

Form 3.3-1 Scenario Outline

|   |                        |   |  |
|---|------------------------|---|--|
| Facility: <b>PRARIE ISLAND</b>  |                        | Scenario #: <b>1</b>  |  |
| <u>Scenario Source:</u><br><b>NEW</b>   |                        | <u>Op. Test #:</u><br><b>PI-ILT-NRC-2201S</b>   |  |
| <u>Examiners:</u><br><b>Zoia / Nance</b><br><b>Rodriguez</b><br><b>Examiner #3</b>  |                        | <u>Applicants/ Operators:</u><br><b>Shift Supervisor (SS): I1, I2</b><br><b>Balance of Plant (LRO): R1, R3</b><br><b>At the Controls (RO): R2, R4</b> |  |
| <u>Initial Conditions:</u>  |                        |   |  |
| Reactor Power:  | <b>100%</b>            |   |  |
| Boron Concentration:  | <b>1186 PPM</b>        |   |  |
| RCS temperature:  | <b>560°F</b>           |   |  |
| RCS pressure:   | <b>2235 PSIG</b>       |   |  |
| Xenon:  | <b>Equalibrium</b>     |   |  |
| Rods:   | <b>CBD @ 218 STEPS</b> |   |  |
| Main Generator:   | <b>582 MW</b>          |   |  |
| <u>Turnover:</u><br><b>Energize all PRZR Backup Heaters per 1C4, Step 5.5.1.</b><br><b>Reduce load to 485 MWe for Flex Power Operation per 1C1.4 Unit 1 Power Operation</b> |                        |   |  |
| <u>Critical Tasks:</u>  |                        |   |  |
| <b>PI-CT-13: Manually start at least one CC Pump within 60 minutes of this critical task's plant conditions being met.</b>  |                        |   |  |
| <b>PI-CT-18: Trip Reactor Coolant Pumps within ten minutes of RCP trip criteria being met.</b>  |                        |   |  |

| Event No.   | Malf. No. | Event Type*             | Event Description                                     |
|---|-----------|-------------------------|---|
| 1   |           | N (BOP)                 | Energize PRZR Backup Heaters                          |
| 2   |           | R (ATC)<br>N (SS)       | Flexible Power Operations to 485 MWe                  |
| 3   | 1         | C (BOP)<br>TS (SS)      | PRZR PORV 1PCV-431 Leakage                            |
| 4   | 2         | I (BOP)<br>TS (SS)      | 1PT-486 Blue Channel First Stage Pressure Fails Low   |
| 5   | 3         | C (BOP, SS)             | Loss of Gap / Support Cooling                         |
| 6   | 4         | M (ALL)                 | Small Break LOCA                                      |
| 7   | 5         | C (BOP, SS)<br>MC (BOP) | Component Cooling Pumps Fail to Start Automatically   |
| 8   | 6         | C (BOP, SS)<br>MC (BOP) | 12 DD Cooling Water Pump Fails to Start Automatically |
|   |           |                         |   |
|   |           |                         |   |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control |           |                         |   |



Form 3.3-1 Scenario Outline Rev. 2

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|--|--|
| Facility: <b>PRARIE ISLAND</b>   | Scenario #: <b>1</b>   |
| <u>Scenario Source:</u><br><b>NEW</b>  | <u>Op. Test #:</u><br><b>PI-ILT-NRC-2201S</b>  |
| <u>Examiners:</u>  | <u>Applicants / Operators:</u><br><b>Shift Supervisor (SS)</b><br><b>Balance of Plant (LRO)</b><br><b>At the Controls (RO)</b> |
| <u>Initial Conditions:</u><br>Reactor Power: <b>100%</b><br>Boron Concentration: <b>1186 PPM</b><br>RCS temperature: <b>560°F</b><br>RCS pressure: <b>2235 PSIG</b><br>Xenon: <b>Xe Eq.</b><br>Rods: <b>CBD @ 218 STEPS</b><br>Main Generator: <b>582 MW</b> |  |
| <u>Turnover:</u><br><b>Energize all PRZR Backup Heaters per 1C4, Step 5.5.1.</b><br><b>Reduce load to 500 MWe for Flex Power Operation per 1C1.4 Unit 1 Power Operation</b>  |  |
| <u>Critical Tasks:</u><br><b>PI-CT-13: Manually start at least one CC Pump prior to transition to recirculation phase.</b><br><b>PI-CT-18: Trip Reactor Coolant Pumps within 8 minutes of RCP trip criteria being met.</b>                                   |  |

