

**ENCLOSURE 6**

**EMERGENCY ACTION LEVEL MATRICES**


**Dominion Energy Nuclear Connecticut, Inc. (DENC)**

**Virginia Electric and Power Company  
(Dominion Energy Virginia)**

**ATTACHMENT 1**

**MPS1 EAL MATRIX**

**Dominion Energy Nuclear Connecticut, Inc. (DENC)  
Millstone Power Station Unit 1**

MPS UNIT 1		ALERT	UNUSUAL EVENT
R Abnormal Rad Levels/ Rad Effluent	1 Rad Effluent	<p>RA1 Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE</p> <p><b>RA1.1</b> Reading on RM-SFPI-02 Unit 1 Spent Fuel Pool Island Monitor &gt; 4.0E+1 µCi/cc for ≥ 15 min. (Notes 1, 2, 3, 4)</p> <p><b>RA1.2</b> Dose assessment using actual meteorology indicates doses &gt; 10 mrem TEDE at or beyond the SITE BOUNDARY (Note 4)</p> <p><b>RA1.3</b> Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses &gt; 10 mrem TEDE at or beyond the SITE BOUNDARY for 60 min. of exposure (Notes 1, 2)</p> <p><b>RA1.4</b> Field survey results indicate closed window dose rates &gt; 10 mR/hr expected to continue for ≥ 60 min. at or beyond the SITE BOUNDARY (Notes 1, 2)</p>	<p>RU1 Release of gaseous or liquid radioactivity greater than 2 times the allocated REMODCM limits for 60 minutes or longer</p> <p><b>RU1.1</b> Reading on RM-SFPI-02 Unit 1 Spent Fuel Pool Island Monitor &gt; 1.1E-2 µCi/cc for ≥ 60 min. (Notes 1, 2, 3)</p> <p><b>RU1.2</b> Reading on RE-M6-110 Liquid Waste Effluent Discharge Monitor &gt; 2 x the "alarm" setpoint established by a current radioactivity discharge permit for ≥ 60 min. (Notes 1, 2, 3)</p> <p><b>RU1.3</b> Sample analysis for a liquid or gaseous release indicates a concentration or release rate &gt; 2 x the allocated REMODCM limits for ≥ 60 min. (Notes 1, 2)</p>
	2 Area Radiation Levels	<p>RA2 UNPLANNED rise in plant radiation levels that IMPEDES plant access required to maintain spent fuel integrity</p> <p><b>RA2.1</b> UNPLANNED Area Radiation Monitor readings or survey results indicate a rise by 100 mR/hr over NORMAL LEVELS that IMPEDES access to areas of the Reactor Building needed to maintain control of radioactive material or operation of systems needed to maintain spent fuel integrity</p>	<p>RU2 UNPLANNED rise in plant radiation levels</p> <p><b>RU2.1</b> UNPLANNED water level drop in the SFP as indicated by <b>any</b> of the following:</p> <ul style="list-style-type: none"> <li>• SPENT FUEL POOL LEVEL LOW alarm PLC-AL101</li> <li>• SPENT FUEL POOL LEVEL LOW-LOW alarm PLC-AL100</li> <li>• Report of dropping level in SFP</li> <li>• Loss of SFP Cooling suction flow</li> </ul> <p><b>AND</b> UNPLANNED rise in area radiation levels as indicated by <b>any</b> of the following radiation monitors:</p> <ul style="list-style-type: none"> <li>• RM-SFPI-01 Channel 1 Refuel Floor West (Low Range)</li> <li>• RM-SFPI-01 Channel 2 Refuel Floor East</li> <li>• RM-SFPI-01 Channel 3 Refuel Floor West (High Range)</li> </ul> <p><b>RU2.2</b> Area radiation monitor reading or survey result indicates an UNPLANNED rise of 25 mR/hr over NORMAL LEVELS</p>
H Hazards	1 Hazardous Event Affecting Safety Systems	<p><b>Table H-1 Hazardous Events</b></p> <ul style="list-style-type: none"> <li>• Seismic event (earthquake)</li> <li>• Internal or external FLOODING event</li> <li>• High winds or tornado strike</li> <li>• FIRE (refer to Unit 2/3 EALs for a fire within the Protected Area)</li> <li>• EXPLOSION</li> <li>• Other events with similar hazard characteristics as determined by the Shift Manager</li> </ul>	<p>HU1 Hazardous event affecting SAFETY SYSTEM equipment necessary for spent fuel cooling</p> <p><b>HU1.1</b> The occurrence of <b>any</b> Table H-1 hazardous event <b>AND</b> Event damage (excluding loss of offsite AC power) has caused indications of degraded performance of <b>EITHER</b>:</p> <ul style="list-style-type: none"> <li>• Spent Fuel Pool Cooling System</li> <li>• Decay Heat Removal System</li> </ul>
	2 DSEO/ ADTS Judgment	<p>HA2 Other conditions existing that in the judgment of the DSEO/ADTS warrant declaration of an Alert</p> <p><b>HA2.1</b> Other conditions exist which in the judgment of the DSEO/ADTS 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 HOSTILE ACTION. <b>Any</b> releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels</p>	<p>HU2 Other conditions existing that in the judgment of the DSEO warrant declaration of an Unusual Event</p> <p><b>HU2.1</b> Other conditions exist which in the judgment of the DSEO 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. <b>No</b> releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of SAFETY SYSTEMS occurs.</p>
M System Malfunc.	1 Loss of Spent Fuel Cooling	<p><b>NOTES</b></p> <p><b>Note 1:</b> The DSEO/ADTS should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded.</p> <p><b>Note 2:</b> If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit.</p> <p><b>Note 3:</b> 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 <b>no</b> longer VALID for classification purposes.</p> <p><b>Note 4:</b> The pre-calculated effluent monitor values presented in EAL RA1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available.</p>	
 <div>MPS UNIT 1</div>			<div>Millstone Power Station Unit 1 Emergency Action Level Matrix Revision E3</div>

**ATTACHMENT 2**

**MPS2 EAL MATRICES (Hot and Cold)**

**Dominion Energy Nuclear Connecticut, Inc. (DENC)  
Millstone Power Station Unit 2 and ISFSI**

**ATTACHMENT 2A**

**MPS2 EAL MATRIX – Hot Conditions (RCS >200 °F)**

**Dominion Energy Nuclear Connecticut, Inc. (DENC)  
Millstone Power Station Unit 2 and ISFSI**

MPS UNIT 2		GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT																																																																																																									
R Abnormal Rad Levels/ Rad Effluent	1 Rad Effluent	RG1 Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE  RG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "GE" for ≥ 15 min. (Notes 1, 2, 3, 4)  RG1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 1,000 mrem TEDE at or beyond the SITE BOUNDARY (Note 4)  RG1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate closed window dose rates > 1,000 mR/hr expected to continue for ≥ 60 min. at or beyond the SITE BOUNDARY (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RS1 Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE  RS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "SAE" for ≥ 15 min. (Notes 1, 2, 3, 4)  RS1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 100 mrem TEDE at or beyond the SITE BOUNDARY (Note 4)  RS1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate closed window dose rates > 100 mR/hr expected to continue for ≥ 60 min. at or beyond the SITE BOUNDARY (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RA1 Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE  RA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "ALERT" for ≥ 15 min. (Notes 1, 2, 3, 4)  RA1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 10 mrem TEDE at or beyond the SITE BOUNDARY (Note 4)  RA1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > 10 mrem TEDE at or beyond the SITE BOUNDARY for 60 min. of exposure (Notes 1, 2)  RA1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate closed window dose rates > 10 mR/hr expected to continue for ≥ 60 min. at or beyond the SITE BOUNDARY (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RU1a Release of liquid radioactivity greater than 2 times the allocated REMODOM limits for 60 minutes or longer  RU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on RM262 SG Blowdown radiation monitor > 2x the "alarm" setpoint for ≥ 60 min. (Notes 1, 2, 3)  RU1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any of the following effluent radiation monitors > 2 x the "alarm" setpoint established by a current radioactivity discharge permit for ≥ 60 min. • RM9049 Clean Liquid Radwaste Effluent • RM9116 Aerated Liquid Radwaste Effluent • CN245 CPF Neut Sump Effluent (Notes 1, 2, 3)  RU1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Sample analysis for a liquid release indicates a concentration or release rate > 2 x the allocated REMODOM limits for ≥ 60 min. (Notes 1, 2)  RU1b Release of gaseous radioactivity resulting in offsite dose greater than 1 mrem TEDE  RU1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "UE" for ≥ 60 min. (Notes 1, 2, 3)  RU1.5 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Sample analysis for a gaseous release indicates a concentration or release rate > 2 x the allocated REMODOM limit for ≥ 60 min. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF
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2 Irradiated Fuel Events	RG2 Spent fuel pool level cannot be restored to at least the top of the fuel racks for 60 minutes or longer  RG2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Spent fuel pool level cannot be restored to at least 1 ft. (Level 3) on LI-7013 or LI-7014 for ≥ 60 min. (Note 1)	1	2	3	4	5	6	DEF	RS2 Spent fuel pool level at the top of the fuel racks  RS2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to 1 ft. (Level 3) on LI-7013 or LI-7014	1	2	3	4	5	6	DEF	RA2 Significant lowering of water level above, or damage to, irradiated fuel  RA2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> IMMINENT uncover of irradiated fuel in the REFUELING PATHWAY Damage to irradiated fuel resulting in a release of radioactivity AND VALID alarm on any of the following radiation monitors: • RM-7890 Personnel Access Area • RM-7891 Containment Refuel Floor • RM-8123B or RM-8262B Containment Gaseous • RM-8139 SFP SW Area • RM-8142 SFP NW Area • RM-8156 SFP NE Area • RM-8157 SFP SE Area • RM-8158 SFP Exhaust Gaseous RA2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to 10 ft. (Level 2) on LI-7013 or LI-7014	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RU2 UNPLANNED loss of water level above irradiated fuel  RU2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> UNPLANNED water level drop in the REFUELING PATHWAY as indicated by any of the following: • SFP LEVEL LO alarm on C-06/7 B-14 • CTMT NORM SUMP LEVEL HI/LO alarm C-06/7 B-21 • Report of dropping level in RFP or SFP • SFP CLG PUMP SUCTION FLOW LO alarm C-06/07 D-13 AND UNPLANNED rise in corresponding area radiation levels as indicated by any of the following radiation monitors: • RM-7890 Personnel Access Area • RM-7891 Containment Refuel Floor • RM-8123B or RM-8262B Containment Gaseous • RM-8139 SFP SW Area • RM-8142 SFP NW Area • RM-8156 SFP NE Area • RM-8157 SFP SE Area	1	2	3	4	5	6	DEF																																																																							
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3 Area Radiation Levels	Table R-2 Safe Operation & Shutdown Rooms/Areas <table><tr><th>Room/Area</th><th>Mode</th></tr><tr><td>Aux. Building EI -59<sup>W</sup> West Area</td><td rowspan="4">3</td></tr><tr><td>Aux. Building EI -59<sup>E</sup> East Near SFP Cooling</td></tr><tr><td>Aux. Building EI 149<sup>W</sup> B51 &amp; B61 Enclosures</td></tr><tr><td>Aux. Building EI 149<sup>E</sup> Boric Acid Batching Tank</td></tr><tr><td>Aux. Building EI -259<sup>W</sup> RB Hx Area</td><td rowspan="2">3, 5</td></tr><tr><td>Enc. Building EI -59<sup>E</sup> East Pipe Penetration</td></tr><tr><td>Aux. Building EI 149<sup>W</sup> By B61</td><td rowspan="2">3, 4</td></tr><tr><td>Enc. Building EI -459<sup>W</sup> "A" &amp; "B" ESF Rooms</td></tr><tr><td>Aux. Building EI -459<sup>E</sup> General Area</td><td rowspan="2">3, 5</td></tr><tr><td>Enc. Building EI -59<sup>E</sup> West Pipe Penetration</td></tr><tr><td>Aux. Building EI -59<sup>E</sup> VCT Block Wall Area</td><td>4</td></tr><tr><td>Enc. Building EI -459<sup>W</sup> "A" ESF Room</td><td>5</td></tr></table>	Room/Area	Mode	Aux. Building EI -59 <sup>W</sup> West Area	3	Aux. Building EI -59 <sup>E</sup> East Near SFP Cooling	Aux. Building EI 149 <sup>W</sup> B51 & B61 Enclosures	Aux. Building EI 149 <sup>E</sup> Boric Acid Batching Tank	Aux. Building EI -259 <sup>W</sup> RB Hx Area	3, 5	Enc. Building EI -59 <sup>E</sup> East Pipe Penetration	Aux. Building EI 149 <sup>W</sup> By B61	3, 4	Enc. Building EI -459 <sup>W</sup> "A" & "B" ESF Rooms	Aux. Building EI -459 <sup>E</sup> General Area	3, 5	Enc. Building EI -59 <sup>E</sup> West Pipe Penetration	Aux. Building EI -59 <sup>E</sup> VCT Block Wall Area	4	Enc. Building EI -459 <sup>W</sup> "A" ESF Room	5	HS1 HOSTILE ACTION within the PROTECTED AREA  HS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by MPS Security Shift Supervision	1	2	3	4	5	6	DEF	HA1 HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes  HA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by MPS Security Shift Supervision OR A validated notification from NRC of an aircraft attack threat within 30 min. of the site	1	2	3	4	5	6	DEF	HU1 Confirmed SECURITY CONDITION or threat  HU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by MPS Security Shift Supervision OR Notification of a credible security threat directed at the site OR A validated notification from the NRC providing information of an aircraft threat	1	2	3	4	5	6	DEF																																																																	
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2 Seismic Event	None	None	None	None	None																																																																																																									
3 Natural or Tech. Hazard	None	None	None	None	None																																																																																																									
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4 Fire	Table H-1 MPS2 Fire Areas <ul style="list-style-type: none"><li>Containment Building</li><li>Control Room</li><li>Auxiliary Building Areas:<ul style="list-style-type: none"><li>Penetration Areas</li><li>RBCOV Pump Rooms</li><li>Diesel Generator Rooms</li><li>Diesel Generator Day Tank Rooms</li><li>Charging Pump Cables</li><li>SI Pump Rooms</li><li>DC Equipment and Battery Rooms</li><li>East 480 VAC Switchgear Room</li></ul></li><li>Intake Structure</li><li>Turbine Building Areas:<ul style="list-style-type: none"><li>Cable Vaults</li><li>West 480 VAC Switchgear Room</li><li>4.16 KV Switchgear Rooms</li><li>Steam Driven Aux Feedwater Room</li><li>Motor Driven Aux Feedwater Room</li></ul></li><li>Yard Areas</li><li>RWST</li><li>CST</li><li>Unit 3 SBO DG</li></ul>	HS1 HOSTILE ACTION within the PROTECTED AREA  HS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by MPS Security Shift Supervision	1	2	3	4	5	6	DEF	HA1 HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes  HA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by MPS Security Shift Supervision OR A validated notification from NRC of an aircraft attack threat within 30 min. of the site	1	2	3	4	5	6	DEF	HU1 Confirmed SECURITY CONDITION or threat  HU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by MPS Security Shift Supervision OR Notification of a credible security threat directed at the site OR A validated notification from the NRC providing information of an aircraft threat	1	2	3	4	5	6	DEF																																																																																					
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H Hazards	Table H-2 Safe Operation & Shutdown Rooms/Areas <table><tr><th>Room/Area</th><th>Mode</th></tr><tr><td>Aux. Building EI -59<sup>W</sup> West Area</td><td rowspan="4">3</td></tr><tr><td>Aux. Building EI -59<sup>E</sup> East Near SFP Cooling</td></tr><tr><td>Aux. Building EI 149<sup>W</sup> B51 &amp; B61 Enclosures</td></tr><tr><td>Aux. Building EI 149<sup>E</sup> Boric Acid Batching Tank</td></tr><tr><td>Aux. Building EI -259<sup>W</sup> RB Hx Area</td><td rowspan="2">3, 5</td></tr><tr><td>Enc. Building EI -59<sup>E</sup> East Pipe Penetration</td></tr><tr><td>Aux. Building EI 149<sup>W</sup> By B61</td><td rowspan="2">3, 4</td></tr><tr><td>Enc. Building EI -459<sup>W</sup> "A" &amp; "B" ESF Rooms</td></tr><tr><td>Aux. Building EI -459<sup>E</sup> General Area</td><td rowspan="2">3, 5</td></tr><tr><td>Enc. Building EI -59<sup>E</sup> West Pipe Penetration</td></tr><tr><td>Aux. Building EI -59<sup>E</sup> VCT Block Wall Area</td><td>4</td></tr><tr><td>Enc. Building EI -459<sup>W</sup> "A" ESF Room</td><td>5</td></tr></table>	Room/Area	Mode	Aux. Building EI -59 <sup>W</sup> West Area	3	Aux. Building EI -59 <sup>E</sup> East Near SFP Cooling	Aux. Building EI 149 <sup>W</sup> B51 & B61 Enclosures	Aux. Building EI 149 <sup>E</sup> Boric Acid Batching Tank	Aux. Building EI -259 <sup>W</sup> RB Hx Area	3, 5	Enc. Building EI -59 <sup>E</sup> East Pipe Penetration	Aux. Building EI 149 <sup>W</sup> By B61	3, 4	Enc. Building EI -459 <sup>W</sup> "A" & "B" ESF Rooms	Aux. Building EI -459 <sup>E</sup> General Area	3, 5	Enc. Building EI -59 <sup>E</sup> West Pipe Penetration	Aux. Building EI -59 <sup>E</sup> VCT Block Wall Area	4	Enc. Building EI -459 <sup>W</sup> "A" ESF Room	5	HS6 Inability to control a key safety function from outside the Control Room  HS6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> An event has resulted in plant control being transferred from the Control Room to the Hot Shutdown Panel (C-21) or Fire Shutdown Panel (C-10) AND Control of any of the following key safety functions is not re-established within 15 min. of the last licensed operator leaving the Control Room (Note 1): • Reactivity (modes 1, 2 and 3 only) • Core cooling • RCS heat removal	1	2	3	4	5	6	DEF	HA6 Control Room evacuation resulting in transfer of plant control to alternate locations  HA6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> An event has resulted in plant control being transferred from the Control Room to the Hot Shutdown Panel (C-21) or Fire Shutdown Panel (C-10)	1	2	3	4	5	6	DEF	HU4 FIRE potentially degrading the level of safety of the plant  HU4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A FIRE is not extinguished within 15 min. of any of the following fire detection indications (Note 1): • 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 AND The FIRE is located in any Table H-1 area  HU4.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Receipt of a single fire alarm (i.e., no other indications of a FIRE) AND The fire alarm is indicating a FIRE within any Table H-1 area (excluding Containment Building) AND The existence of a FIRE is not verified within 30 min. of alarm receipt (Notes 1, 14)  HU4.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A FIRE within the PROTECTED AREA not extinguished within 60 min. of the initial report, alarm or indication (Note 1)  HU4.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A FIRE within the PROTECTED AREA that requires an offsite fire department to assist with extinguishment	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF																																												
Room/Area	Mode																																																																																																													
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1	2	3	4	5	6	DEF																																																																																																								
1	2	3	4	5	6	DEF																																																																																																								
5 Hazardous Gases	None	None	None	None	None																																																																																																									
6 Control Room Evacuation	None	None	None	None	None																																																																																																									
7 DSE/O/ADTS Judgment	HG7 Other conditions exist which in the judgment of the DSE/O/ADTS warrant declaration of a General Emergency  HG7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which in the judgment of the DSE/O/ADTS indicate that events are in progress or have occurred which involve actual or IMMINENT 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 offsite for more than the immediate site area.	1	2	3	4	5	6	DEF	HS7 Other conditions existing that in the judgment of the DSE/O/ADTS warrant declaration of a Site Area Emergency  HS7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which in the judgment of the DSE/O/ADTS 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.	1	2	3	4	5	6	DEF	HA7 Other conditions exist which, in the judgment of the DSE/O/ADTS, 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 HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	HU7 Other conditions existing that in the judgment of the DSE/O warrant declaration of an Unusual Event  HU7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which, in the judgment of the DSE/O, 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.	1	2	3	4	5	6	DEF																																																																																					
1	2	3	4	5	6	DEF																																																																																																								
1	2	3	4	5	6	DEF																																																																																																								
1	2	3	4	5	6	DEF																																																																																																								
E ISFSI	1 Containment Boundary	None	None	None	None																																																																																																									
	2 Fission Product Barrier Degradation	FG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Loss of any two barriers AND Loss or potential loss of the third barrier (Table F-1)	1	2	3	4	5	6	DEF	FS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Loss or potential loss of any two barriers (Table F-1)	1	2	3	4	5	6	DEF	FA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Any loss or any potential loss of EITHER Fuel Clad or RCS (Table F-1)	1	2	3	4	5	6	DEF	None																																																																																				
1	2	3	4	5	6	DEF																																																																																																								
1	2	3	4	5	6	DEF																																																																																																								
1	2	3	4	5	6	DEF																																																																																																								

