

ATTACHMENT 11

**DISCUSSION OF REVISION
TO THE
RADIOLOGICAL EMERGENCY PLAN ANNEX
FOR
THREE MILE ISLAND NUCLEAR STATION**

EP-AA-1009

Enclosures

- Enclosure 11A - EAL Comparison Matrix Document
- Enclosure 11B - EAL Red-Line Basis Document
- Enclosure 11C - EAL Basis Document

NEI 99-01

REVISION 6

DEVELOPMENT OF EMERGENCY ACTION LEVELS FOR NON-PASSIVE REACTORS

ATTACHMENT 11

DISCUSSION OF REVISION TO THE RADIOLOGICAL EMERGENCY PLAN ANNEX FOR

THREE MILE ISLAND STATION



Exelon Generation.

NEI 99-01 Rev 6	Proposed EAL	Justification												
<p style="text-align: right;">AG1</p> <p>Initiating Condition – GENERAL EMERGENCY</p> <p>Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem thyroid CDE.</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels: (1 or 2 or 3)</p> <p>Notes:</p> <ul style="list-style-type: none"> The Emergency Director should declare the General Emergency promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. <ol style="list-style-type: none"> Reading on any of the following radiation monitors greater than the reading shown for 15 minutes or longer: (site specific monitor list and threshold values) Dose assessment actual meteorology indicates doses greater than 1000 mrem TEDE or 5000 mrem thyroid CDE at or beyond (site specific dose receptor point) Field survey results indicate EITHER of the following at or beyond (site specific dose receptor point): <ul style="list-style-type: none"> Closed window dose rates greater than 1000 mR/hr expected to continue for 60 minutes or longer. Analysis of field survey samples indicate thyroid CDE greater than 5000 mrem for one hour of inhalation. 	<p style="text-align: right;">RG1</p> <p>Initiating Condition:</p> <p>Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mRem TEDE or 5,000 mRem thyroid CDE.</p> <p>Operating Mode Applicability: 1,2,3,4,5,6,D</p> <p>Emergency Action Levels (EAL) :</p> <p>Notes:</p> <ul style="list-style-type: none"> The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. <ol style="list-style-type: none"> Readings on ANY Table R1 Effluent Monitor > Table R1 value for ≥ 15 minutes. OR Dose assessment Using actual meteorology indicates doses at or beyond the site boundary of EITHER: <ol style="list-style-type: none"> > 1000 mRem TEDE OR > 5000 mRem CDE Thyroid OR Field survey results at or beyond the site boundary indicate EITHER: <ol style="list-style-type: none"> Gamma (closed window) dose rates >1000 mR/hr are expected to continue for ≥ 60 minutes. OR Analyses of field survey samples indicate > 5000 mRem CDE Thyroid for 60 minutes of inhalation. <table border="1" data-bbox="737 1163 1314 1323"> <thead> <tr> <th colspan="2">Table R1 Effluent Monitor Thresholds</th> </tr> <tr> <th>Effluent Monitor</th> <th>General Emergency</th> </tr> </thead> <tbody> <tr> <td>RM-G-25 (Cond Offgas)</td> <td>9.53 E+06 mR/hr</td> </tr> <tr> <td>RM-A-8GH (Station Vent)</td> <td>3.09 E+05 cpm</td> </tr> <tr> <td>RM-G-24 (RB Purge)</td> <td>5.55 E+05 mR/hr</td> </tr> <tr> <td>RM-A-14 (ESF Vent)</td> <td>6.66 E+02 uCi/cc</td> </tr> </tbody> </table>	Table R1 Effluent Monitor Thresholds		Effluent Monitor	General Emergency	RM-G-25 (Cond Offgas)	9.53 E+06 mR/hr	RM-A-8GH (Station Vent)	3.09 E+05 cpm	RM-G-24 (RB Purge)	5.55 E+05 mR/hr	RM-A-14 (ESF Vent)	6.66 E+02 uCi/cc	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific monitors and Threshold values to ensure timely classification.</p> <p>2) Added "Classification based on effluent monitor readings assumes that a release path to the environment is established." To the third bullet in order to delete the following from the basis section " Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes." This allows for more timely classification since all the basis information pertaining to Note bullet 3 will be contained in the IC and therefor readily available on the 11x17 procedure matrix used by the SM.</p>
Table R1 Effluent Monitor Thresholds														
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NEI 99-01 Rev 6	Proposed EAL	Justification												
<p style="text-align: right;">AS1</p> <p>Initiating Condition – SITE AREA EMERGENCY</p> <p>Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem thyroid CDE.</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels: (1 or 2 or 3)</p> <p>Notes:</p> <ul style="list-style-type: none"> The Emergency Director should declare the General Emergency promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. <p>1. Reading on any of the following radiation monitors greater than the reading shown for 15 minutes or longer:</p> <p>(site specific monitor list and threshold values)</p> <p>2. Dose assessment actual meteorology indicates doses greater than 1000 mrem TEDE or 5000 mrem thyroid CDE at or beyond (site specific dose receptor point)</p> <p>3. Field survey results indicate EITHER of the following at or beyond (site specific dose receptor point):</p> <ul style="list-style-type: none"> Closed window dose rates greater than 100 mR/hr expected to continue for 60 minutes or longer. Analysis of field survey samples indicate thyroid CDE greater than 500 mrem for one hour of inhalation. 	<p style="text-align: right;">RS1</p> <p>Initiating Condition:</p> <p>Release of gaseous radioactivity resulting in offsite dose greater than 100 mRem TEDE or 500 mRem thyroid CDE.</p> <p>Operating Mode Applicability:</p> <p>1,2,3,4,5,6,D</p> <p>Emergency Action Levels (EAL) :</p> <p>Notes:</p> <ul style="list-style-type: none"> The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. <p>1. Readings on ANY Table R1 Effluent Monitor > Table R1 value for ≥ 15 minutes.</p> <p>OR</p> <p>2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of EITHER:</p> <p>a. > 100 mRem TEDE</p> <p>OR</p> <p>b. > 500 mRem CDE Thyroid</p> <p>OR</p> <p>3. Field survey results at or beyond the site boundary indicate EITHER:</p> <p>a. Gamma (closed window) dose rates >100 mR/hr are expected to continue for ≥ 60 minutes.</p> <p>OR</p> <p>b. Analyses of field survey samples indicate > 500 mRem CDE Thyroid for 60 minutes of inhalation.</p> <table border="1" data-bbox="737 1163 1314 1326"> <thead> <tr> <th colspan="2">Table R1 Effluent Monitor Thresholds</th> </tr> <tr> <th>Effluent Monitor</th> <th>Site Area Emergency</th> </tr> </thead> <tbody> <tr> <td>RM-G-25 (Cond Offgas)</td> <td>9.53 E+05 mR/hr</td> </tr> <tr> <td>RM-A-8GH (Station Vent)</td> <td>3.09 E+04 cpm</td> </tr> <tr> <td>RM-G-24 (RB Purge)</td> <td>5.55 E+04 mR/hr</td> </tr> <tr> <td>RM-A-14 (ESF Vent)</td> <td>6.66 E+01 uCi/cc</td> </tr> </tbody> </table>	Table R1 Effluent Monitor Thresholds		Effluent Monitor	Site Area Emergency	RM-G-25 (Cond Offgas)	9.53 E+05 mR/hr	RM-A-8GH (Station Vent)	3.09 E+04 cpm	RM-G-24 (RB Purge)	5.55 E+04 mR/hr	RM-A-14 (ESF Vent)	6.66 E+01 uCi/cc	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific monitors and Threshold values to ensure timely classification.</p> <p>2) Added "Classification based on effluent monitor readings assumes that a release path to the environment is established." To the third bullet in order to delete the following from the basis section " Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes." This allows for more timely classification since all the basis information pertaining to Note bullet 3 will be contained in the IC and therefor readily available on the 11x17 procedure matrix used by the SM.</p>
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NEI 99-01 Rev 6	Proposed EAL	Justification												
<p style="text-align: right;">AA1</p> <p>Initiating Condition – ALERT</p> <p>Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE.</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels: (1 or 2 or 3)</p> <p>Note:</p> <ul style="list-style-type: none"> The Emergency Director should declare the Alert promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. <ol style="list-style-type: none"> Reading on any of the following radiation monitors greater than the reading shown for 15 minutes or longer: <p style="margin-left: 20px;">(site-specific monitor list and threshold values)</p> Dose assessment actual meteorology indicates doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond (site specific dose receptor point) Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond (site-specific dose receptor point) for one hour of exposure. Field survey results indicate EITHER of the following at or beyond (site specific dose receptor point): <ul style="list-style-type: none"> Closed window dose rates greater than 10 mR/hr expected to continue for 60 minutes or longer. Analysis of field survey samples indicate thyroid CDE greater than 50 mrem for one hour of inhalation. 	<p style="text-align: right;">RA1</p> <p>Initiating Condition:</p> <p>Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem thyroid CDE.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL) :</p> <p>Note:</p> <ul style="list-style-type: none"> The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes. Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. <ol style="list-style-type: none"> Readings on ANY Table R1 Effluent Monitor > Table R1 value for ≥ 15 minutes. OR Dose assessment using actual meteorology indicates doses at or beyond the site boundary of EITHER: <ol style="list-style-type: none"> > 10 mRem TEDE OR <ol style="list-style-type: none"> > 50 mRem CDE Thyroid Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than EITHER of the following at or beyond the site boundary <ol style="list-style-type: none"> 10 mRem TEDE for 60 minutes of exposure OR <ol style="list-style-type: none"> 50 mRem CDE Thyroid for 60 minutes of exposure Field survey results at or beyond the site boundary indicate EITHER: <ol style="list-style-type: none"> Gamma (closed window) dose rates > 10 mR/hr are expected to continue for ≥ 60 minutes. OR <ol style="list-style-type: none"> Analyses of field survey samples indicate > 50 mRem CDE Thyroid for 60 minutes of inhalation. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Table R1 Effluent Monitor Thresholds</th> </tr> <tr> <th style="text-align: center;">Effluent Monitor</th> <th style="text-align: center;">Alert</th> </tr> </thead> <tbody> <tr> <td>RM-G-25 (Cond Offgas)</td> <td>9.53 E+04 mR/hr</td> </tr> <tr> <td>RM-A-8GH (Station Vent)</td> <td>3.09 E+03 cpm</td> </tr> <tr> <td>RM-G-24 (RB Purge)</td> <td>5.55 E+03 mR/hr</td> </tr> <tr> <td>RM-A-14 (ESF Vent)</td> <td>6.66 E+00 uCi/cc</td> </tr> </tbody> </table>	Table R1 Effluent Monitor Thresholds		Effluent Monitor	Alert	RM-G-25 (Cond Offgas)	9.53 E+04 mR/hr	RM-A-8GH (Station Vent)	3.09 E+03 cpm	RM-G-24 (RB Purge)	5.55 E+03 mR/hr	RM-A-14 (ESF Vent)	6.66 E+00 uCi/cc	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <ol style="list-style-type: none"> Listed site-specific monitors and Threshold values to ensure timely classification. Added "Classification based on effluent monitor readings assumes that a release path to the environment is established." To the third bullet in order to delete the following from the basis section "Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes." This allows for more timely classification since all the basis information pertaining to Note bullet 3 will be contained in the IC and therefor readily available on the 11x17 procedure matrix used by the SM. Calculations were performed, in accordance with (IAW) guidance provided in NEI 99-01 revision 6 EAL AA1, to determine the effluent monitor response for a radioactive liquid release and a WGDT release via the normal site release pathway. The release would contain activity equivalent to provide 10mrem TEDE or 50mrem thyroid CDE at the site boundary. The calculation determined the effluent monitor responses would be >110% of the instruments maximum range and as such, IAW NEI 99-01 Rev 6 guidance, was not included in this EAL.
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NEI 99-01 Rev 6	Proposed EAL	Justification												
<p style="text-align: right;">AU1</p> <p>Initiating Condition – UNUSUAL EVENT</p> <p>Release of gaseous or liquid radioactivity greater than 2 times the (site-specific effluent release controlling document) limits for 60 minutes or longer</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels: (1 or 2 or 3)</p> <p>Note:</p> <ul style="list-style-type: none"> • The Emergency Director should declare the Alert promptly upon determining that 60 minutes has been exceeded, or will likely be exceeded. • If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes. • If the effluent flow past an effluent monitor is known to have stopped, indicating that the release path is isolated, the effluent monitor reading is no longer valid for classification purposes. <ol style="list-style-type: none"> 1. Reading on ANY effluent radiation monitor greater than 2 times the (site-specific effluent release controlling document) limits for 60 minutes or longer: (site-specific monitor list and threshold values corresponding to 2 times the controlling document limits) 2. Reading on ANY effluent radiation monitor greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer. 3. Sample analysis for a gaseous or liquid release indicates a concentration or release rate greater than 2 times (site-specific effluent release controlling document limits) for 60 minutes or longer. 	<p style="text-align: right;">RU1</p> <p>Initiating Condition:</p> <p>Release of gaseous or liquid radioactivity greater than 2 times the ODCM limits for 60 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL) :</p> <p>Note:</p> <ul style="list-style-type: none"> • The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded. • If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes. • Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes. <ol style="list-style-type: none"> 1. Reading on ANY of the following effluent monitors > 2 times alarm setpoint established by a current radioactive release discharge permit for ≥ 60 minutes. <ul style="list-style-type: none"> ▪ RM-L-6, Radwaste Discharge ▪ RM-L-12, IWTS / IWFS Discharge ▪ RM-A-7, Waste Gas Decay Tank Discharge ▪ Discharge Permit specified monitor <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> 2. Readings on ANY Table R1 Effluent Monitor > Table R1 value for ≥ 60 minutes. <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> 3. Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates > 2 times ODCM Limit with a release duration of ≥ 60 minutes. <table border="1" data-bbox="737 1153 1329 1313" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Table R1 Effluent Monitor Thresholds</th> </tr> <tr> <th style="text-align: center;">Effluent Monitor</th> <th style="text-align: center;">Unusual Evet</th> </tr> </thead> <tbody> <tr> <td>RM-G-25 (Cond Offgas)</td> <td style="text-align: center;">1.09 E+03 mR/hr</td> </tr> <tr> <td>RM-A-8GH (Station Vent)</td> <td style="text-align: center;">7.03 E+01 cpm</td> </tr> <tr> <td>RM-G-24 (RB Purge)</td> <td style="text-align: center;">6.34 E+01 mR/hr</td> </tr> <tr> <td>RM-A-14 (ESF Vent)</td> <td style="text-align: center;">7.60 E-02 uCi/cc</td> </tr> </tbody> </table>	Table R1 Effluent Monitor Thresholds		Effluent Monitor	Unusual Evet	RM-G-25 (Cond Offgas)	1.09 E+03 mR/hr	RM-A-8GH (Station Vent)	7.03 E+01 cpm	RM-G-24 (RB Purge)	6.34 E+01 mR/hr	RM-A-14 (ESF Vent)	7.60 E-02 uCi/cc	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific monitors and Threshold values to ensure timely classification.</p> <p>2) Added "Classification based on effluent monitor readings assumes that a release path to the environment is established." 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NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">AG2</p> <p>Initiating Condition -- GENERAL EMERGENCY</p> <p>Spent fuel pool level cannot be restored to at least (site-specific Level 3 description) for 60 minutes or longer .</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels:</p> <p>NOTES: The Emergency Director should declare the General Emergency promptly upon determining that 60 minutes has been exceeded, or will likely be exceeded</p> <p>1. Spent fuel pool level cannot be restored to at least (site-specific Level 3 description) for 60 minutes or longer.</p>	<p style="text-align: right;">RG2</p>	<p> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) EAL not used in accordance with the discussion in Section 1.4, NRC Order EA-12-051, it is recommended that this EAL be implemented when the enhanced spent fuel pool level instrumentation is available for use. The completion of the enhanced SFP level indicators and need for the inclusion of this EAL is being tracked in accordance with Exelon Generation Company, LLC's Initial Status Report to March 12, 2012 Commission Order Modifying Licenses with Regard for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) dated October 25,2012.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">AS2</p> <p>Initiating Condition – SITE AREA EMERGENCY</p> <p>Spent fuel pool level cannot be restored to at least (site-specific Level 3 description)</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels:</p> <ol style="list-style-type: none"> Spent fuel pool level cannot be restored to at least (site-specific Level 3 description) 	<p style="text-align: right;">RS2</p>	<p> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) EAL not used in accordance with the discussion in Section 1.4, NRC Order EA-12-051, it is recommended that this EAL be implemented when the enhanced spent fuel pool level instrumentation is available for use. The completion of the enhanced SFP level indicators and need for the inclusion of this EAL is being tracked in accordance with Exelon Generation Company, LLC's Initial Status Report to March 12, 2012 Commission Order Modifying Licenses with Regard for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) dated October 25, 2012.</p>

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<p style="text-align: right;">AA2</p> <p>Initiating Condition – ALERT</p> <p>Significant lowering of water level above, or damage to, irradiated fuel.</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels: (1 or 2 or 3)</p> <ol style="list-style-type: none"> 1. Uncovery of irradiated fuel in the REFUELING PATHWAY. 2. Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by ANY of the following radiation monitors: (site-specific listing of radiation monitors, and the associated readings, setpoints and/or alarms) 3. Lowering of spent fuel pool level to (site-specific Level 2 value). 	<p style="text-align: right;">RA2</p> <p>Initiating Condition:</p> <p>Significant lowering of water level above, or damage to, irradiated fuel.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6,D</p> <p>Emergency Action Levels (EAL) :</p> <ol style="list-style-type: none"> 1. Uncovery of irradiated fuel in the REFUELING PATHWAY. <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> 2. Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by ANY Table R1 Radiation Monitor reading >1000 mRem/hr <table border="1" data-bbox="766 550 1302 797"> <thead> <tr> <th colspan="3" style="text-align: center;">Table R2 Radiation Monitors</th> </tr> <tr> <th style="text-align: center;">RMS</th> <th style="text-align: center;">Area Monitored</th> <th style="text-align: center;">Mode</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">RM-G-9</td> <td style="text-align: center;">FHB Bridge Rad Monitor</td> <td style="text-align: center;">ALL</td> </tr> <tr> <td style="text-align: center;">RM-G-6</td> <td style="text-align: center;">RB Auxiliary Bridge Rad Monitor</td> <td style="text-align: center;">5, 6</td> </tr> <tr> <td style="text-align: center;">RM-G-7</td> <td style="text-align: center;">RB Main Bridge Rad Monitor</td> <td style="text-align: center;">5, 6</td> </tr> </tbody> </table>	Table R2 Radiation Monitors			RMS	Area Monitored	Mode	RM-G-9	FHB Bridge Rad Monitor	ALL	RM-G-6	RB Auxiliary Bridge Rad Monitor	5, 6	RM-G-7	RB Main Bridge Rad Monitor	5, 6	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific monitors and Threshold values to ensure timely classification.</p> <p>2) EAL #3 not used in accordance with the discussion in Section 1.4, NRC Order EA-12-051, it is recommended that this EAL be implemented when the enhanced spent fuel pool level instrumentation is available for use. The completion of the enhanced SFP level indicators and need for the inclusion of this EAL is being tracked in accordance with Exelon Generation Company, LLC's Initial Status Report to March 12, 2012 Commission Order Modifying Licenses with Regard for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) dated October 25,2012.</p>
Table R2 Radiation Monitors																	
RMS	Area Monitored	Mode															
RM-G-9	FHB Bridge Rad Monitor	ALL															
RM-G-6	RB Auxiliary Bridge Rad Monitor	5, 6															
RM-G-7	RB Main Bridge Rad Monitor	5, 6															

NEI 99-01 Rev 6	Proposed EAL	Justification															
<p style="text-align: right;">AU2</p> <p>Initiating Condition: UNUSUAL EVENT UNPLANNED loss of water level above irradiated fuel</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels:</p> <p>1. a. UNPLANNED water level drop in the REFUELING PATHWAY as indicated by ANY of the following:</p> <p style="padding-left: 40px;">(site-specific level indications).</p> <p>AND</p> <p>b. UNPLANNED rise in area radiation levels as indicated by ANY of the following radiation monitors.</p> <p style="padding-left: 40px;">(site-specific list of area radiation monitors)</p>	<p style="text-align: right;">RU2</p> <p>Initiating Condition: UNPLANNED loss of water level above irradiated fuel</p> <p>Operating Mode Applicability: 1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL) :</p> <p>1. a. UNPLANNED water level drop in the REFUELING PATHWAY. AND b. UNPLANNED Area Radiation Monitor reading rise on ANY radiation monitors in Table R2.</p> <table border="1" data-bbox="766 591 1302 839" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="3" style="text-align: center;">Table R2 Radiation Monitors</th> </tr> <tr> <th style="text-align: center;">RMS</th> <th style="text-align: center;">Area Monitored</th> <th style="text-align: center;">Mode</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">RM-G-9</td> <td style="text-align: center;">FHB Bridge Rad Monitor</td> <td style="text-align: center;">ALL</td> </tr> <tr> <td style="text-align: center;">RM-G-6</td> <td style="text-align: center;">RB Auxiliary Bridge Rad Monitor</td> <td style="text-align: center;">5, 6</td> </tr> <tr> <td style="text-align: center;">RM-G-7</td> <td style="text-align: center;">RB Main Bridge Rad Monitor</td> <td style="text-align: center;">5, 6</td> </tr> </tbody> </table>	Table R2 Radiation Monitors			RMS	Area Monitored	Mode	RM-G-9	FHB Bridge Rad Monitor	ALL	RM-G-6	RB Auxiliary Bridge Rad Monitor	5, 6	RM-G-7	RB Main Bridge Rad Monitor	5, 6	<p style="text-align: center;"> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific level indication and monitors to ensure timely classification.</p>
Table R2 Radiation Monitors																	
RMS	Area Monitored	Mode															
RM-G-9	FHB Bridge Rad Monitor	ALL															
RM-G-6	RB Auxiliary Bridge Rad Monitor	5, 6															
RM-G-7	RB Main Bridge Rad Monitor	5, 6															

NEI 99-01 Rev 6	Proposed EAL	Justification																
<p style="text-align: right;">AA3</p> <p>Initiating Condition – ALERT</p> <p>Radiation levels that impede access to equipment necessary for normal plant operations, cooldown or shutdown.</p> <p>Operating Mode Applicability: All</p> <p>Example Emergency Action Levels: (1 or 2)</p> <p>Note: If the equipment in the listed room or area was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted</p> <ol style="list-style-type: none"> Dose rate greater than 15 mR/hr in ANY of the following areas: <ul style="list-style-type: none"> Control Room Central Alarm Station (other site-specific areas/rooms) An UNPLANNED event results in radiation levels that prevent or significantly impede access to any of the following plant rooms or areas: (site-specific list of plant rooms or areas with entry-related mode applicability identified) 	<p style="text-align: right;">RA3</p> <p>Initiating Condition:</p> <p>Radiation levels that impede access to equipment necessary for normal plant operations, cooldown or shutdown.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6,D</p> <p>Emergency Action Levels (EAL) :</p> <p>Note: If the equipment in the room or area listed in Table R4 was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted</p> <ol style="list-style-type: none"> Dose rate greater than 15 mR/hr in ANY of the areas contained in Table R3: <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">Table R3</p> <p style="text-align: center;">Areas Requiring Continuous Occupancy</p> <ul style="list-style-type: none"> • Main Control Room • Central Alarm Station – (by survey) </div> <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> UNPLANNED event results in radiation levels that prohibit or significantly impede access to any of the following Table R4 plant rooms or areas: <table border="1" style="margin: 10px auto; width: 80%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Table R4</th> </tr> <tr> <th colspan="2" style="text-align: center;">Areas with Entry Related Mode Applicability</th> </tr> <tr> <th style="text-align: center;">Area</th> <th style="text-align: center;">Entry Related Mode Applicability</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Reactor Building*</td> <td style="text-align: center;">Modes 4, 5, and 6</td> </tr> <tr> <td style="text-align: center;">Intermediate Building*</td> <td style="text-align: center;">Modes 4, 5, and 6</td> </tr> <tr> <td style="text-align: center;">Auxiliary Building*</td> <td style="text-align: center;">Modes 4, 5, and 6</td> </tr> <tr> <td style="text-align: center;">Fuel Handling Building*</td> <td style="text-align: center;">Modes 4, 5, and 6</td> </tr> <tr> <td colspan="2" style="text-align: center;">*Areas required to establish shutdown cooling</td> </tr> </tbody> </table>	Table R4		Areas with Entry Related Mode Applicability		Area	Entry Related Mode Applicability	Reactor Building*	Modes 4, 5, and 6	Intermediate Building*	Modes 4, 5, and 6	Auxiliary Building*	Modes 4, 5, and 6	Fuel Handling Building*	Modes 4, 5, and 6	*Areas required to establish shutdown cooling		<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) Listed site specific plant rooms and areas with identified mode applicability to ensure timely classification.</p>
Table R4																		
Areas with Entry Related Mode Applicability																		
Area	Entry Related Mode Applicability																	
Reactor Building*	Modes 4, 5, and 6																	
Intermediate Building*	Modes 4, 5, and 6																	
Auxiliary Building*	Modes 4, 5, and 6																	
Fuel Handling Building*	Modes 4, 5, and 6																	
*Areas required to establish shutdown cooling																		

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">SU3</p> <p>Initiating Condition: UNUSUAL EVENT Reactor coolant activity greater than Technical Specification allowable limits. Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown Example Emergency Action Levels:</p> <ol style="list-style-type: none"> 1. (Site-specific radiation monitor) reading greater than (site-specific value). OR 2. Sample analysis indicates that a reactor coolant activity value is greater than an allowable limit specified in Technical Specifications. 	<p>RU3</p> <p>Initiating Condition: Reactor coolant activity greater than Technical Specification allowable limits. Operating Mode Applicability: 1, 2, 3, 4 Emergency Action Levels (EAL):</p> <ol style="list-style-type: none"> 1. Letdown Monitor RM-L-1 alert alarm (high or low channel). OR 2. Sample analysis indicates that: <ol style="list-style-type: none"> a. Dose Equivalent I-131 specific coolant activity > 60.0 uCi/gm. OR b. Dose Equivalent XE-133 specific coolant activity > 797.0 uCi/gm. 	<p> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific monitor and threshold value to ensure timely classification.</p> <p>2) Listed this system category EAL in the radiological category EAL section to maintain consistency with current and previous revisions of Exelon EALs. This will ensure a timely classification since the threshold values are more aligned with the radiological category vice system category.</p>

Fission Product Barrier Matrix

Hot Matrix

GENERAL EMERGENCY			SITE AREA EMERGENCY		ALERT	
FG1 Loss of any two barriers AND Loss or Potential Loss of third barrier. 1,2,3,4			FS1 Loss or Potential Loss of ANY two barriers. 1,2,3,4		FA1 ANY Loss or ANY Potential Loss of either Fuel Clad or RCS 1,2,3,4	
Sub-Category	FC – Fuel Clad		RC – Reactor Coolant System		CT - Containment	
	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss
1. RCS or SG Tube Leakage	None	A. RCS/reactor vessel level less than (site-specific level).	A. An automatic or manual ECCS (SI) actuation is required by EITHER of the following: a. UNISOLABLE RCS leakage OR b. SG tube RUPTURE.	A. Operation of a standby charging (makeup) pump is required by EITHER of the following: a. UNISOLABLE RCS leakage OR b. SG tube leakage. OR B. RCS cooldown rate greater than (site specific pressurized thermal shock criteria/limits defined by site specific indications)	A leaking or RUPTURED SG is FAULTED outside of containment.	None
2. Inadequate Heat Removal	A. Core exit thermocouple readings greater than (site specific temperature value)	A. Core exit thermocouple readings greater than (site specific temperature value) OR B. Inadequate RCS heat removal capability via steam generators as indicated by (site specific indications).	None	A. Inadequate RCS heat removal capability via steam generators as indicated by (site specific indications).	None	A. 1. (site specific criteria for entry into core cooling restoration procedure) AND 2. Functional Restoration Procedures <u>not</u> effective in < 15 minutes.
3. RCS Activity/ Containment Radiation	A. Containment radiation monitor reading greater than (site specific value) OR B. (Site specific indications that reactor coolant activity is greater than 300 uCi/gm dose equivalent I-131).	None	A. Containment radiation monitor reading greater than (site specific value)	None	None	A. Containment radiation monitor reading greater than (site specific value)
4. Containment Integrity or Bypass	None	None	None	None	A. Containment isolation is required AND EITHER of the following: 1. Containment integrity has been lost based on Emergency Director judgement. OR 2. UNISOLABLE pathway from containment to the environment exists. OR B. Indication of RCS leakage outside of containment	A. Containment pressure greater than (site specific value) OR B. Explosive mixture exists inside containment. OR C. 1. Containment pressure greater than (site specific value) AND 2. Less than one full train of (site specific equipment) is operating per design for >15 minutes.
5. Emergency Director Judgment	A. Any Condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier.	A. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier.	A. ANY Condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier.	A. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.	A. Any Condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier.	A. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.

