

EOP:	TITLE:	REV: 3
ATT	EOP/AP ATTACHMENTS	PAGE 1 of 1

ATTACHMENT LETDOWN

Supt. TR Schulz Date 1/17/91

- A) The following conditions must be met to place either normal or excess letdown in service:
- o IA to CNMT - ESTABLISHED
 - o CCW - IN SERVICE
 - o PRZR level - GREATER THAN 13%.

B) Establish Normal Letdown:

1. Establish charging line flow to REGEN Hx - GREATER THAN 20 gpm.
2. Place the following switches to CLOSE:
 - o Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)
 - o AOV-427, loop B cold leg to REGEN Hx
3. Place letdown controllers in MANUAL at 25% open:
 - o Temperature control valve, TCV-130
 - o Pressure control valve, PCV-135
4. Verify AOV-371, letdown isolation valve - OPEN.
5. Open loop B cold leg to REGEN Hx, AOV-427.
6. Open one 40 gpm letdown orifice valve (AOV-200A or AOV-200B).
7. Place TCV-130 in AUTO at 105°F.
8. Place PCV-135 in AUTO at 250 psig.
9. Adjust charging pump speed and HCV-142 as necessary to stabilize PRZR level and maintain RCP labyrinth seal D/P.

C) IF normal letdown can NOT be established, THEN establish excess letdown:

1. Place AOV-312 to NORMAL.
2. Ensure CCW from excess letdown Hx, (AOV-745) - OPEN
3. Open excess letdown isolation valve AOV-310.
4. Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig.
5. Adjust charging pump speed as necessary to stabilize PRZR level and maintain RCP labyrinth seal D/P.



EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 1 of 22
----------------	--------------------------	------------------------

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 23

TECHNICAL REVIEW

PORC REVIEW DATE 5/1/91

Joseph A. Widay
PLANT SUPERINTENDENT

5/3/91
EFFECTIVE DATE

CATEGORY 1.0

REVIEWED BY: _____

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

1

2

3

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 2 of 22
----------------	--------------------------	------------------------

A. PURPOSE - This procedure provides the necessary instructions to terminate safety injection and stabilize plant conditions.

B. ENTRY CONDITIONS/SYMPTOMS

1. ENTRY CONDITIONS - This procedure is entered from:

- a. E-0, REACTOR TRIP OR SAFETY INJECTION, and E-1, LOSS OF REACTOR OR SECONDARY COOLANT, when specified termination criteria are satisfied.
- b. FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, after secondary heat sink has been reestablished and SI has been terminated.

12

13

14

15

16

17

18

19

20

21

22

23

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 3 of 22
----------------	--------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>***** <u>CAUTION</u> IF OFFSITE POWER IS LOST AFTER SI RESET, SELECTED SW PUMPS AND ONE CCW PUMP WILL AUTO START ON EMERGENCY D/G. MANUAL ACTION WILL BE REQUIRED TO RESTART SAFEGUARDS EQUIPMENT. *****</p>		
<p><u>NOTE:</u> o FOLDOUT page should be open AND monitored periodically.</p> <p>o Critical Safety Function Status Tress should be monitored (Refer to Appendix I for Red Path Summary.</p> <p>o Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10^{-05} R/hr.</p>		
1	Reset SI	
2	Reset CI:	
	a. Depress CI reset pushbutton b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	b. Perform the following: 1) Reset SI. 2) Depress CI reset pushbutton.
3	Maintain PRZR Pressure Between 1800 PSIG And 2235 PSIG	
	o Reset PRZR heaters o Use normal PRZR spray	

100

100

100

100

100

100

100

100

100

100

100

100

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 4 of 22
----------------	--------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4	Verify Adequate SW Flow:	
a.	Check at least two SW pumps - RUNNING	<p>a. Manually start SW pumps as power supply permits (258 kw each).</p> <p><u>IF</u> less than two SW pumps running, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Ensure SW isolation. 2) Dispatch A0 to establish normal shutdown alignment (Refer to Attachment SD-1). 3) Go to Step 7.
b.	Dispatch A0 to establish normal shutdown alignment (Refer to Attachment SD-1)	