Modes: 

1	2	3	4	5	6	DEF
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Power Operation Startup Hot Standby Hot Shutdown Cold Shutdown Refueling Defueled



Millstone Power Station Unit 2  
Emergency Action Level Matrix  
Revision F

MPS UNIT 2		GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT																																															
M System Malfunc.	1 Loss of Emergency AC Power	MG1 Prolonged loss of all offsite and all onsite AC power to emergency buses  MG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Loss of all offsite and all onsite AC power to 4.16 kV emergency buses 24C and 24D <b>AND</b> CET's > 1200°F	1	2	3	4					MS1 Loss of all offsite power and all onsite AC power to emergency buses for 15 minutes or longer  MS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Loss of all offsite and all onsite AC power to 4.16 kV emergency buses 24C and 24D for ≥ 15 min. (Note 1) <b>AND</b> Indicated voltage is < 105 VDC on both vital 125 VDC buses 201A <b>AND</b> 201B for ≥ 15 min. (Note 1)	1	2	3	4					MA1 Loss of all but one AC power source to emergency buses for 15 minutes or longer  MA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> AC power capability, Table M-1, to 4.16 kV emergency buses 24C and 24D reduced to a single power source for ≥ 15 min. (Note 1) <b>AND</b> Any additional single power source failure will result in loss of all AC power to SAFETY SYSTEMS	1	2	3	4					MU1 Loss of all offsite AC power capability to emergency buses for 15 minutes or longer  MU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Loss of all offsite AC power capability, Table M-1, to 4.16 kV emergency buses 24C and 24D for ≥ 15 min. (Note 1)	1	2	3	4																			
	1	2	3	4																																																
	1	2	3	4																																																
	1	2	3	4																																																
	1	2	3	4																																																
2 Loss of Vital DC Power	MG2 Loss of all emergency AC and vital DC power sources for 15 minutes or longer  MG2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Loss of all offsite and all onsite AC power to 4.16 kV emergency buses 24C and 24D for ≥ 15 min. (Note 1) <b>AND</b> Indicated voltage is < 105 VDC on both vital 125 VDC buses 201A <b>AND</b> 201B for ≥ 15 min. (Note 1)	1	2	3	4					MS2 Loss of all vital DC power for 15 minutes or longer  MS2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Indicated voltage is < 105 VDC on both vital 125 VDC buses 201A <b>AND</b> 201B for ≥ 15 min. (Note 1)	1	2	3	4					None	None																																
1	2	3	4																																																	
1	2	3	4																																																	
3 Loss of CR Indications	<div>Table M-1 AC Power Supplies</div> <div>Offsite:<ul style="list-style-type: none"><li>Unit 2 Reserve Station Service Transformer (RSST)</li><li>Unit 2 Normal Station Service Transformer (NSST)</li><li>Unit 3 Normal Station Service Transformer (NSST) via Buses 34A/B to Unit 2 emergency bus 24E (if already aligned)</li><li>Unit 3 Reserve Station Service Transformer (RSST) via Buses 34A/B to Unit 2 emergency bus 24E (if already aligned)</li></ul>Onsite:<ul style="list-style-type: none"><li>Diesel Generator 15G-12U</li><li>Diesel Generator 15G-13U</li><li>SBO Diesel Generator (if already aligned)</li></ul></div>	None	MA3 UNPLANNED loss of Control Room Indications for 15 minutes or longer with a significant transient in progress  MA3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> An UNPLANNED event results in the inability to monitor one or more Table M-2 parameters from within the Control Room for ≥ 15 min. (Note 1) <b>AND</b> Any significant transient is in progress, Table M-3	1	2	3	4					MU3 UNPLANNED loss of Control Room indications for 15 minutes or longer  MU3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> An UNPLANNED event results in the inability to monitor one or more Table M-2 parameters from within the Control Room for ≥ 15 min. (Note 1)	1	2	3	4																																				
1	2	3	4																																																	
1	2	3	4																																																	
4 RCS Activity	<div>Table M-2 Safety System Parameters</div> <ul style="list-style-type: none"><li>Reactor power</li><li>RCS level</li><li>RCS pressure</li><li>CET temperature</li><li>Level in at least one SG</li><li>Auxiliary feedwater flow to at least one SG</li></ul>	None	None	MU4 Reactor coolant activity greater than Technical Specification allowable limits  MU4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Dose rate at 1 ft. from an unpressurized RCS sample ≥ Table M-4  MU4.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Sample analysis indicates that a reactor coolant activity value is ≥ an allowable limit specified in Technical Specification 3.4.8	1	2	3	4					1	2	3	4																																				
1	2	3	4																																																	
1	2	3	4																																																	
5 RCS Leakage	<div>Table M-3 Significant Transients</div> <ul style="list-style-type: none"><li>Electrical load rejection &gt; 25% full electrical load</li><li>Reactor Trip</li><li>SIAS Actuation</li></ul>	None	None	MU5 RCS leakage for 15 minutes or longer  MU5.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> RCS unidentified or pressure boundary leakage > 10 gpm for ≥ 15 min. <b>OR</b> RCS identified leakage > 25 gpm for ≥ 15 min. <b>OR</b> Leakage from the RCS to a location outside containment > 25 gpm for ≥ 15 min. (Note 1)	1	2	3	4																																												
1	2	3	4																																																	
6 RPS Failure	<div>Table M-4 Tech. Spec. Coolant Activity Dose Rates</div> <table><tr><th>Time &gt; Shutdown (hrs)</th><th>mR/hr/ml</th></tr><tr><td>≤ 2</td><td>0.7</td></tr><tr><td>&gt; 2 – ≤ 8</td><td>0.5</td></tr><tr><td>&gt; 8</td><td>0.3</td></tr></table>  None	Time > Shutdown (hrs)	mR/hr/ml	≤ 2	0.7	> 2 – ≤ 8	0.5	> 8	0.3	MS6 Inability to shut down the reactor causing a challenge to core cooling or RCS heat removal  MS6.1 <table><tr><td>1</td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> An automatic or manual trip did not shut down the reactor as indicated by reactivity control Safety Function Status Check acceptance criteria not met <b>AND</b> All actions taken to shut down the reactor are not successful as indicated by reactivity control Safety Function Status Check acceptance criteria not met <b>AND EITHER:</b> <ul style="list-style-type: none"><li>CET's &gt; 1200°F</li><li>Applicable RCS and Core Heat Removal (HR) Safety Function Status Check acceptance criteria not met</li></ul>	1	2							MA6 Automatic or manual trip fails to shut down the reactor and subsequent manual actions taken at the reactor control consoles are not successful in shutting down the reactor  MA6.1 <table><tr><td>1</td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> An automatic or manual trip (RX TRIP TCBS BUTTONS <b>OR</b> MG Set Output Breakers (B0505 and B0608)) did not shut down the reactor as indicated by reactivity control Safety Function Status Check acceptance criteria not met <b>AND</b> Subsequent automatic or manual trip actions (RX TRIP TCBS BUTTONS <b>AND</b> MG Set Output Breakers (B0505 and B0608)) are not successful in shutting down the reactor as indicated by reactivity control Safety Function Status Check acceptance criteria not met (Note 8)	1	2							MU6 Automatic or manual trip fails to shut down the reactor  MU6.1 <table><tr><td>1</td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> An automatic trip did not shut down the reactor as indicated by reactivity control Safety Function Status Check acceptance criteria not met after any RPS setpoint is exceeded <b>AND</b> A subsequent automatic trip or <b>EITHER</b> manual trip (RX TRIP TCBS BUTTONS <b>OR</b> MG Set Output Breakers (B0505 and B0608)) are successful in shutting down the reactor as indicated by reactivity control Safety Function Status Check acceptance criteria met (Note 8)	1	2																						
Time > Shutdown (hrs)	mR/hr/ml																																																			
≤ 2	0.7																																																			
> 2 – ≤ 8	0.5																																																			
> 8	0.3																																																			
1	2																																																			
1	2																																																			
1	2																																																			
7 Loss of Commun.	<div>Table M-5 Communications Methods</div> <table><tr><th></th><th>Onsite</th><th>State/Local</th><th>NRC</th></tr><tr><td>ENRS / ARCOS</td><td></td><td>X</td><td></td></tr><tr><td>Station Radio System</td><td>X</td><td>X</td><td></td></tr><tr><td>Plant Phone System</td><td>X</td><td>X</td><td></td></tr><tr><td>Public Address System</td><td>X</td><td></td><td></td></tr><tr><td>Galectronics/Maintenance Jacks</td><td>X</td><td></td><td></td></tr><tr><td>Federal Telephone System (ENS)</td><td></td><td></td><td>X</td></tr><tr><td>Commercial Telephone System</td><td></td><td>X</td><td>X</td></tr><tr><td>Satellite Phones</td><td></td><td>X</td><td>X</td></tr><tr><td>Dedicated Hotlines</td><td></td><td>X</td><td></td></tr></table>  None		Onsite	State/Local	NRC	ENRS / ARCOS		X		Station Radio System	X	X		Plant Phone System	X	X		Public Address System	X			Galectronics/Maintenance Jacks	X			Federal Telephone System (ENS)			X	Commercial Telephone System		X	X	Satellite Phones		X	X	Dedicated Hotlines		X		None	None	MU7 Loss of all onsite or offsite communications capabilities  MU7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Loss of all Table M-5 onsite communication methods <b>OR</b> Loss of all Table M-5 State and local agency communication methods <b>OR</b> Loss of all Table M-5 NRC communication methods	1	2	3	4				
	Onsite	State/Local	NRC																																																	
ENRS / ARCOS		X																																																		
Station Radio System	X	X																																																		
Plant Phone System	X	X																																																		
Public Address System	X																																																			
Galectronics/Maintenance Jacks	X																																																			
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Satellite Phones		X	X																																																	
Dedicated Hotlines		X																																																		
1	2	3	4																																																	
8 CTMT Failure	None	None	None	None	MU8 Failure to isolate containment or loss of containment pressure control  MU8.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Any penetration is not closed within 15 min. of a VALID CIAS actuation signal <b>OR</b> CTMT pressure > 10 psig with < one full train of containment heat removal systems (Note 11) operating per design for ≥ 15 min. (Note 1)	1	2	3	4																																											
1	2	3	4																																																	
9 Hazardous Event Affecting Safety Systems	<div>Table M-6 Hazardous Events</div> <ul style="list-style-type: none"><li>Seismic event (earthquake)</li><li>Internal or external FLOODING event</li><li>High winds or tornado strike</li><li>FIRE</li><li>EXPLOSION</li><li>Other events with similar hazard characteristics as determined by the DSE/OADTS</li></ul>	None	None	MA9 Hazardous event affecting SAFETY SYSTEMS needed for the current operating mode  MA9.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> The occurrence of any Table M-6 hazardous event <b>AND</b> Event damage has caused indications of degraded performance to the second train of the SAFETY SYSTEM needed for the current operating mode <b>AND EITHER:</b> <ul style="list-style-type: none"><li>Event damage has caused indications of degraded performance to the second train of the SAFETY SYSTEM needed for the current operating mode</li><li>Event damage has resulted in VISIBLE DAMAGE to the second train of the SAFETY SYSTEM needed for the current operating mode</li></ul> (Notes 9, 10)	1	2	3	4					None																																							
1	2	3	4																																																	
F Fission Product Barrier Degradation	FG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Loss of any two barriers <b>AND</b> Loss or potential loss of the third barrier (Table F-1)	1	2	3	4					FS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Loss or potential loss of any two barriers (Table F-1)	1	2	3	4					FA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td></td><td></td><td></td><td></td></tr></table> Any loss or any potential loss of <b>EITHER</b> Fuel Clad or RCS (Table F-1)	1	2	3	4					None																								
1	2	3	4																																																	
1	2	3	4																																																	
1	2	3	4																																																	