Proposed Fission Product Barrier Matrix

Fission Product Barrier Matrix

Hot Matrix

GENERAL EMERGENCY

SITE AREA EMERGENCY

ALERT

FG1 Loss of any two barriers AND Loss or Potential Loss of third barrier.

1|2|3|4

FS1 Loss or Potential Loss of ANY two barriers.

1|2|3|4

FA1 ANY Loss or ANY Potential Loss of either Fuel Clad or RCS

1|2|3|4

Sub-Category	FC – Fuel Clad		RC – Reactor Coolant System		CT - Containment									
	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss								
1. RCS or SG Tube Leakage	None	1. RCITS hot leg instruments indicate 0 inches after lowering trend. AND 2. In-core thermocouples are unavailable. AND 3. ALL RCP's are secured.	1. Automatic or manual ESAS actuation is required by EITHER of the following: a. UNISOLABLE RCS leakage OR b. Steam Generator tube RUPTURE.	2. UNISOLABLE RCS leakage >150gpm. OR 3. HPI-PORV Cooling in effect. OR 4. a. RCS Pressure > 2450 psig. AND b. RCS Pressure not lowering	1. SG tube leakage > 150gpm AND 2. SG is FAULTED outside of containment.	None								
2. Inadequate Heat Removal	1. T _{clad} > 1400°F	2. > 25°F Superheat OR 3. HPI-PORV Cooling in effect.	None	HPI-PORV Cooling in effect.	None	1. T _{clad} ≥ 1800°F. AND 2. EOP Restoration procedures <u>not</u> effective in < 15 minutes.								
3. Containment Radiation / RCS Activity	1. Containment radiation monitor (RM-G-22 or RM-G-23) reading > 1.95E+03 R/hr. OR 2. Coolant activity > 300uCi/gm Dose Equivalent I-131	None	Containment radiation monitor (RM-G-22 or RM-G-23) reading > 25 R/hr.	None	None	Containment radiation monitor (RM-G-22 or RM-G-23) reading > 4.40E+03 R/hr.								
4. Containment Integrity or Bypass	None	None	None	None	1. Containment isolation is required and EITHER of the following: a. UNPLANNED lowering in containment pressure or rise in radiation monitor readings outside of containment in the Emergency Directors judgment indicate a loss of containment integrity. OR b. UNISOLABLE pathway from containment to the environment exists. OR 2. Indication of RCS leakage outside of containment	3. Reactor Building Pressure > 55 psig and rising. OR 4. Hydrogen Concentration in Containment ≥ 4%. OR 5. a. Reactor Building pressure > 30 psig AND b. Reactor Building Emergency cooling is less than ANY one of the following conditions: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>SPRAY</th> <th>COOLERS</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>0</td> <td>3</td> </tr> <tr> <td>1</td> <td>1</td> </tr> </tbody> </table>	SPRAY	COOLERS	2	0	0	3	1	1
SPRAY	COOLERS													
2	0													
0	3													
1	1													
5. Emergency Director Judgment	1. Any Condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier.	2. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier.	1. Any Condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier.	2. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.	1. Any Condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier.	2. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.								

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">FC1</p> <p>Category: Fuel Clad Barrier RCS or SG tube leakage Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown Fission Product Barrier Threshold: Potential Loss A. RCS/reactor vessel level less than (site-specific level).</p>	<p style="text-align: right;">FC1</p> <p>Category: Fuel Clad Barrier RCS or SG tube leakage Operating Mode Applicability: 1, 2, 3, 4 Fission Product Barrier (FPB) Threshold: <u>Potential Loss</u> 1. RCITS hot leg instruments indicate 0 inches after lowering trend. AND 2. In-core thermocouples are unavailable. AND 3. ALL RCP's are secured.</p>	<p> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific threshold value to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">FC2</p> <p>Category: Fuel Clad Barrier Inadequate Heat Removal</p> <p>Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Fission Product Barrier Threshold:</p> <p><u>Loss</u></p> <p>A. Core exit thermocouple readings greater than (site-specific temperature value).</p> <p><u>Potential Loss</u></p> <p>A. Core exit thermocouple readings greater than (site-specific temperature value). OR</p> <p>B. Inadequate RCS heat removal capability via steam generators as indicated by (site-specific indications).</p>	<p style="text-align: right;">FC2</p> <p>Category: Fuel Clad Barrier RCS Activity</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Fission Product Barrier (FPB) Threshold:</p> <p><u>Loss</u></p> <p>1. $T_{clad} > 1400^{\circ}\text{F}$</p> <p><u>Potential Loss</u></p> <p>2. $> 25^{\circ}\text{F}$ Superheat OR</p> <p>3. HPI-PORV Cooling in effect.</p>	<p style="text-align: center;"> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific threshold value to ensure timely classification.</p> <p>2) Potential Loss #3, The initiation of HPI - PORV cooling creates a controlled opening of the RCS to the RB by an open PORV. This is indicative of the steam generators inability to remove heat from the RCS and represents a potential challenge to the FC barrier and is considered a potential loss.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">FC3</p> <p>Category: Fuel Clad Barrier Containment Radiation / RCS Activity Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown Fission Product Barrier Threshold: Loss A. Containment radiation monitor reading greater than (site-specific value). OR B. (Site-specific indications that reactor coolant activity is greater than 300 $\mu\text{Ci/gm}$ dose equivalent I-131).</p>	<p style="text-align: right;">FC3</p> <p>Category: Fuel Clad Barrier Containment Radiation / RCS Activity Operating Mode Applicability: 1, 2, 3, 4 Fission Product Barrier (FPB) Threshold: <u>Loss</u> 1. Containment radiation monitor (RM-G-22 or RM-G-23) reading > 1.95E+03 R/hr. OR 2. Coolant activity > 300uCi/gm Dose Equivalent I-131</p>	<p style="text-align: center;"> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific monitor and threshold value to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">FC6</p> <p>Category: Fuel Clad Barrier Emergency Director Judgment Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown Fission Product Barrier Threshold: <u>Loss</u> A. Any Condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier. <u>Potential Loss</u> A. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier.</p>	<p style="text-align: right;">FC5</p> <p>Category: Fuel Clad Barrier Emergency Director Judgment Operating Mode Applicability: 1, 2, 3, 4 Fission Product Barrier (FPB) Threshold: <u>Loss</u> 1. Any Condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier. <u>Potential Loss</u> 2. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier.</p>	<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">RC1</p> <p>Category: Reactor Coolant System Barrier RCS or SG Tube Leakage</p> <p>Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Fission Product Barrier Threshold: Loss</p> <p>A. An automatic or manual ECCS (SI) actuation is required by EITHER of the following:</p> <ol style="list-style-type: none"> 1. UNISOLABLE RCS leakage <li style="text-align: center;">OR 2. SG tube RUPTURE. <p>Potential Loss</p> <p>A. Operation of a standby charging (makeup) pump is required by EITHER of the following:</p> <ol style="list-style-type: none"> 1. UNISOLABLE RCS leakage <li style="text-align: center;">OR 2. SG tube leakage. <li style="text-align: center;">OR <p>B. RCS cooldown rate greater than (site-specific pressurized thermal shock criteria/limits defined by site-specific indications).</p>	<p style="text-align: right;">RC1</p> <p>Category: Reactor Coolant System Barrier RCS or SG Tube Leakage</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Fission Product Barrier (FPB) Threshold: <u>Loss</u></p> <ol style="list-style-type: none"> 1. Automatic or manual ESAS actuation is required by EITHER of the following: <ol style="list-style-type: none"> a. UNISOLABLE RCS leakage <li style="text-align: center;">OR b. Steam Generator tube RUPTURE. <u>Potential Loss</u> 2. UNISOLABLE RCS leakage > 150gpm. <li style="text-align: center;">OR 3. HPI-PORV Cooling in effect. <li style="text-align: center;">OR 4. a. RCS Pressure > 2450 psig. <li style="text-align: center;">AND b. RCS Pressure not lowering. 	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific threshold value to ensure timely classification.</p> <p>2) Potential loss threshold #2 is based on the inability to maintain normal liquid inventory within the RCS by normal operation of the Make Up System, when one Make Up Pump is discharging to the charging header. The need for a second Make Up Pump or the use of the high capacity makeup rate would be indicative of a substantial RCS leak. 120 gpm is the nominal capacity of each Make Up Pump. However, 150 gpm (high makeup flow alarm setpoint) was selected because it is more easily recognized by the operator which will result in a more timely declaration than performing a calculation.</p> <p>2) Potential Loss #3, The initiation of HPI - PORV cooling creates a controlled opening of the RCS to the RB by an open PORV. The opening of the RCS and the pressure control mode through throttling of the HPI and or MU valves represents a potential challenge to the RCS barrier and is considered a potential loss.</p> <p>3) Potential Loss #4, The pressurizer code safety valves will open between 2450 psig and 2510 psig(allowance for set pressure and Code Safety valve accumulation). This is the design limit for the RCS and well within tested values (2750 psig). If the RCS heatup is able to keep the pressurizer code safety valves open with pressure either increasing or cycling then the RCS shall be considered a potential breach.</p> <p>4) The proposed EAL provides the Operators with a clear and easily recognizable entry condition for this EAL without altering the intent of the EAL. The usage of the specified thresholds would ensure timely declaration should this event occur. TMI is using these conditions as entry into this EAL to mimic the concerns of the Potential Loss of RCS as shown in the Westinghouse CSFT monitoring for pressurized thermal shock (PTS) through the use of the RCS integrity red path. These are the same thresholds as what was approved in EAL's based on NEI 99-01 Rev 5.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">RC2</p> <p>Category: Reactor Coolant System Barrier Inadequate Heat Removal Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown Fission Product Barrier Threshold: Potential Loss A. Inadequate RCS heat removal capability via steam generators as indicated by (site-specific indications).</p>	<p style="text-align: right;">RC2</p> <p>Category: Reactor Coolant System Barrier Inadequate Heat Removal Operating Mode Applicability: 1, 2, 3, 4 Fission Product Barrier (FPB) Threshold: <u>Potential Loss</u> HPI-PORV Cooling in effect.</p>	<p style="text-align: center;"> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific threshold value to ensure timely classification.</p> <p>2) The initiation of HPI - PORV cooling creates a controlled opening of the RCS to the RB by an open PORV. The opening of the RCS and the pressure control mode through throttling of the HPI and or MU valves represents a potential challenge to the RCS barrier and is considered a potential loss.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">RC3</p> <p>Category: Reactor Coolant System Barrier Containment Radiation / RCS Activity Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown Fission Product Barrier Threshold: Loss A. Containment radiation monitor reading greater than (site-specific value).</p>	<p style="text-align: right;">RC3</p> <p>Category: Reactor Coolant System Barrier RCS Leak Rate Operating Mode Applicability: 1, 2, 3, 4 Fission Product Barrier (FPB) Threshold: <u>Loss</u> Containment radiation monitor (RM-G-22 or RM-G-23) reading > 25 R/hr.</p>	<p style="text-align: center;"> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific systems and threshold values to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">RC6</p> <p>Category: Reactor Coolant System Barrier Emergency Director Judgment Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown Fission Product Barrier Threshold: Loss A. Any Condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier. Potential Loss A. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.</p>	<p style="text-align: right;">RC5</p> <p>Category: Reactor Coolant System Barrier Emergency director Judgment Operating Mode Applicability: 1, 2, 3, 4 Fission Product Barrier (FPB) Threshold: <u>Loss</u> 1. ANY Condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier. <u>Potential Loss</u> 2. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.</p>	<p> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">CT1</p> <p>Category: Containment Barrier RCS or SG Tube Leakage Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown Fission Product Barrier Threshold: Loss A. A leaking or RUPTURED SG is FAULTED outside of containment.</p>	<p style="text-align: right;">CT1</p> <p>Category: Containment Barrier RCS or SG Tube Leakage Operating Mode Applicability: 1, 2, 3, 4 Fission Product Barrier (FPB) Threshold: Loss 1. SG tube leakage > 150gpm AND 2. SG is FAULTED outside of containment.</p>	<p> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific threshold values to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">CT2</p> <p>Category: Containment Barrier Inadequate Heat Removal Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown Fission Product Barrier Threshold: Potential Loss A. 1. (Site-specific criteria for entry into core cooling restoration procedure) AND 2. Restoration procedure not effective within 15 minutes.</p>	<p style="text-align: right;">CT2</p> <p>Category: Containment Barrier Inadequate Heat Removal Operating Mode Applicability: 1, 2, 3, 4 Fission Product Barrier (FPB) Threshold: <u>Potential Loss</u> 1. $T_{clad} \geq 1800^{\circ}\text{F}$. AND 2. EOP Restoration procedures <u>not</u> effective in < 15 minutes.</p>	<p style="text-align: center;"> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific threshold values to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">CT3</p> <p>Category: Containment Barrier Containment Radiation / RCS Activity Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown Fission Product Barrier Threshold: Potential Loss A. Containment radiation monitor reading greater than (site-specific value).</p>	<p style="text-align: right;">CT3</p> <p>Category: Containment Barrier Containment Radiation / RCS Activity Operating Mode Applicability: 1, 2, 3, 4 Fission Product Barrier (FPB) Threshold: <u>Potential Loss</u> Containment radiation monitor (RM-G-22 or RM-G-23) reading > 4.40E+03 R/hr.</p>	<p> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific threshold values to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification								
<p style="text-align: right;">CT4</p> <p>Category: Containment Barrier Containment Integrity or Bypass</p> <p>Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Fission Product Barrier Threshold: Loss</p> <p>A. Containment isolation is required AND EITHER of the following:</p> <ol style="list-style-type: none"> 1. Containment integrity has been lost based on Emergency Director judgment. OR 2. UNISOLABLE pathway from the containment to the environment exists. OR <p>B. Indications of RCS leakage outside of containment.</p> <p>Potential Loss</p> <p>A. Containment pressure greater than (site-specific value) OR</p> <p>B. Explosive mixture exists inside containment OR</p> <p>C. 1. Containment pressure greater than (site-specific pressure setpoint) AND</p> <ol style="list-style-type: none"> 2. Less than one full train of (site-specific system or equipment) is operating per design for 15 minutes or longer. 	<p style="text-align: right;">CT4</p> <p>Category: Containment Barrier Containment Integrity or Bypass</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Fission Product Barrier (FPB) Threshold: Loss</p> <p>1. Containment isolation is required and EITHER of the following:</p> <ol style="list-style-type: none"> a. UNPLANNED lowering in containment pressure or rise in radiation monitor readings outside of containment in the Emergency Directors judgment indicate a loss of containment integrity. OR b. UNISOLABLE pathway from containment to the environment exists. OR <p>2. Indication of RCS leakage outside of containment</p> <p><u>Potential Loss</u></p> <p>3. Reactor Building Pressure > 55 psig and rising. OR</p> <p>4. Hydrogen Concentration in Containment \geq 4%. OR</p> <p>5. a. Reactor Building pressure > 30 psig AND</p> <p>b. Reactor Building Emergency cooling is less than ANY one of the following conditions:</p> <table border="1" data-bbox="909 973 1163 1087" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>SPRAY</th> <th>COOLERS</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> </tr> </tbody> </table>	SPRAY	COOLERS	2	0	0	3	1	1	<p style="text-align: center;"> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site-specific monitor and threshold value to ensure timely classification.</p>
SPRAY	COOLERS									
2	0									
0	3									
1	1									

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">CT6</p> <p>Category: Containment Barrier Emergency director Judgment Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown Fission Product Barrier Threshold: Loss A. Any Condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier. Potential Loss A. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.</p>	<p style="text-align: right;">CT5</p> <p>Category: Containment Barrier Emergency Director Judgment Operating Mode Applicability: 1, 2, 3, 4 Fission Product Barrier (FPB) Threshold: <u>Loss</u> 1. Any Condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier. <u>Potential Loss</u> 2. Any Condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.</p>	<p> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">SG1</p> <p>Initiating Condition: GENERAL EMERGENCY</p> <p>Prolonged loss of all offsite and all onsite AC power to emergency buses.</p> <p>Operating Mode Applicability:</p> <p>Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels:</p> <p>Note: The Emergency Director should declare the General Emergency promptly upon determining that (site-specific hours) has been exceeded, or will likely be exceeded.</p> <p>1. a. Loss of ALL offsite and ALL onsite AC power to (site-specific emergency buses).</p> <p style="padding-left: 40px;">AND</p> <p>b. EITHER of the following:</p> <ul style="list-style-type: none"> • Restoration of at least one emergency bus in less than (site-specific hours) is not likely. • (Site-specific indication of an inability to adequately remove heat from the core) 	<p style="text-align: right;">MG1</p> <p>Initiating Condition:</p> <p>Prolonged loss of all offsite and all onsite AC power to emergency buses.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <p>1. Loss of ALL offsite AC power to Emergency 4KV buses.</p> <p style="padding-left: 40px;">AND</p> <p>2. Failure of EG-Y-1A, EG-Y-1B Emergency Diesel Generators and EG-Y-4 SBO Diesel Generator to supply power to Emergency 4KV buses.</p> <p style="padding-left: 40px;">AND</p> <p>3. EITHER of the following:</p> <ul style="list-style-type: none"> a. Restoration of at least one Emergency 4KV bus in < 4 hours is <u>not</u> likely. <li style="padding-left: 40px;">OR b. > 25°F superheat 	<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) Listed site specific equipment, site specific time based on station blackout coping analysis, and site specific indication to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">SS1</p> <p>Initiating Condition: SITE AREA EMERGENCY</p> <p>Loss of all offsite and all onsite AC power to emergency buses for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels:</p> <p>Note: The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes time has been exceeded, or will likely be exceeded.</p> <p>Loss of ALL offsite and ALL onsite AC Power to (site-specific emergency buses) for 15 minutes or longer.</p>	<p style="text-align: right;">MS1</p> <p>Initiating Condition:</p> <p>Loss of all offsite and onsite AC power to emergency busses for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> 1. Loss of ALL offsite AC Power to Emergency 4KV buses. <p style="text-align: center;">AND</p> <ol style="list-style-type: none"> 2. Failure of EG-Y-1A, EG-Y-1B Emergency Diesel Generators and EG-Y-4 SBO Diesel Generator to supply power to Emergency 4KV buses. <p style="text-align: center;">AND</p> <ol style="list-style-type: none"> 3. Failure to restore power to at least one Emergency 4KV bus in < 15 minutes from the time of loss of both offsite and onsite AC power 	<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) Listed site specific equipment to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">SA1</p> <p>Initiating Condition: ALERT Loss of all but one AC power source to emergency buses for 15 minutes or longer.</p> <p>Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels: Note: The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes time has been exceeded, or will likely be exceeded.</p> <p>1. a. AC power capability to (site-specific emergency buses) is reduced to a single power source for 15 minutes or longer.</p> <p>AND</p> <p>b. Any additional single power source failure will result in loss of all AC power to SAFETY SYSTEMS.</p>	<p style="text-align: right;">MA1</p> <p>Initiating Condition: Loss of all but one AC power source to emergency buses for 15 minutes or longer.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Levels (EAL): Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <p>1. AC power capability to Emergency 4KV buses reduced to only one of the following power sources for ≥ 15 minutes.</p> <ul style="list-style-type: none"> • Auxiliary Transformer 1A • Auxiliary Transformer 1B • Emergency Diesel Generator EG-Y-1A • Emergency Diesel Generator EG-Y-1B • SBO Diesel Generator EG-Y-4 <p>AND</p> <p>2. Any additional single power source failure will result in a loss of ALL AC power to SAFETY SYSTEMS.</p>	<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) Listed site specific equipment to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">SU1</p> <p>Initiating Condition: UNUSUAL EVENT</p> <p>Loss of all offsite AC power capability to emergency buses for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels:</p> <p>Note: The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.</p> <p>Loss of ALL offsite AC power capability to (site-specific emergency buses) for 15 minutes or longer</p>	<p style="text-align: right;">MU1</p> <p>Initiating Condition:</p> <p>Loss of all offsite AC power capability to emergency buses for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <p>Loss of ALL offsite AC power capability to Emergency 4KV buses for \geq 15 minutes.</p>	<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) Listed site specific equipment to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">SG8</p> <p>Initiating Condition: GENERAL EMERGENCY</p> <p>Loss of all AC and Vital DC power sources for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels:</p> <p>Note: The Emergency Director should declare the General Emergency promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.</p> <p>1. Loss of ALL offsite and ALL onsite AC power to (site-specific emergency buses) for 15 minutes or longer.</p> <p>AND</p> <p>Indicated voltage is less than (site-specific bus voltage value) on ALL (site-specific vital DC busses) for 15 minutes or longer.</p>	<p style="text-align: right;">MG2</p> <p>Initiating Condition:</p> <p>Loss of all AC and Vital DC power sources for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <p>1. Loss of ALL offsite AC power to Emergency 4KV buses.</p> <p>AND</p> <p>2. Failure of EG-Y-1A, EG-Y-1B Emergency Diesel Generators and EG-Y-4 SBO Diesel Generator to supply power to Emergency 4KV buses.</p> <p>AND</p> <p>3. Voltage is < 105 VDC on 125 VDC Distribution System 1A and 1B.</p> <p>AND</p> <p>4. ALL AC and Vital DC power sources have been lost for <u>≥ 15</u> minutes.</p>	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) Listed site specific voltage and equipment to ensure timely classification.</p> <p>2) Removed the word "indicated" this will allow for an indication problem to not cause confusion on the need to declare.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">SS8</p> <p>Initiating Condition: SITE AREA EMERGENCY Loss of all Vital DC power for 15 minutes or longer.</p> <p>Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels:</p> <p>Note: The Emergency Director should declare the Site Area Emergency promptly upon determining that 15 minutes time has been exceeded, or will likely be exceeded.</p> <p>Indicated voltage is less than (site-specific bus voltage value) on ALL Vital DC buses for 15 minutes or longer.</p>	<p style="text-align: right;">MS2</p> <p>Initiating Condition: Loss of all Vital DC power for 15 minutes or longer.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <p>Voltage is < 105 VDC on 125 VDC Distribution System 1A and 1B for ≥15 minutes.</p>	<p> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site specific voltage and equipment to ensure timely classification.</p> <p>2) Removed the word "indicated" this will allow for an indication problem to not cause confusion on the need to declare.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">SS5</p> <p>Initiating Condition: SITE AREA EMERGENCY</p> <p>Inability to shutdown the reactor causing a challenge to (core cooling [PWR] / RPV water level [BWR]) or RCS heat removal.</p> <p>Operating Mode Applicability:</p> <p>Power Operation</p> <p>Example Emergency Action Levels:</p> <ol style="list-style-type: none"> 1. <ol style="list-style-type: none"> a. An automatic (trip [PWR] / scram [BWR]) did not shutdown the reactor. <p style="margin-left: 20px;">AND</p> b. All manual actions to shutdown the reactor have been unsuccessful. <p style="margin-left: 20px;">AND</p> <ol style="list-style-type: none"> c. EITHER of the following conditions exist: <ol style="list-style-type: none"> 1. (Site-specific indication of an inability to adequately remove heat from the core) <p style="margin-left: 20px;">OR</p> 2. (Site-specific indication of an inability to adequately remove heat from the RCS) 	<p style="text-align: right;">MS3</p> <p>Initiating Condition:</p> <p>Inability to shutdown the reactor causing a challenge to core cooling or RCS heat removal.</p> <p>Operating Mode Applicability:</p> <p>1,2</p> <p>Emergency Action Levels (EAL):</p> <ol style="list-style-type: none"> 1. Automatic or Manual Trip did <u>not</u> shutdown the reactor as indicated by Reactor Power \geq 5%. <p style="margin-left: 20px;">AND</p> <ol style="list-style-type: none"> 2. ALL manual actions to shutdown the reactor have been unsuccessful as indicated by Reactor Power \geq 5%. <p style="margin-left: 20px;">AND</p> <ol style="list-style-type: none"> 3. EITHER of the following conditions exist: <ol style="list-style-type: none"> a. $T_{\text{clad}} > 1400^{\circ}\text{F}$. <p style="margin-left: 20px;">OR</p> b. HPI-PORV Cooling in effect. 	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <ol style="list-style-type: none"> 1) Listed site specific indications to ensure timely classification. 2) Mode 2 included in operating mode applicability as per developer notes. 3) The initiation of HPI - PORV cooling creates a controlled opening of the RCS to the RB by an open PORV. This is indicative of the steam generators inability to remove heat from the RCS.