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 5 of 22
----------------	--------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5	Establish IA to CNMT:	
a.	Verify non-safeguards busses energized from offsite power <ul style="list-style-type: none"> o Bus 13 normal feed - CLOSED -OR- o Bus 15 normal feed - CLOSED 	a. Perform the following: <ol style="list-style-type: none"> 1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Verify adequate emergency D/G capacity to run air compressors (75 kw each). <u>IF NOT, THEN</u> evaluate if CNMT RECIRC fans should be stopped (Refer to Attachment CNMT RECIRC FANS). 3) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting.
b.	Verify SW isolation valves to turbine building - OPEN <ul style="list-style-type: none"> • MOV-4613 and MOV-4670 • MOV-4614 and MOV-4664 	b. Manually align valves.
c.	Verify at least two air compressors - RUNNING	c. Manually start air compressors as power supply permits (75 kw each). <u>IF</u> air compressors can <u>NOT</u> be started, <u>THEN</u> dispatch A0 to locally reset compressors as necessary.
d.	Check IA supply: <ul style="list-style-type: none"> o Pressure - GREATER THAN 60 PSIG o Pressure - STABLE OR INCREASING 	d. Perform the following: <ol style="list-style-type: none"> 1) Continue attempts to restore IA (Refer to AP-IA.1, LOSS OF INSTRUMENT AIR). 2) Continue with Step 6. <u>WHEN</u> IA restored, <u>THEN</u> do Steps 5e and f.
e.	Reset both trains of XY relays for IA to CNMT AOV-5392	
f.	Verify IA to CNMT AOV-5392 - OPEN	

311

45

10

4

22

10

10

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 6 of 22
----------------	--------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6	Check If Charging Flow Has Been Established:	
	a. Charging pumps - ANY RUNNING	<p>a. Perform the following:</p> <ol style="list-style-type: none"> 1) <u>IF</u> CCW flow is lost to any RCP thermal barrier <u>OR</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> dispatch A0 with key to RWST gate to close seal injection needle valve(s) to affected RCP: <ul style="list-style-type: none"> • RCP A, V-300A • RCP B, V-300B 2) Ensure HCV-142 open, demand at 0%.
	b. Charging pump suction aligned to RWST: <ul style="list-style-type: none"> o LCV-112B - OPEN o LCV-112C - CLOSED 	<p>b. Manually align valves as necessary.</p> <p><u>IF</u> LCV-112B can <u>NOT</u> be opened, <u>THEN</u> perform the following:</p> <ol style="list-style-type: none"> 1) Verify charging pump A <u>NOT</u> running and place in PULL STOP. 2) Dispatch A0 to locally open manual charging pump suction from RWST (V-358 located in charging pump room). 3) <u>WHEN</u> V-358 open, <u>THEN</u> direct A0 to close V-268 to isolate charging pumps B and C from VCT (V-268 located in charging pump room).
	c. Start charging pumps as necessary and adjust charging flow to restore PRZR level	

24

25

26

27

28

29
30
31
32

33

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 7 of 22
----------------	--------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7	Stop SI And RHR Pumps And Place In AUTO	
8	Verify SI Flow Not Required:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	a. Manually operate SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. <u>IF</u> PRZR level can <u>NOT</u> be maintained, <u>THEN</u> manually operate SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.

24

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15



EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 8 of 22
----------------	--------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>ALIGNING SI PUMP SUCTION TO RWST BEFORE ISOLATING BAST MAY RESULT IN BACKFLOW FROM RWST TO BASTS.</p> <p>*****</p>		
9	Align SI Pump Suction To RWST:	
	<p>a. Close SI pump suction valves from BASTs:</p> <ul style="list-style-type: none"> • MOV-826A • MOV-826B • MOV-826C • MOV-826D 	<p>a. Ensure at least one valve in each flow path closed.</p> <ul style="list-style-type: none"> • MOV-826A or MOV-826B • MOV-826C or MOV-826D
	<p>b. Open SI pump suction valves from RWST:</p> <ul style="list-style-type: none"> • MOV-825A • MOV-825B 	<p>b. Ensure at least one valve is open.</p>
	<p>c. Operate all available SI pumps for 5 minutes to flush pump RECIRC lines</p>	
	<p>d. WHEN RECIRC line flush complete, THEN consult plant staff to determine if SI lines should be flushed using Attachment SI FLUSH</p>	