Table F-1 Fission Product Barrier Threshold Matrix																													
	Fuel Clad (FC) Barrier		Reactor Coolant System (RCS) Barrier		Containment (CTMT) Barrier																								
FPB Category	Loss	Potential Loss	Loss	Potential Loss	Loss	Potential Loss																							
A RCS or SG Tube Leakage	None	1. RVLMS reading 0% (#8) (Note 12)	1. An automatic or manual SIAS actuation required by <b>EITHER</b> : <ul style="list-style-type: none"><li>UNISOLABLE RCS leakage</li><li>SG tube RUPTURE</li></ul>	1. UNISOLABLE RCS or SG tube leakage > 50 gpm excluding normal reductions in RCS inventory (e.g. letdown, RCP seal leakage)  2. Uncontrolled RCS cooldown > 100°F/hr and RCS pressure and temperature are to the left of the 200°F Subcooling (PTS) Curve (EOP Figure 1)  3. Applicable RCS and Core Heat Removal (HR) Safety Function Status Check acceptance criteria not met	1. A leaking or RUPTURED SG is FAULTED outside of CTMT  None	None																							
B Inadequate Heat Removal	1. CET's > 1200°F	2. CET's > 700°F  3. Applicable RCS and Core Heat Removal (HR) Safety Function Status Check acceptance criteria not met	None	None	None	1. CET's > 1200°F <b>AND</b> Restoration procedures not effective within 15 min. (Note 1)																							
C CTMT Radiation / RCS Activity	2. CTMT high range radiation monitor RE-8240/B241 reading > Table F-2 column Fuel Clad Loss  3. Coolant activity > 300 µCi/gm dose equivalent l-131  4. Dose rate at 1 ft. from an unpressurized RCS sample ≥ Table F-3  5. Sample line dose rate ≥ Table F-4  6. Core damage estimate > 5% clad damage	None	2. CTMT high range radiation monitor RE-8240/B241 reading > Table F-2 column RCS Loss  <div>Table F-2 CTMT High Range Radiation Monitor Barrier Thresholds RE-8240/B241</div> <table><tr><th>Time &gt; Shutdown (hrs)</th><th>Fuel Clad Loss (R/hr)</th><th>RCS Loss (R/hr)</th><th>CTMT Potential Loss (R/hr)</th></tr><tr><td>≤ 2</td><td>65</td><td>5</td><td>260</td></tr><tr><td>&gt; 2 – ≤ 4</td><td>45</td><td>5</td><td>180</td></tr><tr><td>&gt; 4 – ≤ 8</td><td>25</td><td>5</td><td>100</td></tr><tr><td>&gt; 8 – ≤ 14</td><td>10</td><td>5</td><td>40</td></tr><tr><td>&gt; 14</td><td>6</td><td>5</td><td>24</td></tr></table>	Time > Shutdown (hrs)	Fuel Clad Loss (R/hr)	RCS Loss (R/hr)	CTMT Potential Loss (R/hr)	≤ 2	65	5	260	> 2 – ≤ 4	45	5	180	> 4 – ≤ 8	25	5	100	> 8 – ≤ 14	10	5	40	> 14	6	5	24	None	2. CTMT high range radiation monitor RE-8240/B241 reading > Table F-2 column CTMT Potential Loss  None
Time > Shutdown (hrs)	Fuel Clad Loss (R/hr)	RCS Loss (R/hr)	CTMT Potential Loss (R/hr)																										
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> 14	6	5	24																										
D CTMT Integrity or Bypass	<div>Table F-3 FC Loss Coolant Activity Dose Rates</div> <table><tr><th>Time &gt; Shutdown (hrs)</th><th>mR/hr/ml</th></tr><tr><td>≤ 2</td><td>15</td></tr><tr><td>&gt; 2 – ≤ 8</td><td>8</td></tr><tr><td>&gt; 8</td><td>3</td></tr></table>	Time > Shutdown (hrs)	mR/hr/ml	≤ 2	15	> 2 – ≤ 8	8	> 8	3	<div>Table F-4 FC Loss RCS Sample Line Dose Rates</div> <table><tr><th>Time &gt; Shutdown (hrs)</th><th>R/hr</th></tr><tr><td>≤ 2</td><td>4</td></tr><tr><td>&gt; 2 – ≤ 8</td><td>2</td></tr><tr><td>&gt; 8</td><td>1</td></tr></table>	Time > Shutdown (hrs)	R/hr	≤ 2	4	> 2 – ≤ 8	2	> 8	1	2. CTMT isolation is required <b>AND EITHER:</b> <ul style="list-style-type: none"><li>CTMT integrity has been lost based on DSE/OADTS judgment</li><li>UNISOLABLE pathway from CTMT atmosphere to the environment exists</li></ul> 3. Indications of RCS leakage outside of CTMT	3. CTMT pressure > 54 psig  4. CTMT hydrogen concentration > 4%  5. CTMT pressure > 10 psig with < one full train of CTMT heat removal systems (Note 11) operating per design for ≥ 15 min. (Note 1)									
Time > Shutdown (hrs)	mR/hr/ml																												
≤ 2	15																												
> 2 – ≤ 8	8																												
> 8	3																												
Time > Shutdown (hrs)	R/hr																												
≤ 2	4																												
> 2 – ≤ 8	2																												
> 8	1																												
E DSE/OADTS Judgment	7. Any condition in the opinion of the DSE/OADTS that indicates loss of the Fuel Clad barrier	4. Any condition in the opinion of the DSE/OADTS that indicates potential loss of the Fuel Clad barrier	3. Any condition in the opinion of the DSE/OADTS that indicates loss of the RCS barrier	4. Any condition in the opinion of the DSE/OADTS that indicates potential loss of the RCS barrier	4. Any condition in the opinion of the DSE/OADTS that indicates loss of the CTMT barrier	6. Any condition in the opinion of the DSE/OADTS that indicates potential loss of the CTMT barrier																							

EAL MATRIX - HOT CONDITIONS  
(RCS > 200°F)



