	58.06	
4	58.06	704	704	0.05	58.01	
5	58.01	704	704	0.05	57.96	
6	57.96	704	704	0.05	57.91	
7	57.91	703	703	0.05	57.86	
8	57.86	703	703	0.05	57.82	
9	57.82	703	703	0.05	57.77	
10	57.77	703	703	0.05	57.72	
11	57.72	703	703	0.05	57.67	
12	57.67	703	703	0.05	57.63	
13	57.63	703	703	0.05	57.58	
14	57.58	703	703	0.05	57.53	
15	57.53	703	703	0.05	57.48	
16	57.48	703	703	0.05	57.43	
17	57.43	702	702	0.05	57.39	
18	57.39	702	702	0.05	57.34	
19	57.34	702	702	0.05	57.29	
20	57.29	702	702	0.05	57.24	
21	57.24	702	702	0.05	57.19	
22	57.19	702	702	0.05	57.15	
23	57.15	702	702	0.05	57.10	
24	57.10	702	702	0.05	57.05	
25	57.05	702	702	0.05	57.00	
26	57.00	702	702	0.05	56.96	
27	56.96	702	702	0.05	56.91	
28	56.91	701	701	0.05	56.86	
29	56.86	701	701	0.05	56.81	
30	56.81	701	701	0.05	56.76	
31	56.76	701	701	0.05	56.72	
32	56.72	701	701	0.05	56.67	
33	56.67	701	701	0.05	56.62	
34	56.62	701	701	0.05	56.57	
35	56.57	701	701	0.05	56.53	
36	56.53	701	701	0.05	56.48	
37	56.48	701	701	0.05	56.43	
38	56.43	700	700	0.05	56.38	
39	56.38	700	700	0.05	56.34	
40	56.34	700	700	0.05	56.29	
41	56.29	700	700	0.05	56.24	
42	56.24	700	700	0.05	56.19	
43	56.19	700	700	0.05	56.14	
44	56.14	700	700	0.05	56.10	
45	56.10	700	700	0.05	56.05	

31587 gal

Time	Tank	EST	flow	Elev.	end	
(min)	water	FLOW		data	elev.	
	elev.					
	(ft)	(gpm)	(gpm)	(ft)	(ft)	
46	56.05	700	700	0.05	56.00	
47	56.00	700	700	0.05	55.95	
48	55.95	700	700	0.05	55.91	
49	55.91	699	699	0.05	55.88	
50	55.88	699	699	0.05	55.81	
51	55.81	699	699	0.05	55.76	
52	55.76	699	699	0.05	55.72	
53	55.72	699	699	0.05	55.67	
54	55.67	699	699	0.05	55.62	
55	55.62	699	699	0.05	55.57	
56	55.57	699	699	0.05	55.53	
57	55.53	699	699	0.05	55.48	
58	55.48	699	699	0.05	55.43	
59	55.43	699	699	0.05	55.38	
60	55.38	698	698	0.05	55.34	
61	55.34	698	698	0.05	55.29	
62	55.29	698	698	0.05	55.24	
63	55.24	698	698	0.05	55.19	
64	55.19	698	698	0.05	55.15	
65	55.15	698	698	0.05	55.10	
66	55.10	698	698	0.05	55.05	
67	55.05	698	698	0.05	55.00	
68	55.00	698	698	0.05	54.96	
69	54.96	698	698	0.05	54.91	
70	54.91	697	697	0.05	54.86	
71	54.86	697	697	0.05	54.81	
72	54.81	697	697	0.05	54.77	
73	54.77	697	697	0.05	54.72	
74	54.72	697	697	0.05	54.67	
75	54.67	697	697	0.05	54.62	
76	54.62	697	697	0.05	54.58	
77	54.58	697	697	0.05	54.53	
78	54.53	697	697	0.05	54.48	
79	54.48	697	697	0.05	54.43	
80	54.43	696	696	0.05	54.39	
81	54.39	696	696	0.05	54.34	
82	54.34	696	696	0.05	54.29	
83	54.29	696	696	0.05	54.24	
84	54.24	696	696	0.05	54.20	
85	54.20	696	696	0.05	54.15	
86	54.15	696	696	0.05	54.10	
87	54.10	696	696	0.05	54.05	
88	54.05	696	696	0.05	54.01	
89	54.01	696	696	0.05	53.96	
90	53.96	696	696	0.05	53.91	

31393 gal

Total disch. vol. 62,980 gal

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Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

Sheet No.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
<u>△</u>	Paul Biba	10-30-98	D. Brahms		<u>△</u>					
<u>△</u>					<u>△</u>					

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Project or DCP/FCN N/A

Calc. No. M-0050-017

Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

Sheet No. E19

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
<u>△</u>	Paul Biba	7-15-98	D. Brahms		<u>△</u>					
<u>△</u>					<u>△</u>					

Appx. E, SECTION 8, COMPUTATIONS ... continued:

Appx. E, 8.5 CASE 2, Start of the Emergency Spray pump P-145 due to Seismic Non-1E Interactions.