11
12
13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 9 of 22
----------------	--------------------------	------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10	Check If CNMT Spray Should Be Stopped:	
	a. CNMT spray pumps - RUNNING	a. Go to Step 11.
	b. Check CNMT pressure - LESS THAN 4 PSIG	b. Continue with Step 11. <u>WHEN</u> CNMT pressure less than 4 psig, <u>THEN</u> do Steps 10c through f.
	c. Reset CNMT spray	
	d. Check NaOH tank outlet valves - CLOSED	d. Place NaOH tank outlet valve controllers to MANUAL and close valves.
	• AOV-836A	
	• AOV-836B	
	e. Stop CNMT spray pumps and place in AUTO	
	f. Close CNMT spray pump discharge valves	
	• MOV-860A	
	• MOV-860B	
	• MOV-860C	
	• MOV-860D	
11	Verify MRPI Indicates- ALL CONTROL AND SHUTDOWN RODS ON BOTTOM	<u>IF</u> one or more control rods <u>NOT</u> fully inserted, <u>THEN</u> borate 175 gallons for each control rod not fully inserted (Refer to AP-CVCS.2, IMMEDIATE BORATION).

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

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 10 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12	Establish Condenser Steam Dump Pressure Control:	
a.	Verify condenser available:	a. Place S/G ARV controllers in AUTO at desired pressure and go to Step 13.
	o Any MSIV - OPEN	
	o Annunciator G-15, STEAM DUMP - LIT	
b.	Adjust condenser steam dump controller HC-484 to desired pressure and verify in AUTO.	
c.	Place steam dump mode selector switch to MANUAL.	
13	Verify Adequate SW Flow To CCW Hx:	
a.	Verify at least two SW pumps - RUNNING	a. Manually start pumps as power supply permits (258 kw each). <u>IF</u> less than two SW pumps can be operated, <u>THEN</u> go to Step 20.
b.	Verify AUX BLDG SW isolation valves - OPEN	b. Establish SW to AUX BLDG (Refer to Attachment AUX BLDG SW). Continue with Step 20. <u>WHEN</u> SW restored to AUX BLDG, <u>THEN</u> do Steps 13c through 19.
	• MOV-4615 and MOV-4734	
	• MOV-4616 and MOV-4735	
c.	Verify CNMT RECIRC fan annunciator C-2, HIGH TEMPERATURE ALARM - EXTINGUISHED	c. Manually start an additional SW pump as power supply permits (258 kw each).

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 11 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
14	Check If Normal CVCS Operation Can Be Established	
a.	Verify IA restored: <ul style="list-style-type: none"> o IA to CNMT (AOV-5392) - OPEN o IA pressure - GREATER THAN 60 PSIG 	a. Continue with Step 20. <u>WHEN</u> IA can be restored, <u>THEN</u> do Steps 14 through 19.
b.	Verify instrument bus D - ENERGIZED	b. Energize MCC B. <u>IF</u> MCC B <u>NOT</u> available, <u>THEN</u> perform the following: <ol style="list-style-type: none"> 1) Verify MCC A energized. 2) Place instrument bus D on maintenance supply.
c.	CCW pumps - ANY RUNNING	c. Perform the following: <ol style="list-style-type: none"> 1) <u>IF</u> any RCP #1 seal outlet temperature offscale high, <u>THEN</u> isolate CCW to thermal barrier of affected RCP(s). <ul style="list-style-type: none"> • RCP A, MOV-749A and MOV-759A • RCP B, MOV-749B and MOV-759B 2) Manually start one CCW pump.
d.	Charging pump - ANY RUNNING	d. Continue with Step 20. <u>WHEN</u> any charging pump running, <u>THEN</u> do Steps 15 through 19.

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 12 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
15	Check If Seal Return Flow Should Be Established:	
	a. Verify RCP #1 seal outlet temperature - LESS THAN 235°F	a. Go to Step 16.
	b. Verify RCP seal outlet valves - OPEN <ul style="list-style-type: none"> • AOV-270A • AOV-270B 	b. Manually open valves as necessary.
	c. Reset both trains of XY relays for RCP seal return isolation valve MOV-313	
	d. Open RCP seal return isolation valve MOV-313	d. Perform the following: <ol style="list-style-type: none"> 1) Place MOV-313 switch to OPEN. 2) Dispatch AO with key to RWST gate to locally open MOV-313.
	e. Verify RCP #1 seal leakoff flow - LESS THAN 5.5 GPM	e. <u>IF</u> any RCP seal leakoff flow greater than 5.5 gpm <u>THEN</u> : <ul style="list-style-type: none"> o Close the affected RCP seal discharge valve. <ul style="list-style-type: none"> • RCP A, AOV-270A • RCP B, AOV-270B o Trip the affected RCP. <p><u>IF</u> both RCP seal discharge valves are shut, <u>THEN</u> go to Step 16.</p>
	f. Verify RCP #1 seal leakoff flow - GREATER THAN 0.25 GPM	f. Refer to AP-RCP.1, RCP SEAL MALFUNCTION.
16	Verify PRZR Level - GREATER THAN 13% [40% adverse CNMT]	Continue with Step 18. <u>WHEN</u> PRZR level increases to greater than 13% [40% adverse CNMT], <u>THEN</u> do Step 17.