Millstone Power Station Unit 2  
Emergency Action Level Matrix  
Revision F

**ATTACHMENT 2B**

**MPS2 EAL MATRIX – Cold Conditions (RCS  $\leq$  200 °F)**

**Dominion Energy Nuclear Connecticut, Inc. (DENC)  
Millstone Power Station Unit 2 and ISFSI**



**ATTACHMENT 3**

**MPS3 EAL MATRICES (Hot and Cold)**

**Dominion Energy Nuclear Connecticut, Inc. (DENC)  
Millstone Power Station Unit 3 and ISFSI**

**ATTACHMENT 3A**

**MPS3 EAL MATRIX – Hot Conditions (RCS >200 °F)**

**Dominion Energy Nuclear Connecticut, Inc. (DENC)  
Millstone Power Station Unit 3**





**ATTACHMENT 3B**

**MPS3 EAL MATRIX – Cold Conditions (RCS  $\leq$  200 °F)**

**Dominion Energy Nuclear Connecticut, Inc. (DENC)  
Millstone Power Station Unit 3 and ISFSI**

MPS UNIT 3		GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT	MPS UNIT 3		GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT																																																																																																																																																	
R Abnormal Rad Levels/ Rad Effluent	1 Rad Effluent	RG1 Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE  RG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "GE" for ≥ 15 min. (Notes 1, 2, 3, 4)  RG1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 1,000 mrem TEDE at or beyond the SITE BOUNDARY (Note 4)  RG1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate closed window dose rates > 1000 mR/hr expected to continue for ≥ 60 min. at or beyond the SITE BOUNDARY (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RS1 Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE  RS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "SAE" for ≥ 15 min. (Notes 1, 2, 3, 4)  RS1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 100 mrem TEDE at or beyond the SITE BOUNDARY (Note 4)  RS1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate closed window dose rates > 100 mR/hr expected to continue for ≥ 60 min. at or beyond the SITE BOUNDARY (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RA1 Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE  RA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "ALERT" for ≥ 15 min. (Notes 1, 2, 3, 4)  RA1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 10 mrem TEDE at or beyond the SITE BOUNDARY (Note 4)  RA1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > 10 mrem TEDE at or beyond the SITE BOUNDARY for 60 min. of exposure (Notes 1, 2)  RA1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate closed window dose rates > 10 mR/hr expected to continue for ≥ 60 min. at or beyond the SITE BOUNDARY	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RU1a Release of liquid radioactivity greater than 2 times the allocated REMODCM limits for 60 minutes or longer  RU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on EITHER of the following radiation monitors > 2x the "alarm" setpoint for ≥ 60 min. (Notes 1, 2, 3) • 3SSR-RE08 SG Blowdown • 3DAS-RE50 Turbine Building Floor Drain  RU1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on EITHER of the following effluent radiation monitors > 2 x the "alarm" setpoint established by a current radioactivity discharge permit for ≥ 60 min.: • 3LWS-RE70 Liquid Waste Effluent • 3CND-RE07 Waste Neutralization Sump  RU1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Sample analysis for a liquid release indicates a concentration or release rate > 2 x the allocated REMODCM limits for ≥ 60 min. (Notes 1, 2)  RU1b Release of gaseous radioactivity resulting in offsite dose greater than 1 mrem TEDE  RU1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "UE" for ≥ 60 min. (Notes 1, 2, 3)  RU1.5 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Sample analysis for a gaseous release indicates a concentration or release rate > 2 x the allocated REMODCM limits for ≥ 60 min. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	CG1 Loss of RCS inventory affecting fuel clad integrity with containment challenged  CG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> RVLMS plenum level reading 19% (19% sensor) ≥ 30 min. (Notes 1, 12) AND Any Containment Challenge indication, Table C-2  CG1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> RCS level cannot be monitored for ≥ 30 min. (Note 1) AND Core uncover is indicated by any of the following: • UNPLANNED rise in any Table C-1 sump or tank level of sufficient magnitude to indicate core uncover • Visual observation of UNISOLABLE RCS leakage of sufficient magnitude to indicate core uncover • Any CTMT area radiation monitor reading > 3 R/hr (Refueling Mode) • Erratic source range monitor indications AND Any Containment Challenge indication, Table C-2	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	CS1 Loss of RCS inventory affecting core decay heat removal capability  CS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> RVLMS plenum level reading 19% (19% sensor) (Note 12) AND RCS level cannot be monitored for ≥ 30 min. 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(Note 1) AND EITHER: • UNPLANNED rise in any Table C-1 sump or tank level due to a loss of RCS inventory • Visual observation of UNISOLABLE RCS leakage	1	2	3	4	5	6	DEF	CU1 UNPLANNED loss of RCS inventory  CU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> UNPLANNED loss of reactor coolant results in RCS water level < a required lower limit for ≥ 15 min. (Note 1)  CU1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> RCS level cannot be monitored AND EITHER: • UNPLANNED loss of reactor coolant results in RCS water level < a required lower limit for ≥ 15 min. (Note 1) • Visual observation of UNISOLABLE RCS leakage	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF
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2 Irradiated Fuel Events	Spent fuel pool level cannot be restored to at least the top of the fuel racks for 60 minutes or longer  RG2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Spent fuel pool level cannot be restored to at least 1 ft. (Level 3) on 3SFC-LI55A or 3SFC-LI55B for ≥ 60 min. (Note 1)  <table><tr><th colspan="5">Table R-1 Unit 3 Effluent Monitor Classification Thresholds</th></tr><tr><th>Release Point &amp; Monitor</th><th>GE</th><th>SAE</th><th>Alert</th><th>UE</th></tr><tr><td>Ventilation Vent Normal/High Range (HVR10A/B)</td><td>5.9E+00 µCi/cc</td><td>5.9E-01 µCi/cc</td><td>5.9E-02 µCi/cc</td><td>5.9E-03 µCi/cc</td></tr><tr><td>Stack (SLCRS) Normal/High Range (HVR19A/B)</td><td>3.6E+02 µCi/cc</td><td>3.6E+01 µCi/cc</td><td>3.6E+00 µCi/cc</td><td>3.6E-01 µCi/cc</td></tr><tr><td>Main Steam Release (MSS75-78)</td><td>5.3E+01 µCi/cc</td><td>5.3E+00 µCi/cc</td><td>5.3E-01 µCi/cc</td><td>N/A</td></tr><tr><td>Aux FOWTR Pump Mntnr (MSS79)</td><td>1.6E+01 µCi/cc</td><td>1.6E+00 µCi/cc</td><td>1.6E-01 µCi/cc</td><td>N/A</td></tr></table>  None	1	2	3	4	5	6	DEF	Table R-1 Unit 3 Effluent Monitor Classification Thresholds					Release Point & Monitor	GE	SAE	Alert	UE	Ventilation Vent Normal/High Range (HVR10A/B)	5.9E+00 µCi/cc	5.9E-01 µCi/cc	5.9E-02 µCi/cc	5.9E-03 µCi/cc	Stack (SLCRS) Normal/High Range (HVR19A/B)	3.6E+02 µCi/cc	3.6E+01 µCi/cc	3.6E+00 µCi/cc	3.6E-01 µCi/cc	Main Steam Release (MSS75-78)	5.3E+01 µCi/cc	5.3E+00 µCi/cc	5.3E-01 µCi/cc	N/A	Aux FOWTR Pump Mntnr (MSS79)	1.6E+01 µCi/cc	1.6E+00 µCi/cc	1.6E-01 µCi/cc	N/A	RS2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to 1 ft. (Level 3) on 3SFC-LI55A or 3SFC-LI55B  <table><tr><th colspan="5">Table R-2 Safe Operation &amp; Shutdown Rooms/Areas</th></tr><tr><th>Room/Area</th><th>Mode</th><th></th><th></th><th></th></tr><tr><td>Aux. Building EI 43' Aux. Building EI 24' East MCC/RCA EI 24' West MCC/RCA EI 24' Aux. Building EI 38'</td><td>1, 2, 3 3, 4 3</td><td></td><td></td><td></td></tr><tr><td>Containment ESF Building A RHR Cubicle ESF Building B RHR Cubicle ESF Building EI 36' ESF Building EI 24' East Switchgear West Switchgear</td><td>4</td><td></td><td></td><td></td></tr></table>  None	1	2	3	4	5	6	DEF	Table R-2 Safe Operation & Shutdown Rooms/Areas					Room/Area	Mode				Aux. Building EI 43' Aux. Building EI 24' East MCC/RCA EI 24' West MCC/RCA EI 24' Aux. Building EI 38'	1, 2, 3 3, 4 3				Containment ESF Building A RHR Cubicle ESF Building B RHR Cubicle ESF Building EI 36' ESF Building EI 24' East Switchgear West Switchgear	4				RA2 Significant lowering of water level above, or damage to, irradiated fuel  RA2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> IMMINENT uncover of irradiated fuel in the REFUELING PATHWAY RA2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Damage to irradiated fuel resulting in a release of radioactivity AND VALID alarm on any of the following radiation monitors: • CMS22 CTMT G/A • RMS01 Manipulator Crane • RMS41/42 Fuel Drop • HVR17 Fuel Bldg • RMS08 SFP Bridge • RMS36 Fuel Pool  RA2.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to 10 ft. (Level 2) on 3SFC-LI55A or 3SFC-LI55B  RA3 Radiation levels that IMPEDE access to equipment necessary for normal plant operations, cooldown or shutdown  RA3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose rates > 15 mR/hr in EITHER of the following: • Control Room • Central Alarm Station  RA3.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> An UNPLANNED event results in radiation levels that prohibit or IMPEDE access to any Table R-2 room or area (Note 5)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RU2 UNPLANNED loss of water level above irradiated fuel  RU2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> UNPLANNED water level drop in the REFUELING PATHWAY as indicated by any of the following: • FUEL POOL LEVEL LO alarm MBIA 3-4 • FUEL POOL WATER LEVEL LO alarm FP 1-3 • Report of dropping level in refueling cavity or SFP AND UNPLANNED rise in corresponding area radiation levels as indicated by any of the following radiation monitors: • RMS01 Manipulator Crane • RMS41/42 Fuel Drop • RMS08 SFP Bridge • RMS36 Fuel Pool	1	2	3	4	5	6	DEF	None	None	None																																											
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3 Area Radiation Levels	None	None	None	None	None	None	None	None	None	None	None																																																																																																																																																	
H Hazards	1 Security	Aux. Building EI 43' Aux. Building EI 24' East MCC/RCA EI 24' West MCC/RCA EI 24' Aux. Building EI 38' Containment ESF Building A RHR Cubicle ESF Building B RHR Cubicle ESF Building EI 36' ESF Building EI 24' East Switchgear West Switchgear	HS1 HOSTILE ACTION within the PROTECTED AREA  HS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by MPS Security Shift Supervision	1	2	3	4	5	6	DEF	HA1 HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes  HA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by MPS Security Shift Supervision OR A validated notification from NRC of an aircraft attack threat within 30 min. of the site	1	2	3	4	5	6	DEF	HU1 Confirmed SECURITY CONDITION or threat  HU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by MPS Security Shift Supervision OR Notification of a credible security threat directed at the site OR A validated notification from the NRC providing information of an aircraft threat	1	2	3	4	5	6	DEF	2 Seismic Event	None	None	None	None																																																																																																																													
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3 Natural or Tech. Hazard	None	None	None	None	None	3 Natural or Tech. Hazard	None	None	None	None																																																																																																																																																		
4 Fire	Table H-1 MPS3 Fire Areas  • Containment Building • Auxiliary Building • Control Building • Emergency Generator Enclosure • ESF Building • Main Steam Valve Building • A & B Train Service Water Cubicles • North & South Cable Tunnels • Yard Areas • RWST • DWST	HS1 HOSTILE ACTION within the PROTECTED AREA  HS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by MPS Security Shift Supervision	1	2	3	4	5	6	DEF	HA1 HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes  HA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by MPS Security Shift Supervision OR A validated notification from NRC of an aircraft attack threat within 30 min. of the site	1	2	3	4	5	6	DEF	HU1 Confirmed SECURITY CONDITION or threat  HU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by MPS Security Shift Supervision OR Notification of a credible security threat directed at the site OR A validated notification from the NRC providing information of an aircraft threat	1	2	3	4	5	6	DEF	5 Hazardous Gases	Table H-2 Safe Operation & Shutdown Rooms/Areas  Room/Area Mode Aux. Building EI 43' 1, 2, 3 Aux. Building EI 24' 3, 4 East MCC/RCA EI 24' 3 West MCC/RCA EI 24' 3 Aux. Building EI 38' 3 Containment ESF Building A RHR Cubicle ESF Building B RHR Cubicle ESF Building EI 36' ESF Building EI 24' East Switchgear West Switchgear 4	HS1 HOSTILE ACTION within the PROTECTED AREA  HS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by MPS Security Shift Supervision	1	2	3	4	5	6	DEF	HA1 HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes  HA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by MPS Security Shift Supervision OR A validated notification from NRC of an aircraft attack threat within 30 min. of the site	1	2	3	4	5	6	DEF	HU1 Confirmed SECURITY CONDITION or threat  HU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by MPS Security Shift Supervision OR Notification of a credible security threat directed at the site OR A validated notification from the NRC providing information of an aircraft threat	1	2	3	4	5	6	DEF	6 Control Room Evacuation	None	None	None	None																																																																																																				
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7 DSEO/ ADTS Judgment	H7 Other conditions exist which in the judgment of the DSEO/ADTS warrant declaration of a General Emergency  HG7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which in the judgment of the DSEO/ADTS indicate that events are in progress or have occurred which involve actual or IMMINENT 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 offsite for more than the immediate site area.	1	2	3	4	5	6	DEF	HS7 Other conditions existing that in the judgment of the DSEO/ADTS warrant declaration of a Site Area Emergency  HS7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which in the judgment of the DSEO/ADTS 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.	1	2	3	4	5	6	DEF	HA7 Other conditions exist that in the judgment of the DSEO/ADTS warrant declaration of an Alert  HA7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which, in the judgment of the DSEO/ADTS, 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 HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	1	2	3	4	5	6	DEF	HU7 Other conditions existing that in the judgment of the DSEO warrant declaration of an Unusual Event  HU7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which, in the judgment of the DSEO, 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.	1	2	3	4	5	6	DEF																																																																																																																												
1	2	3	4	5	6	DEF																																																																																																																																																						
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E ISFSI	1 Confinement Boundary	None	None	None	None	1 Confinement Boundary	None	None	None	None	EU1 Damage to a loaded cask CONFINEMENT BOUNDARY  EU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading on the surface of a loaded spent fuel cask (HSM) > any of the following: • 1,700 mrem/hr on the HSM front bird screen • 400 mrem/hr on the outside HSM door • 12 mrem/hr on the HSM end shield wall	1	2	3	4	5	6	DEF																																																																																																																																										
1	2	3	4	5	6	DEF																																																																																																																																																						

Modes:	1 Power Operation	2 Startup	3 Hot Standby	4 Hot Shutdown	5 Cold Shutdown	6 Refueling	DEF Defueled	 MPS UNIT 3	Millstone Power Station Unit 3 Emergency Action Level Matrix Revision F	EAL MATRIX - COLD CONDITIONS (RCS ≤ 200°F)	 MPS UNIT 3	Millstone Power Station Unit 3 Emergency Action Level Matrix Revision F
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Modes:

1

2

3

4

5

6

DEF

Power Operation

Startup

Hot Standby

Hot Shutdown

Cold Shutdown

Refueling

Defueled



Millstone Power Station Unit 3  
Emergency Action Level Matrix  
Revision F

EAL MATRIX - COLD CONDITIONS  
(RCS ≤ 200°F)