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">SA5</p> <p>Initiating Condition: ALERT</p> <p>Automatic or manual (trip [PWR] / scram [BWR]) fails to shutdown the reactor, and subsequent manual actions taken at the reactor control consoles are not successful in shutting down the reactor.</p> <p>Operating Mode Applicability:</p> <p>Power Operation</p> <p>Example Emergency Action Levels:</p> <p>Note: A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies.</p> <p>1. a. An automatic (trip [PWR] / scram [BWR]) did not shutdown the reactor.</p> <p style="text-align: center;">AND</p> <p>b. Manual action taken at the reactor control consoles are not successful in shutting down the reactor.</p>	<p style="text-align: right;">MA3</p> <p>Initiating Condition:</p> <p>Automatic or manual trip fails to shutdown the reactor, and subsequent manual actions taken at the reactor control consoles are not successful in shutting down the reactor.</p> <p>Operating Mode Applicability:</p> <p>1.2</p> <p>Emergency Action Levels (EAL):</p> <p>Note: A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies.</p> <p>1. Automatic Trip did <u>not</u> shutdown the reactor as indicated by Reactor Power $\geq 5\%$.</p> <p style="text-align: center;">AND</p> <p>2. Manual actions taken at the Console Center are <u>not</u> successful in shutting down the reactor as indicated by Reactor Power $\geq 5\%$.</p>	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) Listed site specific indications to ensure timely classification.</p> <p>2) Mode 2 included in operating mode applicability as per developer notes.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p>Initiating Condition: UNUSUAL EVENT SU5</p> <p>Automatic or manual (trip [PWR] / scram [BWR]) fails to shutdown the reactor.</p> <p>Operating Mode Applicability:</p> <p>Power Operation</p> <p>Example Emergency Action Levels: (1 or 2)</p> <p>Note: A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies.</p> <p>1. a. An automatic (trip [PWR] / scram [BWR]) did not shutdown the reactor.</p> <p style="padding-left: 40px;">AND</p> <p>b. A subsequent manual action taken at the reactor control consoles is successful in shutting down the reactor.</p> <p>2. a. A manual trip ([PWR] / scram [BWR]) did not shutdown the reactor.</p> <p style="padding-left: 40px;">AND</p> <p>b. EITHER of the following:</p> <p style="padding-left: 80px;">1. A subsequent manual action taken at the reactor control consoles is successful in shutting down the reactor.</p> <p style="padding-left: 40px;">OR</p> <p style="padding-left: 80px;">2. A subsequent automatic (trip [PWR] / scram [BWR]) is successful in shutting down the reactor.</p>	<p>Initiating Condition: MU3</p> <p>Automatic or manual trip fails to shutdown the reactor.</p> <p>Operating Mode Applicability:</p> <p>1,2</p> <p>Emergency Action Levels (EAL):</p> <p>Note: A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies.</p> <p>1. a. Automatic Trip did not shutdown the reactor as indicated by Reactor Power \geq 5%.</p> <p style="padding-left: 40px;">AND</p> <p>b. Subsequent manual action taken at the Console Center is successful in shutting down the reactor.</p> <p style="padding-left: 40px;">OR</p> <p>2. a. Manual Trip did not shutdown the reactor as indicated by Reactor Power \geq 5%.</p> <p style="padding-left: 40px;">AND</p> <p>b. Subsequent automatic Trip is successful in shutting down the reactor.</p>	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) Listed site specific indications to ensure timely classification.</p> <p>2) Mode 2 included in operating mode applicability as per developer notes.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification																		
<p style="text-align: right;">SA2</p> <p>Initiating Condition: ALERT</p> <p>UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress.</p> <p>Operating Mode Applicability:</p> <p>Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels:</p> <p>Note: The Emergency Director should declare the Alert promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.</p> <p>1. a. An UNPLANNED event results in the inability to monitor one or more of the following parameters from within the Control Room for 15 minutes or longer. [see table below]</p> <table border="1" data-bbox="107 588 684 921"> <thead> <tr> <th>{ BWR parameter list}</th> <th>{ PWR parameter list}</th> </tr> </thead> <tbody> <tr> <td>Reactor Power</td> <td>Reactor Power</td> </tr> <tr> <td>RPV Level</td> <td>RCS Level</td> </tr> <tr> <td>RPV Pressure</td> <td>RCS Pressure</td> </tr> <tr> <td>Primary Containment Pressure</td> <td>In Core/Core Exit Temperature</td> </tr> <tr> <td>Suppression Pool Level</td> <td>Levels in at least (site specific number) steam generators</td> </tr> <tr> <td>Suppression Pool Temperature</td> <td>Steam Generator Auxiliary or Emergency Feed Water Flow</td> </tr> </tbody> </table> <p>AND</p> <p>b. Any of the following transient events in progress.</p> <ul style="list-style-type: none"> • Automatic or Manual runback greater than 25% thermal reactor power • Electrical load rejection greater than 25% full electrical load • Reactor Scram [BWR] / trip [PWR] • ECCS (SI) actuation • Thermal power oscillations greater than 10% [BWR] 	{ BWR parameter list}	{ PWR parameter list}	Reactor Power	Reactor Power	RPV Level	RCS Level	RPV Pressure	RCS Pressure	Primary Containment Pressure	In Core/Core Exit Temperature	Suppression Pool Level	Levels in at least (site specific number) steam generators	Suppression Pool Temperature	Steam Generator Auxiliary or Emergency Feed Water Flow	<p style="text-align: right;">MA4</p> <p>Initiating Condition:</p> <p>UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <p>1. a. An UNPLANNED event results in the inability to monitor ANY Table M1 parameters from within the Control Room for ≥ 15 minutes.</p> <table border="1" data-bbox="814 637 1257 863"> <thead> <tr> <th>Table M1 Control Room Parameters</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Reactor Power • PZR Level • RCS Pressure • In Core/Core Exit Temperature • Level in at least one OTSG. • OTSG Emergency Feed Water Flow </td> </tr> </tbody> </table> <p>AND</p> <p>b. ANY Table M2 transient in progress.</p> <table border="1" data-bbox="795 979 1274 1174"> <thead> <tr> <th>Table M2 Significant Transients</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Automatic Turbine Runback >25% thermal reactor power • Electrical Load Rejection >25% full electrical load • Reactor Trip • ESAS Actuation • Thermal Power oscillations > 10% </td> </tr> </tbody> </table>	Table M1 Control Room Parameters	<ul style="list-style-type: none"> • Reactor Power • PZR Level • RCS Pressure • In Core/Core Exit Temperature • Level in at least one OTSG. • OTSG Emergency Feed Water Flow 	Table M2 Significant Transients	<ul style="list-style-type: none"> • Automatic Turbine Runback >25% thermal reactor power • Electrical Load Rejection >25% full electrical load • Reactor Trip • ESAS Actuation • Thermal Power oscillations > 10% 	<p style="text-align: center;"> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site specific number of steam generators to ensure timely classification.</p>
{ BWR parameter list}	{ PWR parameter list}																			
Reactor Power	Reactor Power																			
RPV Level	RCS Level																			
RPV Pressure	RCS Pressure																			
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<ul style="list-style-type: none"> • Automatic Turbine Runback >25% thermal reactor power • Electrical Load Rejection >25% full electrical load • Reactor Trip • ESAS Actuation • Thermal Power oscillations > 10% 																				

NEI 99-01 Rev 6	Proposed EAL	Justification																
<p style="text-align: right;">SU2</p> <p>Initiating Condition: UNUSUAL EVENT</p> <p>UNPLANNED loss of Control Room indications for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels: Note: The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.</p> <p>An UNPLANNED event results in the inability to monitor one or more of the following parameters from within the Control Room for 15 minutes or longer. [see table below]</p> <table border="1" data-bbox="107 624 680 954"> <thead> <tr> <th>[BWR parameter list]</th> <th>[PWR parameter list]</th> </tr> </thead> <tbody> <tr> <td>Reactor Power</td> <td>Reactor Power</td> </tr> <tr> <td>RPV Level</td> <td>RCS Level</td> </tr> <tr> <td>RPV Pressure</td> <td>RCS Pressure</td> </tr> <tr> <td>Primary Containment Pressure</td> <td>In Core/Core Exit Temperature</td> </tr> <tr> <td>Suppression Pool Level</td> <td>Levels in at least (site specific number) steam generators</td> </tr> <tr> <td>Suppression Pool Temperature</td> <td>Steam Generator Auxiliary or Emergency Feed Water Flow</td> </tr> </tbody> </table>	[BWR parameter list]	[PWR parameter list]	Reactor Power	Reactor Power	RPV Level	RCS Level	RPV Pressure	RCS Pressure	Primary Containment Pressure	In Core/Core Exit Temperature	Suppression Pool Level	Levels in at least (site specific number) steam generators	Suppression Pool Temperature	Steam Generator Auxiliary or Emergency Feed Water Flow	<p style="text-align: right;">MU4</p> <p>Initiating Condition:</p> <p>UNPLANNED loss of Control Room indications for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <p>UNPLANNED event results in the inability to monitor ANY Table M1 parameters from within the Control Room for ≥ 15 minutes.</p> <table border="1" data-bbox="779 649 1289 882"> <thead> <tr> <th>Table M1 Control Room Parameters</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Reactor Power • PZR Level • RCS Pressure • In Core/Core Exit Temperature • Level in at least one OTSG. • OTSG Emergency Feed Water Flow </td> </tr> </tbody> </table>	Table M1 Control Room Parameters	<ul style="list-style-type: none"> • Reactor Power • PZR Level • RCS Pressure • In Core/Core Exit Temperature • Level in at least one OTSG. • OTSG Emergency Feed Water Flow 	<p style="text-align: center;"> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site specific number of steam generators to ensure timely classification.</p>
[BWR parameter list]	[PWR parameter list]																	
Reactor Power	Reactor Power																	
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NEI 99-01 Rev 6	Proposed EAL	Justification
<p>SA9 Initiating Condition: ALERT</p> <p>Hazardous event affecting a SAFETY SYSTEM needed for the current operating mode.</p> <p>Operating Mode Applicability: Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels:</p> <p>1. a. The occurrence of ANY of the following hazardous events:</p> <ul style="list-style-type: none"> • Seismic event (earthquake) • Internal or external flooding event • High winds or tornado strike • FIRE • EXPLOSION • (site-specific hazards) • Other events with similar hazard characteristics as determined by the Shift Manager <p>AND</p> <p>b. EITHER of the following:</p> <p>1. Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating mode.</p> <p>OR</p> <p>2. The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating mode.</p>	<p>MA5 Initiating Condition: ALERT</p> <p>Hazardous event affecting a SAFETY SYSTEM required for the current operating mode.</p> <p>Operating Mode Applicability: 1, 2, 3, 4</p> <p>Emergency Action Levels (EAL):</p> <p>1. The occurrence of ANY of the following hazardous events:</p> <ul style="list-style-type: none"> • Seismic event (earthquake) • Internal or external flooding event • High winds or tornado strike • FIRE • EXPLOSION • Other events with similar hazard characteristics as determined by the Shift Manager <p>AND</p> <p>2. EITHER of the following:</p> <p>a. Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode.</p> <p>OR</p> <p>b. The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure required by Technical Specifications for the current operating mode.</p>	<p><input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) No additional site specific hazards noted</p> <p>2) Changed the word "needed" to "required" in the IC and "required by Technical Specification" in the EAL to be consistent with terminology used by operators and minimize confusion.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">SU4</p> <p>Initiating Condition: UNUSUAL EVENT</p> <p>RCS leakage for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels: (1 or 2 or 3)</p> <p>Note: The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> 1. RCS unidentified or pressure boundary leakage greater than (site-specific value) for 15 minutes or longer. 2. RCS identified leakage greater than (site-specific value) for 15 minutes or longer 3. Leakage from the RCS to a location outside containment greater than 25 gpm for 15 minutes or longer 	<p style="text-align: right;">MU6</p> <p>Initiating Condition:</p> <p>RCS leakage for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> 1. RCS unidentified or pressure boundary leakage > 10 gpm for \geq 15 minutes OR 2. RCS identified leakage >25 gpm for \geq 15 minutes OR 3. Leakage from the RCS to a location outside containment >25 gpm for \geq 15 minutes 	<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) Listed site specific values to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification																																												
<p>Initiating Condition: UNUSUAL EVENT SU6</p> <p>Loss of all onsite or offsite communications capabilities</p> <p>Operating Mode Applicability:</p> <p>Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels: (1 or 2 or 3)</p> <ol style="list-style-type: none"> Loss of ALL of the following onsite communication methods: (site-specific list of communications method) Loss of ALL of the following ORO communications s) methods: (site-specific list of communications methods) Loss of ALL of the following NRC communications methods: (site-specific list of communications methods) 	<p>Initiating Condition: MU7</p> <p>Loss of all onsite or offsite communication capabilities.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4</p> <p>Emergency Action Levels (EAL):</p> <ol style="list-style-type: none"> Loss of ALL Table M3 Onsite communications capability affecting the ability to perform routine operations. <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> Loss of ALL Table M3 Offsite communication capability affecting the ability to perform offsite notifications. <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> Loss of ALL Table M3 NRC communication capability affecting the ability to perform NRC notifications. <table border="1" data-bbox="766 855 1297 1144"> <thead> <tr> <th colspan="4">Table M3 Communications Capability</th> </tr> <tr> <th>System</th> <th>Onsite</th> <th>Offsite</th> <th>NRC</th> </tr> </thead> <tbody> <tr> <td>Radios</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Plant page</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Plant Telephone System</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Sound Powered Phones</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Commercial Telephones</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>NARS</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>ENS</td> <td></td> <td>X</td> <td>X</td> </tr> <tr> <td>HPN</td> <td></td> <td>X</td> <td>X</td> </tr> <tr> <td>Satellite phones</td> <td></td> <td>X</td> <td>X</td> </tr> </tbody> </table>	Table M3 Communications Capability				System	Onsite	Offsite	NRC	Radios	X			Plant page	X			Plant Telephone System	X			Sound Powered Phones	X			Commercial Telephones	X	X	X	NARS		X		ENS		X	X	HPN		X	X	Satellite phones		X	X	<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) Listed site specific communication methods to ensure timely classification.</p>
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HPN		X	X																																											
Satellite phones		X	X																																											

NEI 99-01 Rev 6	Proposed EAL	Justification								
<p style="text-align: right;">SU7</p> <p>Initiating Condition: UNUSUAL EVENT</p> <p>Failure to isolate containment or loss of containment pressure control. [PWR]</p> <p>Operating Mode Applicability:</p> <p>Power Operation, Startup, Hot Standby, Hot Shutdown</p> <p>Example Emergency Action Levels: (1 or 2)</p> <p>1. a. Failure of containment to isolate when required by an actuation signal.</p> <p style="padding-left: 40px;">AND</p> <p>b. ALL required penetrations are not closed within 15 minutes of the actuation signal.</p> <p>2. a. Containment pressure greater than (site-specific pressure).</p> <p style="padding-left: 40px;">AND</p> <p>b. Less than one full train of (site-specific system or equipment) is operating per design for 15 minutes or longer.</p>	<p style="text-align: right;">MU8</p> <p>Initiating Condition:</p> <p>Failure to isolate containment or loss of containment pressure control.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4</p> <p>Emergency Action Levels (EAL):</p> <p>1. a. Failure of containment to isolate when required by an actuation signal.</p> <p style="padding-left: 40px;">AND</p> <p>b. ANY required penetration remains open > 15 minutes of the actuation signal.</p> <p style="padding-left: 40px;">OR</p> <p>2. a. Reactor Building pressure > 30 psig</p> <p style="padding-left: 40px;">AND</p> <p>b. Reactor Building Emergency cooling is less than ANY one of the following conditions for ≥ 15 minutes:</p> <table border="1" data-bbox="877 799 1188 918" style="margin-left: 80px;"> <thead> <tr> <th>SPRAY</th> <th>COOLERS</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">1</td> </tr> </tbody> </table>	SPRAY	COOLERS	2	0	0	3	1	1	<p> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site specific indications to ensure timely classification.</p> <p>2) Reworded EAL 1.b to be a positive statement</p>
SPRAY	COOLERS									
2	0									
0	3									
1	1									

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">CA2</p> <p>Initiating Condition: ALERT Loss of all offsite and all onsite AC power to emergency buses for 15 minutes or longer.</p> <p>Operating Mode Applicability: Cold Shutdown, Refueling, Defueled</p> <p>Example Emergency Action Levels:</p> <p>Note: The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes time has been exceeded, or will likely be exceeded.</p> <p>Loss of ALL offsite and ALL onsite AC Power to (site-specific emergency buses) for 15 minutes or longer.</p>	<p style="text-align: right;">CA1</p> <p>Initiating Condition: Loss of all offsite and onsite AC power to emergency busses for 15 minutes or longer.</p> <p>Operating Mode Applicability: 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> 1. Loss of ALL offsite AC power to Emergency 4KV buses. <p style="text-align: center;">AND</p> <ol style="list-style-type: none"> 2. Failure of EG-Y-1A, EG-Y-1B Emergency Diesel Generators and EG-Y-4 SBO Diesel Generator to supply power to Emergency 4KV buses. <p style="text-align: center;">AND</p> <ol style="list-style-type: none"> 3. Failure to restore power to at least one Emergency 4KV bus in < 15 minutes from the time of loss of both offsite and onsite AC power. 	<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p> <p>1) Listed site specific equipment to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">CU2</p> <p>Initiating Condition: UNUSUAL EVENT Loss of all but one AC power source to emergency buses for 15 minutes or longer. Operating Mode Applicability: Cold Shutdown, Refueling, Defueled Example Emergency Action Levels: Note: The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes time has been exceeded, or will likely be exceeded.</p> <p>1. a. AC power capability to (site-specific emergency buses) is reduced to a single power source for 15 minutes or longer.</p> <p>AND</p> <p>b. Any additional single power source failure will result in loss of all AC power to SAFETY SYSTEMS.</p>	<p style="text-align: right;">CU1</p> <p>Initiating Condition: Loss of all but one AC power source to emergency buses for 15 minutes or longer. Operating Mode Applicability: 5, 6, D Emergency Action Levels (EAL): Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <p>1. AC power capability to Emergency 4KV buses reduced to only one of the following power sources for ≥ 15 minutes.</p> <ul style="list-style-type: none"> • Auxiliary Transformer 1A • Auxiliary Transformer 1B • Emergency Diesel Generator EG-Y-1A • Emergency Diesel Generator EG-Y-1B • SBO Diesel Generator EG-Y-4 <p>AND</p> <p>2. ANY additional single power source failure will result in a loss of ALL AC power to SAFETY SYSTEMS.</p>	<p> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site specific equipment to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">CA6</p> <p>Initiating Condition – ALERT Hazardous event affecting SAFETY SYSTEM needed for the current operating mode.</p> <p>Operating Mode Applicability: Cold Shutdown, Refueling</p> <p>Example Emergency Action Levels:</p> <ol style="list-style-type: none"> 1. a. The occurrence of ANY of the following hazardous events: <ul style="list-style-type: none"> ● Seismic event (earthquake) ● Internal or external flooding event ● High winds or tomado strike ● FIRE ● EXPLOSION ● (site-specific hazards) ● Other events with similar hazard characteristics as determined by the Shift Manager <p>AND</p> <ol style="list-style-type: none"> b. EITHER of the following: <ol style="list-style-type: none"> 1. Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM needed for the current operating mode. <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> 2. The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure needed for the current operating mode. 	<p style="text-align: right;">CA2</p> <p>Initiating Condition: Hazardous event affecting SAFETY SYSTEM required for the current operating mode.</p> <p>Operating Mode Applicability: 5, 6</p> <p>Emergency Action Levels (EAL):</p> <ol style="list-style-type: none"> 1. The occurrence of ANY of the following hazardous events: <ul style="list-style-type: none"> ● Seismic event (earthquake) ● Internal or external flooding event ● High winds or tomado strike ● FIRE ● EXPLOSION ● Other events with similar hazard characteristics as determined by the Shift Manager <p>AND</p> <ol style="list-style-type: none"> 2. EITHER of the following: <ol style="list-style-type: none"> a. Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM required by Technical Specifications for the current operating mode. <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> b. The event has caused VISIBLE DAMAGE to a SAFETY SYSTEM component or structure required by Technical Specifications for the current operating mode. 	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) No additional site specific hazards noted</p> <p>2) Changed the word "needed" to "required" in the IC and "required by Technical Specification" in the EAL to be consistent with terminology used by operators and minimize confusion.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">CU4</p> <p>Initiating Condition: UNUSUAL EVENT Loss of Vital DC power for 15 minutes or longer.</p> <p>Operating Mode Applicability: Cold Shutdown, Refueling</p> <p>Example Emergency Action Levels:</p> <p>Note: The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes time has been exceeded, or will likely be exceeded.</p> <p>Indicated voltage is less than (site-specific bus voltage value) on required Vital DC buses for 15 minutes or longer.</p>	<p style="text-align: right;">CU3</p> <p>Initiating Condition: Loss of Vital DC power for 15 minutes or longer.</p> <p>Operating Mode Applicability: 5, 6</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <p>Voltage is < 105 VDC on required 125 VDC Distribution System 1A and 1B for \geq 15 minutes.</p>	<p> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site specific voltage and equipment to ensure timely classification.</p> <p>2) Removed the word "indicated" this will allow for an indication problem to not cause confusion on the need to declare.</p>