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

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 13 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
17	<p>Establish Normal Letdown:</p> <ol style="list-style-type: none"> Establish charging line flow to REGEN Hx - GREATER THAN 20 GPM Place the following switches to CLOSE: <ul style="list-style-type: none"> Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202) AOV-371, letdown isolation valve AOV-427, loop B cold leg to REGEN Hx Place letdown controllers in MANUAL at 25% open <ul style="list-style-type: none"> TCV-130 PCV-135 Reset both trains of XY relays for AOV-371 and AOV-427 Open AOV-371 and AOV-427 Open letdown orifice valves as necessary Place TCV-130 in AUTO at 105°F Place PCV-135 in AUTO at 250 psig Adjust charging pump speed and HCV-142 as necessary to control PRZR level 	<p><u>IF</u> RCP seal return has been established, <u>THEN</u> establish excess letdown as follows:</p> <ul style="list-style-type: none"> Place excess letdown divert valve, AOV-312, to NORMAL. Ensure CCW from excess letdown open, (AOV-745). Open excess letdown isolation valve AOV-310. Slowly open HCV-123 to maintain excess letdown temperature less than 195°F and pressure less than 100 psig. Adjust charging pump speed as necessary. <p><u>IF</u> RCP seal return <u>NOT</u> established, <u>THEN</u> consult Plant Staff to determine if excess letdown should be placed in service.</p>

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119



EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 14 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED										
18	Check VCT Makeup System:											
a.	BAST levels - ANY GREATER THAN 5%	a. Go to Step 19.										
b.	Check Annunciator B-23, BORIC ACID TANK LO LO LEVEL - EXTINGUISHED	b. Perform the following: 1) Adjust boric acid flow control valve to required flow from table.										
		<table border="1"> <thead> <tr> <th>BAST LEVEL</th> <th>BORIC ACID FLOW (GPM)</th> </tr> </thead> <tbody> <tr> <td><10%</td> <td>4.5</td> </tr> <tr> <td>10-15%</td> <td>6.7</td> </tr> <tr> <td>15-20%</td> <td>8.9</td> </tr> <tr> <td>>20%</td> <td>10.0</td> </tr> </tbody> </table>	BAST LEVEL	BORIC ACID FLOW (GPM)	<10%	4.5	10-15%	6.7	15-20%	8.9	>20%	10.0
BAST LEVEL	BORIC ACID FLOW (GPM)											
<10%	4.5											
10-15%	6.7											
15-20%	8.9											
>20%	10.0											
c.	Adjust boric acid flow control valve in AUTO to 4.5 gpm	2) Go to Step 18d.										
d.	Verify the following: 1) RMW mode selector switch in AUTO 2) RMW control armed - RED LIGHT LIT	d. Adjust controls as necessary.										
e.	Check VCT level: o Level - GREATER THAN 20% -OR- o Level - STABLE OR INCREASING	e. Manually increase VCT makeup flow as follows: 1) Ensure BA transfer pumps and RMW pumps running. <u>IF NOT</u> , <u>THEN</u> dispatch AO to locally reset MCC C and MCC D UV lockouts as necessary. 2) Place RMW flow control valve HCV-111 in MANUAL and increase RMW flow. 3) Increase boric acid flow as necessary.										