| Event No.   | Malf. No. | Event Type*             | Event Description   |
|---|-----------|-------------------------|---|
| 1   |           | N (BOP)                 | <b>Energize PRZR Backup Heaters</b> <ul style="list-style-type: none"> <li>The crew will energize PRZR Backup Heaters per 1C4 in preparation for Flex Ops.</li> </ul>   |
| 2   |           | R (ATC)<br>N (SS)       | <b>Flexible Power Operations to 500 MWe</b> <ul style="list-style-type: none"> <li>Crew will take the duty at approximately 582 MWe.</li> <li>In response to a request from marketing for Flexible Power Operations, the crew will lower Generator Electric load to 500 MWe.</li> <li><b>EVENT not used on past 2 exams</b></li> </ul>  |
| 3   | 1         | C (BOP,SS)<br>TS (SS)   | <b>PRZR PORV 1PCV-431 Leakage</b> <ul style="list-style-type: none"> <li>PORV PCV-431 will develop seat leakage.</li> <li>PRZR Relief Line temperatures will rise.</li> <li>The crew will respond per C47012-0506.</li> <li>The crew will isolate the leakage by closing CS-46263, PRZR Relief Isol MV-32195.</li> <li>The Shift Supervisor will TS LCO 3.4.11 Condition A.</li> </ul>        |
| 4   | 2         | I (BOP,SS)<br>TS (SS)   | <b>1PT-486 Blue Channel First Stage Pressure Fails Low</b> <ul style="list-style-type: none"> <li>C47011-0405 FW Control System Trouble will alarm.</li> <li>The crew will place steam dump in steam pressure mode per 1C51.3 Instrument failure guide.</li> <li>The crew will address T.S. 3.3.1 Condition A and T and TRM 3.3.4 A</li> <li><b>EVENT not used on past 2 exams</b></li> </ul> |
| 5   | 3         | C (BOP, SS)             | <b>Loss of Gap / Support Cooling</b> <ul style="list-style-type: none"> <li>11 RX VSL support cooling fan will trip.</li> <li>The crew will start 12 RX VSL support cooling fan per C47021-0503.</li> <li><b>EVENT not used on past 2 exams</b></li> </ul>  |
| 6   | 4         | M (ALL)                 | <b>Small Break LOCA</b> <ul style="list-style-type: none"> <li>PRZR level and RCS pressure will lower.</li> <li>The crew will manually actuate Safety Injection.</li> <li>The crew will respond per 1E-0 and 1E-1.</li> <li><b>EVENT not used on past 2 exams</b></li> </ul>  |
| 7   | 5         | C (BOP, SS)<br>MC (BOP) | <b>Component Cooling Pumps Fail to Start Automatically</b> <ul style="list-style-type: none"> <li>The crew will manually start CC pumps IAW 1E-0. ATT L</li> </ul>  |
| 8   | 6         | C (BOP, SS)<br>MC (BOP) | <b>12 DD Cooling Water Pump Fails to Start Automatically</b> <ul style="list-style-type: none"> <li>12 Diesel Driven Cooling Water pump will fail to start</li> <li>The crew will start the 12 DD CL water pump per Att. L of 1E-0.</li> <li><b>EVENT not used on past 2 exams</b></li> </ul>   |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control |           |                         |   |