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<p style="text-align: right;">CU5</p> <p>Initiating Condition: UNUSUAL EVENT Loss of all onsite or offsite communications capabilities Operating Mode Applicability: Cold Shutdown, Refueling, Defueled Example Emergency Action Levels: (1 or 2 or 3)</p> <ol style="list-style-type: none"> Loss of ALL of the following onsite communication methods: (site-specific list of communications method) Loss of ALL of the following ORO communications s) methods: (site-specific list of communications methods) Loss of ALL of the following NRC communications methods: (site-specific list of communications methods) 	<p style="text-align: right;">CU4</p> <p>Initiating Condition: Loss of all onsite or offsite communication capabilities. Operating Mode Applicability: 5, 6, D Emergency Action Levels (EAL):</p> <ol style="list-style-type: none"> Loss of ALL Table C1 Onsite communications capability affecting the ability to perform routine operations. OR Loss of ALL Table C1 Offsite communication capability affecting the ability to perform offsite notifications. OR Loss of ALL Table C1 NRC communication capability affecting the ability to perform NRC notifications. <table border="1" data-bbox="756 652 1312 941"> <thead> <tr> <th colspan="4">Table C1 Communications Capability</th> </tr> <tr> <th>System</th> <th>Onsite</th> <th>Offsite</th> <th>NRC</th> </tr> </thead> <tbody> <tr> <td>Radios</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Plant page</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Plant Telephone System</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Sound Powered Phones</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>Commercial Telephones</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>NARS</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>ENS</td> <td></td> <td>X</td> <td>X</td> </tr> <tr> <td>HPN</td> <td></td> <td>X</td> <td>X</td> </tr> <tr> <td>Satellite phones</td> <td></td> <td>X</td> <td>X</td> </tr> </tbody> </table>	Table C1 Communications Capability				System	Onsite	Offsite	NRC	Radios	X			Plant page	X			Plant Telephone System	X			Sound Powered Phones	X			Commercial Telephones	X	X	X	NARS		X		ENS		X	X	HPN		X	X	Satellite phones		X	X	<p> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site specific communications methods to ensure timely classification</p>
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<p style="text-align: right;">CA3</p> <p>Initiating Condition: ALERT Inability to maintain the plant in cold shutdown.</p> <p>Operating Mode Applicability: Cold Shutdown, Refueling</p> <p>Example Emergency Action Levels: (1 or 2)</p> <p>Note: The Emergency Director should declare the Alert promptly upon determining that the applicable has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> UNPLANNED increase in RCS temperature to greater than (site-specific Technical Specification cold shutdown temperature limit) for greater than the duration specified in the following table. UNPLANNED RCS pressure increase greater than (site-specific pressure reading). (This EAL does not apply during water-solid plant conditions. [PWR]) <table border="1" data-bbox="117 629 688 872"> <caption>Table: RCS Heat-up Duration Thresholds</caption> <thead> <tr> <th>RCS Status</th> <th>Containment Closure Status</th> <th>Heat-up Duration</th> </tr> </thead> <tbody> <tr> <td>Intact (but not RCS Reduced Inventory [PWR])</td> <td>Not Applicable</td> <td>60 minutes*</td> </tr> <tr> <td rowspan="2">Not Intact (or at reduced inventory [PWR])</td> <td>Established</td> <td>20 minutes*</td> </tr> <tr> <td>Not Established</td> <td>0 minutes</td> </tr> </tbody> </table> <p>* If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, the EAL is not applicable.</p>	RCS Status	Containment Closure Status	Heat-up Duration	Intact (but not RCS Reduced Inventory [PWR])	Not Applicable	60 minutes*	Not Intact (or at reduced inventory [PWR])	Established	20 minutes*	Not Established	0 minutes	<p style="text-align: right;">CA5</p> <p>Initiating Condition: Inability to maintain plant in cold shutdown.</p> <p>Operating Mode Applicability: 5, 6</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> UNPLANNED rise in RCS temperature > 200°F due to loss of decay heat removal for > Table C2 duration. <p>OR</p> <ol style="list-style-type: none"> UNPLANNED RCS pressure rise > 10 psig as a result of temperature rise due to loss of decay heat removal. (This EAL does not apply during water- solid plant conditions.) <table border="1" data-bbox="768 637 1297 910"> <caption>Table C2 RCS Heat-up Duration Thresholds</caption> <thead> <tr> <th>RCS Status</th> <th>Containment Closure Status</th> <th>Heat-up Duration</th> </tr> </thead> <tbody> <tr> <td>Intact</td> <td>Not Applicable</td> <td>60 minutes*</td> </tr> <tr> <td rowspan="2">Not Intact</td> <td>Established</td> <td>20 minutes*</td> </tr> <tr> <td>Not Established</td> <td>0 minutes</td> </tr> </tbody> </table> <p>* If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, then EAL #1 is not applicable.</p>	RCS Status	Containment Closure Status	Heat-up Duration	Intact	Not Applicable	60 minutes*	Not Intact	Established	20 minutes*	Not Established	0 minutes	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <ol style="list-style-type: none"> Listed site specific Technical Specification cold shutdown temperature limit to ensure timely classification. Listed site specific pressure reading to enhance timely classification. Added wording relating the temp and press rise to a loss of decay heat removal capability as per the developer notes for PWR's
RCS Status	Containment Closure Status	Heat-up Duration																						
Intact (but not RCS Reduced Inventory [PWR])	Not Applicable	60 minutes*																						
Not Intact (or at reduced inventory [PWR])	Established	20 minutes*																						
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	Not Established	0 minutes																						

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">CU3</p> <p>Initiating Condition: UNUSUAL EVENT UNPLANNED increase in RCS temperature.</p> <p>Operating Mode Applicability: Cold Shutdown, Refueling</p> <p>Example Emergency Action Levels: (1 or 2)</p> <p>Note: The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> UNPLANNED increase in RCS temperature to greater than (site-specific Technical Specification cold shutdown temperature limit). Loss of ALL RCS temperature and (reactor vessel/RCS [PWR] or RPV [BWR]) level indication for 15 minutes or longer. 	<p style="text-align: right;">CU5</p> <p>Initiating Condition: UNPLANNED rise in RCS temperature.</p> <p>Operating Mode Applicability: 5, 6</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> UNPLANNED rise in RCS temperature > 200°F due to loss of decay heat removal. <p>OR</p> <ol style="list-style-type: none"> Loss of the following for <u>≥ 15 minutes</u>. <ul style="list-style-type: none"> ALL RCS temperature indications <p style="text-align: center;">AND</p> <ul style="list-style-type: none"> ALL RCS level indications 	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site specific Technical Specification cold shutdown temperature limit to ensure timely classification.</p> <p>2) Changed the word increase to rise in the initiating condition to be consistent with operations language and training.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification			
<p style="text-align: right;">CG1</p> <p>Initiating Condition: GENERAL EMERGENCY Loss of (reactor vessel/RCS [PWR] or RPV [BWR]) inventory affecting fuel clad integrity with containment challenged.</p> <p>Operating Mode Applicability: Cold Shutdown, Refueling</p> <p>Example Emergency Action Levels: (1 or 2)</p> <p>Note: The Emergency Director should declare the Unusual Event promptly upon determining that 30 minutes time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> 1. a. (Reactor vessel/RCS [PWR] or RPV [BWR]) vessel level less than (site-specific level) for 30 minutes or longer. AND b. ANY indication from the Containment Challenge Table 2. a. (Reactor vessel/RCS [PWR] or RPV [BWR]) vessel level cannot be monitored for 30 minutes or longer. AND b. Core uncover is indicated by ANY of the following: <ul style="list-style-type: none"> • (Site-specific radiation monitor) reading greater than (site-specific value) • Erratic source range monitor indication [PWR] • UNPLANNED increase in (site-specific sump and/or tank levels) of sufficient magnitude to indicate core uncover • (Other site-specific indications) AND c. ANY indication from the Containment Challenge Table). <table border="1" data-bbox="128 930 722 1120"> <tr> <td> <p>Table: Containment Challenge Table</p> <ul style="list-style-type: none"> • CONTAINMENT CLOSURE not established* • (Explosive mixture) exists inside containment • UNPLANNED increase in containment pressure • Secondary containment radiation monitor reading above (site-specific value) [BWR] <p>* if CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute core uncover time limit, then escalation to a General Emergency is not required.</p> </td> </tr> </table>	<p>Table: Containment Challenge Table</p> <ul style="list-style-type: none"> • CONTAINMENT CLOSURE not established* • (Explosive mixture) exists inside containment • UNPLANNED increase in containment pressure • Secondary containment radiation monitor reading above (site-specific value) [BWR] <p>* if CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute core uncover time limit, then escalation to a General Emergency is not required.</p>	<p style="text-align: right;">CG6</p> <p>Initiating Condition: Loss of reactor vessel / RCS inventory affecting fuel clad integrity with containment challenged.</p> <p>Operating Mode Applicability: 5, 6</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> 1. Reactor Vessel / RCS level unknown for ≥ 30 minutes. AND 2. Core uncover is indicated by ANY of the following: <ul style="list-style-type: none"> • Table C3 indications of a sufficient magnitude to indicate core uncover OR • Erratic Source Range Neutron Monitor indication. OR • Radiation Monitor RM-G-6 or RM-G-7 reading > 3 R/hr. AND 3. ANY Containment Challenge Indication (Table C4) <table border="1" data-bbox="785 827 1291 1009"> <tr> <td> <p>Table C3 Indications of RCS Leakage</p> <ul style="list-style-type: none"> • UNPLANNED Reactor Building Sump level rise* • UNPLANNED Auxiliary Bldg Sump level rise* • UNPLANNED BWST level rise* • UNPLANNED RCDT level rise* • UNPLANNED rise in RCS makeup • Observation of leakage or inventory loss <p>*Rise in level is attributed to a loss of reactor vessel/RCS inventory.</p> </td> </tr> </table> <table border="1" data-bbox="806 1034 1270 1252"> <tr> <td> <p>Table C4 Containment Challenge Indications</p> <ul style="list-style-type: none"> • Hydrogen Concentration in Containment $\geq 4\%$ • UNPLANNED rise in containment pressure • CONTAINMENT CLOSURE <u>not</u> established* <p>* if CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute core uncover time limit, then escalation to a General Emergency is not required.</p> </td> </tr> </table>	<p>Table C3 Indications of RCS Leakage</p> <ul style="list-style-type: none"> • UNPLANNED Reactor Building Sump level rise* • UNPLANNED Auxiliary Bldg Sump level rise* • UNPLANNED BWST level rise* • UNPLANNED RCDT level rise* • UNPLANNED rise in RCS makeup • Observation of leakage or inventory loss <p>*Rise in level is attributed to a loss of reactor vessel/RCS inventory.</p>	<p>Table C4 Containment Challenge Indications</p> <ul style="list-style-type: none"> • Hydrogen Concentration in Containment $\geq 4\%$ • UNPLANNED rise in containment pressure • CONTAINMENT CLOSURE <u>not</u> established* <p>* if CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute core uncover time limit, then escalation to a General Emergency is not required.</p>	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <ol style="list-style-type: none"> 1) EAL 1a not included as per guidance in developer notes since top of active fuel is below level indication lowest value. 2) Listed site specific radiation monitors to ensure timely classification 3) Listed site specific sumps and tanks to ensure timely classification 4) Listed Explosive mixture in the Containment Challenge Table to ensure timely classification 5) Worded "cannot be monitored" as unknown to ensure clarity for instances when the indicator is working but is over/under ranged. This is also in keeping with current EAL wording.
<p>Table: Containment Challenge Table</p> <ul style="list-style-type: none"> • CONTAINMENT CLOSURE not established* • (Explosive mixture) exists inside containment • UNPLANNED increase in containment pressure • Secondary containment radiation monitor reading above (site-specific value) [BWR] <p>* if CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute core uncover time limit, then escalation to a General Emergency is not required.</p>					
<p>Table C3 Indications of RCS Leakage</p> <ul style="list-style-type: none"> • UNPLANNED Reactor Building Sump level rise* • UNPLANNED Auxiliary Bldg Sump level rise* • UNPLANNED BWST level rise* • UNPLANNED RCDT level rise* • UNPLANNED rise in RCS makeup • Observation of leakage or inventory loss <p>*Rise in level is attributed to a loss of reactor vessel/RCS inventory.</p>					
<p>Table C4 Containment Challenge Indications</p> <ul style="list-style-type: none"> • Hydrogen Concentration in Containment $\geq 4\%$ • UNPLANNED rise in containment pressure • CONTAINMENT CLOSURE <u>not</u> established* <p>* if CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute core uncover time limit, then escalation to a General Emergency is not required.</p>					

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">CS1</p> <p>Initiating Condition: SITE AREA EMERGENCY</p> <p>Loss of (reactor vessel/RCS [PWR] or RPV [BWR]) inventory affecting core decay heat removal capability.</p> <p>Operating Mode Applicability: Cold Shutdown, Refueling</p> <p>Example Emergency Action Levels: (1 or 2 or 3)</p> <p>Note: The Emergency Director should declare the Unusual Event promptly upon determining that 30 minutes time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> 1. a. CONTAINMENT CLOSURE not established. <p>AND</p> <ol style="list-style-type: none"> b. (Reactor vessel/RCS [PWR] or RPV [BWR]) level less than (site-specific level). <ol style="list-style-type: none"> 2. a. CONTAINMENT CLOSURE established. <p>AND</p> <ol style="list-style-type: none"> b. (Reactor vessel/RCS [PWR] or RPV [BWR]) level less than (site-specific level). <ol style="list-style-type: none"> 3. a. (Reactor vessel/RCS [PWR] or RPV [BWR]) level cannot be monitored for 30 minutes or longer. <p>AND</p> <ol style="list-style-type: none"> b. Core uncover is indicated by ANY of the following: <ul style="list-style-type: none"> • (Site-specific radiation monitor) reading greater than (site-specific value) • Erratic source range monitor indication [PWR] • UNPLANNED increase in (site-specific sump and/or tank levels) of sufficient magnitude to indicate core uncover • (Other site-specific indications) 	<p style="text-align: right;">CS6</p> <p>Initiating Condition:</p> <p>Loss of reactor vessel / RCS inventory affecting core decay heat removal capabilities.</p> <p>Operating Mode Applicability: 5, 6</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> 1. Reactor vessel level unknown for ≥ 30 minutes. <p>AND</p> <ol style="list-style-type: none"> 2. Core uncover is indicated by any of the following: <ul style="list-style-type: none"> • Table C3 indications of a sufficient magnitude to indicate core uncover <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> • Erratic Source Range Neutron Monitor indication. <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> • Radiation Monitors RM-G-6 or RM-G-7 reading > 3 R/hr. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center;">Table C3 Indications of RCS Leakage</p> <ul style="list-style-type: none"> • UNPLANNED Reactor Building Sump level rise* • UNPLANNED Auxiliary Bldg. Sump level rise* • UNPLANNED BWST level rise* • UNPLANNED RCDD level rise* • UNPLANNED rise in RCS makeup • Observation of leakage or inventory loss <p style="font-size: small;">*Rise in level is attributed to a loss of reactor vessel/RCS inventory.</p> </div>	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <ol style="list-style-type: none"> 1) EAL 1 not included as per guidance in developer notes since 6" below bottom ID of RCS loop is below level indication lowest value. 2) EAL 2 not included as per guidance in developer notes since top of active fuel is below level indication lowest value.. 3) Listed site specific radiation monitors to ensure timely classification 4) Listed site specific sumps and tanks to ensure timely classification 5) Worded "cannot be monitored" as unknown to ensure clarity for instances when the indicator is working but is over/under ranged. This is also in keeping with current EAL wording.

NEI 99-01 Rev 6	Proposed EAL	Justification			
<p style="text-align: right;">CA1</p> <p>Initiating Condition: ALERT Loss of (reactor vessel/RCS [PWR] or RPV [BWR]) inventory Operating Mode Applicability: Cold Shutdown, Refueling Example Emergency Action Levels: (1 or 2) Note: The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> Loss of (reactor vessel/RCS [PWR] or RPV [BWR]) inventory as indicated by level less than (site-specific level). <ol style="list-style-type: none"> (Reactor vessel/RCS [PWR] or RPV [BWR]) level cannot be monitored for 15 minutes or longer <p>AND</p> <ol style="list-style-type: none"> UNPLANNED increase in (site-specific sump and/or tank) levels due to a loss of (reactor vessel/RCS [PWR] or RPV [BWR]) inventory. 	<p style="text-align: right;">CA6</p> <p>Initiating Condition: Loss of reactor vessel / RCS inventory Operating Mode Applicability: 5, 6 Emergency Action Levels (EAL): Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> Loss of Reactor Vessel / RCS inventory as indicated by RCS level < 0 inches on Draindown Level indicator. <p>OR</p> <ol style="list-style-type: none"> <ol style="list-style-type: none"> Reactor vessel / RCS level unknown for ≥ 15 minutes. <p>AND</p> <ol style="list-style-type: none"> Loss of reactor vessel / RCS inventory per Table C3 indications. <table border="1" data-bbox="781 657 1289 839"> <thead> <tr> <th>Table C3 Indications of RCS Leakage</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> UNPLANNED Reactor Building Sump level rise* UNPLANNED Auxiliary Bldg. Sump level rise* UNPLANNED BWST level rise* UNPLANNED RCDT level rise* UNPLANNED rise in RCS makeup Observation of leakage or inventory loss </td> </tr> <tr> <td>*Rise in level is attributed to a loss of reactor vessel/RCS inventory.</td> </tr> </tbody> </table>	Table C3 Indications of RCS Leakage	<ul style="list-style-type: none"> UNPLANNED Reactor Building Sump level rise* UNPLANNED Auxiliary Bldg. Sump level rise* UNPLANNED BWST level rise* UNPLANNED RCDT level rise* UNPLANNED rise in RCS makeup Observation of leakage or inventory loss 	*Rise in level is attributed to a loss of reactor vessel/RCS inventory.	<p> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <ol style="list-style-type: none"> Listed site specific levels to ensure timely classification. Listed site specific sumps and tanks to ensure timely classification. Worded "cannot be monitored" as unknown to ensure clarity for instances when the indicator is working but is over/under ranged. This is also in keeping with current EAL wording.
Table C3 Indications of RCS Leakage					
<ul style="list-style-type: none"> UNPLANNED Reactor Building Sump level rise* UNPLANNED Auxiliary Bldg. Sump level rise* UNPLANNED BWST level rise* UNPLANNED RCDT level rise* UNPLANNED rise in RCS makeup Observation of leakage or inventory loss 					
*Rise in level is attributed to a loss of reactor vessel/RCS inventory.					

NEI 99-01 Rev 6	Proposed EAL	Justification			
<p style="text-align: right;">CU1</p> <p>Initiating Condition: UNUSUAL EVENT</p> <p>UNPLANNED loss of (reactor vessel/RCS [PWR] or RPV [BWR]) inventory for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>Cold Shutdown, Refueling</p> <p>Example Emergency Action Levels: (1 or 2)</p> <p>Note: The Emergency Director should declare the Unusual Event promptly upon determining that 15 minutes has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> UNPLANNED loss of reactor coolant results in (reactor vessel/RCS [PWR] or RPV [BWR]) level less than a required lower limit for 15 minutes or longer. a. (Reactor vessel/RCS [PWR] or RPV [BWR]) level cannot be monitored. <p style="text-align: center;">AND</p> <ol style="list-style-type: none"> UNPLANNED increase in (site-specific sump and/or tank) levels. 	<p style="text-align: right;">CU6</p> <p>Initiating Condition:</p> <p>UNPLANNED loss of reactor vessel / RCS inventory for 15 minutes or longer.</p> <p>Operating Mode Applicability:</p> <p>5, 6</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> UNPLANNED loss of reactor coolant results in the inability to restore and maintain reactor vessel / RCS level to > procedurally established lower limit for ≥ 15 minutes. <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> a. Reactor vessel / RCS level unknown. <p style="text-align: center;">AND</p> <ol style="list-style-type: none"> Loss of reactor vessel / RCS inventory per Table C3 indications. <table border="1" data-bbox="785 707 1291 893" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Table C3 Indications of RCS Leakage</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • UNPLANNED Reactor Building Sump level rise* • UNPLANNED Auxiliary Bldg. Sump level rise* • UNPLANNED BWST level rise* • UNPLANNED RCDT level rise* • UNPLANNED rise in RCS makeup • Observation of leakage or inventory loss </td> </tr> <tr> <td>*Rise in level is attributed to a loss of reactor vessel/RCS inventory.</td> </tr> </tbody> </table>	Table C3 Indications of RCS Leakage	<ul style="list-style-type: none"> • UNPLANNED Reactor Building Sump level rise* • UNPLANNED Auxiliary Bldg. Sump level rise* • UNPLANNED BWST level rise* • UNPLANNED RCDT level rise* • UNPLANNED rise in RCS makeup • Observation of leakage or inventory loss 	*Rise in level is attributed to a loss of reactor vessel/RCS inventory.	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Described "a required lower limit" as a procedurally established lower limit, and listed site specific sumps and tanks to ensure timely classification.</p> <p>2) Worded "cannot be monitored" as unknown to ensure clarity for instances when the indicator is working but is over/under ranged. This is also in keeping with current EAL wording.</p>
Table C3 Indications of RCS Leakage					
<ul style="list-style-type: none"> • UNPLANNED Reactor Building Sump level rise* • UNPLANNED Auxiliary Bldg. Sump level rise* • UNPLANNED BWST level rise* • UNPLANNED RCDT level rise* • UNPLANNED rise in RCS makeup • Observation of leakage or inventory loss 					
*Rise in level is attributed to a loss of reactor vessel/RCS inventory.					