220

48

60

100

100

20

20

20

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 15 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19	Check Charging Pump Suction Aligned To VCT: a. VCT level - GREATER THAN 20%	a. <u>IF</u> VCT level can <u>NOT</u> be maintained greater than 5%, <u>THEN</u> perform the following: 1) Ensure charging pump suction aligned to RWST o LCV-112B open o LCV-112C closed 2) Continue with Step 20. <u>WHEN</u> VCT level greater than 40%, <u>THEN</u> do Step 19b.
	b. Verify charging pumps aligned to VCT o LCV-112C - OPEN o LCV-112B - CLOSED	b. Manually align valves as necessary.
20	Check RCS Hot Leg Temperatures - STABLE	Control steam dump and total feed flow as necessary to stabilize RCS temperature.
<u>NOTE:</u> If auxiliary spray is in use, spray flow may be increased by closing normal charging valve AOV-294 and normal PRZR spray valves.		
21	Control PRZR Heaters And Operate Normal Spray To Stabilize RCS Pressure	<u>IF</u> normal spray <u>NOT</u> available and letdown is in service, <u>THEN</u> use auxiliary spray. <u>IF</u> auxiliary spray <u>NOT</u> available, <u>THEN</u> use one PRZR PORV.



EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 16 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF CST LEVEL DECREASES TO LESS THAN 5 FEET, THEN ALTERNATE WATER SOURCES FOR AFW PUMPS WILL BE NECESSARY (REFER TO ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).</p> <p>*****</p> <p><u>NOTE:</u> TDAFW pump flow control valves fail open on loss of IA.</p>		
22	Check Intact S/G Levels:	
	<p>a. Narrow range level - GREATER THAN 5% [25% adverse CNMT]</p> <p>b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%</p>	<p>a. Maintain total feed flow greater than 200 gpm until narrow range level greater than 5% [25% adverse CNMT] in at least one S/G.</p> <p>b. <u>IF</u> narrow range level in any S/G continues to increase, <u>THEN</u> stop feed flow to that S/G.</p>