## CRITICAL TASK SHEET

|                                    |  |
|------------------------------------|--|
| Number:                            | PI-CT-13   |
| Critical Task:                     | Manually start at least one CC Pump prior to transition to Recirculation Phase.  |
| Safety Significance:               | Operation of the ECCS injection pumps without Component Cooling Water could lead to pump failure or damage. This would result in a degraded emergency core cooling system (ECCS) capacity. A single Component Cooling Water Pump is required by the USAR for recirculation phase to provide adequate Post-LOCA heat removal capabilities.              |
| Initiating Cue:                    | <ul style="list-style-type: none"> <li>• Indication that Safety Injection actuated.</li> <li>• "SI ACTIVE" lights are NOT lit for both CC Pumps.</li> <li>• Component Cooling Water Discharge pressure reads zero.</li> <li>• Component Cooling Water Low Flow alarms to ECCS Pumps.</li> </ul>  |
| Performance Feedback:              | <ul style="list-style-type: none"> <li>• "SI ACTIVE" lights are LIT for at least one CC Pump.</li> <li>• Component Cooling Water Low Flow alarm clears for at least one train of Safeguards components.</li> </ul>   |
| Plant Conditions/<br>Success Path: | <ul style="list-style-type: none"> <li>• Safety Injection.</li> <li>• Both Component Cooling Water Pumps are NOT running.</li> <li>• At least one Component Cooling Water Pump can be started from the Control Room.</li> </ul>  |
| Measurable Performance Standard:   | <ul style="list-style-type: none"> <li>• Starting one or both CC Pumps by operating the following switches:             <ul style="list-style-type: none"> <li>○ CS-46036, 11 CC WTR PUMP.</li> <li>○ CS-46037, 12 CC WTR PUMP.</li> </ul> </li> <li>• CC Pump must be started prior to starting an RHR pump for transfer to recirculation.</li> </ul> |

## CRITICAL TASK SHEET

|                                  |  |
|----------------------------------|--|
| Number:                          | PI-CT-18   |
| Critical Task:                   | Trip Reactor Coolant Pumps within 8 minutes of RCP trip criteria being met.  |
| Safety Significance:             | Failure to trip the RCPs under the postulated plant conditions lead to core uncovering and to fuel cladding temperatures in excess of 2200°F. Thus, failure to perform the task represents mis-operation or incorrect crew performance in which the crew has failed to prevent degradation of the fuel cladding barrier to fission product release. USAR 4.3.3 references WOG letter to NRC OG-117 1984 in which the WOG determined the postulated trip criteria in the ERG (E-1-C) meets the requirements of NUREG 0737 Item II.K.3.5 (TMI automatic RCP trip functions). It also describes that for the postulated small break LOCA size of 3", the window for adverse conditions is 8-12 minutes. As the break size decreases, the window start time increases. Because it is not realistic for operators to determine exact break size in the early stages of a LOCA, licensee agrees that the start of the window for adverse conditions, at the largest break size for the postulated Small Break LOCA, is an appropriate response time. |
| Initiating Cue:                  | <ul style="list-style-type: none"> <li>• Injection flow exists to RCS: <ul style="list-style-type: none"> <li>○ At least one SI Pump running and flow indicated.</li> <li style="text-align: center;">-OR-</li> <li>○ At least one RHR Pump running and flow indicated.</li> </ul> </li> <li>• RCS Pressure is less than 1275 PSIG [1600 PSIG].</li> <li>• An operator controlled cool down has NOT been initiated.</li> </ul>   |
| Performance Feedback:            | <ul style="list-style-type: none"> <li>• Indication that all RCPs are stopped.</li> <li>• Both RCP Pump green indicating lights LIT.</li> <li>• Both RCP Pump red indicating lights NOT LIT.</li> <li>• RCP flow decreasing.</li> </ul>  |
| Plant Conditions/ Success Path:  | <ul style="list-style-type: none"> <li>• Small Break LOCA.</li> <li>• Break size less than 3 inches.</li> <li>• At least one Safety Injection Pump running.</li> <li>• RCPs Running.</li> <li>• RCP trip criteria are met.</li> </ul>  |
| Measurable Performance Standard: | <ul style="list-style-type: none"> <li>• Manually stopping RCPs using: <ul style="list-style-type: none"> <li>○ CS-46255, 11 REACTOR CLNT PUMP.</li> <li>○ CS-46256, 12 REACTOR CLNT PUMP.</li> </ul> </li> <li>• Operators must trip running RCPs within 8 minutes of RCP trip criteria being met in the EOPs.</li> </ul>   |