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">HG1</p> <p>Initiating Condition: GENERAL EMERGENCY</p> <p>HOSTILE ACTION resulting in loss of physical control of the facility.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels:</p> <p>1. a. A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the (site-specific security shift supervision).</p> <p>AND</p> <p>b. EITHER of the following:</p> <p>1. ANY of the following safety functions cannot be controlled or maintained.</p> <ul style="list-style-type: none"> ▪ Reactivity control ▪ Core cooling [PWR] / RPV water level [BWR] ▪ RCS heat removal <p>OR</p> <p>2. Damage to spent fuel has occurred or is IMMINENT</p>	<p style="text-align: right;">HG1</p> <p>Initiating Condition:</p> <p>HOSTILE ACTION resulting in loss of physical control of the facility.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>1. A notification from the Security Force that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.</p> <p>AND</p> <p>2. a. ANY Table H1 safety function <u>cannot</u> be controlled or maintained.</p> <p>OR</p> <p>b. Damage to spent fuel has occurred or is IMMINENT</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">Table H1 Safety Functions</p> <ul style="list-style-type: none"> • Reactivity Control (ability to shut down the reactor and keep it shutdown) • Core Cooling (ability to cool the core) • RCS Heat Removal (ability to maintain heat sink) </div>	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) List site security shift supervision as Security Force.</p> <p>2) Added descriptors to better explain each safety function and allow for a timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">HS1</p> <p>Initiating Condition: SITE AREA EMERGENCY</p> <p>HOSTILE ACTION within the Protected Area.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels:</p> <p>A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the (site-security shift supervision).</p>	<p style="text-align: right;">HS1</p> <p>Initiating Condition:</p> <p>HOSTILE ACTION within the Protected Area.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>A notification from the Security Force that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.</p>	<p> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) List site security shift supervision as Security Force.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">HA1</p> <p>Initiating Condition: ALERT</p> <p>HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels: (1 or 2)</p> <ol style="list-style-type: none"> 1. A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by the (site-specific security shift supervision). 2. A validated notification from NRC of an aircraft attack threat within 30 minutes of the site. 	<p style="text-align: right;">HA1</p> <p>Initiating Condition:</p> <p>HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <ol style="list-style-type: none"> 1. A validated notification from NRC of an aircraft attack threat < 30 minutes from the site. <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> 2. Notification by the Security Force that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA. 	<p> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1)List site security shift supervision as Security Force.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p>Initiating Condition: UNUSUAL EVENT HU1</p> <p>Confirmed SECURITY CONDITION or threat.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels: (1 or 2 or 3)</p> <ol style="list-style-type: none"> 1. A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by the (site-specific security shift supervision). 2. Notification of a credible security threat directed at the site. 3. A validated notification from the NRC providing information of an aircraft threat. 	<p>Initiating Condition: HU1</p> <p>Confirmed SECURITY CONDITION or threat.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <ol style="list-style-type: none"> 1. Notification of a credible security threat directed at the site as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities. <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> 2. A validated notification from the NRC providing information of an aircraft threat. <p style="text-align: center;">OR</p> <ol style="list-style-type: none"> 3. Notification by the Security Force of a SECURITY CONDITION that does <u>not</u> involve a HOSTILE ACTION. 	<p> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) List site security shift supervision as Security Force.</p> <p>2) Further described credible security threat through listing a site specific procedure.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">HS6</p> <p>Initiating Condition: SITE AREA EMERGENCY</p> <p>Inability to control a key safety function from outside the Control Room.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels: (1 and 2)</p> <p>Note: The Emergency Director should declare the event promptly upon determining that (site-specific number of minutes) has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> An event has resulted in plant control being transferred from the Control Room to (site-specific remote shutdown panels and local control stations). Control of ANY of the following key safety functions is not reestablished within (site-specific number of minutes). <ul style="list-style-type: none"> Reactivity control Core cooling [PWR] / RPV water level [BWR] RCS heat removal 	<p style="text-align: right;">HS2</p> <p>Initiating Condition:</p> <p>Inability to control a key safety function from outside the Control Room.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per OP-TM-EOP-020, Cooldown from Outside the Control Room. <p>AND</p> <ol style="list-style-type: none"> Control of ANY Table H1 key safety function is <u>not</u> reestablished in < 15 minutes. <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;">Table H1 Safety Functions</p> <ul style="list-style-type: none"> Reactivity Control (ability to shut down the reactor and keep it shutdown) Core Cooling (ability to cool the core) RCS Heat Removal (ability to maintain heat sink) </div>	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) EAL uses the site specific Control Room evacuation procedures to effectively list all of the alternate locations, panels, and stations requested by the developer notes. This would be the procedures the Control Room would enter should such an event occur, this allows for greater clarity as to when this EAL would apply than if each panel and station used in alternate shutdown were to be listed,</p> <p>2) Added descriptors to better explain each safety function and allow for a timely classification.</p> <p>3) Changed "An event" to "A Control Room evacuation" to remove confusion if partial plant control was transferred to outside the control room with the control room still manned, due to testing or equipment failure.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">HA6</p> <p>Initiating Condition: ALERT</p> <p>Control Room evacuation resulting in transfer of plant control to alternate locations.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels: An event has resulted in plant control being transferred from the Control Room to (site-specific remote shutdown panels and local control stations).</p>	<p style="text-align: right;">HA2</p> <p>Initiating Condition:</p> <p>Control Room evacuation resulting in transfer of plant control to alternate locations.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>A Control Room evacuation has resulted in plant control being transferred from the Control Room to alternate locations per OP-TM-EOP-020, Cooldown from Outside the Control Room.</p>	<p> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) EAL uses the site specific Control Room evacuation procedures to effectively list all of the alternate locations, panels, and stations requested by the developer notes. This would be the procedures the Control Room would enter should such an event occur, this allows for greater clarity as to when this EAL would apply than if each panel and station used in alternate shutdown were to be listed,</p> <p>2) Changed "An event" to "A Control Room evacuation" to remove confusion if partial plant control was transferred to outside the control room with the control room still manned, due to testing or equipment failure.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p>Initiating Condition: UNUSUAL EVENT HU4</p> <p>FIRE potentially degrading the level of safety of the plant.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels: (1 or 2 or 3 or 4)</p> <p>Note: The Emergency Director should declare the Unusual Event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> 1. a. A FIRE is NOT extinguished within 15-minutes of ANY of the following FIRE detection indications: <ul style="list-style-type: none"> • Report from the field (i.e., visual observation) • Receipt of multiple (more than 1) fire alarms or indications • Field verification of a single fire alarm <p>AND</p> b. The FIRE is located within ANY of the following plant rooms or areas: (site-specific list of plant rooms or areas) <ol style="list-style-type: none"> 2. a. Receipt of a single fire alarm (i.e., no other indications of a FIRE). AND b. The FIRE is located within ANY of the following plant rooms or areas: (site-specific list of plant rooms or areas) AND c. The existence of a FIRE is not verified within 30-minutes of alarm receipt. <ol style="list-style-type: none"> 3. A FIRE within the plant or ISFSI [for plants with an ISFSI outside the plant Protected Area] PROTECTED AREA not extinguished within 60-minutes of the initial report, alarm or indication. <ol style="list-style-type: none"> 4. A FIRE within the plant or ISFSI [for plants with an ISFSI outside the plant Protected Area] PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish. 	<p>Initiating Condition: HU3</p> <p>FIRE potentially degrading the level of safety of the plant.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>Note: The Emergency Director should declare the event promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.</p> <ol style="list-style-type: none"> 1. a. A FIRE in any Table H2 area is <u>not</u> extinguished in <15-minutes of ANY of the following FIRE detection indications: <ul style="list-style-type: none"> • Report from the field (i.e., visual observation) • Receipt of multiple (more than 1) fire alarms or indications • Field verification of a single fire alarm <p>OR</p> 2. a. Receipt of a single fire alarm in any Table H2 area (i.e., no other indications of a FIRE). AND b. The existence of a FIRE is not verified in <30-minutes of alarm receipt. OR 3. A FIRE within the plant PROTECTED AREA not extinguished in <60-minutes of the initial report, alarm or indication. OR 4. A FIRE within the plant PROTECTED AREA that requires firefighting support by an offsite fire response agency to extinguish. <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center; margin: 0;">Table H2 Vital Areas</p> <ul style="list-style-type: none"> • Reactor Building • Intake Building • Intermediate Building • Control Tower • Auxiliary and Fuel Handling Buildings • 1A and 1B Diesel Generator Buildings • BWST • CST </div>	<p style="text-align: center;"> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site specific list of plant rooms or areas that contain SAFETY SYSTEM equipment to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">HU2</p> <p>Initiating Condition: UNUSUAL EVENT</p> <p>Seismic event greater than OBE levels.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels:</p> <p>Seismic event greater than Operating Basis Earthquake (OBE) as indicated by: a. (site-specific indication that a seismic event met or exceeded OBE limits)</p>	<p style="text-align: right;">HU4</p> <p>Initiating Condition:</p> <p>Seismic event greater than OBE levels.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>Seismic event > Operating Basis Earthquake (OBE) as indicated by seismic Alarms PRF-1-3 Operating Basis earthquake and PRF-1-2 Threshold Seismic Condition.</p>	<p> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed site specific indication to determining OBE limits have been met or exceeded to ensure timely classification.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification														
<p style="text-align: right;">HA5</p> <p>Initiating Condition: ALERT</p> <p>Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels:</p> <p>Note: If the equipment in the listed room or area was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted.</p> <p>1. a. Release of a toxic, corrosive, asphyxiant or flammable gas into any of the following plant rooms or areas: (site-specific list of plant rooms or areas with entry-related mode applicability identified)</p> <p>AND</p> <p>b. Entry into the room or area is prohibited or impeded.</p>	<p style="text-align: right;">HA5</p> <p>Initiating Condition:</p> <p>Gaseous release impeding access to equipment necessary for normal plant operations, cooldown or shutdown.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>Note: If the equipment in the listed room or area was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted.</p> <p>1. Release of a toxic, corrosive, asphyxiant or flammable gas in ANY Table H3 area.</p> <table border="1" data-bbox="785 662 1289 938" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2" style="text-align: center;">Table H3 Areas with Entry Related Mode Applicability</th> </tr> <tr> <th style="text-align: center;">Area</th> <th style="text-align: center;">Entry Related Mode Applicability</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Reactor Building*</td> <td style="text-align: center;">Modes 4, 5, and 6</td> </tr> <tr> <td style="text-align: center;">Intermediate Building*</td> <td style="text-align: center;">Modes 4, 5, and 6</td> </tr> <tr> <td style="text-align: center;">Auxiliary Building*</td> <td style="text-align: center;">Modes 4, 5, and 6</td> </tr> <tr> <td style="text-align: center;">Fuel Handling Building*</td> <td style="text-align: center;">Modes 4, 5, and 6</td> </tr> <tr> <td colspan="2" style="text-align: center;">*Areas required to establish shutdown cooling</td> </tr> </tbody> </table> <p>AND</p> <p>2. Entry into the room or area is prohibited or impeded</p>	Table H3 Areas with Entry Related Mode Applicability		Area	Entry Related Mode Applicability	Reactor Building*	Modes 4, 5, and 6	Intermediate Building*	Modes 4, 5, and 6	Auxiliary Building*	Modes 4, 5, and 6	Fuel Handling Building*	Modes 4, 5, and 6	*Areas required to establish shutdown cooling		<p style="text-align: center;"> <input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Listed plant specific rooms and areas with entry related mode applicability to ensure timely classification.</p>
Table H3 Areas with Entry Related Mode Applicability																
Area	Entry Related Mode Applicability															
Reactor Building*	Modes 4, 5, and 6															
Intermediate Building*	Modes 4, 5, and 6															
Auxiliary Building*	Modes 4, 5, and 6															
Fuel Handling Building*	Modes 4, 5, and 6															
*Areas required to establish shutdown cooling																

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">HU3</p> <p>Initiating Condition: UNUSUAL EVENT</p> <p>Hazardous Event</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels: (1 or 2 or 3 or 4)</p> <p>Note: EAL #3 does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents.</p> <ol style="list-style-type: none"> 1. A tornado strike within the PROTECTED AREA. 2. Internal room or area flooding of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component needed for the current operating mode. 3. Movement of personnel within the PROTECTED AREA is impeded due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release). 4. A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles. 5. (Site-specific list of natural or technological hazard events) 	<p style="text-align: right;">HU6</p> <p>Initiating Condition:</p> <p>Hazardous Event</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>Note: EAL #4 does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents.</p> <ol style="list-style-type: none"> 1. Tornado strike within the PROTECTED AREA. OR 2. Internal room or area flooding of a magnitude sufficient to require manual or automatic electrical isolation of a SAFETY SYSTEM component required by Technical Specifications for the current operating mode. OR 3. Movement of personnel within the PROTECTED AREA is impeded due to an offsite event involving hazardous materials (e.g., an offsite chemical spill or toxic gas release). OR 4. A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles. OR 5. Abnormal river water level at the intake Pump and Screen House, as indicated by EITHER: <ol style="list-style-type: none"> a. > 300 ft. el. (high level) OR b. < 274 ft. el. (low level) 	<p style="text-align: center;"> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>1) Included river water level as part of the site-specific list of natural or technological hazard events. The EAL values selected are the current Approved UE EAL values.</p> <p>2) Changed the word "needed" to "required by Technical Specifications" in the EAL to be consistent with terminology used by operators and minimize confusion.</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">HG8</p> <p>Initiating Condition: GENERAL EMERGENCY</p> <p>Other conditions exist which in the judgment of the Emergency Director warrant declaration of a General Emergency.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels: Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMEDIATE substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels off-site for more than the immediate site area.</p>	<p style="text-align: right;">HG7</p> <p>Initiating Condition:</p> <p>Other conditions exist which in the judgment of the Emergency Director warrant declaration of a General Emergency.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL): Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMEDIATE substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels off-site for more than the immediate site area..</p>	<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">HS8</p> <p>Initiating Condition: SITE AREA EMERGENCY</p> <p>Other conditions exist which in the judgment of the Emergency Director warrant declaration of a Site Area Emergency.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels:</p> <p>Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.</p>	<p style="text-align: right;">HS7</p> <p>Initiating Condition:</p> <p>Other conditions exist which in the judgment of the Emergency Director warrant declaration of a Site Area Emergency.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) that prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels beyond the site boundary.</p>	<p><input checked="" type="checkbox"/> No Change. <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">HA6</p> <p>Initiating Condition: ALERT</p> <p>Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels:</p> <p>Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of <i>HOSTILE ACTION</i>. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.</p>	<p style="text-align: right;">HA7</p> <p>Initiating Condition:</p> <p>Other conditions exist which in the judgment of the Emergency Director warrant declaration of an Alert.</p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of <i>HOSTILE ACTION</i>. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.</p>	<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">HU7</p> <p>Initiating Condition: UNUSUAL EVENT</p> <p><i>Other conditions existing which in the judgment of the Emergency director warrant declaration of an UNUSUAL EVENT.</i></p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels:</p> <p>Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.</p>	<p style="text-align: right;">HU7</p> <p>Initiating Condition:</p> <p><i>Other conditions existing which in the judgment of the Emergency director warrant declaration of an UNUSUAL EVENT.</i></p> <p>Operating Mode Applicability:</p> <p>1, 2, 3, 4, 5, 6, D</p> <p>Emergency Action Levels (EAL):</p> <p>Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.</p>	<p><input checked="" type="checkbox"/> No Change <input type="checkbox"/> Difference <input type="checkbox"/> Deviation</p>

NEI 99-01 Rev 6	Proposed EAL	Justification
<p style="text-align: right;">E-HU1</p> <p>Initiating Condition: UNUSUAL EVENT</p> <p>Damage to a loaded cask CONFINEMENT BOUNDARY.</p> <p>Operating Mode Applicability:</p> <p>All</p> <p>Example Emergency Action Levels:</p> <p>Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading greater than (2 times the site-specific cask specific technical specification allowable radiation level) on the surface of the spent fuel cask.</p>		<p> <input type="checkbox"/> No Change <input checked="" type="checkbox"/> Difference <input type="checkbox"/> Deviation </p> <p>TMI Station does not have an ISFSI,</p>

TABLE TMI 3-2: EAL Technical Basis

RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

ARG1**Initiating Condition:**

Release of gaseous radioactivity resulting in offsite dose greater than 1000 mRrem TEDE or 5000 mRrem thyroid CDE.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

Emergency Action Level (EAL):**Notes:**

- The Emergency Director should declare the **General Emergency event** promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

~~(1) Reading on ANY of the following radiation monitors greater than the reading shown for 15 minutes or longer:~~

~~—— (site-specific monitor list and threshold values)~~

1. Readings on ANY Table R1 Effluent Monitor > Table R1 value for > 15 minutes.

OR

2. Dose assessment Using actual meteorology indicates doses at or beyond (site-specific dose receptor point) the site boundary of EITHER:

a. > 1000 mRem TEDE

OR

b. > 5000 mRem CDE Thyroid

OR

TABLE TMI 3-2: EAL Technical Basis

RECOGNITION CATEGORY

ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

~~Field survey results indicate **EITHER** of the following at or beyond (site-specific dose receptor point):~~

~~Closed window dose rates greater than 1,000 mR/hr expected to continue for 60 minutes or longer.~~

~~Analyses of field survey samples indicate thyroid CDE greater than 5,000 mrem for one hour of inhalation.~~

3. Field survey results at or beyond the site boundary indicate **EITHER**:

a. Gamma (closed window) dose rates >1000 mR/hr are expected to continue for > 60 minutes.

OR

b. Analyses of field survey samples indicate > 5000 mRem CDE Thyroid for 60 minutes of inhalation.

Table R1 Effluent Monitor Thresholds	
Effluent Monitor	General Emergency
<u>RM-G-25 (Cond Offgas)</u>	<u>9.53 E+06 mR/hr</u>
<u>RM-A-8GH (Station Vent)</u>	<u>3.09 E+05 cpm</u>
<u>RM-G-24 (RB Purge)</u>	<u>5.55 E+05 mR/hr</u>
<u>RM-A-14 (ESF Vent)</u>	<u>6.66 E+02 uCi/cc</u>

Basis:

This IC addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude will require implementation of protective actions for the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at the EPA PAG of 1000 mRrem while the 5000 mRrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

~~Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have~~

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY****ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

~~stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.~~

Basis Reference(s):

1. NEI 99-01 Rev 6, AG1
2. EP-EAL-0609 Revision 1, Criteria for Choosing Radiological Gaseous Effluent EAL Threshold Values, Three Mile Island
3. EP-AA-112-500 Emergency Environmental Monitoring
4. FSAR Section 11.4 Radiation Monitoring System
5. EP-AA-110-200 Dose Assessment
6. EP-AA-110-201 On Shift Dose Assessment

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS****ARS1****Initiating Condition:**

Release of gaseous radioactivity resulting in offsite dose greater than 100 mRrem TEDE or 500 mRrem thyroid CDE.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

Emergency Action Level (EAL):**Notes:**

- The Emergency Director should declare the ~~Site Area Emergency event~~ promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
- The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.

~~(1) Reading on ANY of the following radiation monitors greater than the reading shown for 15 minutes or longer:~~

~~(site-specific monitor list and threshold values)~~

~~(2) Dose assessment using actual meteorology indicates doses greater than 100 mrem TEDE or 500 mrem thyroid CDE at or beyond (site-specific dose receptor point).~~

~~(3) Field survey results indicate EITHER of the following at or beyond (site-specific dose receptor point):~~

- ~~• Closed window dose rates greater than 100 mR/hr expected to continue for 60 minutes or longer.~~
- ~~• Analyses of field survey samples indicate thyroid CDE greater than 500 mrem for one hour of inhalation.~~

1. Readings on ANY Table R1 Effluent Monitor > Table R1 value for > 15 minutes.

OR

TABLE TMI 3-2: EAL Technical Basis

RECOGNITION CATEGORY

ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of EITHER:

a. > 100 mRem TEDE

OR

b. > 500 mRem CDE Thyroid

OR

3. Field survey results at or beyond the site boundary indicate EITHER:

a. Gamma (closed window) dose rates >100 mR/hr are expected to continue for > 60 minutes.

OR

Analyses of field survey samples indicate > 500 mRem CDE Thyroid for 60 minutes of inhalation.

Table R1 Effluent Monitor Thresholds	
<u>Effluent Monitor</u>	<u>Site Area Emergency</u>
<u>RM-G-25 (Cond Offgas)</u>	<u>9.53 E+05 mR/hr</u>
<u>RM-A-8GH (Station Vent)</u>	<u>3.09 E+04 cpm</u>
<u>RM-G-24 (RB Purge)</u>	<u>5.55 E+04 mR/hr</u>
<u>RM-A-14 (ESF Vent)</u>	<u>6.66 E+01 uCi/cc</u>

Basis:

This IC addresses a release of gaseous radioactivity that results in projected or actual offsite doses greater than or equal to 10% of the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude are associated with the failure of plant systems needed for the protection of the public.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 10% of the EPA PAG of 1000 mRrem while the 500 mRrem thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

~~Classification based on effluent monitor readings assumes that a release path to~~

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY****ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

~~the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.~~

Escalation of the emergency classification level would be via IC RAG1.

Basis Reference(s):

1. NEI 99-01 Rev 6, AS1
2. EP-EAL-0609 Revision 1, Criteria for Choosing Radiological Gaseous Effluent EAL Threshold Values, Three Mile Island
3. EP-AA-112-500 Emergency Environmental Monitoring
4. FSAR Section 11.4 Radiation Monitoring System
5. EP-AA-110-200 Dose Assessment
6. EP-AA-110-201 On Shift Dose Assessment

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS****ARA1****Initiating Condition:**

Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mRrem TEDE or 50 mRrem thyroid CDE.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

Emergency Action Level (EAL):**Notes:**

- The Emergency Director should declare the **Alert event** promptly upon determining that the applicable time has been exceeded, or will likely be exceeded.
 - If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 15 minutes.
 - Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.
 - The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.
- ~~(1) — Reading on ANY of the following radiation monitors greater than the reading shown for 15 minutes or longer:~~
- ~~(site-specific monitor list and threshold values)~~
- ~~(2) — Dose assessment using actual meteorology indicates doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond (site-specific dose receptor point).~~
- ~~(3) — Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than 10 mrem TEDE or 50 mrem thyroid CDE at or beyond (site-specific dose receptor point) for one hour of exposure.~~
- ~~(4) — Field survey results indicate **EITHER** of the following at or beyond (site-specific dose receptor point):~~
- ~~• Closed window dose rates greater than 10 mR/hr expected to continue for 60 minutes or longer.~~
 - ~~• Analyses of field survey samples indicate thyroid CDE greater than 50 mrem for one hour of inhalation.~~

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

1. Readings on ANY Table R1 Effluent Monitor > Table R1 value for > 15 minutes.

OR

2. Dose assessment using actual meteorology indicates doses at or beyond the site boundary of EITHER:

a. > 10 mRem TEDE

OR

b. > 50 mRem CDE Thyroid

OR

3. Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses greater than EITHER of the following at or beyond the site boundary

a. 10 mRem TEDE for 60 minutes of exposure

OR

b. 50 mRem CDE Thyroid for 60 minutes of exposure

OR

4. Field survey results at or beyond the site boundary indicate EITHER:

a. Gamma (closed window) dose rates > 10 mR/hr are expected to continue for > 60 minutes.

OR

b. Analyses of field survey samples indicate > 50 mRem CDE Thyroid for 60 minutes of inhalation.

<u>Table R1 Effluent Monitor Thresholds</u>	
<u>Effluent Monitor</u>	<u>Alert</u>
<u>RM-G-25 (Cond Offgas)</u>	<u>9.53 E+04 mR/hr</u>
<u>RM-A-8GH (Station Vent)</u>	<u>3.09 E+03 cpm</u>
<u>RM-G-24 (RB Purge)</u>	<u>5.55 E+03 mR/hr</u>
<u>RM-A-14 (ESF Vent)</u>	<u>6.66 E+00 uCi/cc</u>

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS****Basis:**

This IC addresses a release of gaseous or liquid radioactivity that results in projected or actual offsite doses greater than or equal to 1% of the EPA Protective Action Guides (PAGs). It includes both monitored and un-monitored releases. Releases of this magnitude represent an actual or potential substantial degradation of the level of safety of the plant as indicated by a radiological release that significantly exceeds regulatory limits (e.g., a significant uncontrolled release).

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

The TEDE dose is set at 1% of the EPA PAG of 1000 mR_{rem} while the 50 mR_{rem} thyroid CDE was established in consideration of the 1:5 ratio of the EPA PAG for TEDE and thyroid CDE.

~~Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.~~

Escalation of the emergency classification level would be via IC RAS1.

Basis Reference(s):

1. NEI 99-01 Rev 6, AA1
2. OP 1101-2.1 Radiation Monitoring System Setpoints
3. FSAR Section 11.4 Radiation Monitoring System
4. OP-TM-MAP-C0101, Radiation Level HI
5. EP-EAL-0609 Revision 1, Criteria for Choosing Radiological Gaseous Effluent EAL Threshold Values, Three Mile Island
6. EP-EAL-0616, Revision 0, Three Mile Island Criteria for Choosing Radiological Liquid Effluent EAL Threshold Values
7. EP-EAL-0622, Revision 0, Three Mile Island Criteria for Choosing Radiological Gaseous Effluent EAL Threshold Values for Waste Gas Decay Tanks

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS****ARU1****Initiating Condition:**

Release of gaseous or liquid radioactivity greater than 2 times the ODCM (site-specific effluent release controlling document) limits for 60 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

Emergency Action Level (EAL):**Notes:**

- The Emergency Director should declare the Unusual Event event promptly upon determining that 60 minutes the applicable time has been exceeded, or will likely be exceeded.
- If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded 60 minutes.
- Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.

~~(1) Reading on ANY effluent radiation monitor greater than 2 times the (site-specific effluent release controlling document) limits for 60 minutes or longer:~~

~~(site-specific monitor list and threshold values corresponding to 2 times the controlling document limits)~~

~~(2) Reading on ANY effluent radiation monitor greater than 2 times the alarm setpoint established by a current radioactivity discharge permit for 60 minutes or longer.~~

~~(3) Sample analysis for a gaseous or liquid release indicates a concentration or release rate greater than 2 times the (site-specific effluent release controlling document) limits for 60 minutes or longer.~~

1. Reading on any of the following effluent monitors > 2 times alarm setpoint established by a current radioactive release discharge permit for ≥ 60 minutes.

i. RM-L-6, Radwaste Discharge

ii. RM-L-12, IWTS / IWFS Discharge

iii. RM-A-7, Waste Gas Decay Tank Discharge

iv. Discharge Permit specified monitor

OR

2. Readings on ANY Table R1 Effluent Monitor > Table R1 value for > 60 minutes.

OR

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

3. Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates > 2 times ODCM Limit with a release duration of > 60 minutes.

Table R1 Effluent Monitor Thresholds	
Effluent Monitor	Unusual Event
<u>RM-G-25 (Cond Offgas)</u>	<u>1.09 E+03 mR/hr</u>
<u>RM-A-8GH (Station Vent)</u>	<u>7.03 E+01 cpm</u>
<u>RM-G-24 (RB Purge)</u>	<u>6.34 E+01 mR/hr</u>
<u>RM-A-14 (ESF Vent)</u>	<u>7.60 E-02 uCi/cc</u>

Basis:

This IC addresses a potential decrease in the level of safety of the plant as indicated by a low-level radiological release that exceeds regulatory commitments for an extended period of time (e.g., an uncontrolled release). It includes any gaseous or liquid radiological release, monitored or un-monitored, including those for which a radioactivity discharge permit is normally prepared.

Nuclear power plants incorporate design features intended to control the release of radioactive effluents to the environment. Further, there are administrative controls established to prevent unintentional releases, and to control and monitor intentional releases. The occurrence of an extended, uncontrolled radioactive release to the environment is indicative of degradation in these features and/or controls.

Radiological effluent EALs are also included to provide a basis for classifying events and conditions that cannot be readily or appropriately classified on the basis of plant conditions alone. The inclusion of both plant condition and radiological effluent EALs more fully addresses the spectrum of possible accident events and conditions.

~~Classification based on effluent monitor readings assumes that a release path to the environment is established. If the effluent flow past an effluent monitor is known to have stopped due to actions to isolate the release path, then the effluent monitor reading is no longer valid for classification purposes.~~

Releases should not be prorated or averaged. For example, a release exceeding 4 times release limits for 30 minutes does not meet the EAL.

EAL #1 Basis:

EAL #2- This EAL addresses radioactivity releases that cause effluent radiation monitor readings to exceed 2 times the limit established by a radioactivity discharge permit. This EAL will typically be associated with planned batch releases from non-continuous release pathways (e.g., radwaste, waste gas).

The effluent monitors listed are those normally used for planned discharges. If a discharge is performed using a different flowpath or effluent monitor other than those

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY****ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

listed (e.g., a portable or temporary effluent monitor), then the declaration criteria will be based on the monitor specified in the Discharge Permit.

EAL #2 Basis:

~~EAL #1~~—This EAL addresses normally occurring continuous radioactivity releases from monitored gaseous ~~or liquid~~ effluent pathways.

EAL #3 Basis:

~~EAL #3~~—This EAL addresses uncontrolled gaseous or liquid releases that are detected by sample analyses or environmental surveys, particularly on unmonitored pathways (e.g., spills of radioactive liquids into storm drains, heat exchanger leakage in river water systems, etc.).

Escalation of the emergency classification level would be via IC RAA1.

Basis Reference(s):

1. NEI 99-01 Rev 6, AU1
2. OP 1101-2.1 Radiation Monitoring System Setpoints
3. FSAR Section 11.4 Radiation Monitoring System
4. Offsite Dose Calculation (ODCM)
5. OP-TM-MAP-C0101, Radiation Level HI
6. EP-EAL-0609 Revision 1, Criteria for Choosing Radiological Gaseous Effluent EAL Threshold Values, Three Mile Island

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

ARA2

Initiating Condition:

Significant lowering of water level above, or damage to, irradiated fuel.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

Emergency Action Level (EAL):

- ~~(1) — Uncovery of irradiated fuel in the REFUELING PATHWAY.~~
- ~~(2) — Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by **ANY** of the following radiation monitors:

 - ~~_____ (site-specific listing of radiation monitors, and the associated readings, setpoints and/or alarms)~~~~
- ~~(3) — Lowering of spent fuel pool level to (site-specific Level 2 value). [See Developer Notes]~~

1. Uncovery of irradiated fuel in the REFUELING PATHWAY.

OR

2. Damage to irradiated fuel resulting in a release of radioactivity from the fuel as indicated by **ANY** Table R2 Radiation Monitor reading >1000 mRem/hr

Table R2 Radiation Monitors		
<u>RMS</u>	<u>Area Monitored</u>	<u>Mode</u>
<u>RM-G-9</u>	<u>FHB Bridge Rad Monitor</u>	<u>ALL</u>
<u>RM-G-6</u>	<u>RB Auxiliary Bridge Rad Monitor</u>	<u>5, 6</u>
<u>RM-G-7</u>	<u>RB Main Bridge Rad Monitor</u>	<u>5, 6</u>

Basis:

REFUELING PATHWAY: all the cavities, tubes, canals and pools through which irradiated fuel may be moved or stored, but not including the reactor vessel below the flange.