24

25

26

27

28

29

30

31

32

33

34

35

36

37

38

39

40

41

42

43

44

45

46

47

48

49

50

51

52

53

54

55

56

57

58

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99

100

101

102

103

104

105

106

107

108

109

110

111

112

113

114

115

116

117

118

119

120

121

122

123

124

125

126

127

128

129

130

131

132

133

134

135

136

137

138

139

140

141

142

143

144

145

146

147

148

149

150

151

152

153

154

155

156

157

158

159

160

161

162

163

164

165

166

167

168

169

170

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

187

188

189

190

191

192

193

194

195

196

197

198

199

200

201

202

203

204

205

206

207

208

209

210

211

212

213

214

215

216

217

218

219

220

221

222

223

224

225

226

227

228

229

230

231

232

233

234

235

236

237

238

239

240

241

242

243

244

245

246

247

248

249

250

251

252

253

254

255

256

257

258

259

260

261

262

263

264

265

266

267

268

269

270

271

272

273

274

275

276

277

278

279

280

281

282

283

284

285

286

287

288

289

290

291

292

293

294

295

296

297

298

299

300

301

302

303

304

305

306

307

308

309

310

311

312

313

314

315

316

317

318

319

320

321

322

323

324

325

326

327

328

329

330

331

332

333

334

335

336

337

338

339

340

341

342

343

344

345

346

347

348

349

350

351

352

353

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 17 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
23	<p>Verify All AC Busses - ENERGIZED BY OFFSITE POWER</p> <ul style="list-style-type: none"> o Normal feed breakers to all 480 volt busses - CLOSED o 480 volt bus voltage - GREATER THAN 420 VOLTS o Emergency D/G output breakers - OPEN 	<p>Perform the following:</p> <ul style="list-style-type: none"> a. <u>IF</u> any AC emergency bus normal feed breaker open, <u>THEN</u> ensure associated D/G breaker closed. b. Perform the following as necessary: <ul style="list-style-type: none"> 1) Close non-safeguards bus tie breakers: <ul style="list-style-type: none"> • Bus 13 to Bus 14 tie • Bus 15 to Bus 16 tie 2) Reset Bus 13 and Bus 15 lighting breakers. 3) Dispatch A0 to locally reset and start two IA compressors. 4) Place the following pumps in PULL STOP: <ul style="list-style-type: none"> • EH pumps • Turning gear oil pump • HP seal oil backup pump 5) Restore power to MCCs. <ul style="list-style-type: none"> • A from Bus 13 • B from Bus 15 • E from Bus 15 • F from Bus 15 6) Start CNMT RECIRC fans as necessary. 7) Refer to Attachment SI/UV for other equipment lost with loss of offsite power. c. Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 18 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p><u>NOTE:</u> Adverse CNMT conditions or loss of forced air cooling may result in failure of NIS detectors.</p>		
24	Check If Source Range Channels Should Be Energized:	
a.	Source range channels - DEENERGIZED	a. Go to Step 24e.
b.	Check intermediate range flux - EITHER CHANNEL LESS THAN 10^{-10} AMPS	b. Perform the following: <ol style="list-style-type: none"> 1) <u>IF</u> neither intermediate range channel is decreasing, <u>THEN</u> initiate boration. 2) Continue with Step 25. <u>WHEN</u> flux is LESS THAN 10^{-10} amps on any operable channel, <u>THEN</u> do Steps 24c, d and e.
c.	Check the following: <ul style="list-style-type: none"> o Both intermediate range channels - LESS THAN 10^{-10} AMPS <p>-OR-</p> <ul style="list-style-type: none"> o Greater than 20 minutes since reactor trip 	c. Continue with step 25. <u>WHEN</u> either condition met, <u>THEN</u> do Steps 24d and e.
d.	Verify source range detectors - ENERGIZED	d. Manually energize source range detectors by depressing P-6 permissive defeat pushbuttons (2 of 2). <p><u>IF</u> source ranges can <u>NOT</u> be restored, <u>THEN</u> refer to ER-NIS:1, SR MALFUNCTION, and go to Step 25.</p>
e.	Transfer Rk-45 recorder to one source range and one intermediate range channel	

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

100

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 19 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
25	<p>Check If Emergency D/Gs Should Be Stopped:</p> <ul style="list-style-type: none"> a. Verify AC emergency busses energized by offsite power: <ul style="list-style-type: none"> o Emergency D/G output breakers - OPEN o AC emergency bus voltage - GREATER THAN 420 VOLTS o AC emergency bus normal feed breakers - CLOSED b. Stop any unloaded emergency D/G and place in standby (Refer to Attachment D/G STOP) 	<ul style="list-style-type: none"> a. Try to restore offsite power (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER).
	<p><u>NOTE:</u> SW should be aligned to CCW Hxs before restoring RCP seal cooling.</p>	
26	<p>Check RCP Cooling:</p> <ul style="list-style-type: none"> a. Check CCW to RCPs: <ul style="list-style-type: none"> o Annunciator A-7, RCP 1A CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED o Annunciator A-15, RCP 1B CCW RETURN HIGH TEMP OR LOW FLOW - EXTINGUISHED b. Check RCP seal injection: <ul style="list-style-type: none"> o Labyrinth seal D/Ps - GREATER THAN 15 INCHES WATER <p style="text-align: center;">-OR-</p> <ul style="list-style-type: none"> o RCP seal injection flow to each RCP - GREATER THAN 6 GPM 	<p>Establish normal cooling to RCPs (Refer to Attachment SEAL COOLING).</p>

26

14

64

20

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

10

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 20 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<p>*****</p> <p style="text-align: center;"><u>CAUTION</u></p> <p>IF RCP SEAL COOLING HAD PREVIOUSLY BEEN LOST, THEN THE AFFECTED RCP SHOULD NOT BE STARTED PRIOR TO A STATUS EVALUATION.</p> <p>*****</p>		
27	Check RCP Status - AT LEAST ONE RUNNING	<p>Perform the following:</p> <ul style="list-style-type: none"> a. Establish conditions for starting an RCP: <ul style="list-style-type: none"> o Verify bus 11A or 11B energized. o Refer to Attachment RCP START. b. Start one RCP. <p><u>IF</u> an RCP can <u>NOT</u> be started, <u>THEN</u> verify natural circulation (Refer to Attachment NC).</p> <p><u>IF</u> natural circulation <u>NOT</u> verified, <u>THEN</u> increase dumping steam from intact S/Gs.</p>

24

25

26

27

28

29

30

31

32

33

34

35

36

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 21 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
28	Establish Normal Shutdown Alignment:	
	a. Check condenser - AVAILABLE	a. Dispatch A0 to perform Attachment SD-2.
	b. Perform the following:	
	o Open generator disconnects	
	• 1G13A71	
	• 9X13A73	
	o Place voltage regulator to OFF	
	o Open turbine drain valves	
	o Rotate reheater steam supply controller cam to close valves	
	o Place reheater dump valve switches to HAND	
	o Stop all but one condensate pump	
	c. Verify adequate Rx head cooling:	
	1) Check IA to CNMT - AVAILABLE	1) Go to Step 29.
	2) Verify at least one control rod shroud fan - RUNNING	2) Manually start one fan as power supply permits (45 kw)
	3) Verify one Rx compartment cooling fan - RUNNING	3) Perform the following:
		o Dispatch A0 to reset UV relays at MCC C and MCC D.
		o Manually start one fan as power supply permits (23 kw)
	d. Verify Attachment SD-1 - COMPLETE	