Millstone Power Station Unit 3  
Emergency Action Level Matrix  
Revision F

**ATTACHMENT 4**

**NAPS EAL MATRICES (Hot and Cold)**

**Virginia Electric and Power Company  
(Dominion Energy Virginia)  
North Anna Power Station Units 1 and 2 and ISFSIs**

**ATTACHMENT 4A**

**NAPS EAL MATRIX – Hot Conditions (RCS >200 °F)**

**Virginia Electric and Power Company  
(Dominion Energy Virginia)  
North Anna Power Station Units 1 and 2**

Prepared for Dominion Energy by *Operations Support Services, Inc.* 12-17-18

## EAL MATRIX - HOT CONDITIONS (RCS > 200°F)

**ATTACHMENT 4B**

**NAPS EAL MATRIX – Cold Conditions (RCS  $\leq$  200 °F)**

**Virginia Electric and Power Company  
(Dominion Energy Virginia)  
North Anna Power Station Units 1 and 2 and ISFSIs**

NAPS		GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT	NAPS		GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT																																																																																												
R	1 Rad Effluent	RG1 Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem adult thyroid CDE  RG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "GE" for ≥ 15 min. (Notes 1, 2, 3, 4)  RG1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 1,000 mrem TEDE or 500 mrem adult thyroid CDE at or beyond the SITE BOUNDARY (Note 4)  RG1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 1,000 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate adult thyroid CDE > 5,000 mrem for 60 min. of inhalation. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RS1 Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem adult thyroid CDE  RS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "SAE" for ≥ 15 min. (Notes 1, 2, 3, 4)  RS1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 100 mrem TEDE or 500 mrem adult thyroid CDE at or beyond the SITE BOUNDARY (Note 4)  RS1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 100 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate adult thyroid CDE > 500 mrem for 60 min. of inhalation. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RA1 Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem adult thyroid CDE  RA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "ALERT" for ≥ 15 min. (Notes 1, 2, 3, 4)  RA1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 10 mrem TEDE or 50 mrem adult thyroid CDE at or beyond the SITE BOUNDARY (Note 4)  RA1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > 10 mrem TEDE or 50 mrem adult thyroid CDE at or beyond the SITE BOUNDARY for 60 min. of exposure (Notes 1, 2)  RA1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 10 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate adult thyroid CDE > 50 mrem for 60 min. of inhalation. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RU1a Release of liquid radioactivity greater than 2 times the allocated ODCM limits for 60 minutes or longer  RU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on SIW-RM-130(230) CW Discharge Tunnel radiation monitor > 2 x the "H-H" setpoint for ≥ 60 min. (Notes 1, 2, 3)  RU1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Sample analysis for a liquid release indicates a concentration or release rate > 2 x the allocated ODCM limits for ≥ 60 min. (Notes 1, 2)  RU1b Release of gaseous radioactivity resulting in offsite dose greater than 1 mrem TEDE  RU1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "NOUE" for ≥ 60 min. (Notes 1, 2, 3)  RU1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Sample analysis for a gaseous release indicates a concentration or release rate > 2 x the allocated ODCM limits for ≥ 60 min. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF
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1	2	3	4	5	6	DEF																																																																																																	
2 Irradiated Fuel Events	RG2 Spent fuel pool level cannot be restored to at least the top of the fuel racks for 60 minutes or longer  RG2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Spent fuel pool level cannot be restored to at least 1 ft. (Level 3) on 1-FC-LI-105-1, 2 or 2A Spent Fuel Pit Wide Range Level for ≥ 60 min. (Note 1)  <table><tr><th colspan="5">Table R-1 Gaseous Effluent Monitor Classification Thresholds</th></tr><tr><th>Release Point &amp; Monitor</th><th>GE</th><th>SAE</th><th>Alert</th><th>NOUE</th></tr><tr><td><b>Vent Stack A</b> VG-RI-179-1 or 2</td><td>2.6E+08 µCi/sec</td><td>2.6E+07 µCi/sec</td><td>2.6E+06 µCi/sec</td><td>2.6E+05 µCi/sec</td></tr><tr><td><b>Vent Stack B</b> VG-RI-180-1 or 2</td><td>2.0E+08 µCi/sec</td><td>2.0E+07 µCi/sec</td><td>2.0E+06 µCi/sec</td><td>2.0E+05 µCi/sec</td></tr><tr><td><b>Process Vent</b> GW-RI-178-1 or 2</td><td>3.5E+08 µCi/sec</td><td>3.5E+07 µCi/sec</td><td>3.5E+06 µCi/sec</td><td>3.5E+05 µCi/sec</td></tr><tr><td><b>Main Steam Line</b> MS-RI-170 (270) MS-RI-171 (271) MS-RI-172 (272)</td><td>1.3E+03 mR/hr</td><td>1.3E+02 mR/hr</td><td>1.3E+01 mR/hr</td><td>N/A</td></tr><tr><td><b>TD AFW Pump EXH</b> MS-RI-178 (276)</td><td>6.0E+01 mR/hr</td><td>6.0E+00 mR/hr</td><td>6.0E-01 mR/hr</td><td>N/A</td></tr></table> <table><tr><th colspan="2">Table R-2 Safe Operation &amp; Shutdown Rooms/Areas</th></tr><tr><th>Room/Area</th><th>Mode</th></tr><tr><td>Auxiliary Building EI 274*</td><td>1, 2, 3, 4</td></tr><tr><td>Instrument Rack Rooms Cable Vault &amp; Tunnels</td><td>4</td></tr></table>	1	2	3	4	5	6	DEF	Table R-1 Gaseous Effluent Monitor Classification Thresholds					Release Point & Monitor	GE	SAE	Alert	NOUE	<b>Vent Stack A</b> VG-RI-179-1 or 2	2.6E+08 µCi/sec	2.6E+07 µCi/sec	2.6E+06 µCi/sec	2.6E+05 µCi/sec	<b>Vent Stack B</b> VG-RI-180-1 or 2	2.0E+08 µCi/sec	2.0E+07 µCi/sec	2.0E+06 µCi/sec	2.0E+05 µCi/sec	<b>Process Vent</b> GW-RI-178-1 or 2	3.5E+08 µCi/sec	3.5E+07 µCi/sec	3.5E+06 µCi/sec	3.5E+05 µCi/sec	<b>Main Steam Line</b> MS-RI-170 (270) MS-RI-171 (271) MS-RI-172 (272)	1.3E+03 mR/hr	1.3E+02 mR/hr	1.3E+01 mR/hr	N/A	<b>TD AFW Pump EXH</b> MS-RI-178 (276)	6.0E+01 mR/hr	6.0E+00 mR/hr	6.0E-01 mR/hr	N/A	Table R-2 Safe Operation & Shutdown Rooms/Areas		Room/Area	Mode	Auxiliary Building EI 274*	1, 2, 3, 4	Instrument Rack Rooms Cable Vault & Tunnels	4	RS2 Spent fuel pool level at the top of the fuel racks  RS2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to 1 ft. (Level 3) on 1-FC-LI-105-1, 2 or 2A Spent Fuel Pit Wide Range Level for ≥ 60 min. (Note 1)  RA2 Significant lowering of water level above, or damage to, irradiated fuel  RA2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> IMMINENT uncovers of irradiated fuel in the REFUELING PATHWAY RA2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Damage to irradiated fuel resulting in a release of radioactivity AND • VALID HI-HI alarm on any of the following radiation monitors: – RM-RMS-152 New Fuel Storage Areas – RM-RMS-153 Fuel Pit Bridge – RM-RMS-162 (262) Manipulator Crane Area (Refueling Mode) – RM-RMS-163 (263) Reactor Containment Area – RM-RMS-159 (259) Containment Particulate – RM-RMS-160 (260) Containment Area Gas • VALID high alarm on VG-RI-180-1 Vent Stack B Normal Range RA2.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to 10 ft. (Level 2) on 1-FC-LI-105-1, 2 or 2A Spent Fuel Pit Wide Range Level  RA3 Radiation levels that IMPEDE access to equipment necessary for normal plant operations, cooldown or shutdown  RA3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose rates > 15 mR/hr in <b>EITHER</b> of the following: • Control Room • Central Alarm Station (by survey) RA3.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> An UNPLANNED event results in radiation levels that prohibit or IMPEDE access to any Table R-2 room or area (Note 5)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RU2 UNPLANNED loss of water level above irradiated fuel  RU2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> UNPLANNED water level drop in the REFUELING PATHWAY as indicated by any of the following: • Spent Fuel Pit Lo Level (IE-C8) alarm • Report of dropping level in refueling cavity or SFP • Loss of SFP Cooling suction flow AND UNPLANNED rise in corresponding area radiation levels as indicated by any of the following radiation monitors: • RM-RMS-152 New Fuel Storage Area • RM-RMS-153 Fuel Pit Bridge • RM-RMS-162 (262) Manipulator Crane Area (Refueling Mode) • RM-RMS-163 (263) Reactor Containment Area	1	2	3	4	5	6	DEF	
1	2	3	4	5	6	DEF																																																																																																	
Table R-1 Gaseous Effluent Monitor Classification Thresholds																																																																																																							
Release Point & Monitor	GE	SAE	Alert	NOUE																																																																																																			
<b>Vent Stack A</b> VG-RI-179-1 or 2	2.6E+08 µCi/sec	2.6E+07 µCi/sec	2.6E+06 µCi/sec	2.6E+05 µCi/sec																																																																																																			
<b>Vent Stack B</b> VG-RI-180-1 or 2	2.0E+08 µCi/sec	2.0E+07 µCi/sec	2.0E+06 µCi/sec	2.0E+05 µCi/sec																																																																																																			
<b>Process Vent</b> GW-RI-178-1 or 2	3.5E+08 µCi/sec	3.5E+07 µCi/sec	3.5E+06 µCi/sec	3.5E+05 µCi/sec																																																																																																			
<b>Main Steam Line</b> MS-RI-170 (270) MS-RI-171 (271) MS-RI-172 (272)	1.3E+03 mR/hr	1.3E+02 mR/hr	1.3E+01 mR/hr	N/A																																																																																																			
<b>TD AFW Pump EXH</b> MS-RI-178 (276)	6.0E+01 mR/hr	6.0E+00 mR/hr	6.0E-01 mR/hr	N/A																																																																																																			
Table R-2 Safe Operation & Shutdown Rooms/Areas																																																																																																							
Room/Area	Mode																																																																																																						
Auxiliary Building EI 274*	1, 2, 3, 4																																																																																																						
Instrument Rack Rooms Cable Vault & Tunnels	4																																																																																																						
1	2	3	4	5	6	DEF																																																																																																	
1	2	3	4	5	6	DEF																																																																																																	
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1	2	3	4	5	6	DEF																																																																																																	
1	2	3	4	5	6	DEF																																																																																																	
3 Area Radiation Levels	None	None	None	None	None	None	None	None	None	None	None																																																																																												
	None	None	None	None	None	None	None	None	None	None	None																																																																																												
H	1 Security	None	None	None	None	None	None	None	None	None	None																																																																																												
		None	None	None	None	None	None	None	None	None	None																																																																																												
	2 Seismic Event	None	None	None	None	None	None	None	None	None	None																																																																																												
	3 Natural or Tech. Hazard	None	None	None	None	None	None	None	None	None	None																																																																																												
E	5 Hazardous Gases	<table><tr><th colspan="2">Table H-1 NAPS Fire Areas</th></tr><tr><th>Room/Area</th><th>Mode</th></tr><tr><td>• Cable Vaults &amp; Tunnels • Emergency Switchgear Rooms • Emergency Diesel Generator Rooms • Reactor Containment • Quench Spray Pump Houses • Safeguards Area • Main Steam Valve House • Cable Spreading Rooms • Control Room • CR Chiller Rooms • Auxiliary / Fuel / Decontamination Buildings • Fuel Oil Pump House Room A or B • Service Water Pump House and Valve House • Intake Structure Control House • Auxiliary Feedwater Pump House • Turbine Building</td><td>1, 2, 3, 4  4</td></tr></table>	Table H-1 NAPS Fire Areas		Room/Area	Mode	• Cable Vaults & Tunnels • Emergency Switchgear Rooms • Emergency Diesel Generator Rooms • Reactor Containment • Quench Spray Pump Houses • Safeguards Area • Main Steam Valve House • Cable Spreading Rooms • Control Room • CR Chiller Rooms • Auxiliary / Fuel / Decontamination Buildings • Fuel Oil Pump House Room A or B • Service Water Pump House and Valve House • Intake Structure Control House • Auxiliary Feedwater Pump House • Turbine Building	1, 2, 3, 4  4	HA5 Gaseous release IMPEDEING access to equipment necessary for normal plant operations, cooldown or shutdown  HA5.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Release of a toxic, corrosive, asphyxiant or flammable gas into any Table H-2 room or area AND Entry into the room or area is prohibited or IMPEDED (Note 5)	1	2	3	4	5	6	DEF	None	None	None	None	None	None	None	None	None																																																																														
		Table H-1 NAPS Fire Areas																																																																																																					
	Room/Area	Mode																																																																																																					
	• Cable Vaults & Tunnels • Emergency Switchgear Rooms • Emergency Diesel Generator Rooms • Reactor Containment • Quench Spray Pump Houses • Safeguards Area • Main Steam Valve House • Cable Spreading Rooms • Control Room • CR Chiller Rooms • Auxiliary / Fuel / Decontamination Buildings • Fuel Oil Pump House Room A or B • Service Water Pump House and Valve House • Intake Structure Control House • Auxiliary Feedwater Pump House • Turbine Building	1, 2, 3, 4  4																																																																																																					
1	2	3	4	5	6	DEF																																																																																																	
6 Control Room Evacuation	None	None	None	None	None	None	None	None	None	None	None																																																																																												
	None	None	None	None	None	None	None	None	None	None	None																																																																																												
7 SEM Judgment	HG7 Other conditions exist which in the judgment of the SEM warrant declaration of a General Emergency  HG7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which in the judgment of the SEM indicate that events are in progress or have occurred which involve actual or IMMINENT 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 offsite for more than the immediate site area.	1	2	3	4	5	6	DEF	HS7 Other conditions existing that in the judgment of the SEM warrant declaration of a Site Area Emergency  HS7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions existing that in the judgment of the SEM 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.	1	2	3	4	5	6	DEF	HA7 Other conditions exist that in the judgment of the SEM warrant declaration of an Alert  HA7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which, in the judgment of the SEM, 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 HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	1	2	3	4	5	6	DEF	HU7 Other conditions existing that in the judgment of the SEM warrant declaration of a NOUE  HU7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which, in the judgment of the SEM, 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.	1	2	3	4	5	6	DEF																																																																							
1	2	3	4	5	6	DEF																																																																																																	
1	2	3	4	5	6	DEF																																																																																																	
1	2	3	4	5	6	DEF																																																																																																	
1	2	3	4	5	6	DEF																																																																																																	
1 ISFSI	<table><tr><th colspan="3">Table E-1 ISFSI Cask Surface Dose Rate Limits</th></tr><tr><th>TN-32</th><th>TN-32B HBU</th><th>HSM-H</th></tr><tr><td>• 116 mrem/hr (neutron + gamma) average on top of the cask • 436 mrem/hr (neutron + gamma) average on the side of the cask</td><td>• 192 mrem/hr (neutron + gamma) average on top of the cask • 436 mrem/hr (neutron + gamma) average on the side of the cask</td><td>• 1,600 mrem/hr at the front bird screen • 4 mrem/hr at the door centerline • 4 mrem/hr at the end shield wall exterior</td></tr></table>	Table E-1 ISFSI Cask Surface Dose Rate Limits			TN-32	TN-32B HBU	HSM-H	• 116 mrem/hr (neutron + gamma) average on top of the cask • 436 mrem/hr (neutron + gamma) average on the side of the cask	• 192 mrem/hr (neutron + gamma) average on top of the cask • 436 mrem/hr (neutron + gamma) average on the side of the cask	• 1,600 mrem/hr at the front bird screen • 4 mrem/hr at the door centerline • 4 mrem/hr at the end shield wall exterior	EU1 Damage to a loaded cask CONFINEMENT BOUNDARY  EU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading on the surface of a loaded spent fuel cask > any Table E-1 limit	1	2	3	4	5	6	DEF	None	None	None	None	None	None	None	None	None																																																																												
Table E-1 ISFSI Cask Surface Dose Rate Limits																																																																																																							
TN-32	TN-32B HBU	HSM-H																																																																																																					
• 116 mrem/hr (neutron + gamma) average on top of the cask • 436 mrem/hr (neutron + gamma) average on the side of the cask	• 192 mrem/hr (neutron + gamma) average on top of the cask • 436 mrem/hr (neutron + gamma) average on the side of the cask	• 1,600 mrem/hr at the front bird screen • 4 mrem/hr at the door centerline • 4 mrem/hr at the end shield wall exterior																																																																																																					
1	2	3	4	5	6	DEF																																																																																																	

Modes:		1	2	3	4	5	6	DEF		North Anna Power Station Emergency Action Level Matrix Revision F
		Power Operation	Startup	Hot Standby ≥ 350°F	Hot Shutdown < 350°F	Cold Shutdown ≤ 200°F	Refueling	Defueled		

EAL MATRIX - COLD CONDITIONS (RCS ≤ 200°F)							North Anna Power Station Emergency Action Level Matrix Revision F	
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**ATTACHMENT 5**