The operation of then Emergency Spray Cooling Pump P-145 would result in a flow of 147 gpm for 30 minutes (see Assumption E6).

The total outflow in 45 minutes:

$$Q = \cancel{45} \times 147 = \cancel{6615} \text{ gallons}$$

$$\underline{30} \quad \underline{4,410}$$

Appx. E, 8.6 CASE 3, Makeup Flow to the Separator Tank T-132 due to Malfunction of the Float Level Control Valve LCV-3321 in an Open Position due to Seismic Interaction

The failure of the makeup valve LCV-3321 in an open position would result in a flow of 5 gpm for 90 minutes or 450 gallons total, per Assumption E5.

$$\underline{90} \quad \underline{450}$$

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Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

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△					△					

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Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

Sheet No. E22

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	5-21-98			△					
△					△					

TABLE ES-5: DISCHARGE OF WATER FROM T-120 TO CONDENSER HOT-WELLS

Time (min)	Temp. WV. EL. (°F)	Flow (GPM)	Elev. above PW (ft)	End Elev. (ft)
1	56.20	2484	0.17	56.03
2	56.03	2481	0.17	57.88
3	57.96	2480	0.17	57.89
4	57.90	2480	0.17	57.82
5	57.52	2480	0.17	57.36
6	57.30	2475	0.17	57.18
7	57.18	2479	0.17	57.02
8	57.02	2474	0.17	56.85
9	56.85	2471	0.17	56.68
10	56.68	2468	0.17	56.51
11	56.51	2460	0.17	56.34
12	56.34	2460	0.17	56.18
13	56.18	2459	0.17	56.01
14	56.01	2459	0.17	55.84
15	55.84	2453	0.17	55.67
16	55.67	2451	0.17	55.51
17	55.51	2446	0.17	55.34
18	55.34	2446	0.17	55.17
19	55.17	2442	0.17	55.01
20	55.01	2438	0.17	54.84
21	54.84	2438	0.17	54.68
22	54.68	2430	0.17	54.51
23	54.51	2430	0.17	54.34
24	54.34	2427	0.17	54.18
25	54.18	2425	0.17	54.01
26	54.01	2422	0.18	53.85
27	53.85	2419	0.18	53.68
28	53.68	2418	0.18	53.52
29	53.52	2413	0.18	53.36
30	53.36	2410	0.18	53.19
31	53.19	2407	0.18	53.03
32	53.03	2404	0.18	52.86
33	52.86	2401	0.16	52.70
34	52.70	2399	0.16	52.54
35	52.54	2398	0.16	52.37
36	52.37	2398	0.16	52.21
37	52.21	2390	0.16	52.05
38	52.05	2387	0.16	51.88
39	51.88	2384	0.16	51.72
40	51.72	2381	0.16	51.56
41	51.56	2379	0.16	51.40
42	51.40	2378	0.16	51.24
43	51.24	2379	0.16	51.08
44	51.08	2378	0.16	50.91
45	50.91	2387	0.16	50.75

Total disch. vol. 106368 GPM

1063,400 cu ft of water per foot of T-120
14880 gallons per foot of T-120

*replace
with
following
sheet*

EC&FS DEPARTMENT CALCULATION SHEET

ICCN NO. / PRELIM. CCN NO.	N-3	PAGE <u>23</u> OF <u>24</u>
CCN CONVERSION: CCN NO.		<u>3</u>

Project or DCP/FCN N/A

Calc. No. M-0050-017

Subject MISCELLANEOUS OUTFLOWS ... APPENDIX E

Sheet No. _____

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	R E V
△	Paul Biba	10-30-98	D. Brahms		△					↓
△					△					
△					△					

TABLE E8-5: DISCHARGE OF WATER FROM T-120 TO CONDENSER HOT-WELLS:

Time [min]	Tank Wtr. El. [ft]	flow [gpm]	Elev. delta [ft]	End Elev. [ft]
1	58.20	2494	0.17	58.03
2	58.03	2491	0.17	57.86
3	57.86	2488	0.17	57.69
4	57.69	2485	0.17	57.52
5	57.52	2482	0.17	57.35
6	57.35	2479	0.17	57.18
7	57.18	2476	0.17	57.02
8	57.02	2474	0.17	56.85
9	56.85	2471	0.17	56.68
10	56.68	2468	0.17	56.51
11	56.51	2465	0.17	56.34
12	56.34	2462	0.17	56.18
13	56.18	2459	0.17	56.01
14	56.01	2456	0.17	55.84
15	55.84	2453	0.17	55.67
16	55.67	2451	0.17	55.51
17	55.51	2448	0.17	55.34
18	55.34	2445	0.17	55.17
19	55.17	2442	0.17	55.01
20	55.01	2439	0.17	54.84
21	54.84	2436	0.17	54.68
22	54.68	2433	0.17	54.51
23	54.51	2430	0.17	54.34
24	54.34	2427	0.17	54.18
25	54.18	2425	0.17	54.01
26	54.01	2422	0.16	53.85
27	53.85	2419	0.16	53.68
28	53.68	2416	0.16	53.52
29	53.52	2413	0.16	53.36
30	53.36	2410	0.16	53.19

1983.495 cuft of water per foot of T-120
14888 gallons per foot of T-120

Total disch. vol. 73,558 gal

EC&FS DEPARTMENT CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	N-3	PAGE <u>24</u> OF <u>24</u>
CCN CONVERSION: CCN NO.		<u>3</u>

Project or DCP/FCN N/A

Calc. No. M-0050-017

Subject MISCELLANEOUS INPUTS ... APPENDIX G

Sheet No. 5

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
△	Paul Biba	10-30-98	D. Brahms		△					△
△					△					△

EC&FS DEPARTMENT CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	N-2	PAGE <u>27</u> OF <u>27</u>
CCN CONVERSION: CCN NO.		<u>2</u>

Project or DCP/FCN N/A

Calc. No. M-0050-017

Subject MISCELLANEOUS INPUTS ... APPENDIX G

Sheet No. 5

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
△	Paul Biba	7-15-98	D. Brahms		△					△
△					△					△

[32] From: LAURA BARTZ at WEST3 7/13/98 3:36PM (462 bytes: 1 ln)
To: PAUL BIBA at MESA2
cc: MICHAEL JONES at WEST3
Subject: Isolation of T-120 for OBE

----- Message Contents -----

Paul,

I walked down closure of MU092 and HV5715. It is realistic to take credit for closing both valves within 45 minutes of an OBE event.

Laura Bartz
87162

replace with ↓

[47] From: DAVID KAUPPINEN at SOUTH 10/29/98 3:11PM (899 bytes: 1 ln)
To: PAUL BIBA at MESA2
cc: MEHRDAD HOJATI at G48, DAVID KAUPPINEN, MICHAEL JONES at WEST3
Subject: Post OBE T-120 Actions

----- Message Contents -----

Paul,

During an evaluation of Post OBE actions in SO23-13-3 Rev5, Operations has determined that the required 30 minute closure time for S2(3)1414MU092, MT-120/MT-121 Makeup Header Isolation, AND 2(3)HV-5715, Condensate Transfer Pump MP-049 Suction from MT-120, needs to be adjusted based on capabilities of the Operating crews.

Closure of MU092 needs to be within 30 minutes and closure of HV-5715 needs to be within 90 minutes.

David Kauppinen
OPG Supervisor

* User Name: HOLGUIE File Name: *
* Server: SONGS1 Queue: G48B_SW_LASER *
* Job Number: 256 *
* Copies: 1 *
* December 1, 1998 11:16:03 AM *

*
* H H OOO L GGG U U IIIII EEEEE *
* H H O O L G G U U I E *
* H H O O L G U U I E *
* HHHHH O O L G U U I EEEE *
* H H O O L G GG U U I E *
* H H O O L G G U U I E *
* H H OOO LLLLL GGGG UUU IIIII EEEEE *

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* L SSS TTTTT *
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(For FIDCNs Only)

DCP NO.

REV.

Southern California Edison Company
 FIELD CHANGE NOTICE (FCN)/
 FIELD INTERIM DESIGN
 CHANGE NOTICE (FIDCN)
 SUPPLEMENTAL PAGE

FCN NO.

F15330M

FIDCN NO.

DCN NO.

DOC. REV.

DOCUMENT NO.

SA-1417-ML-308

SHEET NO.

1

REV.

5

DESCRIPTION OF CHANGE ☐ BEFORE ☒ AFTER ☐ AS FOUND ☐ ADD ☐ INTERIM ☐ INFORMATION ONLY

FIELD NOTES: 1. ALL DIMENSIONS AND BILL OF MATERIALS ARE APPROXIMATE.

2. VERTICAL ORIENTATION OF VENT VALVE (ITEM # 34) BELOW.