Form 3.3-1 Scenario Outline

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|--|--|
| Facility: <b>PRARIE ISLAND</b>   | Scenario #: <b>2</b>   |
| <u>Scenario Source:</u><br><b>NEW</b>  | <u>Op. Test #:</u><br><b>PI-ILT-NRC-2202S</b>  |
| <u>Examiners:</u><br><br><b>Zoia / Nance</b><br><br><b>Rodriguez</b>   | <u>Applicants/ Operators:</u><br><br><b>Shift Supervisor (SS): SURROGATE</b><br><br><b>Balance of Plant (LRO): I1</b><br><br><b>At the Controls (RO): R5</b> |
| <u>Initial Conditions:</u><br>Reactor Power: <b>95%</b><br>Boron Concentration: <b>0 (CDC) PPM</b><br>RCS temperature: <b>560°F</b><br>RCS pressure: <b>2235 PSIG</b><br>Xenon: <b>Equalibrium</b><br>Rods: <b>CBD @ 221 STEPS</b><br>Main Generator: <b>543 MW</b>  |  |
| <u>Turnover:</u><br><b>11 TDAFWP OOS</b><br><b>After taking the duty, swap HDT pumps per 1C28.4 and pre-job brief.</b>   |  |
| <u>Critical Tasks:</u><br><br><b>PI-CT-2A: Manually insert control rods and/or borate the RCS to prevent an ORANGE or RED path on the Core Cooling CSF.</b><br><br><b>PI-CT-12A: During an ATWS, establish Auxiliary Feed Water flow to the Steam Generators to prevent an ORANGE or RED path on the CORE COOLING CSF.</b> |  |

| Event No.   | Malf. No. | Event Type*             | Event Description                              |
|---|-----------|-------------------------|--|
| 1   |           | N (ATC)                 | 50 gallon manual makeup to the VCT             |
| 2   | 1         | I (BOP)<br>R (ATC)      | Thot Yellow Channel Fails High                 |
| 3   | 2         | I (BOP)                 | 1PT-478, 12 SG Pressure Blue Channel Fails Low |
| 4   | 3         |                         | 11 Circ Water Pump High Temp                   |
| 5   |           | R (BOP)<br>C (ATC, SS)  | Rapid Power Reduction                          |
| 6   | 4         | M (ALL)                 | Turbine Trip / ATWS                            |
| 7   | 5         | C (BOP, SS)<br>MC (BOP) | 12 MDAFWP Fails to Start                       |
| 8   | 6         | C (BOP, SS)             | Normal Boration Fails                          |
|   |           |                         |  |
|   |           |                         |  |
|   |           |                         |  |
|   |           |                         |  |
|   |           |                         |  |
|   |           |                         |  |
|   |           |                         |  |
|   |           |                         |  |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control |           |                         |  |