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY****ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

IMMINENT: The trajectory of events or conditions is such that an EAL will be met within a relatively short period of time regardless of mitigation or corrective actions.

This IC addresses events that have caused IMMINENT or actual damage to an irradiated fuel assembly, ~~or a significant lowering of water level within the spent fuel pool (see Developer Notes).~~ These events present radiological safety challenges to plant personnel and are precursors to a release of radioactivity to the environment. As such, they represent an actual or potential substantial degradation of the level of safety of the plant.

~~— This IC applies to irradiated fuel that is licensed for dry storage up to the point that the loaded storage cask is sealed. Once sealed, damage to a loaded cask causing loss of the CONFINEMENT BOUNDARY is classified in accordance with IC E-HU1.~~

~~Escalation of the emergency would be based on either Recognition Category A or C ICs.~~

EAL #1 Basis:**EAL #1**

This EAL escalates from RAU2 in that the loss of level, in the affected portion of the REFUELING PATHWAY, is of sufficient magnitude to have resulted in uncover of irradiated fuel. Indications of irradiated fuel uncover may include direct or indirect visual observation (e.g., reports from personnel or camera images), as well as significant changes in water and radiation levels, or other plant parameters. Computational aids may also be used (e.g., a boil-off curve). Classification of an event using this EAL should be based on the totality of available indications, reports and observations.

While an area radiation monitor could detect an increaserise in a dose rate due to a lowering of water level in some portion of the REFUELING PATHWAY, the reading may not be a reliable indication of whether or not the fuel is actually uncovered. To the degree possible, readings should be considered in combination with other available indications of inventory loss.

A drop in water level above irradiated fuel within the reactor vessel may be classified in accordance Recognition Category C during the Cold Shutdown and Refueling modes.

EAL #2 Basis:**EAL #2**

This EAL addresses a release of radioactive material caused by mechanical damage to irradiated fuel. Damaging events may include the dropping, bumping or binding of an assembly, or dropping a heavy load onto an assembly. A rise in readings on radiation monitors should be considered in conjunction with in-plant reports or observations of a potential fuel damaging event (e.g., a fuel handling accident).

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY****ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

Escalation of the emergency would be based on either Recognition Category R, A or C ICs.

EAL #3

~~Spent fuel pool water level at this value is within the lower end of the level range necessary to prevent significant dose consequences from direct gamma radiation to personnel performing operations in the vicinity of the spent fuel pool. This condition reflects a significant loss of spent fuel pool water inventory and thus it is also a precursor to a loss of the ability to adequately cool the irradiated fuel assemblies stored in the pool.~~

~~Escalation of the emergency classification level would be via ICs AS1 or AS2 (see AS2 Developer Notes).~~

Basis Reference(s):

1. NEI 99-01 Rev 6, AA2
2. Operating Procedure OP-TM-MAP-C0105 RCS Draindown LVL HI/LO
3. OP-TM-MAP-C0101, Radiation Level HI
4. UFSAR, Section 14.2.2.1 - "Fuel Handling Accident"
5. Technical Specification 3.8.11 (Reactor Cavity Level)
6. Operating Procedure OP 1101-2.1 Radiation Monitoring System Setpoints

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

ARU2

Initiating Condition:

UNPLANNED loss of water level above irradiated fuel.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

Emergency Action Level (EAL):

(1) ~~a. UNPLANNED water level drop in the REFUELING PATHWAY as indicated by ANY of the following:~~

~~(site-specific level indications).~~

~~AND~~

~~b. UNPLANNED rise in area radiation levels as indicated by ANY of the following radiation monitors:~~

~~(site-specific list of area radiation monitors)~~

1. a. UNPLANNED water level drop in the REFUELING PATHWAY.

AND

b. UNPLANNED Area Radiation Monitor reading rise on ANY radiation monitors in Table R2.

<u>Table R2 Radiation Monitors</u>		
<u>RMS</u>	<u>Area Monitored</u>	<u>Mode</u>
<u>RM-G-9</u>	<u>FHB Bridge Rad Monitor</u>	<u>ALL</u>
<u>RM-G-6</u>	<u>RB Auxiliary Bridge Rad Monitor</u>	<u>5, 6</u>
<u>RM-G-7</u>	<u>RB Main Bridge Rad Monitor</u>	<u>5, 6</u>

Basis:

UNPLANNED: A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY****ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

REFUELING PATHWAY: all the cavities, tubes, canals and pools through which irradiated fuel may be moved or stored, but not including the reactor vessel below the flange.

This IC addresses a ~~decrease~~-loss in water level above irradiated fuel sufficient to cause elevated radiation levels. This condition could be a precursor to a more serious event and is also indicative of a minor loss in the ability to control radiation levels within the plant. It is therefore a potential degradation in the level of safety of the plant.

A water level ~~decrease~~-loss will be primarily determined by indications from available level instrumentation. Other sources of level indications may include reports from plant personnel (e.g., from a refueling crew) or video camera observations (if available) or from any other temporarily installed monitoring instrumentation. A significant drop in the water level may also cause an ~~increase~~rise in the radiation levels of adjacent areas that can be detected by monitors in those locations.

The effects of planned evolutions should be considered. For example, a refueling bridge area radiation monitor reading may ~~increase~~rise due to planned evolutions such as lifting of the reactor vessel head or movement of a fuel assembly. Note that this EAL is applicable only in cases where the elevated reading is due to an UNPLANNED loss of water level.

A drop in water level above irradiated fuel within the reactor vessel may be classified in accordance Recognition Category C during the Cold Shutdown and Refueling modes.

Escalation of the emergency classification level would be via IC RAA2.

Basis Reference(s):

1. NEI 99-01 Rev 6, AU2
2. UFSAR, Section 14.2.2.1 - "Fuel Handling Accident"
3. OP-TM-MAP-C0105 RCS Draindown
4. OP 1202-12, Excessive Radiation Levels
5. OP 1101-2.1 Radiation Monitoring System Setpoints
6. Technical Specification 3.8.11 (Reactor Cavity Level)

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

ARA3

Initiating Condition:

Radiation levels that impede access to equipment necessary for normal plant operations, cooldown or shutdown.

Operating Mode Applicability:

1, 2, 3, 4, 5, 6, D

Emergency Action Level (EAL):

Note: If the equipment in the ~~listed~~ room or area listed in Table R4 was already inoperable, or out of service, before the event occurred, then no emergency classification is warranted

~~(1) Dose rate greater than 15 mR/hr in ANY of the following areas:~~

- ~~• Control Room~~
- ~~• Central Alarm Station~~
- ~~• (other site specific areas/rooms)~~

~~(2) An UNPLANNED event results in radiation levels that prohibit or impede access to any of the following plant rooms or areas:~~

~~(site-specific list of plant rooms or areas with entry-related mode applicability identified)~~

1. Dose rate greater than > 15 mR/hr in ANY of the areas contained in Table R3:

<u>Table R3</u> <u>Areas Requiring Continuous Occupancy</u>
<ul style="list-style-type: none"> <u>• Main Control Room</u> <u>• Central Alarm Station – (by survey)</u>

OR

TABLE TMI 3-2: EAL Technical Basis

RECOGNITION CATEGORY

ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

2. UNPLANNED event results in radiation levels that prohibit or significantly impede access to any of the following Table R4 plant rooms or areas:

<u>Table R4</u> <u>Areas with Entry Related Mode Applicability</u>	
<u>Area</u>	<u>Entry Related Mode Applicability</u>
<u>Reactor Building*</u>	<u>Modes 4, 5, and 6</u>
<u>Intermediate Building*</u>	<u>Modes 4, 5, and 6</u>
<u>Auxiliary Building*</u>	<u>Modes 4, 5, and 6</u>
<u>Fuel Handling Building*</u>	<u>Modes 4, 5, and 6</u>
<u>*Areas required to establish shutdown cooling</u>	

Basis:

UNPLANNED: A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

This IC addresses elevated radiation levels in certain plant rooms/areas sufficient to preclude or impede personnel from performing actions necessary to transition the plant from normal plant operation to cooldown and shutdown as specified in normal plant procedures~~maintain normal plant operation, or to perform a normal plant cooldown and shutdown~~. As such, it represents an actual or potential substantial degradation of the level of safety of the plant. The Emergency Director should consider the cause of the increased radiation levels and determine if another IC may be applicable.

Table R4 is a list of plant rooms or areas with entry-related mode applicability that contain equipment which require a manual/local action necessary to transition the plant from normal plant operation to cooldown and shutdown as specified in normal operating procedures (establish shutdown cooling), where if this action is not completed the plant would not be able to attain and maintain cold shutdown. This Table does not include rooms or areas for which entry is required solely to perform actions of an administrative or record keeping nature (e.g., normal rounds or routine inspections).

Rooms and areas listed in EAL #1 do not need to be included in EAL #2, including the Control Room.

For EAL #2, an Alert declaration is warranted if entry into the affected room/area is, or may be, procedurally required during the plant operating mode in effect and the elevated radiation levels preclude the ability to place shutdown cooling in service~~at the time of the elevated radiation levels~~. The emergency classification is not contingent upon whether entry is actually necessary at the time of the increased radiation levels. Access should be considered as impeded if extraordinary measures are necessary to facilitate entry of

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY****ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS**

personnel into the affected room/area (e.g., installing temporary shielding beyond that required by procedures, requiring use of non-routine protective equipment, requesting an extension in dose limits beyond normal administrative limits).

An emergency declaration is not warranted if any of the following conditions apply.

- The plant is in an operating mode different than the mode specified for the affected room/area (i.e., entry is not required during the operating mode in effect at the time of the elevated radiation levels). For example, the plant is in Mode 1 when the radiation increase/rise occurs, and the procedures used for normal operation, cooldown and shutdown do not require entry into the affected room until Mode 4.
- The increased radiation levels are a result of a planned activity that includes compensatory measures which address the temporary inaccessibility of a room or area (e.g., radiography, spent filter or resin transfer, etc.).
- The action for which room/area entry is required is of an administrative or record keeping nature (e.g., normal rounds or routine inspections).
- The access control measures are of a conservative or precautionary nature, and would not actually prevent or impede a required action.

Escalation of the emergency classification level would be via Recognition Category RA, C or F ICs.

Basis Reference(s):

1. NEI 99-01 Rev 6, AA3
2. FSAR Section 5.01 Class I Structures, Components, and Systems
3. OP-TM-MAP-C0101, Radiation Level HI

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS****SRU3****Initiating Condition:**

Reactor coolant activity greater than Technical Specification allowable limits.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

~~(1) (Site-specific radiation monitor) reading greater than (site-specific value).~~

~~(2) Sample analysis indicates that a reactor coolant activity value is greater than an allowable limit specified in Technical Specifications.~~

1. Letdown Monitor RM-L-1 alert alarm (high or low channel).

OR

2. Sample analysis indicates that:

a. Dose Equivalent I-131 specific coolant activity > 60.0 uCi/gm.

OR

b. Dose Equivalent XE-133 specific coolant activity > 797.0 uCi/gm.

Basis:

This IC addresses a reactor coolant activity value that exceeds an allowable limit specified in Technical Specifications. This condition is a precursor to a more significant event and represents a potential degradation of the level of safety of the plant.

Conditions that cause the specified monitor to alarm that are not related to fuel clad degradation should not result in the declaration of an Unusual Event.

This EAL addresses site-specific radiation monitor readings that provide indication of a degradation of fuel clad integrity.

An Unusual Event is only warranted when actual fuel clad damage is the cause of the elevated coolant sample activity (as determined by laboratory confirmation). Fuel clad damage should be assumed to be the cause of elevated Reactor Coolant activity unless another cause is known.

Escalation of the emergency classification level would be via ICs FA1 or the Recognition Category RA ICs.

TABLE TMI 3-2: EAL Technical Basis

RECOGNITION CATEGORY

ABNORMAL RAD LEVELS / RADIOLOGICAL EFFLUENTS

Basis Reference(s):

1. NEI 99-01 Rev 6, SU3
2. Operating Procedure 1101-2.1 Radiation Monitoring System Setpoints
3. FSAR Section 11.4.4, Liquid Monitoring Subsystem
4. OP-TM-MAP-C0101, Radiation Level HI
5. Technical Specifications 3.1.4, Reactor Coolant System Activity

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

FG1

Initiating Condition:

Loss of ANY Two Barriers AND Loss or Potential Loss of the third barrier.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Refer to Fission Product Barrier Loss and Potential Loss threshold values to determine barrier status.

Basis:

Fuel Cladding, RCS and Containment comprise the fission product barriers.

At the General Emergency classification level each barrier is weighted equally.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

FS1

Initiating Condition:

Loss or Potential Loss of ANY two barriers.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Refer to Fission Product Barrier Loss and Potential Loss threshold values to determine barrier status.

Basis:

Fuel Cladding, RCS and Containment comprise the fission product barriers.

At the Site Area Emergency classification level, each barrier is weighted equally.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION****FA1****Initiating Condition:**

ANY Loss or ANY Potential Loss of either Fuel Clad or RCS.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Refer to Fission Product Barrier Loss and Potential Loss threshold values to determine barrier status.

Basis:

Fuel Cladding, RCS and Containment comprise the fission product barriers.

At the Alert classification level, Fuel Cladding and RCS barriers are weighted more heavily than the Containment barrier. Unlike the Containment barrier, loss or potential loss of either the Fuel Cladding or RCS barrier may result in the relocation of radioactive materials or degradation of core cooling capability. Note that the loss or potential loss of Containment barrier in combination with loss or potential loss of either Fuel Cladding or RCS barrier results in declaration of a Site Area Emergency under EAL FS1.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3

TABLE TMI 3-2: EAL Technical BasisRECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

FC1

Initiating Condition:

RCS or SG Tube Leakage

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:POTENTIAL LOSS**A. RCS/reactor vessel level less than (site specific value).****1. RCITS hot leg instruments indicate 0 inches after lowering trend.****AND****2. In-core thermocouples are unavailable.****AND****3. ALL RCP's are secured.****Basis:**

There is no Loss threshold associated with RCS or SG Tube Leakage.

Potential Loss Threshold Basis:

This reading indicates a reduction in reactor vessel water level sufficient to allow the onset of heat-induced cladding damage.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3
2. FSAR 7.3.2.2.c.10.d
3. OP-TM-EOP-008, RCS Superheated
4. OP-TM-EOP-010, Emergency Procedure Rules Guides and Graphs

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

FC2**Initiating Condition:**

Inadequate Heat Removal

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:LOSS~~A. Core Exit Thermocouple readings greater than (site specific temperature value)~~~~1. $T_{\text{clad}} > 1400^{\circ}\text{F}$~~ Potential Loss~~A. Core exit thermocouple readings greater than (site specific temperature value).~~~~B. Inadequate RCS heat removal capability via steam generators as indicated by (site specific indications).~~~~2. $> 25^{\circ}\text{F}$ Superheat~~**OR**~~3. HPI-PORV Cooling in effect~~**Basis:****Loss Threshold #1 Basis**Loss 2.A~~This reading indicates temperatures within the core are sufficient to cause significant superheating of reactor coolant.~~**Potential Loss Threshold #2 Basis**Potential Loss 2.A~~This reading indicates temperatures within the core are sufficient to allow the onset of heat-induced cladding damage.~~**Potential Loss Threshold #3 Basis**Potential Loss 2.B

This condition indicates an extreme challenge to the ability to remove RCS heat using the steam generators (i.e., loss of an effective secondary-side heat sink). This condition represents a potential loss of the Fuel Clad Barrier. In accordance with EOPs, there may be unusual accident conditions during which operators intentionally reduce the

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

heat removal capability of the steam generators; during these conditions, classification using threshold is not warranted.

Meeting this threshold results in a Site Area Emergency because this threshold is identical to RCS Barrier RC2 Potential Loss threshold 2.A; both will be met. This condition warrants a Site Area Emergency declaration because inadequate RCS heat removal may result in fuel heat-up sufficient to damage the cladding and increase RCS pressure to the point where mass will be lost from the system.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3
2. OS-24 Attachment D
3. OP-TM-EOP-004, Lack of Primary to Secondary Heat Transfer
4. OP-TM-EOP-008, RCS Superheated
5. OP-TM-EOP-010, Emergency Procedure Rules, Guides And Graphs
6. OS-24, Conduct of Operations during Abnormal and Emergency Events

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION****FC3****Initiating Condition:**

Containment Radiation / RCS Activity

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:LOSS

1A. Containment radiation monitor ~~reading greater than (site specific value)~~
~~(RM-G-22 or RM-G-23) reading > 1.95E+03 R/hr.~~

OR

2B. ~~(Site-specific indications that reactor coolant activity is greater than 300uCi/gm dose equivalent I-131)~~ Coolant activity as sampled > 300uCi/gm Dose Equivalent I-131

Basis:**Loss Threshold #1 Basis**Loss 3.A

The radiation monitor reading corresponds to an instantaneous release of all reactor coolant mass into the containment, assuming that reactor coolant activity equals 300 μ Ci/gm dose equivalent I-131. Reactor coolant activity above this level is greater than that expected for iodine spikes and corresponds to an approximate range of 2% to 5% fuel clad damage. Since this condition indicates that a significant amount of fuel clad damage has occurred, it represents a loss of the Fuel Clad Barrier.

The radiation monitor reading in this threshold is higher than that specified for RCS Barrier ~~RC3~~ Loss ~~T~~ threshold ~~3.A~~ since it indicates a loss of both the Fuel Clad Barrier and the RCS Barrier. Note that a combination of the two monitor readings appropriately escalates the emergency classification level to a Site Area Emergency.

Loss Threshold #2 BasisLoss 3.B

This threshold indicates that RCS radioactivity concentration is greater than 300 μ Ci/gm dose equivalent I-131. Reactor coolant activity above this level is greater than that expected for iodine spikes and corresponds to an approximate range of 2% to 5% fuel clad damage. Since this condition indicates that a significant amount of fuel clad damage has occurred, it represents a loss of the Fuel Clad Barrier.

It is recognized that sample collection and analysis of reactor coolant with highly elevated activity levels could require several hours to complete. Nonetheless, a sample-related threshold is included as a backup to other indications

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

There is no Fuel Clad Barrier Potential Loss threshold associated with RCS Activity / Containment Radiation.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3
2. OP-TM-MAP-C0101, Radiation Level HI
3. FSAR Section 11.4.4, Liquid Monitoring System Description
4. Calculation C3640-98-034, Prediction of the Response of RM-G-6 and 7 to Fuel Damage
5. Core Damage Assessment Methodology (CDAM)

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION****FC56****Initiating Condition:**

Emergency Director Judgment.

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:LOSS

1A. Any condition in the opinion of the Emergency Director that indicates Loss of the Fuel Clad Barrier.

POTENTIAL LOSS

2A. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Fuel Clad Barrier.

Basis:**Loss Threshold #1 Basis****Loss 6.A**

This threshold addresses any other factors that may be used by the Emergency Director in determining whether the Fuel Clad Barrier is lost.

Potential Loss Threshold #2 Basis**Potential Loss 6.A**

This threshold addresses any other factors that may be used by the Emergency Director in determining whether the Fuel Clad Barrier is potentially lost. The Emergency Director should also consider whether or not to declare the barrier potentially lost in the event that barrier status cannot be monitored.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

RC1**Initiating Condition:**

RCS or SG Tube Leakage

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:LOSS

~~A.1. An~~ A automatic or manual ~~ECGS (S)ESAS~~ actuation is required by **EITHER** of the following:

~~a1.~~ a1. UNISOLABLE RCS leakage

OR

~~b2.~~ b2. Steam Generator tube RUPTURE.

POTENTIAL LOSS

~~2.~~ 2. UNISOLABLE RCS leakage > 150gpm.

OR

~~3.~~ 3. HPI-PORV Cooling in effect.

OR

~~4.~~ 4. a. RCS Pressure > 2450 psig.

AND

~~b.~~ b. RCS Pressure not lowering.

~~Operation of a standby charging (makeup) pump is required by EITHER of the following:~~ ~~1. UNISOLABLE RCS leakage~~

OR

~~SG tube leakage.~~

~~B. RCS cooldown rate greater than (site specific pressurized thermal shock criteria/limits defined by site specific indications)~~

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION****~~3. RCS Integrity Red entry conditions met.~~****Basis:**

UNISOLABLE: An open or breached system line that cannot be isolated, remotely or locally.

RUPTURE(D): The condition of a steam generator in which primary-to-secondary leakage is of sufficient magnitude to require a safety injection.

FAULTED: The term applied to a steam generator that has a steam leak on the secondary side of sufficient size to cause an uncontrolled drop in steam generator pressure or the steam generator to become completely depressurized.

Loss Threshold #1 Basis**Loss 1.A**

This threshold is based on an UNISOLABLE RCS leak of sufficient size to require an automatic or manual actuation of the Emergency Core Cooling System (ECCS). This condition clearly represents a loss of the RCS Barrier.

This threshold is applicable to unidentified and pressure boundary leakage, as well as identified leakage. It is also applicable to UNISOLABLE RCS leakage through an interfacing system. The mass loss may be into any location – inside containment, to the secondary-side (i.e., steam generator tube leakage) or outside of containment.

A steam generator with primary-to-secondary leakage of sufficient magnitude to require a safety injection is considered to be RUPTURED. If a RUPTURED steam generator is also FAULTED outside of containment, the declaration escalates to a Site Area Emergency since the Containment Barrier CT1 Loss threshold ~~1.A~~ will also be met.

Potential Loss Threshold #2 Basis**Potential Loss 1.A**

This threshold is based on an UNISOLABLE RCS leak that results in the inability to maintain pressurizer level within specified limits by operation of a normally used charging (makeup) pump, but an ECCS (SI) actuation has not occurred. The threshold is met when an operating procedure, or operating crew supervision, directs that a standby charging (makeup) pump be placed in service to restore and maintain pressurizer level.

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

This threshold is applicable to unidentified and pressure boundary leakage, as well as identified leakage. It is also applicable to UNISOLABLE RCS leakage through an interfacing system. The mass loss may be into any location – inside containment, to the secondary-side (i.e., steam generator tube leakage) or outside of containment.

If a leaking steam generator is also FAULTED outside of containment, the declaration escalates to a Site Area Emergency since the Containment Barrier Loss threshold CT1.A will also be met.

Potential Loss Threshold #3 Basis**Potential Loss 1.B**

This condition indicates an extreme challenge to the integrity of the RCS pressure boundary due to pressurized thermal shock – a transient that causes rapid RCS cooldown while the RCS is in Mode 3 or higher (i.e., hot and pressurized).

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3
2. OP-TM-EOP-010 Emergency Procedure Rules, Guides And Graphs
3. OP-TM-EOP-002 Loss of 25°F Subcooled Margin
4. OP-TM-MAP-D031, MU Flow HI
5. OP-TM-EOP-005, OTSG Tube Leakage

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

RC2**Initiating Condition:**

Inadequate Heat Removal

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:POTENTIAL LOSS

A.

HPI-PORV Cooling in effect

~~Inadequate RCS heat removal capability via steam generators as indicated by (site specific indications)~~

Basis:

There is no Loss threshold associated with Inadequate Heat Removal.

Potential Loss Threshold BasisPotential Loss 2.A

HPI-PORV Cooling in effect indicates a Lack of Primary to Secondary Heat Transfer capability.

This condition indicates an extreme challenge to the ability to remove RCS heat using the steam generators (i.e., loss of an effective secondary-side heat sink). This condition represents a potential loss of the RCS Barrier. In accordance with EOPs, there may be unusual accident conditions during which operators intentionally reduce the heat removal capability of the steam generators; during these conditions, classification using threshold is not warranted.

Meeting this threshold results in a Site Area Emergency because this threshold is identical to Fuel Clad Barrier FC2 Potential Loss Ithreshold 2.B#3; both will be met. This condition warrants a Site Area Emergency declaration because inadequate RCS heat removal may result in fuel heat-up sufficient to damage the cladding and ~~increase~~raise RCS pressure to the point where mass will be lost from the system.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3
2. OP-TM-EOP-004, Lack of Primary to Secondary Heat Transfer

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION****RC3****Initiating Condition:**

Containment Radiation / RCS Activity

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:LOSS

A. Containment radiation monitor ~~reading greater than~~ (RM-G-22 or RM-G-23) reading > 25 R/hr.
~~(site specific value).~~

Basis:**Loss Threshold Basis****Loss 3.A**

The radiation monitor reading corresponds to an instantaneous release of all reactor coolant mass into the containment, assuming that reactor coolant activity equals Technical Specification allowable limits. This value is lower than that specified for Fuel Clad Barrier FC3 Loss Threshold 3.A#1 since it indicates a loss of the RCS Barrier only.

There is no RCS Potential Loss threshold associated with RCS Activity / Containment Radiation.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3
2. EP-EAL-0611, Criteria for Choosing Containment Radiation Monitor Reading Indicative of Loss of RCS Barrier

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION****RC56****Initiating Condition:**

Emergency Director Judgment.

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:LOSS

1A. Any condition in the opinion of the Emergency Director that indicates Loss of the RCS Barrier.

POTENTIAL LOSS

2B. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the RCS Barrier.

Basis:**Loss Threshold #1 Basis**Loss-6.A

This threshold addresses any other factors that may be used by the Emergency Director in determining whether the RCS Barrier is lost.

