



MODE A' - NORMAL OPERATION R.S.S. 1020 PSIA SEE NOTE 4

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
FLOW GPM	264	264	133	133	264	210	210	202	101	101	101	101	101	101	101	101	202	239	239											
TEMPERATURE °F	532	532	532	533	533	233	233	120	120	120	120	120	120	120	120	120	435	436												
PRESS PSIA	1039	1039	1039	1039	1039																									
MAXIMUM PRESSURE DROP PSI	164 TDH		1.4																											
ALLOWABLE PIPE FRICTION DROP	28.6		BY MODE 'A'																											

OPERATING PROCEDURE:  
 1. MAIN CLEAN-UP PUMPS IN OPERATION  
 2. RHX UNDER FULL LOAD  
 3. NRHX UNDER FULL LOAD  
 4. FILTER-DEMINERALIZERS IN OPERATION  
 5. FCV IN OPERATION  
 6. NO BY PASS FLOW

MODE B - START-UP OPERATION R.S.S. 200 PSIA SEE NOTE 4

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30			
FLOW GPM	230	230	115	115	230	213	213	204	102	102	102	102	102	102	102	102	111	123	173	93	93	93	101A	93	93	310	317	327	334	370	377	360	367
TEMPERATURE °F	381	381	381	381	257	257	130	130	130	130	130	130	130	130	130	130	130	130	364	130	130	130	130	130	130	130	130	130	169	105	176		
PRESS PSIA	217	209	338																														
MAXIMUM PRESSURE DROP PSI	189 TDH		1.4																														
ALLOWABLE PIPE FRICTION DROP	BY MODE 'A'		BY MODE 'A'																														

OPERATING PROCEDURE:  
 1. MAIN CLEAN-UP PUMPS IN OPERATION  
 2. RHX UNDER PARTIAL LOAD  
 3. NRHX UNDER MAX START UP LOAD  
 4. FILTER-DEMINERALIZER IN OPERATION  
 5. FCV IN OPERATION  
 6. CRD 4 SWELL WATER IS DISCHARGED TO RADWASTE OR CONDENSER

MODE C' - BLOWDOWN OPERATION R.S.S. 1003 PSIA SEE NOTE 4

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
FLOW GPM	94	47	47	94	94	94	70	35	35	35	35	35	35	35	35	35	71	71	71	71	71	71	71	71	71	71	71	71	71	71	71
TEMPERATURE °F	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545
PRESS PSIA	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018	1018
MAXIMUM PRESSURE DROP PSI	163 TDH		1.6																												
ALLOWABLE PIPE FRICTION DROP	BY MODE 'A'		BY MODE 'A'																												

OPERATING PROCEDURE:  
 1. MAIN PUMPS IN OPERATION  
 2. RHX UNDER NO LOAD  
 3. NRHX UNDER FULL LOAD  
 4. FILTER-DEMINERALIZER IN OPERATION  
 5. FCV IN OPERATION  
 6. ENTIRE FLOW IS DISCHARGED TO RADWASTE OR CONDENSER

MODE D' - REFUELING OPERATION (MAX BYPASS) R.S.S. 15 PSIA

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		
FLOW GPM	204	204	102	102	204	204	204	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	
TEMPERATURE °F	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	
PRESS PSIA	50	43	267																											
MAXIMUM PRESSURE DROP PSI	224 TDH		1.6																											
ALLOWABLE PIPE FRICTION DROP	BY MODE 'A'		BY MODE 'A'																											

OPERATING PROCEDURE:  
 1. MAIN PUMPS IN OPERATION  
 2. NO RHX LOAD  
 3. NO NRHX LOAD  
 4. FILTER-DEMINERALIZER IN OPERATION  
 5. FCV IN OPERATION  
 6. ENTIRE FLOW IS DISCHARGED TO RADWASTE OR CONDENSER

MODE E' - REFUELING OPERATION R.S.S. 15 PSIA

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		
FLOW GPM	204	204	102	102	204	204	204	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102		
TEMPERATURE °F	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125	125		
PRESS PSIA	50	43	267																											
MAXIMUM PRESSURE DROP PSI	224 TDH		1.6																											
ALLOWABLE PIPE FRICTION DROP	BY MODE 'A'		BY MODE 'A'																											

OPERATING PROCEDURE:  
 1. MAIN PUMPS IN OPERATION  
 2. NO RHX LOAD  
 3. NO NRHX LOAD  
 4. FILTER-DEMINERALIZER IN OPERATION  
 5. FCV IN OPERATION  
 6. NO BYPASS FLOW

MODE F' - HOT STANDBY OPERATION R.S.S. 1003 PSIA SEE NOTE 4

POSITION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
FLOW GPM	270	270	135	135	270	212	212	204	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	
TEMPERATURE °F	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	545	
PRESS PSIA	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	1015	
MAXIMUM PRESSURE DROP PSI	164 TDH		1.6																											
ALLOWABLE PIPE FRICTION DROP	BY MODE 'A'		BY MODE 'A'																											

OPERATING PROCEDURE:  
 1. MAIN PUMPS IN OPERATION  
 2. RHX UNDER FULL LOAD  
 3. NRHX UNDER PARTIAL LOAD  
 4. FILTER-DEMINERALIZER IN OPERATION  
 5. FCV IN OPERATION  
 6. NO BYPASS FLOW

- NOTES:  
 1. \* THIS IS THE MAXIMUM RBCCW OUTLET TEMPERATURE  
 \*\* THIS IS THE MAXIMUM FLOW RATE POSSIBLE FOR THIS MODE WITH THESE HEAT EXCHANGERS  
 \*\*\* TEMP. 7 MINUS TEMP. 9 IS THE MAXIMUM TEMP. DIFFERENCE ACROSS THE NRHX. THIS OPERATING MODE SHOULD BE LIMITED DURING THE LIFE OF THE PLANT TO THE NUMBER OF CYCLES PERMITTED BY PARA. M-415.1 OF SECTION 111 OF THE ASME CODE (100 MAXIMUM).  
 2. REQUIRED PUMP NPSH 10 FT.  
 3. ELEVATIONS GIVEN ARE ONLY RELATIVE.  
 4. POSITIONS 27 & 28 INDICATE CLEANUP SYSTEM CONDITIONS WITH VARIOUS RBCCW INLET TEMPERATURES. FOR A GIVEN PLANT'S RBCCW INLET TEMP. TO THE NRHX SEE REFERENCE 4.  
 5. FOR BACKWASH & PRECOAT FREQUENCY SEE RADWASTE SYS. PROCESS DIAG. MPL #10-702. FLOWS ARE APPROXIMATE. VENDOR REQUIREMENTS WILL SUPERSEDE THESE RATES.

- REFERENCE DRAWINGS:  
 1. REACTOR WATER CLEANUP P&ID - MPL #17  
 2. ARRANGEMENT DRAWING PRIMARY & SECONDARY CONTAINMENT - MPL #1-1  
 3. FILTER & DEMINERALIZER SYSTEM - MPL #12-4  
 4. DESIGN SPECIFICATION - MPL #12-201  
 5. PIPING & INSTRUMENT SYMBOLS - 104#900

"THIS DRAWING SUPERSEDES DRAWING 730E148BA, REV 2, FOR COOPER. DIFFERENCES ARE DENOTED BY ENCIRCLEMENT PER ECA 90825-02"

INFORMATION ONLY 454005663

REVISIONS	DATE	BY	CHK	APP
1	11/14/67	W. IVANKO	GAB	
		CHK BY		
		W. IVANKO		
		J. DEWIERLE		