Form 3.3-1 Scenario Outline Rev. 2

|  |   |
|--|---|
| Facility: <b>PRARIE ISLAND</b>   | Scenario #: <b>2</b>  |
| <u>Scenario Source:</u><br><b>NEW</b>  | <u>Op. Test #:</u><br><b>PI-ILT-NRC-2202S</b>   |
| <u>Examiners:</u>  | <u>Applicants / Operators:</u><br><b>Shift Supervisor (SS)</b><br><b>Balance of Plant LRO)</b><br><b>At the Controls (RO)</b> |
| <u>Initial Conditions:</u><br>Reactor Power: <b>95%</b><br>Boron Concentration: <b>0 (CDC) PPM</b><br>RCS temperature: <b>559.5°F</b><br>RCS pressure: <b>2235 PSIG</b><br>Xenon: <b>Equilibrium</b><br>Rods: <b>CBD @ 225 STEPS</b><br>Main Generator: <b>543 MW</b>  |   |
| <u>Turnover:</u><br><b>11 TDAFWP OOS</b><br><b>After taking the duty, swap HDT pumps per 1C28.4 and pre-job brief.</b>   |   |
| <u>Critical Tasks:</u><br><b>PI-CT-2A: Manually insert control rods and/or borate the RCS to prevent an ORANGE or RED path on the Core Cooling CSF.</b><br><br><b>PI-CT-12A: During an ATWS, establish Auxiliary Feed Water flow to the Steam Generators to prevent an ORANGE or RED path on the CORE COOLING CSF.</b> |   |

| Event No.   | Malif. No. | Event Type*                                   | Event Description   |
|---|------------|---|---|
| 1   |            | N (BOP)                                       | <b>Swap Auto HDT Pump per 1C28.4</b> <ul style="list-style-type: none"> <li>The crew will place 12 HDT Pump in Automatic and 11 HDT pump to Manual.</li> <li><b>NEW EVENT, not used on past 2 exams</b></li> </ul>  |
| 2   | 1          | I (BOP, SS)<br>R (ATC)<br>MC (ATC)<br>TS (SS) | <b>Thot Yellow Channel Fails High</b> <ul style="list-style-type: none"> <li>Rods will step in.</li> <li>Charging pump speed will go to maximum.</li> <li>The crew will take manual control of rods and charging.</li> <li>The crew will select yellow channel T<sub>AVG</sub> defeat switch and pull out.</li> <li>The SS will enter T.S. 3.3.1 Cond. A &amp; E; T.S. 3.3.2 Cond. A &amp; D; and T.R.M. 3.3.3 Cond. A.</li> </ul>    |
| 3   | 2          | I (BOP,SS)<br>TS (SS)                         | <b>1PT-478, 12 SG Pressure Blue Channel Fails Low</b> <ul style="list-style-type: none"> <li>1PI-478 B Steam Generator Pressure (Blue) fails LOW.</li> <li>The crew will place 12 SG PORV in manual per 1C51.3</li> <li>The SS will enter T.S. 3.3.2 Condition A and T.S. LCO 3.3.2 Condition D.</li> <li><b>NEW EVENT, not used on past 2 exams</b></li> </ul>   |
| 4   | 3          |   | <b>11 Circ Water Pump High Temp</b> <ul style="list-style-type: none"> <li>Crew will receive 11 Circ Water High Temp Alarm.</li> <li>The crew will determine a rapid load reduction is required per C47001.</li> <li><b>NEW EVENT, not used on past 2 exams</b></li> </ul>  |
| 5   |            | R (BOP)<br>N (ATC)<br>C (SS)                  | <b>Rapid Power Reduction</b> <ul style="list-style-type: none"> <li>The crew will perform a Rapid Load Reduction per 1C1.4 AOP1.</li> </ul>   |
| 6   | 4          | M (ALL)                                       | <b>Turbine Trip / ATWS</b> <ul style="list-style-type: none"> <li>Main Turbine will trip and MFW pumps will lockout.</li> <li>The reactor will fail to trip automatically and rods will fail to move automatically.</li> <li>Attempts to trip the reactor from the Control Room will be unsuccessful.</li> <li>The crew will manually insert control rods per 1FR-S.1.</li> <li><b>NEW EVENT, not used on past 2 exams</b></li> </ul> |
| 7   | 5          | C (BOP, SS)<br>MC (BOP)                       | <b>12 MDAFWP Fails to Start</b> <ul style="list-style-type: none"> <li>12 MDAFW pumps will fail to start automatically.</li> <li>The crew will start 12 MDAFW Pumps per 1FR-S.1.</li> </ul>   |
| 8   | 6          | C (BOP, SS)                                   | <b>Normal Boration Fails</b> <ul style="list-style-type: none"> <li>The normal boration method will fail.</li> <li>The crew will emergency borate the reactor per 1FR-S.1.</li> <li><b>NEW EVENT, not used on past 2 exams</b></li> </ul>   |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control |            |   |   |