Potential Loss Threshold #2 BasisPotential Loss-6.A

This threshold addresses any other factors that may be used by the Emergency Director in determining whether the RCS Barrier is potentially lost. The Emergency Director should also consider whether or not to declare the barrier potentially lost in the event that barrier status cannot be monitored.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

CT1

Initiating Condition:

RCS or SG Tube Leakage

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:LOSS~~A. A leaking or RUPTURED SG is FAULTED outside of containment.~~~~1. SG tube leakage > 150gpm~~~~**AND**~~~~2. SG is FAULTED outside of containment.~~**Basis:**~~RUPTURE(D): The condition of a steam generator in which primary-to-secondary leakage is of sufficient magnitude to require a safety injection.~~~~FAULTED: The term applied to a steam generator that has a steam leak on the secondary side of sufficient size to cause an uncontrolled drop in steam generator pressure or the steam generator to become completely depressurized.~~**Loss Threshold Basis**Loss 1.A

This threshold addresses a leaking or RUPTURED Steam Generator (SG) that is also FAULTED outside of containment. The condition of the SG, whether leaking or RUPTURED, is determined in accordance with the thresholds for RCS Barrier RC1 Potential Loss Threshold 2.b 1.A and Loss Threshold 1.b.A, respectively. This condition represents a bypass of the containment barrier.

FAULTED is a defined term within the NEI 99-01 methodology; this determination is not necessarily dependent upon entry into, or diagnostic steps within, an EOP. For example, if the pressure in a steam generator is decreasing uncontrollably [*part of the FAULTED definition*] and the faulted steam generator isolation procedure is not entered because EOP user rules are dictating implementation of another procedure to address a higher priority condition, the steam generator is still considered FAULTED for emergency classification purposes.

The FAULTED criterion establishes an appropriate lower bound on the size of a steam release that may require an emergency classification. Steam releases of this size are readily observable with normal Control Room indications. The lower bound for this aspect of the containment barrier is analogous to the lower bound criteria specified in IC

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

RSU3 for the fuel clad barrier (i.e., RCS activity values) and IC **MSU64** for the RCS barrier (i.e., RCS leak rate values).

This threshold also applies to prolonged steam releases necessitated by operational considerations such as the forced steaming of a leaking or RUPTURED steam generator directly to atmosphere to cooldown the plant, or to drive an auxiliary (emergency) feed water pump. These types of conditions will result in a significant and sustained release of radioactive steam to the environment (and are thus similar to a FAULTED condition). The inability to isolate the steam flow without an adverse effect on plant cooldown meets the intent of a loss of containment.

Steam releases associated with the expected operation of a SG power operated relief valve or safety relief valve do not meet the intent of this threshold. Such releases may occur intermittently for a short period of time following a reactor trip as operators process through emergency operating procedures to bring the plant to a stable condition and prepare to initiate a plant cooldown. Steam releases associated with the unexpected operation of a valve (e.g., a stuck-open safety valve) ~~do~~ **meets** this threshold.

Following an SG tube leak or rupture, there may be minor radiological releases through a secondary-side system component (e.g., air ejectors, gland seal exhausters, valve packing, etc.). These types of releases do not constitute a loss or potential loss of containment but should be evaluated using the Recognition Category **RA** ICs.

The emergency classification levels resulting from primary-to-secondary leakage, with or without a steam release from the FAULTED SG, are summarized below.

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

**Affected SG is FAULTED
Outside of Containment?**

P-to-S Leak Rate	Yes	No
Less than or equal to 25 gpm (or other value per SU4 Developer Notes)	No classification	No classification
Greater than 25 gpm (or other value per SU4 Developer Notes)	Unusual Event per <u>SU4MU6</u>	Unusual Event per <u>SU4MU6</u>
<u>Greater than 150 gpm. The capacity of one makeup pump in the normal charging mode is exceeded</u> Requires operation of a standby charging (makeup) pump (RCS Barrier Potential Loss)	Site Area Emergency per FS1	Alert per FA1
Requires an automatic or manual ECCS (SI) actuation (RCS Barrier Loss)	Site Area Emergency per FS1	Alert per FA1

There is no Potential Loss threshold associated with RCS or SG Tube Leakage.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3
2. OP-TM-EOP-010, Emergency Procedure Rules, Guides And Graphs
3. OP-TM-EOP-005, OTSG Tube Leakage
4. OP-TM-EOP-001, Reactor Trip

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION****CT2****Initiating Condition:**

Inadequate Heat Removal

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:POTENTIAL LOSS~~A. 1. (Site specific criteria for entry into core cooling restoration procedure)~~~~AND~~~~—2. Restoration procedure not effective within 15 minutes.~~~~1. $T_{\text{clad}} > 1800^{\circ}\text{F}$~~ ~~AND~~~~2. EOP Restoration procedures not effective in < 15 minutes.~~**Basis:**IMMINENT: The trajectory of events or conditions is such that an EAL will be met within a relatively short period of time regardless of mitigation or corrective actions.

There is no Loss threshold associated with Inadequate Heat Removal.

Potential Loss Threshold BasisPotential Loss 2.A

This condition represents an IMMEDIATE core melt sequence which, if not corrected, could lead to vessel failure and an increased potential for containment failure. For this condition to occur, there must already have been a loss of the RCS Barrier and the Fuel Clad Barrier. If implementation of a procedure(s) to restore adequate core cooling is not effective (successful) within 15 minutes, it is assumed that the event trajectory will likely lead to core melting and a subsequent challenge of the Containment Barrier.

The restoration procedure is considered "effective" if core exit thermocouple readings are decreasing and/or if reactor vessel level is increasing. Whether or not the procedure(s) will be effective should be apparent within 15 minutes. The Emergency Director should escalate the emergency classification level as soon as it is determined that the procedure(s) will not be effective.

Severe accident analyses (e.g., NUREG-1150) have concluded that function restoration procedures can arrest core degradation in a significant fraction of core damage scenarios, and that the likelihood of containment failure is very small in these events. Given this, it is appropriate to provide 15 minutes beyond the required entry point to determine if procedural actions can reverse the core melt sequence.

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3
2. OP-TM-EOP-008, RCS Superheated
3. OP-TM-EOP-010, Emergency Procedure Rules, Guides And Graphs
4. OP-TM-EOP-006, LOCA Cooldown

TABLE TMI 3-2: EAL Technical BasisRECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION

CT3

Initiating Condition:

Containment Radiation / RCS Activity

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:POTENTIAL LOSS

A. Containment radiation monitor ~~reading greater than (RM-G-22 or RM-G-23) reading > 4.40E+03 R/hr. (site specific value).~~

Basis:

There is no Loss threshold associated with RCS Activity / Containment Radiation.

Potential Loss Threshold BasisPotential Loss 3.A

The radiation monitor reading corresponds to an instantaneous release of all reactor coolant mass into the containment, assuming that 20% of the fuel cladding has failed. This level of fuel clad failure is well above that used to determine the analogous Fuel Clad Barrier Loss and RCS Barrier Loss thresholds.

NUREG-1228, *Source Estimations During Incident Response to Severe Nuclear Power Plant Accidents*, indicates the fuel clad failure must be greater than approximately 20% in order for there to be a major release of radioactivity requiring offsite protective actions. For this condition to exist, there must already have been a loss of the RCS Barrier and the Fuel Clad Barrier. It is therefore prudent to treat this condition as a potential loss of containment which would then escalate the emergency classification level to a General Emergency.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3
2. Core Damage Assessment Methodology (CDAM)

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

CT4

Initiating Condition:

Containment Integrity or Bypass

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:

LOSS

1A. Containment isolation is required **AND EITHER** of the following:

a1. UNPLANNED ~~decrease~~ lowering in containment pressure or rise in radiation monitor readings outside of containment in the Emergency Directors judgment that indicate a loss of containment integrity.

OR

b2. UNISOLABLE pathway from containment to the environment exists.

OR

2B. Indication of RCS leakage outside of containment

POTENTIAL LOSS

~~3A. Containment Red entry conditions met~~ Reactor Building pressure > 55 psig and rising.

OR

~~4B. Explosive mixture exists inside containment.~~ Hydrogen Concentration in Containment > 4%.

OR

~~5C. a1. Containment~~ Reactor Building pressure greater than (site specific pressure setpoint) > 30 psig

AND

~~b2. Less than one full train of (site specific system or equipment) is operating per design for 15 minutes or longer. Reactor Building Emergency Cooling is less than ANY one of the following conditions.~~

<u>SPRAY</u>	<u>COOLERS</u>
<u>2</u>	<u>0</u>
<u>0</u>	<u>3</u>
<u>1</u>	<u>1</u>

Basis:

FAULTED: The term applied to a steam generator that has a steam leak on the secondary side of sufficient size to cause an uncontrolled drop in steam generator pressure or the steam generator to become completely depressurized.

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

UNPLANNED: A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

UNISOLABLE: An open or breached system line that cannot be isolated, remotely or locally.

LossThreshold #1 Basis:**Loss 4.A**

These thresholds address a situation where containment isolation is required and one of two conditions exists as discussed below. Users are reminded that there may be accident and release conditions that simultaneously meet both loss thresholds 1.a4.A.1 and 1.b4.A.2.

1.a4.A.1 – Containment integrity has been lost, i.e., the actual containment atmospheric leak rate likely exceeds that associated with allowable leakage (or sometimes referred to as design leakage). Following the release of RCS mass into containment, containment pressure will fluctuate based on a variety of factors; a loss of containment integrity condition may (or may not) be accompanied by a noticeable drop in containment pressure. Recognizing the inherent difficulties in determining a containment leak rate during accident conditions, it is expected that the Emergency Director will assess this threshold using judgment, and with due consideration given to current plant conditions, and available operational and radiological data (e.g., containment pressure, readings on radiation monitors outside containment, operating status of containment pressure control equipment, etc.).

Refer to the middle piping run of Figure 9-F-4. Two simplified examples are provided. One is leakage from a penetration and the other is leakage from an in-service system valve. Depending upon radiation monitor locations and sensitivities, the leakage could be detected by any of the four monitors depicted in the figure.

Another example would be a loss or potential loss of the RCS barrier, and the simultaneous occurrence of two FAULTED locations on a steam generator where one fault is located inside containment (e.g., on a steam or feedwater line) and the other outside of containment. In this case, the associated steam line provides a pathway for the containment atmosphere to escape to an area outside the containment.

Following the leakage of RCS mass into containment and a rise in containment pressure, there may be minor radiological releases associated with allowable (design) containment leakage through various penetrations or system components. These releases do not constitute a loss or potential loss of containment but should be evaluated using the Recognition Category RA ICs.

1.b4.A.2 – Conditions are such that there is an UNISOLABLE pathway for the migration of radioactive material from the containment atmosphere to the environment. As used here, the term “environment” includes the atmosphere of a room or area, outside the containment, that may, in turn, communicate with the outside-the-plant atmosphere

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

(e.g., through discharge of a ventilation system or atmospheric leakage). Depending upon a variety of factors, this condition may or may not be accompanied by a noticeable drop in containment pressure.

Refer to the top piping run of Figure 9-F-4. In this simplified example, the inboard and outboard isolation valves remained open after a containment isolation was required (i.e., containment isolation was not successful). There is now an UNISOLABLE pathway from the containment to the environment.

The existence of a filter is not considered in the threshold assessment. Filters do not remove fission product noble gases. In addition, a filter could become ineffective due to iodine and/or particulate loading beyond design limits (i.e., retention ability has been exceeded) or water saturation from steam/high humidity in the release stream.

Leakage between two interfacing liquid systems, by itself, does not meet this threshold.

Refer to the bottom piping run of Figure 9-F-4. In this simplified example, leakage in an RCP seal cooler is allowing radioactive material to enter the Auxiliary Building. The radioactivity would be detected by the Process Monitor. If there is no leakage from the closed water cooling system to the Auxiliary Building, then no threshold has been met. If the pump or system piping developed a leak that allowed steam/water to enter the Auxiliary Building, then loss threshold 24.B would be met. Depending upon radiation monitor locations and sensitivities, this leakage could be detected by any of the four monitors depicted in the figure and cause threshold 1.a4.A.1 to be met as well.

Following the leakage of RCS mass into containment and a rise in containment pressure, there may be minor radiological releases associated with allowable (design) containment leakage through various penetrations or system components. Minor releases may also occur if a containment isolation valve(s) fails to close but the containment atmosphere escapes to a closed system. These releases do not constitute a loss or potential loss of containment but should be evaluated using the Recognition Category RA ICs.

The status of the containment barrier during an event involving steam generator tube leakage is assessed using Containment Barrier CT1 Loss T threshold 1.A.

Loss Threshold #2 Basis:**Loss 4.B**

Containment sump, temperature, pressure and/or radiation levels will increaserise if reactor coolant mass is leaking into the containment. If these parameters have not increased, then the reactor coolant mass may be leaking outside of containment (i.e., a containment bypass sequence). IncreaseRaise in sump, temperature, pressure, flow and/or radiation level readings outside of the containment may indicate that the RCS mass is being lost outside of containment.

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

Unexpected elevated readings and alarms on radiation monitors with detectors outside containment should be corroborated with other available indications to confirm that the source is a loss of RCS mass outside of containment. If the fuel clad barrier has not been lost, radiation monitor readings outside of containment may not increase rise significantly; however, other unexpected changes in sump levels, area temperatures or pressures, flow rates, etc. should be sufficient to determine if RCS mass is being lost outside of the containment.

Refer to the middle piping run of Figure 9-F-4. In this simplified example, a leak has occurred at a reducer on a pipe carrying reactor coolant in the Auxiliary Building. Depending upon radiation monitor locations and sensitivities, the leakage could be

detected by any of the four monitors depicted in the figure and cause loss threshold 1.a4.A.1 to be met as well.

To ensure proper escalation of the emergency classification, the RCS leakage outside of containment must be related to the mass loss that is causing the RCS Barrier RC1 Loss Threshold 1.a and/or Potential Loss threshold 2.a1.A to be met.

Potential Loss Threshold #3 Basis**Potential Loss 4.A**

If containment pressure exceeds the design pressure, there exists a potential to lose the Containment Barrier. To reach this level, there must be an inadequate core cooling condition for an extended period of time; therefore, the RCS and Fuel Clad barriers would already be lost. Thus, this threshold is a discriminator between a Site Area Emergency and General Emergency since there is now a potential to lose the third barrier.

Potential Loss Threshold #4 Basis**Potential Loss 4.B**

The existence of an explosive mixture means, at a minimum, that the containment atmospheric hydrogen concentration is sufficient to support a hydrogen burn (i.e., at the lower deflagration limit). A hydrogen burn will raise containment pressure and could result in collateral equipment damage leading to a loss of containment integrity. It therefore represents a potential loss of the Containment Barrier.

Potential Loss Threshold #5 Basis**Potential Loss 4.C**

This threshold describes a condition where containment pressure is greater than the setpoint at which containment energy (heat) removal systems are designed to automatically actuate, and less than one full train of equipment is capable of operating per design. The 15-minute criterion is included to allow operators time to manually start equipment that may not have automatically started, if possible. This threshold represents a potential loss of containment in that containment heat removal/depressurization systems (e.g., containment sprays, ice condenser fans, etc.,

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION**

but not including containment venting strategies) are either lost or performing in a degraded manner

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3
2. FSAR Section 6.6 Reactor Building Pressure-Time Response
3. Technical Specifications 3.5.3, Engineered Safeguards Protection System Actuation Setpoints
4. FSAR Section 6.3.3, Actuation
5. FSAR Section 6.5.3, Hydrogen Generation
6. OP-TM-EOP-006, LOCA Cooldown
7. 1302-5.25 Reactor Building Sump Level
8. FSAR Section 5.2 Reactor Building
9. FSAR Section 9.2, Chemical Addition and Sampling System
10. OP-TM-EOP-002, Loss of 25⁰F Subcooling Margin
11. OP-TM-EOP-006, LOCA Cooldown
12. OP-TM-EOP-010, Emergency Procedure Rules, Guides and Graphs
13. OP-TM-MAP-D0301, High Make-up Flow

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
FISSION PRODUCT BARRIER DEGRADATION****CT56****Initiating Condition:**

Emergency Director Judgment.

Operating Mode Applicability:

1, 2, 3, 4

Fission Product Barrier (FPB) Threshold:LOSS

1A. Any condition in the opinion of the Emergency Director that indicates Loss of the Containment Barrier.

POTENTIAL LOSS

2B. Any condition in the opinion of the Emergency Director that indicates Potential Loss of the Containment Barrier.

Basis:**Loss Threshold #1 Basis**Loss 6.A

This threshold addresses any other factors that may be used by the Emergency Director in determining whether the Containment Barrier is lost.

Potential Loss Threshold #2 BasisPotential Loss 6.A

This threshold addresses any other factors that may be used by the Emergency Director in determining whether the Containment Barrier is potentially lost. The Emergency Director should also consider whether or not to declare the barrier potentially lost in the event that barrier status cannot be monitored.

Basis Reference(s):

1. NEI 99-01 Rev 6, Table 9-F-3

TABLE TMI 3-2: EAL Technical BasisRECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**MSG1****Initiating Condition:**

Prolonged loss of all Off-site and all On-Site AC power to emergency busses.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Note: The Emergency Director should declare the General Emergency event promptly upon determining that ~~(site-specific hours)~~ the applicable time has been exceeded, or will likely be exceeded.

1-a. Loss of **ALL** offsite ~~and ALL onsite~~ AC power to ~~(site-specific emergency busses)~~ Emergency 4KV buses.

AND

2. Failure of EG-Y-1A, EG-Y-1B Emergency Diesel Generators and EG-Y-4 SBO Diesel Generator to supply power to Emergency 4KV buses.

AND

3b. **EITHER** of the following:

a. Restoration of at least one ~~emergency~~ Emergency 4KV bus in < 4 hours is not less than (site-specific hours) is not likely.

OR

b. > 25°F superheat
 • ~~(Site-specific indication of an inability to adequately remove heat from the core)~~

Basis:

SAFETY SYSTEM: A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related.

This IC addresses a prolonged loss of all power sources to AC emergency buses. A loss of all AC power compromises the performance of all SAFETY SYSTEMS requiring electric power including those necessary for emergency core cooling, containment heat removal/pressure control, spent fuel heat removal and the ultimate heat sink. A prolonged loss of these buses will lead to a loss of ~~one or more~~ any fission product

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

barriers. In addition, fission product barrier monitoring capabilities may be degraded under these conditions.

The EAL should require declaration of a General Emergency prior to meeting the thresholds for IC FG1. This will allow additional time for implementation of offsite protective actions.

Escalation of the emergency classification from Site Area Emergency will occur if it is projected that power cannot be restored to at least one AC emergency bus by the end of the analyzed station blackout coping period. Beyond this time, plant responses and event trajectory are subject to greater uncertainty, and there is an increased likelihood of challenges to multiple fission product barriers.

The estimate for restoring at least one emergency bus should be based on a realistic appraisal of the situation. Mitigation actions with a low probability of success should not be used as a basis for delaying a classification upgrade. The goal is to maximize the time available to prepare for, and implement, protective actions for the public.

The emergency busses of the affected unit can be powered from the unaffected unit through the crosstie breakers. Unit crosstie is considered an adequate source of offsite power when evaluating this EAL.

The EAL will also require a General Emergency declaration if the loss of AC power results in parameters that indicate an inability to adequately remove decay heat from the core.

Basis Reference(s):

1. NEI 99-01 Rev 6, SG1
2. OP-TM-EOP-010 Emergency Procedure Rules, Guides And Graphs
3. FSAR Section 8.2.2 Unit Distribution System
4. FSAR Section 8.2.3 Sources of Auxiliary Power
5. FSAR Section 8.5 Station Blackout
6. Technical Specification Section 3.7, Unit Electric Power System
7. 1107-1 Normal Electrical System
8. 1107-2A Emergency Electrical - 4KV and 480 Volt
9. OP-TM-AOP-020 Loss Of Station Power
10. 1107-3 Diesel Generator
11. 1107-9 SBO Diesel Generator
12. OP-TM-EOP-008 RCS Superheated
13. OS-24, Conduct of Operation during Abnormal and Emergency Events

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS****MSS1****Initiating Condition:**

Loss of all offsite and all onsite AC power to emergency busses for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Note: The Emergency Director should declare the Site Area Emergency event promptly upon determining that the applicable time 15 minutes has been exceeded, or will likely be exceeded.

1. Loss of **ALL** offsite ~~and ALL onsite~~ AC Power to ~~(site-specific emergency busses)~~ Emergency 4KV buses for 15 minutes or longer.

AND

2. Failure of EG-Y-1A, EG-Y-1B Emergency Diesel Generators and EG-Y-4 SBO Diesel Generator to supply power to Emergency 4KV buses.

AND

3. Failure to restore power to at least one Emergency 4KV bus in < 15 minutes from the time of loss of both offsite and onsite AC power.

Basis:

SAFETY SYSTEM: A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related.

This IC addresses a total loss of AC power that compromises the performance of all SAFETY SYSTEMS requiring electric power including those necessary for emergency core cooling, containment heat removal/pressure control, spent fuel heat removal and the ultimate heat sink. In addition, fission product barrier monitoring capabilities may be degraded under these conditions. This IC represents a condition that involves actual or likely major failures of plant functions needed for the protection of the public.

The emergency busses of the affected unit can be powered from the unaffected unit through the crosstie breakers. Unit crosstie is considered an adequate source of offsite power when evaluating this EAL.

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Escalation of the emergency classification level would be via ICs RAG1, FG1, or MSG1, or MG2.

Basis Reference(s):

1. NEI 99-01 Rev 6, SS1
2. FSAR Section 8.2.3, Sources of Auxiliary Power
3. Technical Specification Section 3.7, Unit Electric Power System
4. 1107-1 Normal Electrical System
5. 1107-2A Emergency Electrical - 4KV and 480 Volt
6. OP-TM-AOP-020 Loss Of Station Power
7. 1107-3 Diesel Generator
8. 1107-9 SBO Diesel Generator
9. FSAR Section 8.2.2, Unit Distribution System
10. FSAR Section 8.5, Station Blackout

TABLE TMI 3-2: EAL Technical BasisRECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**MSA1****Initiating Condition:**

Loss of all but one AC power source to emergency buses for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Note: The Emergency Director should declare the eventAlert promptly upon determining that the applicable time 15 minutes has been exceeded, or will likely be exceeded.

1. AC power capability to Emergency 4KV buses reduced to only one of the following power sources for > 15 minutes.

- Auxiliary Transformer 1A
- Auxiliary Transformer 1B
- Emergency Diesel Generator EG-Y-1A
- Emergency Diesel Generator EG-Y-1B
- SBO Diesel Generator EG-Y-4

a. AC power capability to (site-specific emergency buses) is reduced to a single power source for 15 minutes or longer.

AND

2b. Any additional single power source failure will result in a loss of ~~all~~ ALL AC power to SAFETY SYSTEMS.

Basis:

SAFETY SYSTEM: A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related.

This IC describes a significant degradation of offsite and onsite AC power sources such that any additional single failure would result in a loss of all AC power to SAFETY SYSTEMS. In this condition, the sole AC power source may be powering one, or more than one, train of safety-related equipment. This IC provides an escalation path from IC MSU1.

An "AC power source" is a source recognized in AOPs and EOPs, and capable of supplying required power to an emergency bus. Some examples of this condition are presented below.

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

- A loss of all offsite power with a concurrent failure of all but one emergency power source (e.g., an onsite diesel generator).

- A loss of all offsite power and loss of all emergency power sources (e.g., onsite diesel generators) with a single train of emergency buses being back-fed from the unit main generator.
- A loss of emergency power sources (e.g., onsite diesel generators) with a single train of emergency buses being back-fed from an offsite power source.

Fifteen minutes was selected as a threshold to exclude transient or momentary losses of power.

Escalation of the emergency classification level would be via IC **MSS1**.

Basis Reference(s):

1. NEI 99-01 Rev 6, SA1
2. FSAR Section 8.2.3, Sources of Auxiliary Power
3. FSAR Section 8.5, Station Blackout
4. Technical Specification Section 3.7, Unit Electric Power System
5. 1107-1 Normal Electrical System
6. 1107-2A Emergency Electrical - 4KV and 480 Volt
7. OP-TM-AOP-020 Loss Of Station Power
8. 1107-3 Diesel Generator
9. 1107-9 SBO Diesel Generator
10. FSAR Section 8.2.2, Unit Distribution System

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS****MSU1****Initiating Condition:**

Loss of all offsite AC power capability to emergency buses for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Note: The Emergency Director should declare the Unusual Event promptly upon determining that the applicable time 15 minutes has been exceeded, or will likely be exceeded.

~~1.~~ Loss of **ALL** offsite AC power capability to Emergency 4KV buses (site-specific emergency buses) for ≥ 15 minutes ~~or longer~~.

Basis:

This IC addresses a prolonged loss of offsite power. The loss of offsite power sources renders the plant more vulnerable to a complete loss of power to AC emergency buses. This condition represents a potential reduction in the level of safety of the plant.

For emergency classification purposes, "capability" means that an offsite AC power source(s) is available to the emergency buses, whether or not the buses are powered from it.

The emergency busses of the affected unit can be powered from the unaffected unit through the crosstie breakers. Unit crosstie is considered an adequate source of offsite power when evaluating this EAL.

Fifteen minutes was selected as a threshold to exclude transient or momentary losses of offsite power.

Escalation of the emergency classification level would be via IC MSA1.