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 22 of 22
----------------	--------------------------	-------------------------

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
29	Maintain Plant Conditions Stable:	
	a. RCS pressure - BETWEEN 1800 PSIG AND 2235 PSIG	a. Control PRZR heaters and spray as necessary.
	b. PRZR level - BETWEEN 20% AND 30%	b. Control charging as necessary.
	c. Intact S/G narrow range levels - BETWEEN 17% AND 39%	c. Control S/G feed flow as necessary.
	d. RCS cold leg temperature - STABLE	d. Control dumping steam as necessary. <u>IF</u> cooldown continues, <u>THEN</u> close both MSIVs.
30	Verify SI Flow Not Required:	
	a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING FIGURE MIN SUBCOOLING	a. Manually operate SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
	b. PRZR level - GREATER THAN 5% [30% adverse CNMT]	b. Control charging flow to maintain PRZR level. <u>IF</u> PRZR level can <u>NOT</u> be maintained, <u>THEN</u> manually operate SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.
31	Go To Procedure O-2.1, NORMAL SHUTDOWN TO HOT SHUTDOWN	

-END-

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 1 of 1
----------------	--------------------------	-----------------------

ES-1.1 APPENDIX LIST

<u>TITLE</u>	<u>PAGES</u>
1) RED PATH SUMMARY	1
2) FIGURE MIN SUBCOOLING	1
3) ATTACHMENT CNMT RECIRC	1
4) ATTACHMENT D/G STOP	1
5) ATTACHMENT NC	1
6) ATTACHMENT SEAL COOLING	2
7) ATTACHMENT RCP START	1
8) ATTACHMENT SD-1	1
9) ATTACHMENT SD-2	1
10) ATTACHMENT SI/UV	1
11) ATTACHMENT SI FLUSH	1
12) ATTACHMENT AUX BLDG SW	1
13) FOLDOUT	1