## CRITICAL TASK SHEET

|                                  |   |
|----------------------------------|---|
| Number:                          | PI-CT-2A  |
| Critical Task:                   | Manually insert control rods and/or borate the RCS to prevent an ORANGE or RED path on the Core Cooling CSF.  |
| Safety Significance:             | Negative reactivity must be added, and/or positive reactivity sources must be removed from a core that is observed to be critical when expected to be shutdown.<br>Plant safeguards systems design basis assumes decay heat and RCP heat only. These safeguards systems cannot perform their safety functions when needed to protect the core during accident conditions if critical core heat is also being added. (e.g. AFW cannot provide sufficient heat removal from SGs if core is still critical)  |
| Initiating Cue:                  | <ul style="list-style-type: none"> <li>• Reactor trip First Out annunciator lit.</li> <li>• Reactor trip breakers closed.</li> <li>• Rods not at bottom.</li> <li>• ROD AT BOTTOM lights not lit.</li> <li>• Reactor trip switches fail to generate a reactor trip.</li> <li>• AMSAC/DSS switch fails to insert control rods.</li> </ul>  |
| Performance Feedback:            | <ul style="list-style-type: none"> <li>• Rods stepping in.</li> <li>• Reactor power lowering.</li> <li>• Negative SUR.</li> </ul>   |
| Plant Conditions/ Success Path:  | <ul style="list-style-type: none"> <li>• Reactor power is greater than or equal to 70%.</li> <li>• At least one of the following occurs: <ul style="list-style-type: none"> <li>○ Loss of normal feed water to the Steam Generators.</li> <li>○ Main Turbine Trip.</li> </ul> </li> <li>• The reactor fails to automatically trip.</li> <li>• The reactor cannot be manually tripped from the Control Room.</li> <li>• Out-plant operators are unable to trip the reactor locally.</li> <li>• Rods fail to automatically insert.</li> <li>• At least one of the following is drawing steam from the SGs: <ul style="list-style-type: none"> <li>○ Main Turbine.</li> <li>○ Steam Dumps.</li> <li>○ SG PORVs.</li> </ul> </li> </ul> |
| Measurable Performance Standard: | <p>Prior to reaching an ORANGE or RED path in Core Cooling, the crew performs one or both of the following:</p> <ol style="list-style-type: none"> <li>1. Control Rods <ul style="list-style-type: none"> <li>• CS-46280 in a position other than AUTO, and</li> <li>• CS-46281 in the IN position.</li> </ul> <p style="text-align: center;">-AND / OR-</p> </li> <li>2. Boron injection to RCS at 12 – 15 gpm.</li> </ol>   |