**SPS EAL MATRICES (Hot and Cold)**

**Virginia Electric and Power Company  
(Dominion Energy Virginia)  
Surry Power Station Units 1 and 2 and ISFSIs**

**ATTACHMENT 5A**

**SPS EAL MATRIX – Hot Conditions (RCS >200 °F)**


**Virginia Electric and Power Company  
(Dominion Energy Virginia)  
Surry Power Station Units 1 and 2 and ISFSIs**

SPS		GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT																																																																																																																								
R Abnormal Rad Levels/ Rad Effluent	1 Rad Effluent	RG1 Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem adult thyroid CDE  RG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "GE" for ≥ 15 min. (Notes 1, 2, 3, 4)  RG1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 1,000 mrem TEDE or 5,000 mrem adult thyroid CDE at or beyond the SITE BOUNDARY (Note 4)  RG1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 1,000 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate adult thyroid CDE > 5,000 mrem for 60 min. of inhalation. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RS1 Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 500 mrem adult thyroid CDE  RS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "SAE" for ≥ 15 min. (Notes 1, 2, 3, 4)  RS1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 100 mrem TEDE or 500 mrem adult thyroid CDE at or beyond the SITE BOUNDARY (Note 4)  RS1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 100 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate adult thyroid CDE > 500 mrem for 60 min. of inhalation. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RA1 Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 50 mrem adult thyroid CDE  RA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "ALERT" for ≥ 15 min. (Notes 1, 2, 3, 4)  RA1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 10 mrem TEDE or 50 mrem adult thyroid CDE at or beyond the SITE BOUNDARY (Note 4)  RA1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > 10 mrem TEDE or 50 mrem adult thyroid CDE at or beyond the SITE BOUNDARY for 60 min. of exposure (Notes 1, 2)  RA1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 10 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate adult thyroid CDE > 50 mrem for 60 min. of inhalation. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RU1a Release of liquid radioactivity greater than 2 times the allocated ODCM limits for 60 minutes or longer  RU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on SW-RM-120(220) CW Discharge Tunnel radiation monitor > 2 x the "high" setpoint for ≥ 60 min. (Notes 1, 2, 3)  RU1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Sample analysis for a liquid release indicates a concentration or release rate > 2 x the allocated ODCM limits for ≥ 60 min. (Notes 1, 2)  RU1b Release of gaseous radioactivity resulting in offsite dose greater than 1 mrem TEDE  RU1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "NOUE" for ≥ 60 min. (Notes 1, 2, 3)  RU1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Sample analysis for a gaseous release indicates a concentration or release rate > 2 x the allocated ODCM limits for ≥ 60 min. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF																						
		1	2	3	4	5	6	DEF																																																																																																																					
		1	2	3	4	5	6	DEF																																																																																																																					
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1	2	3	4	5	6	DEF																																																																																																																							
2 Irradiated Fuel Events	RG2 Spent fuel pool level cannot be restored to at least the top of the fuel racks for 60 minutes or longer  RG2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Spent fuel pool level cannot be restored to at least 1 ft. (Level 3) on 1-FC-LI-105-1, 2 or 1A Spent Fuel Pool Wide Range Level for ≥ 60 min. (Note 1)  <table><tr><th colspan="5">Table R-1 Gaseous Effluent Monitor Classification Thresholds</th></tr><tr><th>Release Point &amp; Monitor</th><th>GE</th><th>SAE</th><th>Alert</th><th>NOUE</th></tr><tr><td>Vent #2 1-VG-R1-131 B or C</td><td>7.2E+07 µCi/sec</td><td>7.2E+06 µCi/sec</td><td>7.2E+05 µCi/sec</td><td>7.2E+04 µCi/sec</td></tr><tr><td>Process Vent 1-GW-R1-130 B or C</td><td>2.8E+08 µCi/sec</td><td>2.8E+07 µCi/sec</td><td>2.8E+06 µCi/sec</td><td>2.8E+05 µCi/sec</td></tr><tr><td>Steam Safety (JMS-RM-124, 125, 126)</td><td>1.5E+03 mR/hr</td><td>1.5E+02 mR/hr</td><td>1.5E+01 mR/hr</td><td>N/A</td></tr><tr><td>AFW Steam Exhaust (JMS-RM-129)</td><td>2.3E+01 mR/hr</td><td>2.3E+00 mR/hr</td><td>2.3E-01 mR/hr</td><td>N/A</td></tr></table>	1	2	3	4	5	6	DEF	Table R-1 Gaseous Effluent Monitor Classification Thresholds					Release Point & Monitor	GE	SAE	Alert	NOUE	Vent #2 1-VG-R1-131 B or C	7.2E+07 µCi/sec	7.2E+06 µCi/sec	7.2E+05 µCi/sec	7.2E+04 µCi/sec	Process Vent 1-GW-R1-130 B or C	2.8E+08 µCi/sec	2.8E+07 µCi/sec	2.8E+06 µCi/sec	2.8E+05 µCi/sec	Steam Safety (JMS-RM-124, 125, 126)	1.5E+03 mR/hr	1.5E+02 mR/hr	1.5E+01 mR/hr	N/A	AFW Steam Exhaust (JMS-RM-129)	2.3E+01 mR/hr	2.3E+00 mR/hr	2.3E-01 mR/hr	N/A	RS2 Spent fuel pool level at the top of the fuel racks  RS2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to 1 ft. (Level 3) on 1-FC-LI-105-1, 2 or 1A Spent Fuel Pool Wide Range Level  RS2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to 10 ft. (Level 2) on 1-FC-LI-105-1, 2 or 1A Spent Fuel Pool Wide Range Level  RS2.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Radiation levels that IMPEDE access to equipment necessary for normal plant operations, cooldown or shutdown  RA3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose rates > 15 mR/hr in <b>EITHER</b> of the following: • Control Room • Central Alarm Station (by survey) OR RA3.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> An UNPLANNED event results in radiation levels that prohibit or IMPEDE access to any Table R-2 room or area (Note 5)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RA2 Significant lowering of water level above, or damage to, irradiated fuel  RA2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> IMMINENT uncover of irradiated fuel in the REFUELING PATHWAY  RA2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Damage to irradiated fuel resulting in a release of radioactivity  VALID high alarm on any of the following radiation monitors: • RM-R1-152 New Fuel Storage Area • RM-R1-153 Fuel Pit Bridge • RM-R1-162 Manipulator Crane • RM-R1-163 Reactor Containment • RM-R1-160 Containment Gas • RM-R1-159 Containment Particulate • VG-R1-131-(A,B,C) Vent #2 RA2.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to 10 ft. (Level 2) on 1-FC-LI-105-1, 2 or 1A Spent Fuel Pool Wide Range Level  RA3 Radiation levels that IMPEDE access to equipment necessary for normal plant operations, cooldown or shutdown  RA3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose rates > 15 mR/hr in <b>EITHER</b> of the following: • Control Room • Central Alarm Station (by survey) OR RA3.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> An UNPLANNED event results in radiation levels that prohibit or IMPEDE access to any Table R-2 room or area (Note 5)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RU2 UNPLANNED loss of water level above irradiated fuel  RU2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> UNPLANNED water level drop in the REFUELING PATHWAY as indicated by any of the following: • O-VSP-C4 SPENT FUEL PIT LO LVL • Report of dropping level in refueling cavity or SFP • Loss of SFP Cooling suction flow AND UNPLANNED rise in corresponding area radiation levels as indicated by any of the following radiation monitors: • RM-R1-152 New Fuel Storage Area • RM-R1-153 Fuel Pit Bridge • RM-R1-162 Manipulator Crane • RM-R1-163 Reactor Containment OR RU2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> An automatic or manual trip did not shut down the reactor as indicated by reactor power ≥ 5% AND All actions taken to shut down the reactor are not successful as indicated by reactor power ≥ 5% AND <b>EITHER</b> : • Core Cooling-RED Path conditions met • Heat Sink-RED Path conditions met	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF
	1	2	3	4	5	6	DEF																																																																																																																						
	Table R-1 Gaseous Effluent Monitor Classification Thresholds																																																																																																																												
Release Point & Monitor	GE	SAE	Alert	NOUE																																																																																																																									
Vent #2 1-VG-R1-131 B or C	7.2E+07 µCi/sec	7.2E+06 µCi/sec	7.2E+05 µCi/sec	7.2E+04 µCi/sec																																																																																																																									
Process Vent 1-GW-R1-130 B or C	2.8E+08 µCi/sec	2.8E+07 µCi/sec	2.8E+06 µCi/sec	2.8E+05 µCi/sec																																																																																																																									
Steam Safety (JMS-RM-124, 125, 126)	1.5E+03 mR/hr	1.5E+02 mR/hr	1.5E+01 mR/hr	N/A																																																																																																																									
AFW Steam Exhaust (JMS-RM-129)	2.3E+01 mR/hr	2.3E+00 mR/hr	2.3E-01 mR/hr	N/A																																																																																																																									
1	2	3	4	5	6	DEF																																																																																																																							
1	2	3	4	5	6	DEF																																																																																																																							
1	2	3	4	5	6	DEF																																																																																																																							
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1	2	3	4	5	6	DEF																																																																																																																							
3 Area Radiation Levels	Table R-2 Safe Operation & Shutdown Rooms/Areas <table><tr><th>Room/Area</th><th>Mode</th></tr><tr><td>Auxiliary Building EI 13'</td><td>3</td></tr><tr><td>Auxiliary Building EI 27'</td><td>3, 4</td></tr><tr><td>ESGR</td><td>3</td></tr></table>	Room/Area	Mode	Auxiliary Building EI 13'	3	Auxiliary Building EI 27'	3, 4	ESGR	3	None	None	None	None																																																																																																																
	Room/Area	Mode																																																																																																																											
	Auxiliary Building EI 13'	3																																																																																																																											
Auxiliary Building EI 27'	3, 4																																																																																																																												
ESGR	3																																																																																																																												

1 Security	HS1 HOSTILE ACTION within the PLANT PROTECTED AREA  HS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the PLANT PROTECTED AREA as reported by SPS Security Shift Supervisor	1	2	3	4	5	6	DEF	HA1 HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes  HA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by SPS Security Shift Supervisor OR A validated notification from NRC of an aircraft attack threat within 30 min. of the site	1	2	3	4	5	6	DEF	HU1 Confirmed SECURITY CONDITION or threat  HU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by SPS Security Shift Supervisor OR Notification of a credible security threat directed at the site OR A validated notification from the NRC providing information of an aircraft threat	1	2	3	4	5	6	DEF								
	1	2	3	4	5	6	DEF																									
	1	2	3	4	5	6	DEF																									
1	2	3	4	5	6	DEF																										
2 Seismic Event	None	None	[Refer to CA6.1 or MA6.1 for potential escalation due to a seismic event]	HU2 Seismic event greater than OBE levels  HU2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Seismic event > OBE (0.07g horizontal or 0.04g vertical) as determined per 0-AP-37.00 Seismic Event (Note 13)	1	2	3	4	5	6	DEF																					
1	2	3	4	5	6	DEF																										
3 Natural or Tech. Hazard	None	None	[Refer to CA6.1 or MA6.1 for potential escalation due to a hazardous event]	HU3 Hazardous event  HU3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A tornado strike within the PLANT PROTECTED AREA  HU3.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> 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  HU3.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Movement of personnel within the PLANT PROTECTED AREA is IMPEDED due to an event external to the PLANT PROTECTED AREA involving hazardous materials (e.g., an offsite chemical spill or toxic gas release)  HU3.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles (Note 7)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF
	1	2	3	4	5	6	DEF																									
	1	2	3	4	5	6	DEF																									
1	2	3	4	5	6	DEF																										
1	2	3	4	5	6	DEF																										

4 Fire	Table H-1 SPS Fire Areas <ul style="list-style-type: none"><li>Cable Vaults &amp; Tunnels</li><li>Emergency Switchgear &amp; Relay Rooms</li><li>Unit Switchgear Room</li><li>Reactor Containment</li><li>Safeguards Complex (incl. Cont. Spray Pump Area &amp; Main Steam Valve House)</li><li>Main Control Room</li><li>Emergency Diesel Generator Rooms 1, 2 and 3</li><li>Auxiliary / Fuel / Decontamination Buildings</li><li>Underground Fuel Oil Pump House Rooms</li><li>Intake Structure – Emergency Service Water Pump House</li><li>Turbine Building</li><li>Mechanical Equipment Rooms 3, 4 &amp; 5</li><li>Cable Tray Room</li></ul>	HS6 Inability to control a key safety function from outside the Control Room  HS6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> An event has resulted in plant control being transferred from the Control Room to the Auxiliary Shutdown Panel AND Control of any of the following key safety functions is not re-established within 15 min. of the last licensed operator leaving the Control Room (Note 1): • Reactivity (modes 1, 2 and 3 only) • Core cooling • RCS heat removal	1	2	3	4	5	6	DEF	HA5 Gaseous release IMPEDING access to equipment necessary for normal plant operations, cooldown or shutdown  HA5.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Release of a toxic, corrosive, asphyxiant or flammable gas into any Table H-2 room or area AND Entry into the room or area is prohibited or IMPEDED (Note 5)	1	2	3	4	5	6	DEF	HU4 FIRE potentially degrading the level of safety of the plant  HU4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A FIRE is not extinguished within 15 min. of any of the following fire detection indications (Note 1): • 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 AND The FIRE is located within any Table H-1 area HU4.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Receipt of a single fire alarm (i.e., no other indications of a FIRE) AND The fire alarm is indicating a FIRE within any Table H-1 area (excluding Reactor Containment) AND The existence of a FIRE is not verified within 30 min. of alarm receipt (Notes 1, 14) HU4.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A FIRE within the plant PLANT PROTECTED AREA or ISFSI Protected Area not extinguished within 60 min. of the initial report, alarm or indication (Note 1) HU4.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A FIRE within the PLANT PROTECTED AREA or ISFSI Protected Area that requires an offsite fire department to assist with extinguishment	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF
	1	2	3	4	5	6	DEF																																							
	1	2	3	4	5	6	DEF																																							
1	2	3	4	5	6	DEF																																								
1	2	3	4	5	6	DEF																																								
1	2	3	4	5	6	DEF																																								
1	2	3	4	5	6	DEF																																								
5 Hazardous Gases	Table H-2 Safe Operation & Shutdown Rooms/Areas <table><tr><th>Room/Area</th><th>Mode</th></tr><tr><td>Auxiliary Building EI 13'</td><td>3</td></tr><tr><td>Auxiliary Building EI 27'</td><td>3, 4</td></tr><tr><td>ESGR</td><td>3</td></tr></table>	Room/Area	Mode	Auxiliary Building EI 13'	3	Auxiliary Building EI 27'	3, 4	ESGR	3	None	None	None																																		
	Room/Area	Mode																																												
	Auxiliary Building EI 13'	3																																												
Auxiliary Building EI 27'	3, 4																																													
ESGR	3																																													
6 Control Room Evacuation	None	None	None	None																																										