Basis Reference(s):

1. NEI 99-01 Rev 6, SU1
2. FSAR Section 8.2.3, Sources of Auxiliary Power
3. Technical Specification Section 3.7, Unit Electric Power System
4. 1107-1 Normal Electrical System
5. 1107-2A Emergency Electrical - 4KV and 480 Volt
6. OP-TM-AOP-020 Loss Of Station Power
7. 1107-3 Diesel Generator
8. 1107-9 SBO Diesel Generator

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

9. FSAR Section 8.2.2, Unit Distribution System

TABLE TMI 3-2: EAL Technical BasisRECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**MSG28****Initiating Condition:**

Loss of all AC and Vital DC power sources for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Note: The Emergency Director should declare the General Emergency event promptly upon determining that the applicable time 15 minutes has been exceeded, or will likely be exceeded.

1. Loss of ALL offsite AC power to Emergency 4KV buses.

AND

2. Failure of EG-Y-1A, EG-Y-1B Emergency Diesel Generators and EG-Y-4 SBO Diesel Generator to supply power to Emergency 4KV buses.

AND

3. Voltage is < 105 VDC on 125 VDC Distribution System 1A and 1B.

AND

4. ALL AC and Vital DC power sources have been lost for > 15 minutes.

~~1. a. Loss of ALL offsite and ALL onsite AC power to (site-specific emergency buses) for 15 minutes or longer.~~

~~AND~~

~~b. Indicated voltage is less than (site-specific bus voltage value) on ALL (site-specific Vital DC busses) for 15 minutes or longer.~~

Basis:

SAFETY SYSTEM: A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related.

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

This IC addresses a concurrent and prolonged loss of both AC and Vital DC power. A loss of all AC power compromises the performance of all SAFETY SYSTEMS requiring electric power including those necessary for emergency core cooling, containment heat removal/pressure control, spent fuel heat removal and the ultimate heat sink. A loss of Vital DC power compromises the ability to monitor and control SAFETY SYSTEMS. A sustained loss of both AC and DC power will lead to multiple challenges to fission product barriers.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses. The 15-minute emergency declaration clock begins at the point when ~~both~~all EALs ~~thresholds~~ are met.

Basis Reference(s):

1. NEI 99-01 Rev 6, SG8
2. FSAR Section 8.2.2.6, 250/125 VDC System
3. 1107-2C Vital DC Electrical System
4. OP-TM-AOP-023, A DC System Failure
5. OP-TM-AOP-024, B DC System Failure
6. FSAR Section 8.2.2, Unit Distribution System
7. FSAR Section 8.2.3, Sources of Auxiliary Power
8. Technical Specification Section 3.7, Unit Electric Power System
9. 1107-1 Normal Electrical System
10. 1107-2A Emergency Electrical - 4KV and 480 Volt
11. OP-TM-AOP-020 Loss Of Station Power
12. 1107-3 Diesel Generator
13. 1107-9 SBO Diesel Generator
14. FSAR Section 8.5, Station Blackout

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS****MSS28****Initiating Condition:**

Loss of all vital DC power for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Note: The Emergency Director should declare the ~~Site Area Emergency event~~ promptly upon determining that ~~the applicable time 15 minutes~~ has been exceeded, or will likely be exceeded.

~~Indicated voltage is < 105 VDC less than (site-specific bus voltage value) on 125 VDC Distribution System 1A and 1B ALL (site-specific Vital DC busses) for >=15 minutes or longer.~~

Basis:

SAFETY SYSTEM: A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related.

This IC addresses a loss of Vital DC power which compromises the ability to monitor and control SAFETY SYSTEMS. In modes above Cold Shutdown, this condition involves a major failure of plant functions needed for the protection of the public.

Fifteen minutes was selected as a threshold to exclude transient or momentary power losses.

Escalation of the emergency classification level would be via ICs RAG1, FG1 or MSG38.

Basis Reference(s):

1. NEI 99-01 Rev 6, SS8
2. FSAR Section 8.2.2.6, 250/125 VDC System
3. 1107-2C Vital DC Electrical System
4. OP-TM-AOP-023, A DC System Failure
5. OP-TM-AOP-024, B DC System Failure

TABLE TMI 3-2: EAL Technical BasisRECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**MSS35****Initiating Condition:**

Inability to shutdown the reactor causing a challenge to core cooling or RCS heat removal.

Operating Mode Applicability:

1, 2

Emergency Action Level (EAL):

1. Automatic or Manual Trip did not shutdown the reactor as indicated by Reactor Power > 5%.

AND

2. ~~All~~ **ALL** manual actions to shutdown the reactor have been unsuccessful as indicated by Reactor Power > 5%.

AND

3. EITHER of the following conditions exist:

a. $T_{\text{clad}} > 1400^{\circ}\text{F}.$

OR

b. HPI-PORV Cooling in effect

~~a. (Site-specific indication of an inability to adequately remove heat from the core)~~

OR

~~b. (Site-specific indication of an inability to adequately remove heat from the RCS)~~

Basis:

This IC addresses a failure of the RPS to initiate or complete an automatic or manual reactor trip that results in a reactor shutdown, all subsequent operator manual actions, both inside and outside the Control Room including driving in control rods and boron injection, all subsequent operator actions to manually shutdown the reactor are unsuccessful, and continued power generation is challenging the capability to adequately remove heat from the core and/or the RCS. This condition will lead to fuel

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

damage if additional mitigation actions are unsuccessful and thus warrants the declaration of a Site Area Emergency.

In some instances, the emergency classification resulting from this IC/EAL may be higher than that resulting from an assessment of the plant responses and symptoms against the Recognition Category F ICs/EALs. This is appropriate in that the Recognition Category F ICs/EALs do not address the additional threat posed by a failure to shutdown the reactor. The inclusion of this IC and EAL ensures the timely declaration of a Site Area Emergency in response to prolonged failure to shutdown the reactor.

A reactor shutdown is determined in accordance with applicable Emergency Operating Procedure criteria.

Escalation of the emergency classification level would be via IC RAG1 or FG1.

Basis Reference(s):

1. NEI 99-01 Rev 6, SS5
2. OP-TM-EOP-004, Lack of Primary-to-Secondary Heat Transfer
3. OP-TM-EOP-010, Emergency Procedure Rules, Guides And Graphs
4. OP-TM-EOP-001, Reactor Trip
5. 1102-4 Power Operation
6. OP-TM-641-000- Reactor Protection System (RPS/DSS)

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS****MSA35****Initiating Condition:**

Automatic or manual trip fails to shutdown the reactor, and subsequent manual actions taken at the reactor control consoles are not successful in shutting down the reactor.

Operating Mode Applicability:

1, 2

Emergency Action Level (EAL):

Note: A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies.

1. ~~An automatic or manual~~ trip did **not** shutdown the reactor as indicated by Reactor Power > 5%.

AND

2. Manual actions taken at the ~~reactor control consoles~~ Console Center are **not** successful in shutting down the reactor as indicated by Reactor Power > 5%.

Basis:

This IC addresses a failure of the RPS to initiate or complete an automatic ~~or manual~~ reactor trip that results in a reactor shutdown, and subsequent operator manual actions taken at the Console Center ~~reactor control consoles~~ to shutdown the reactor are also unsuccessful. This condition represents an actual or potential substantial degradation of the level of safety of the plant. An emergency declaration is required even if the reactor is subsequently shutdown by an action taken away from the reactor control consoles since this event entails a significant failure of the RPS.

A manual action at the Console Center ~~reactor control consoles~~ is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core (e.g., initiating a manual reactor trip. This action does not include manually driving in control rods or implementation of boron injection strategies. If this action(s) is unsuccessful, operators would immediately pursue additional manual actions at locations away from the Console Center ~~reactor control consoles~~ (e.g., locally opening breakers). Actions taken at back-panels or other locations within the Control Room, or any location outside the Control Room, are not considered to be "at the Console Center ~~reactor control consoles~~".

The plant response to the failure of an automatic ~~or manual~~ reactor trip will vary based upon several factors including the reactor power level prior to the event, availability of the condenser, performance of mitigation equipment and actions, other concurrent plant conditions, etc. If the failure to shutdown the reactor is prolonged enough to cause a challenge to the core cooling or RCS heat removal safety functions, the emergency

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

classification level will escalate to a Site Area Emergency via IC **MSS35**. Depending upon plant responses and symptoms, escalation is also possible via IC FS1. Absent the plant conditions needed to meet either IC **MSS35** or FS1, an Alert declaration is appropriate for this event.

It is recognized that plant responses or symptoms may also require an Alert declaration in accordance with the Recognition Category F ICs; however, this IC and EAL are included to ensure a timely emergency declaration.

A reactor shutdown is determined in accordance with applicable Emergency Operating Procedure criteria.

Basis Reference(s):

1. NEI 99-01 Rev 6, SA5
2. OP-TM-EOP-004, Lack of Primary-to-Secondary Heat Transfer
3. OP-TM-EOP-010, Emergency Procedure Rules, Guides And Graphs
4. OP-TM-EOP-001, Reactor Trip
5. 1102-4 Power Operation
6. OP-TM-641-000- Reactor Protection System (RPS/DSS)

TABLE TMI 3-2: EAL Technical BasisRECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**MSU35****Initiating Condition:**

Automatic or manual trip fails to shutdown the reactor.

Operating Mode Applicability:

1, 2

Emergency Action Level (EAL):

Note: A manual action is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core, and does not include manually driving in control rods or implementation of boron injection strategies.

1. a. ~~An a~~Automatic ~~T~~trip did not shutdown the reactor as indicated by Reactor Power > 5%.

AND

- b. ~~A s~~Subsequent manual action taken at the ~~reactor control consoles~~Console Center is successful in shutting down the reactor.

OR

2. a. ~~A m~~Manual ~~T~~trip did not shutdown the reactor as indicated by Reactor Power > 5%.

AND

- b. **EITHER** of the following:

- ~~1. A subsequent manual action taken at the reactor control consoles is successful in shutting down the reactor.~~

OR

- ~~2. A s~~Subsequent automatic ~~T~~trip is successful in shutting down the reactor.

Basis:

This IC addresses a failure of the RPS to initiate or complete an automatic or manual reactor trip that results in a reactor shutdown, and either a subsequent operator manual

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

action taken at the Console Center reactor control consoles or an automatic trip is successful in shutting down the reactor. This event is a precursor to a more significant condition and thus represents a potential degradation of the level of safety of the plant.

EAL #1 Basis

Following the failure on an automatic reactor trip, operators will promptly initiate manual actions at the Console Center reactor control consoles to shutdown the reactor (e.g., initiate a manual reactor trip). If these manual actions are successful in shutting down the reactor, core heat generation will quickly fall to a level within the capabilities of the plant's decay heat removal systems.

EAL #2 Basis

If an initial manual reactor trip is unsuccessful, ~~operators will promptly take manual action at another location(s) on the reactor control consoles to shutdown the reactor (e.g., initiate a manual reactor trip using a different switch). Depending upon several factors, the initial or subsequent effort to manually trip the reactor, or a concurrent plant condition,~~ may lead to the generation of an automatic reactor trip signal. If a subsequent ~~manual or~~ automatic trip is successful in shutting down the reactor, core heat generation will quickly fall to a level within the capabilities of the plant's decay heat removal systems.

A manual action at the Console Center reactor control consoles is any operator action, or set of actions, which causes the control rods to be rapidly inserted into the core (e.g., initiating a manual reactor trip). This action does not include manually driving in control rods or implementation of boron injection strategies. Actions taken at back-panels or other locations within the Control Room, or any location outside the Control Room, are not considered to be "at the Console Center reactor control consoles".

The plant response to the failure of an automatic or manual reactor trip will vary based upon several factors including the reactor power level prior to the event, availability of the condenser, performance of mitigation equipment and actions, other concurrent plant conditions, etc. If subsequent operator manual actions taken at the Console Center reactor control consoles are also unsuccessful in shutting down the reactor, then the emergency classification level will escalate to an Alert via IC MSA35. Depending upon the plant response, escalation is also possible via IC FA1. Absent the plant conditions needed to meet either IC MSA35 or FA1, an Unusual Event declaration is appropriate for this event.

A reactor shutdown is determined in accordance with applicable Emergency Operating Procedure criteria.

Should a reactor trip signal be generated as a result of plant work (e.g., RPS setpoint testing), the following classification guidance should be applied.

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

- If the signal generated as a result of plant work causes a plant transient that created a real condition that should have included an automatic reactor trip and the RPS fails to automatically shutdown the reactor, then this IC and the EALs are applicable, and should be evaluated.
- If the signal generated as a result of plant work does not cause a plant transient but should have generated an RPS trip signal and the trip failure is determined through other means (e.g., assessment of test results), then this IC and the EALs are not applicable and no classification is warranted.

Basis Reference(s):

1. NEI 99-01 Rev 6, SU5
2. OP-TM-EOP-010, Emergency Procedure Rules, Guides And Graphs
3. OP-TM-EOP-001, Reactor Trip
4. 1102-4 Power Operation
5. OP-TM-641-000- Reactor Protection System (RPS/DSS)

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

MSA42

Initiating Condition:

UNPLANNED loss of Control Room indications for 15 minutes or longer with a significant transient in progress.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Note: The Emergency Director should declare the eventAlert promptly upon determining that the applicable time 15 minutes has been exceeded, or will likely be exceeded.

1. a. ~~An UNPLANNED event results in the inability to monitor ANY one or more Table M1 of the following parameters from within the Control Room for ≥15 minutes or longer.~~

~~[see table below]~~

[PWR parameter list]
Reactor Power
RCS Level
RCS Pressure
In Core/Core Exit Temperature
Levels in at least (site specific number) steam generators
Steam Generator Auxiliary or Emergency Feed Water Flow

<u>Table M1 Control Room Parameters</u>
<u>• Reactor Power</u>
<u>• PZR Level</u>
<u>• RCS Pressure</u>
<u>• In Core/Core Exit Temperature</u>
<u>• Level in at least one OTSG</u>
<u>• OTSG Emergency Feed Water Flow</u>

AND

- b. Any Table M2 of the following transient events in progress.

- ~~• Automatic or Manual runback greater than 25% thermal reactor power~~
- ~~• Electrical load rejection greater than 25% full electrical load~~
- ~~• Reactor trip~~
- ~~• ECCS (SI) actuation~~

TABLE TMI 3-2: EAL Technical BasisRECOGNITION CATEGORY
SYSTEM MALFUNCTIONSTable M2 Significant Transients

- Automatic Turbine Runback >25% thermal reactor power
- Electrical Load Rejection >25% full electrical load
- Reactor Trip
- ESAS Actuation
- Thermal Power oscillations > 10%

Basis:

UNPLANNED: A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

SAFETY SYSTEM: A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related.

This IC addresses the difficulty associated with monitoring rapidly changing plant conditions during a transient without the ability to obtain SAFETY SYSTEM parameters from within the Control Room. During this condition, the margin to a potential fission product barrier challenge is reduced. It thus represents a potential substantial degradation in the level of safety of the plant.

As used in this EAL, an "inability to monitor" means that values for one or more any of the listed parameters cannot be determined from within the Control Room. This situation would require a loss of all of the Control Room sources for the given parameter(s). For example, the reactor power level cannot be determined from any analog, computer point, digital and recorder source within the Control Room.

An event involving a loss of plant indications, annunciators and/or display systems is evaluated in accordance with 10 CFR 50.72 (and associated guidance in NUREG-1022) to determine if an NRC event report is required. The event would be reported if it significantly impaired the capability to perform emergency assessments. In particular, emergency assessments necessary to implement abnormal operating procedures, emergency operating procedures, and emergency plan implementing procedures addressing emergency classification, accident assessment, or protective action decision-making.

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

This EAL is focused on a selected subset of plant parameters associated with the key safety functions of reactivity control, core cooling and RCS heat removal. The loss of the ability to determine ~~one or more~~any of these parameters from within the Control Room is considered to be more significant than simply a reportable condition. In addition, if all indication sources for ~~one or more~~any of the listed parameters are lost, then the ability to determine the values of other SAFETY SYSTEM parameters may be impacted as well. For example, if the value for reactor vessel level cannot be determined from the indications and recorders on a main control board, the SPDS or the plant computer, the availability of other parameter values may be compromised as well.

Fifteen minutes was selected as a threshold to exclude transient or momentary losses of indication.

Escalation of the emergency classification level would be via ICs FS1 or IC RAS1.

Basis Reference(s):

1. NEI 99-01 Rev 6, SA2

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

MSU42

Initiating Condition:

UNPLANNED loss of Control Room indications for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Note: The Emergency Director should declare the ~~Unusual Event~~ promptly upon determining that ~~the applicable time 15 minutes~~ has been exceeded, or will likely be exceeded.

a. ~~An UNPLANNED event results in the inability to monitor one or more ANY Table M1 parameters from within the Control Room for > 15 minutes.~~

Table M1 Control Room Parameters
<ul style="list-style-type: none"> • <u>Reactor Power</u> • <u>RCS Level</u> • <u>RCS Pressure</u> • <u>In Core/Core Exit Temperature</u> • <u>Level in at least one OTSG.</u> • <u>OTSG Emergency Feed Water Flow</u>

~~1. of the following parameters from within the Control Room for 15 minutes or longer.~~

2. [BWR parameter list]	3. [PWR parameter list]
4. Reactor Power	6. Reactor Power
5.	7.
8. RPV Water Level	9. RCS Level
10. RPV Pressure	11. RCS Pressure
12. Primary Containment Pressure	13. In-Core/Core Exit Temperature
14. Suppression Pool Level	15. Levels in at least (site-specific number) steam generators
16. Suppression Pool Temperature	17. Steam Generator Auxiliary or

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

2. [BWR parameter list]	3. [PWR parameter list]
	Emergency Feed Water Flow

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS****Basis:**

UNPLANNED: A parameter change or an event that is not 1) the result of an intended evolution or 2) an expected plant response to a transient. The cause of the parameter change or event may be known or unknown.

SAFETY SYSTEM: A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related.

This IC addresses the difficulty associated with monitoring normal plant conditions without the ability to obtain SAFETY SYSTEM parameters from within the Control Room. This condition is a precursor to a more significant event and represents a potential degradation in the level of safety of the plant.

As used in this EAL, an "inability to monitor" means that values for one or more any of the listed parameters cannot be determined from within the Control Room. This situation would require a loss of all of the Control Room sources for the given parameter(s). For example, the reactor power level cannot be determined from any analog, digital and recorder source within the Control Room.

An event involving a loss of plant indications, annunciators and/or display systems is evaluated in accordance with 10 CFR 50.72 (and associated guidance in NUREG-1022) to determine if an NRC event report is required. The event would be reported if it significantly impaired the capability to perform emergency assessments. In particular, emergency assessments necessary to implement abnormal operating procedures, emergency operating procedures, and emergency plan implementing procedures addressing emergency classification, accident assessment, or protective action decision-making.

This EAL is focused on a selected subset of plant parameters associated with the key safety functions of reactivity control, core cooling and RCS heat removal. The loss of the ability to determine one or more any of these parameters from within the Control Room is considered to be more significant than simply a reportable condition. In addition, if all indication sources for one or more any of the listed parameters are lost, then the ability to determine the values of other SAFETY SYSTEM parameters may be impacted as well. For example, if the value for reactor vessel level cannot be determined from the indications and recorders on a main control board, the SPDS or the plant computer, the availability of other parameter values may be compromised as well.

Fifteen minutes was selected as a threshold to exclude transient or momentary losses of indication.

Escalation of the emergency classification level would be via IC MSA42.

TABLE TMI 3-2: EAL Technical Basis

**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

Basis Reference(s):

1. NEI 99-01 Rev 6, SU2

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS****MSA59****Initiating Condition:**

Hazardous event affecting a SAFETY SYSTEM ~~needed~~required for the current operating mode.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

(1) ~~1.a.~~ The occurrence of **ANY** of the following hazardous events:

- Seismic event (earthquake)
- Internal or external flooding event
- High winds or tornado strike
- FIRE
- EXPLOSION
- ~~(site-specific hazards)~~
- Other events with similar hazard characteristics as determined by the Shift Manager

AND

~~2.b.~~ **EITHER** of the following:

~~a.1.~~ Event damage has caused indications of degraded performance in at least one train of a SAFETY SYSTEM ~~needed~~required by Technical Specifications for the current operating mode.

OR

~~b.2.~~ The event has caused **VISIBLE DAMAGE** to a SAFETY SYSTEM component or structure ~~needed~~required by Technical Specifications for the current operating mode.

Basis:

FIRE: Combustion characterized by heat and light. Sources of smoke such as slipping drive belts or overheated electrical equipment do not constitute FIRES. Observation of flame is preferred but is NOT required if large quantities of smoke and heat are observed.

EXPLOSION: A rapid, violent and catastrophic failure of a piece of equipment due to combustion, chemical reaction or overpressurization. A release of steam (from high energy lines or components) or an electrical component failure (caused by short circuits, grounding, arcing, etc.) should not automatically be considered an explosion. Such

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

events may require a post-event inspection to determine if the attributes of an explosion are present.

SAFETY SYSTEM: A system required for safe plant operation, cooling down the plant and/or placing it in the cold shutdown condition, including the ECCS. These are typically systems classified as safety-related.

VISIBLE DAMAGE: Damage to a component or structure that is readily observable without measurements, testing, or analysis. The visual impact of the damage is sufficient to cause concern regarding the operability or reliability of the affected component or structure.

This IC addresses a hazardous event that causes damage to a SAFETY SYSTEM, or a structure containing SAFETY SYSTEM components, ~~needed~~ required for the current operating mode, "required", i.e. required to be operable by Technical Specifications for the current operating mode. This condition significantly reduces the margin to a loss or potential loss of a fission product barrier, and therefore represents an actual or potential substantial degradation of the level of safety of the plant. Manual or automatic electrical isolation of safety equipment due to flooding, in and of itself, does not constitute degraded performance and is classified under HU6.

EAL 1.b.1#2.a Basis

This EAL addresses damage to a SAFETY SYSTEM train that is required to be operable by Technical Specifications for the current operating mode, and is in service/operation since indications for it will be readily available. The indications of degraded performance should be significant enough to cause concern regarding the operability or reliability of the SAFETY SYSTEM train.

EAL 1.b.2#2.b Basis

This EAL addresses damage to a SAFETY SYSTEM component that is required to be operable by Technical Specifications for the current operating mode, and is not in service/operation or readily apparent through indications alone, or as well as damage to a structure containing SAFETY SYSTEM components. Operators will make this determination based on the totality of available event and damage report information. This is intended to be a brief assessment not requiring lengthy analysis or quantification of the damage.

Escalation of the emergency classification level would be via IC FS1 or RAS1.

If the EAL conditions of MA5 are not met then assess the event via HU3, HU4, or HU6.

Basis Reference(s):

1. NEI 99-01, Rev 6 SA9

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS****MSU64****Initiating Condition:**

RCS leakage for 15 minutes or longer.

Operating Mode Applicability:

1, 2, 3, 4

Emergency Action Level (EAL):

Note: The Emergency Director should declare the Unusual Event promptly upon determining that the applicable time 15 minutes has been exceeded, or will likely be exceeded.

1. RCS unidentified or pressure boundary leakage greater than > 10 gpm for > 15 minutes. ~~(site-specific value) for 15 minutes or longer.~~

OR

2. RCS identified leakage ~~greater than~~ >25 gpm for > 15 minutes. ~~(site-specific value) for 15 minutes or longer.~~

OR

3. Leakage from the RCS to a location outside containment >25 gpm for > 15 minutes. ~~greater than 25 gpm for 15 minutes or longer.~~

Basis:

UNISOLABLE: An open or breached system line that cannot be isolated, remotely or locally.

This IC addresses RCS leakage which may be a precursor to a more significant event. In this case, RCS leakage has been detected and operators, following applicable procedures, have been unable to promptly isolate the leak. This condition is considered to be a potential degradation of the level of safety of the plant.

EAL #1 and EAL #2 Basis

These EALs are focused on a loss of mass from the RCS due to "unidentified leakage", "pressure boundary leakage" or "identified leakage" (as these leakage types are defined in the plant Technical Specifications).

EAL #3 Basis

This EAL addresses a RCS mass loss caused by an UNISOLABLE leak through an interfacing system.

These EALs thus apply to leakage into the containment, a secondary-side system (e.g., steam generator tube leakage) or a location outside of containment.

TABLE TMI 3-2: EAL Technical Basis**RECOGNITION CATEGORY
SYSTEM MALFUNCTIONS**

The leak rate values for each EAL were selected because they are usually observable with normal Control Room indications. Lesser values typically require time-consuming calculations to determine (e.g., a mass balance calculation). EAL #1 uses a lower value that reflects the greater significance of unidentified or pressure boundary leakage.

The release of mass from the RCS due to the as-designed/expected operation of a relief valve does not warrant an emergency classification. An emergency classification

would be required if a mass loss is caused by a relief valve that is not functioning as designed/expected (e.g., a relief valve sticks open and the line flow cannot be isolated).

The 15-minute threshold duration allows sufficient time for prompt operator actions to isolate the leakage, if possible.

Escalation of the emergency classification level would be via ICs of Recognition Category **RA** or F.

Basis Reference(s):

1. NEI 99-01 Rev 6, SU4
2. OP-TM-220-251 RCS Leak Rate Determination
3. OP-TM-220-252, Primary – To – Secondary Leakrate Determination
4. OP-TM-PRF1-0405 RB Sump Level HI
5. UFSAR 6.4.3, Bases of Leakage Estimate
6. UFSAR 6.4.4, Design Basis Leakage
7. OP-TM-AOP-050, Reactor Coolant Leakage
8. Technical Specification 3.1.6, Leakage and Table 4.1-2, Minimum Equipment Test Frequency