45

46

47

48

49

50

51

52

53

54

55

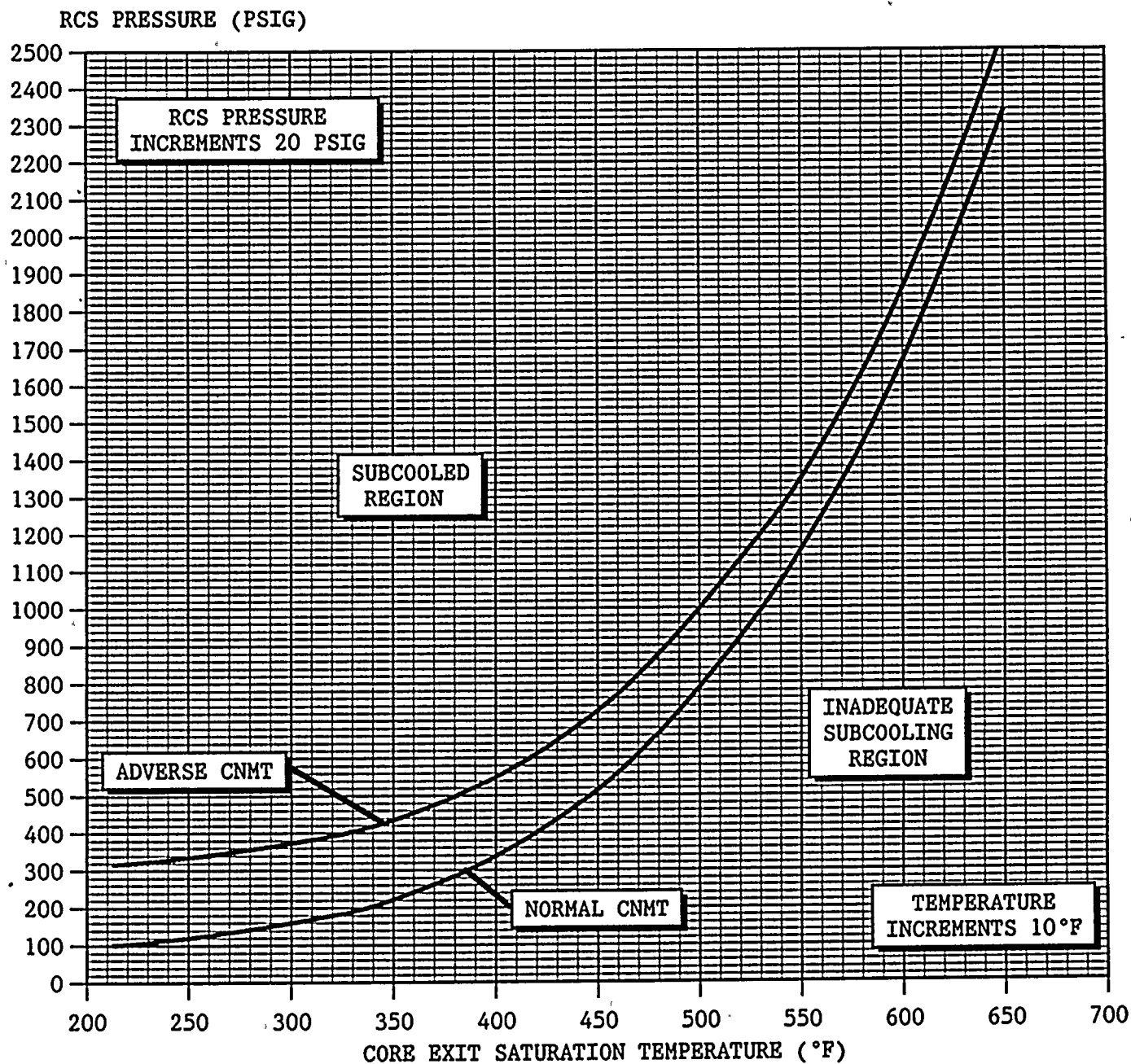




EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 1 of 1
----------------	--------------------------	-----------------------

FIGURE MIN SUBCOOLING

NOTE: Subcooling Margin = Saturation Temperature From Figure
Below [-] Core Exit T/C Indication





11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

29

30

31

32

EOP: ES-1.1	TITLE: SI TERMINATION	REV: 7 PAGE 1 of 1
----------------	--------------------------	-----------------------

FOLDOUT PAGE

1. SI REINITIATION CRITERIA

IF EITHER condition listed below occurs, THEN manually operate SI pumps as necessary and go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1:

- o RCS subcooling based on core exit T/Cs - LESS THAN 0°F USING FIGURE MIN SUBCOOLING
- OR -
- o PRZR level - CHARGING CAN NOT CONTROL LEVEL GREATER THAN 5% [30% adverse CNMT]

2. SI TERMINATION CRITERIA

IF ALL conditions listed below occur, THEN go to ES-1.1, SI TERMINATION, Step 1:

- a. RCS subcooling based on core exit T/Cs - GREATER THAN 0°F USING REQUIREMENTS OF FIGURE MIN SUBCOOLING
- b. Total feed flow to intact S/Gs - GREATER THAN 200 GPM
- OR -
- Narrow range level in at least one intact S/G - GREATER THAN 5% [25% adverse CNMT]
- c. RCS pressure:
 - o GREATER THAN 1625 PSIG [1825 psig adverse CNMT]
 - o STABLE OR INCREASING
- d. PRZR level - GREATER THAN 5% [30% adverse CNMT]

3. SECONDARY INTEGRITY CRITERIA

IF any S/G pressure is decreasing in an uncontrolled manner or is completely depressurized AND has not been isolated, THEN go to E-2, FAULTED S/G ISOLATION, Step 1.

4. COLD LEG RECIRCULATION SWITCHOVER CRITERION

IF RWST level decreases to less than 28%, THEN go to ES-1.3, TRANSFER TO COLD LEG RECIRCULATION, Step 1.

5. AFW SUPPLY SWITCHOVER CRITERION

IF CST level decreases to less than 5 feet, THEN switch to alternate AFW water supply (Refer to ER-AFW.1, ALTERNATE WATER SUPPLY TO AFW PUMPS).

6. E-3 TRANSITION CRITERIA

IF any S/G level increases in an uncontrolled manner or any S/G has abnormal radiation, THEN go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.