7 SEM Judgment	HS7 Other conditions existing that in the judgment of the SEM warrant declaration of a General Emergency  HS7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which in the judgment of the SEM indicate that events are in progress or have occurred which involve actual or IMMINENT 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 offsite for more than the immediate site area.	1	2	3	4	5	6	DEF	HA7 Other conditions exist that in the judgment of the SEM warrant declaration of an Alert  HA7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which, in the judgment of the SEM, 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 HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	1	2	3	4	5	6	DEF	HU7 Other conditions existing that in the judgment of the SEM warrant declaration of a NOUE  HU7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which, in the judgment of the SEM, indicate that events are in progress or have occurred which involve actual or potential substantial 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.	1	2	3	4	5	6	DEF
	1	2	3	4	5	6	DEF																	
	1	2	3	4	5	6	DEF																	
1	2	3	4	5	6	DEF																		
E ISFSI	1 Confinement Boundary	Table E-1 ISFSI Cask Surface Dose Rate Limits <table><tr><th colspan="2">SSSC</th><th>HSM-H</th></tr><tr><td>• 152 mrem/hr (neutron + gamma) average on top of the cask • 445 mrem/hr (neutron + gamma) average on the side of the cask</td><td>• 1,600 mrem/hr at the front bird screen • 4 mrem/hr at the door centerline • 4 mrem/hr at the end shield wall exterior</td><td>None</td></tr></table>	SSSC		HSM-H	• 152 mrem/hr (neutron + gamma) average on top of the cask • 445 mrem/hr (neutron + gamma) average on the side of the cask	• 1,600 mrem/hr at the front bird screen • 4 mrem/hr at the door centerline • 4 mrem/hr at the end shield wall exterior	None	None	None														
	SSSC		HSM-H																					
	• 152 mrem/hr (neutron + gamma) average on top of the cask • 445 mrem/hr (neutron + gamma) average on the side of the cask	• 1,600 mrem/hr at the front bird screen • 4 mrem/hr at the door centerline • 4 mrem/hr at the end shield wall exterior	None																					

Modes:	1	2	3	4	5	6	DEF	 SPS	Surry Power Station Emergency Action Level Matrix Revision F
	Power Operation	Reactor Critical	Hot Shutdown ≥ 547°F	Intermediate Shutdown ≥ 547°F	Cold Shutdown ≤ 200°F	Refueling ≤ 140°F	Defueled		

**ATTACHMENT 5B**

**SPS EAL MATRIX – Cold Conditions (RCS  $\leq$ 200 °F)**

**Virginia Electric and Power Company  
(Dominion Energy Virginia)  
Surry Power Station Units 1 and 2 and ISFSIs**

SPS		GENERAL EMERGENCY		SITE AREA EMERGENCY		ALERT		UNUSUAL EVENT																																																																																																																						
R  Abnormal Rad Levels/ Rad Effluent	1  Rad Effluent	RG1 Release of gaseous radioactivity resulting in offsite dose greater than 1,000 mrem TEDE or 5,000 mrem adult thyroid CDE  RG1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "GE" for ≥ 15 min. (Notes 1, 2, 3, 4)  RG1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 1,000 mrem TEDE or 5,000 mrem adult thyroid CDE at or beyond the SITE BOUNDARY (Note 4)  RG1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 1,000 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate adult thyroid CDE > 5,000 mrem for 60 min. of inhalation. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RS1 Release of gaseous radioactivity resulting in offsite dose greater than 100 mrem TEDE or 600 mrem adult thyroid CDE  RS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "SAE" for ≥ 15 min. (Notes 1, 2, 3, 4)  RS1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 100 mrem TEDE or 600 mrem adult thyroid CDE at or beyond the SITE BOUNDARY (Note 4)  RS1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 100 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate adult thyroid CDE > 600 mrem for 60 min. of inhalation. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RA1 Release of gaseous or liquid radioactivity resulting in offsite dose greater than 10 mrem TEDE or 60 mrem adult thyroid CDE  RA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "ALERT" for ≥ 15 min. (Notes 1, 2, 3, 4)  RA1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose assessment using actual meteorology indicates doses > 10 mrem TEDE or 60 mrem adult thyroid CDE at or beyond the SITE BOUNDARY (Note 4)  RA1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Analysis of a liquid effluent sample indicates a concentration or release rate that would result in doses > 10 mrem TEDE or 60 mrem adult thyroid CDE at or beyond the SITE BOUNDARY for 60 min. of exposure (Notes 1, 2)  RA1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Field survey results indicate <b>EITHER</b> of the following at or beyond the SITE BOUNDARY: • Closed window dose rates > 10 mR/hr expected to continue for ≥ 60 min. • Analyses of field survey samples indicate adult thyroid CDE > 50 mrem for 60 min. of inhalation. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RU1a Release of liquid radioactivity greater than 2 times the allocated ODCM limits for 60 minutes or longer  RU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on SW-RM-120(220) CW Discharge Tunnel radiation monitor > 2 x the "high" setpoint for ≥ 60 min. (Notes 1, 2, 3)  RU1.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Sample analysis for a liquid release indicates a concentration or release rate > 2 x the allocated ODCM limits for ≥ 60 min. (Notes 1, 2)  RU1b Release of gaseous radioactivity resulting in offsite dose greater than 1 mrem TEDE  RU1.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Reading on any Table R-1 effluent radiation monitor > column "NOUE" for ≥ 60 min. (Notes 1, 2, 3)  RU1.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Sample analysis for a gaseous release indicates a concentration or release rate > 2 x the allocated ODCM limits for ≥ 60 min. (Notes 1, 2)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF																							
	1	2	3	4	5	6	DEF																																																																																																																							
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1	2	3	4	5	6	DEF																																																																																																																								
2  Irradiated Fuel Events	RG2 Spent fuel pool level cannot be restored to at least the top of the fuel racks for 60 minutes or longer  RG2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Spent fuel pool level cannot be restored to at least 1 ft. (Level 3) on 1-FC-LJ-105-1, 2 or 1A Spent Fuel Pool Wide Range Level for ≥ 60 min. (Note 1)  <table><tr><th colspan="6">Table R-1 Gaseous Effluent Monitor Classification Thresholds</th></tr><tr><th>Release Point &amp; Monitor</th><th>GE</th><th>SAE</th><th>Alert</th><th colspan="2">NOUE</th></tr><tr><td>Vent #2 1-VG-RI-131 B or C</td><td>7.2E+07 µCi/sec</td><td>7.2E+06 µCi/sec</td><td>7.2E+05 µCi/sec</td><td colspan="2">7.2E+04 µCi/sec</td></tr><tr><td>Process Vent 1-GW-RI-130 B or C</td><td>2.8E+08 µCi/sec</td><td>2.8E+07 µCi/sec</td><td>2.8E+06 µCi/sec</td><td colspan="2">2.8E+05 µCi/sec</td></tr><tr><td>Steam Safety (MS-RM-124, 125, 126)</td><td>1.5E+03 mR/hr</td><td>1.5E+02 mR/hr</td><td>1.5E+01 mR/hr</td><td colspan="2">N/A</td></tr><tr><td>APW Steam Exhaust (MS-RM-129)</td><td>2.3E+01 mR/hr</td><td>2.3E+00 mR/hr</td><td>2.3E-01 mR/hr</td><td colspan="2">N/A</td></tr></table>	1	2	3	4	5	6	DEF	Table R-1 Gaseous Effluent Monitor Classification Thresholds						Release Point & Monitor	GE	SAE	Alert	NOUE		Vent #2 1-VG-RI-131 B or C	7.2E+07 µCi/sec	7.2E+06 µCi/sec	7.2E+05 µCi/sec	7.2E+04 µCi/sec		Process Vent 1-GW-RI-130 B or C	2.8E+08 µCi/sec	2.8E+07 µCi/sec	2.8E+06 µCi/sec	2.8E+05 µCi/sec		Steam Safety (MS-RM-124, 125, 126)	1.5E+03 mR/hr	1.5E+02 mR/hr	1.5E+01 mR/hr	N/A		APW Steam Exhaust (MS-RM-129)	2.3E+01 mR/hr	2.3E+00 mR/hr	2.3E-01 mR/hr	N/A		RS2 Spent fuel pool level at the top of the fuel racks  RS2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to 1 ft. (Level 3) on 1-FC-LJ-105-1, 2 or 1A Spent Fuel Pool Wide Range Level Range Level for ≥ 60 min. (Note 1)  <table><tr><th colspan="6">Table R-2 Safe Operation &amp; Shutdown Rooms/Areas</th></tr><tr><th>Room/Area</th><th colspan="5">Mode</th></tr><tr><td>Auxiliary Building EI 13'</td><td colspan="5">3</td></tr><tr><td>Auxiliary Building EI 27'</td><td colspan="5">3, 4</td></tr><tr><td>ESGR</td><td colspan="5">3</td></tr></table>	1	2	3	4	5	6	DEF	Table R-2 Safe Operation & Shutdown Rooms/Areas						Room/Area	Mode					Auxiliary Building EI 13'	3					Auxiliary Building EI 27'	3, 4					ESGR	3					RA2 Significant lowering of water level above, or damage to, irradiated fuel  RA2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> IMMEDIATE uncovery of irradiated fuel in the REFUELING PATHWAY  RA2.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Damage to irradiated fuel resulting in a release of radioactivity <b>AND</b> VALID high alarm on any of the following radiation monitors: • RM-RI-152 New Fuel Storage Area • RM-RI-153 Fuel Pit Bridge • RM-RI-154 (X2) Manipulator Crane • RM-RI-155 Reactor Containment • RM-RI-156 Containment Gas • RM-RI-159 Containment Particulate • VG-RI-131-1 (A,B,C) Vent #2  RA2.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Lowering of spent fuel pool level to 10 ft. (Level 2) on 1-FC-LJ-105-1, 2 or 1A Spent Fuel Pool Wide Range Level  RA3 Radiation levels that IMPEDE access to equipment necessary for normal plant operations, cooldown or shutdown  RA3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Dose rates > 15 mR/hr in <b>EITHER</b> of the following: • Control Room • Central Alarm Station (by survey)  RA3.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> An UNPLANNED event results in radiation levels that prohibit or IMPEDE access to any Table R-2 room or area (Note 5)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	RU2 UNPLANNED loss of water level above irradiated fuel  RU2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> UNPLANNED water level drop in the REFUELING PATHWAY as indicated by any of the following: • 0-VSP-C4 SPENT FUEL PIT LO LVL • Report of dropping level in refueling cavity or SFP • Loss of SFP Cooling suction flow <b>AND</b> UNPLANNED rise in corresponding area radiation levels as indicated by any of the following radiation monitors: • RM-RI-152 New Fuel Storage Area • RM-RI-153 Fuel Pit Bridge • RM-RI-154 (X2) Manipulator Crane • RM-RI-155 Reactor Containment • RM-RI-156 Containment Gas  None	1	2	3	4	5	6	DEF
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3  Area Radiation Levels																																																																																																																														

1  Security	None	HS1 HOSTILE ACTION within the PLANT PROTECTED AREA  HS1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the PLANT PROTECTED AREA as reported by SPS Security Shift Supervisor	1	2	3	4	5	6	DEF	HA1 HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat within 30 minutes  HA1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA as reported by SPS Security Shift Supervisor  OR A validated notification from NRC of an aircraft attack threat within 30 min. of the site  (Refer to CA6.1 or MA6.1 for potential escalation due to a seismic event)	1	2	3	4	5	6	DEF	HU1 Confirmed SECURITY CONDITION or threat  A SECURITY CONDITION that does not involve a HOSTILE ACTION as reported by SPS Security Shift Supervisor  OR Notification of a credible security threat directed at the site  OR A validated notification from the NRC providing information of an aircraft threat  HU2 Seismic event greater than OBE levels  HU2.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Seismic event > OBE (0.07g horizontal or 0.04g vertical) as determined per O-A-P-37.00 Seismic Event (Note 13)	1	2	3	4	5	6	DEF																									
	1	2	3	4	5	6	DEF																																											
	1	2	3	4	5	6	DEF																																											
1	2	3	4	5	6	DEF																																												
2  Seismic Event	None	None	None	None																																														
3  Natural or Tech. Hazard	None	<div>NOTES</div> <div>Note 1: The SEM should declare the event promptly upon determining that the time limit has been exceeded, or will likely be exceeded. Note 2: If an ongoing release is detected and the release start time is unknown, assume that the release duration has exceeded the specified time limit. Note 3: 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. Note 4: The pre-calculated effluent monitor values presented in EALs RA1.1, RS1.1, and RG1.1 should be used for emergency classification assessments until the results from a dose assessment using actual meteorology are available. Note 5: 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. Note 6: If CONTAINMENT CLOSURE is re-established prior to exceeding the 30-minute time limit, declaration of a General Emergency is not required Note 7: This EAL does not apply to routine traffic impediments such as fog, snow, ice, or vehicle breakdowns or accidents. Note 8: A manual trip 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. Note 9: If the affected SAFETY SYSTEM train was already inoperable or out of service before the hazardous event occurred, then emergency classification is not warranted. Note 10: If the hazardous event only resulted in VISIBLE DAMAGE, with no indications of degraded performance to at least one train of a SAFETY SYSTEM, then this emergency classification is not warranted. Note 11: One full train of containment depressurization equipment consist of one Containment Spray Subsystem and two Recirculation Spray Subsystems operating together. Note 12: If an RCS heat removal system is in operation within the applicable Table C-4 heat-up duration and RCS temperature is being reduced, the EAL is not applicable. Note 13: If, subsequent to activation of the SMAA Event Indicator, the seismic event magnitude has not been determined (Channel 1 – horizontal and Channel 2 – vertical) within 15 minutes, the event should be immediately declared provided Control Room personnel felt the seismic event. Note 14: A Reactor Containment fire alarm is considered VALID upon receipt of multiple (more than one) fire zone alarms.</div>		(Refer to CA6.1 or MA6.1 for potential escalation due to fire)	HU3 Hazardous event  A tornado strike within the PLANT PROTECTED AREA  HU3.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A tornado strike within the PLANT PROTECTED AREA  HU3.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> 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  HU3.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Movement of personnel within the PLANT PROTECTED AREA is IMPEDED due to an event external to the PLANT PROTECTED AREA involving hazardous materials (e.g., an offsite chemical spill or toxic gas release)  HU3.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A hazardous event that results in on-site conditions sufficient to prohibit the plant staff from accessing the site via personal vehicles (Note 7)	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF																	
1	2	3	4	5	6	DEF																																												
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4  Fire	<table><tr><th colspan="6">Table H-1 SPS Fire Areas</th></tr><tr><td>• Cable Vaults &amp; Tunnels • Emergency Switchgear &amp; Relay Rooms • Unit Switchgear Room • Reactor Containment • Safeguards Complex (incl. Cont. Spray Pump Area &amp; Main Steam Valve House) • Main Control Room • Emergency Diesel Generator Rooms 1, 2 and 3 • Auxiliary / Fuel / Decontamination Buildings • Underground Fuel Oil Pump House Rooms • Intake Structure – Emergency Service Water Pump House • Turbine Building • Mechanical Equipment Rooms 3, 4 &amp; 5 • Cable Tray Room</td><td colspan="5"></td></tr></table>	Table H-1 SPS Fire Areas						• Cable Vaults & Tunnels • Emergency Switchgear & Relay Rooms • Unit Switchgear Room • Reactor Containment • Safeguards Complex (incl. Cont. Spray Pump Area & Main Steam Valve House) • Main Control Room • Emergency Diesel Generator Rooms 1, 2 and 3 • Auxiliary / Fuel / Decontamination Buildings • Underground Fuel Oil Pump House Rooms • Intake Structure – Emergency Service Water Pump House • Turbine Building • Mechanical Equipment Rooms 3, 4 & 5 • Cable Tray Room						HA5 Gaseous release IMPEDED access to equipment necessary for normal plant operations, cooldown or shutdown  HA5.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Release of a toxic, corrosive, asphyxiant or flammable gas into any Table H-2 room or area <b>AND</b> Entry into the room or area is prohibited or IMPEDED (Note 5)	1	2	3	4	5	6	DEF	HU4 FIRE potentially degrading the level of safety of the plant  HU4.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A FIRE is not extinguished within 15 min. of any of the following fire detection indications (Note 1): • 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 <b>AND</b> The FIRE is located within any Table H-1 area  HU4.2 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Receipt of a single fire alarm (i.e., no other indications of a FIRE) <b>AND</b> The fire alarm is indicating a FIRE within any Table H-1 area (excluding Reactor Containment) <b>AND</b> The existence of a FIRE is not verified within 30 min. of alarm receipt (Notes 1, 14)  HU4.3 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A FIRE within the plant PLANT PROTECTED AREA or ISFSI Protected Area not extinguished within 60 min. of the initial report, alarm or indication. (Note 1)  HU4.4 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> A FIRE within the PLANT PROTECTED AREA or ISFSI Protected Area that requires an offsite fire department to assist with extinguishment	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF	1	2	3	4	5	6	DEF
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5  Hazardous Gases	<table><tr><th colspan="6">Table H-2 Safe Operation &amp; Shutdown Rooms/Areas</th></tr><tr><th>Room/Area</th><th colspan="5">Mode</th></tr><tr><td>Auxiliary Building EI 13'</td><td colspan="5">3</td></tr><tr><td>Auxiliary Building EI 27'</td><td colspan="5">3, 4</td></tr><tr><td>ESGR</td><td colspan="5">3</td></tr></table>	Table H-2 Safe Operation & Shutdown Rooms/Areas						Room/Area	Mode					Auxiliary Building EI 13'	3					Auxiliary Building EI 27'	3, 4					ESGR	3					None																		
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Auxiliary Building EI 27'	3, 4																																																	
ESGR	3																																																	
6  Control Room Evacuation	None	HS6 Inability to control a key safety function from outside the Control Room  HS6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> An event has resulted in plant control being transferred from the Control Room to the Auxiliary Shutdown Panel <b>AND</b> Control of any of the following key safety functions is not re-established within 15 min. of the last licensed operator leaving the Control Room (Note 1): • Reactivity (modes 1, 2 and 3 only) • Core cooling • RCS heat removal	1	2	3	4	5	6	DEF	HA6 Control Room evacuation resulting in transfer of plant control to alternate locations  HA6.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> An event has resulted in plant control being transferred from the Control Room to the Auxiliary Shutdown Panel	1	2	3	4	5	6	DEF	None																																
1	2	3	4	5	6	DEF																																												
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7  SEM Judgment	HG7 Other conditions exist which in the judgment of the SEM warrant declaration of a General Emergency  HG7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which in the judgment of the SEM indicate that events are in progress or have occurred which involve actual or IMMINENT 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 offsite for more than the immediate site area.	1	2	3	4	5	6	DEF	HS7 Other conditions existing that in the judgment of the SEM warrant declaration of a Site Area Emergency  HS7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which in the judgment of the SEM, 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, (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.	1	2	3	4	5	6	DEF	HA7 Other conditions exist that in the judgment of the SEM warrant declaration of an Alert  HA7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which, in the judgment of the SEM, 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 HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels.	1	2	3	4	5	6	DEF	HU7 Other conditions existing that in the judgment of the SEM warrant declaration of a NOUE  HU7.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Other conditions exist which, in the judgment of the SEM, 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.	1	2	3	4	5	6	DEF																		
1	2	3	4	5	6	DEF																																												
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E  ISFSI	1  Confinement Boundary	<table><tr><th colspan="6">Table E-1 ISFSI Cask Surface Dose Rate Limits</th></tr><tr><th>SSSC</th><th colspan="5">HSM-H</th></tr><tr><td>• 152 mrem/hr (neutron + gamma) average on top of the cask • 448 mrem/hr (neutron + gamma) average on the side of the cask</td><td colspan="5">• 1,600 mrem/hr at the front bird screen • 4 mrem/hr at the door centerline • 4 mrem/hr at the end shield wall exterior</td></tr></table>	Table E-1 ISFSI Cask Surface Dose Rate Limits						SSSC	HSM-H					• 152 mrem/hr (neutron + gamma) average on top of the cask • 448 mrem/hr (neutron + gamma) average on the side of the cask	• 1,600 mrem/hr at the front bird screen • 4 mrem/hr at the door centerline • 4 mrem/hr at the end shield wall exterior					None	None	EU1 Damage to a loaded cask CONFINEMENT BOUNDARY  EU1.1 <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>DEF</td></tr></table> Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by an on-contact radiation reading on the surface of a loaded spent fuel cask > any Table E-1 limit	1	2	3	4	5	6	DEF																				
Table E-1 ISFSI Cask Surface Dose Rate Limits																																																		
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1	2	3	4	5	6	DEF																																												

Modes:

1

2

3

4

5

6

DEF

Power Operation

Reactor Critical

Hot Shutdown  
≥ 547°F

Intermediate Shutdown  
≤ 547°F

Cold Shutdown  
≤ 200°F

Refueling  
≤ 140°F

Defueled

SPS

Surry Power Station  
Emergency Action Level Matrix  
Revision F

SPS		GENERAL EMERGENCY		SITE AREA EMERGENCY		ALERT		UNUSUAL EVENT																																																							
C	1 RCS Level	CG1 Loss of RCS inventory affecting fuel clad integrity with containment challenged  CG1.1 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> Any confirmed loss of inventory indication, Table C-2, with RVLIS full range < 57% for ≥ 30 min. (Notes 1, 12) <b>AND</b> Any Containment Challenge indication, Table C-3  CG1.2 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> RCS level cannot be monitored for ≥ 30 min. (Note 1) <b>AND</b> Core uncovery is indicated by any of the following: • UNPLANNED increase in any Table C-1 sump or tank level of sufficient magnitude to indicate core uncovery • Visual observation of UNISOLABLE RCS leakage of sufficient magnitude to indicate core uncovery • Any containment area radiation monitor reading > 3 R/hr (Refueling Mode) • Erratic source range monitor indications <b>AND</b> Any Containment Challenge indication, Table C-3						5	6					5	6	CS1 Loss of RCS inventory affecting core decay heat removal capability  CS1.1 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> With CONTAINMENT CLOSURE not established, any confirmed loss of inventory indication, Table C-2, with RVLIS full range < 63%  CS1.2 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> With CONTAINMENT CLOSURE established, any confirmed loss of inventory indication, Table C-2, with RVLIS full range < 57%  CS1.3 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> RCS level cannot be monitored for ≥ 30 min. (Note 1) <b>AND</b> Core uncovery is indicated by any of the following: • UNPLANNED increase in any Table C-1 sump or tank level of sufficient magnitude to indicate core uncovery • Visual observation of UNISOLABLE RCS leakage of sufficient magnitude to indicate core uncovery • Any containment area radiation monitor reading > 3 R/hr (Refueling Mode) • Erratic source range monitor indications						5	6					5	6					5	6	CA1 Significant loss of RCS inventory  CA1.1 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> RCS level < minimum required for continued RHR pump operation  CA1.2 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> RCS water level cannot be monitored for ≥ 15 min. (Note 1) <b>AND EITHER</b> • UNPLANNED increase in any Table C-1 sump or tank level due to a loss of RCS inventory • Visual observation of UNISOLABLE RCS leakage						5	6					5	6	CU1 UNPLANNED loss of RCS inventory  CU1.1 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> UNPLANNED loss of reactor coolant results in RCS water level < a required lower limit for ≥ 15 min. (Note 1)  CU1.2 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> RCS level cannot be monitored <b>AND EITHER:</b> • UNPLANNED increase in any Table C-1 sump or tank level due to a loss of RCS inventory • Visual observation of UNISOLABLE RCS leakage						5	6					5	6
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2 Loss of Emergency AC Power	None		None		CA2 Loss of all offsite and all onsite AC power to emergency buses for 15 minutes or longer  CA2.1 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td><td>DEF</td></tr></table> Loss of all offsite and all onsite AC power to Unit ( ) 4160V emergency buses H and J for ≥ 15 min. (Note 1)						5	6	DEF	CU2 Loss of all but one AC power source to emergency buses for 15 minutes or longer  CU2.1 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td><td>DEF</td></tr></table> AC power capability, Table C-4, to Unit ( ) 4160V emergency buses H and J reduced to a single power source for ≥ 15 min. (Note 1) <b>AND</b> Any additional single power source failure will result in loss of all AC power to SAFETY SYSTEMS						5	6	DEF																																									
				5	6	DEF																																																									
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3 RCS Temp.	None		None		CA3 Inability to maintain plant in cold shutdown  CA3.1 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> UNPLANNED increase in RCS temperature to > 200°F for > Table C-5 duration (Notes 1, 12) <b>OR</b> UNPLANNED RCS pressure increase > 10 psi (does not apply to solid plant conditions)						5	6	CU3 UNPLANNED increase in RCS temperature  CU3.1 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> UNPLANNED increase in RCS temperature to > 200°F  CU3.2 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> Loss of all RCS temperature and RCS water level indication for ≥ 15 min. (Note 1)						5	6					5	6																																					
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4 Loss of Vital DC Power	None		None		None		CU4 Loss of vital DC power for 15 minutes or longer  CU4.1 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> Indicated voltage is < 105 VDC on required vital 125 VDC battery buses ( )A <b>OR</b> ( )B for ≥ 15 min. (Note 1)						5	6																																																	
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5 Loss of Commun.	None		None		None		CU5 Loss of all onsite or offsite communications capabilities  CU5.1 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td><td>DEF</td></tr></table> Loss of all Table C-6 onsite communication methods <b>OR</b> Loss of all Table C-6 State and local agency communication methods <b>OR</b> Loss of all Table C-6 NRC communication methods						5	6	DEF																																																
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6 Hazardous Event Affecting Safety Systems	None		None		CA6 Hazardous event affecting SAFETY SYSTEMS needed for the current operating mode  CA6.1 <table><tr><td></td><td></td><td></td><td></td><td>5</td><td>6</td></tr></table> The occurrence of any Table C-7 hazardous event <b>AND</b> Event damage has caused indications of degraded performance on one train of a SAFETY SYSTEM needed for the current operating mode <b>AND EITHER:</b> • Event damage has caused indications of degraded performance to the second train of the SAFETY SYSTEM needed for the current operating mode • Event damage has resulted in VISIBLE DAMAGE to the second train of the SAFETY SYSTEM needed for the current operating mode (Notes 9, 10)						5	6	None																																																		
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Table C-1 Sumps/Tanks			
<ul style="list-style-type: none"><li>Reactor Containment Sump</li><li>Pressurizer Relief Tank (PRT)</li><li>Primary Drain Transfer Tank (PDTT)</li><li>Component Cooling (CC) Surge Tank</li><li>Refueling Water Storage Tank (RWST)</li></ul>			

Table C-2 Inventory Loss Confirmatory Indications			
<ul style="list-style-type: none"><li>In service Standpipe and Ultrasonic level bottomed out</li><li>Decreasing RVLIS level trend</li><li>RHR pump amp fluctuations</li></ul>			

Table C-3 Containment Challenge Indications			
<ul style="list-style-type: none"><li>CONTAINMENT CLOSURE not established (Note 6)</li><li>CTMT hydrogen concentration ≥ 4%</li><li>UNPLANNED increase in CTMT pressure</li></ul>			

Table C-4 AC Power Supplies			
<b>Offsite:</b> <u>Unit 1</u> <ul style="list-style-type: none"><li>Reserve Station Service Transformer A</li><li>Reserve Station Service Transformer C</li><li>Station Service Buses back-fed via Main Transformer (if already aligned)</li></ul> <u>Unit 2</u> <ul style="list-style-type: none"><li>Reserve Station Service Transformer B</li><li>Reserve Station Service Transformer C</li><li>Station Service Buses back-fed via Main Transformer (if already aligned)</li></ul> <b>Onsite:</b> <ul style="list-style-type: none"><li>EDG 1</li><li>EDG 2</li><li>EDG 3</li><li>AAC (SBO) Diesel Generator</li></ul>			

Table C-5 RCS Heat-up Duration Thresholds		
RCS Status	CONTAINMENT CLOSURE Status	Heat-up Duration
Intact <b>AND</b> not reduced inventory		60 minutes
Not intact <b>OR</b> reduced inventory	Established	20 minutes
	Not Established	0 minutes

Table C-6 Communications Methods			
System	Onsite	State/Local	NRC
Radio Communications System	X		
Public Address and Intercom System	X		
Private Branch Telephone Exchange (PBX)	X	X	X
Sound Powered Telephone System	X		
Commercial Telephone System		X	X
Automatic Ring Downs (ARD)		X	
Instaphone Loop		X	
Dedicated NRC Communications			X

Table C-7 Hazardous Events	
<ul style="list-style-type: none"><li>Seismic event (earthquake)</li><li>Internal or external FLOODING event</li><li>High winds or tornado strike</li><li>FIRE</li><li>EXPLOSION</li><li>Other events with similar hazard characteristics as determined by the Shift Manager/SEM</li></ul>	

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Instaphone Loop		X	
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# EAL MATRIX - COLD CONDITIONS (RCS ≤ 200°F)



Surry Power Station  
Emergency Action Level Matrix  
Revision F