## CRITICAL TASK SHEET

|                                    |   |
|------------------------------------|---|
| Number:                            | PI-CT-12A   |
| Critical Task:                     | During an ATWS, establish Auxiliary Feed Water flow to the Steam Generators to prevent an ORANGE or RED path on the Core Cooling CSF.   |
| Safety Significance:               | With insufficient feed water flow, the Steam Generators dry out, causing an RCS pressure increase that opens the pressurizer PORVs. The open PORVs create a small break LOCA that challenges the Core Cooling CSF. Also, failure to maintain an adequate heat sink will result in degradation of the Fuel Clad Barrier and RCS Barrier.   |
| Cues:                              | <ul style="list-style-type: none"> <li>• Less than 200 GPM of feed water flow to the Steam Generators.</li> <li>• Both Steam Generators levels lowering.</li> <li>• RCS pressure is above the pressure of all Steam Generators.</li> </ul>  |
| Performance Feedback:              | <ul style="list-style-type: none"> <li>• Increasing water level in at least one Steam Generator.</li> <li>• Feed water flow into at least one SG.</li> </ul>  |
| Plant Conditions/<br>Success Path: | <ul style="list-style-type: none"> <li>• Reactor power is greater than or equal to 70%.</li> <li>• At least one of the following occurs: <ul style="list-style-type: none"> <li>○ Loss of normal feed water to the Steam Generators.</li> <li>○ Main Turbine Trip.</li> </ul> </li> <li>• The reactor fails to automatically trip.</li> <li>• The reactor cannot be manually tripped from the Control Room.</li> <li>• Out-plant operators are unable to trip the reactor locally.</li> <li>• Rods fail to automatically insert.</li> <li>• SGs are required for heat sinks.</li> <li>• Feed water flow is available but not established from any of the following: <ul style="list-style-type: none"> <li>○ 11 Turbine Driven Auxiliary Feed Water Pump</li> <li>○ 12 Motor Driven Auxiliary Feed Water Pump</li> <li>○ 21 Motor Driven Auxiliary Feed Water Pump</li> </ul> </li> <li>• At least one of the following is drawing steam from the SGs: <ul style="list-style-type: none"> <li>○ Main Turbine.</li> <li>○ Steam Dumps.</li> <li>○ SG PORVs.</li> </ul> </li> </ul> |
| Measurable Performance Standard:   | <ul style="list-style-type: none"> <li>• Prior to the need to establish bleed and feed, the crew manipulates controls to establish feed water flow into at least one SG with Auxiliary Feed Water Pumps.</li> </ul> <p>NOTE:<br/>The crew establishing RCS bleed and feed instead of using a feed water source would most likely constitute a failure.</p>  |





Form 3.3-1 Scenario Outline

|   |                        |  |  |
|---|------------------------|--|--|
| Facility: <b>PRARIE ISLAND</b>  |                        | Scenario #: <b>5 (SPARE)</b>   |  |
| <u>Scenario Source:</u><br><b>NEW</b>   |                        | <u>Op. Test #:</u><br><b>PI-ILT-NRC-2205S</b>  |  |
| <u>Examiners:</u><br><b>Zoia / Nance<br/>Rodriguez<br/>Examiner #3</b>  |                        | <u>Applicants/ Operators:</u><br><b>Shift Supervisor (SS):<br/>Balance of Plant (LRO):<br/>At the Controls (RO):</b> |  |
| <u>Initial Conditions:</u>  |                        |  |  |
| Reactor Power:  | <b>100%</b>            |  |  |
| Boron Concentration:  | <b>1217 PPM</b>        |  |  |
| RCS temperature:  | <b>560°F</b>           |  |  |
| RCS pressure:   | <b>2235 PSIG</b>       |  |  |
| Xenon:  | <b>Equalibrium</b>     |  |  |
| Rods:   | <b>CBD @ 218 STEPS</b> |  |  |
| Main Generator:   | <b>582 MW</b>          |  |  |
| <u>Turnover:</u><br><b>11TDAFWP OSS<br/>Swap reactor makeup pumps per C13.1<br/>Reduce load from 100% to 90% per 1C1.4 Unit 1 Power Operation</b> |                        |  |  |
| <u>Critical Tasks:</u>  |                        |  |  |
| <b>PI-CT-2A: Manually insert control rods and/or borate the RCS to prevent an ORANGE or RED path on the Core Cooling CSF.</b>                     |                        |  |  |
| <b>PI-CT-16: Establish Bleed &amp; Feed flow path to prevent an ORANGE or RED path on Core Cooling CSF.</b>                                       |                        |  |  |

| Event No.   | Malf. No. | Event Type*             | Event Description   |
|---|-----------|-------------------------|---|
| 1   |           | N (BOP)                 | Swap reactor makeup pumps   |
| 2   |           | R (ATC)<br>N (SS)       | Perform load decrease from 100% to 90%                            |
| 3   |           | I (BOP, ATC)<br>TS (SS) | Blue channel (controlling) PRZR level fails high                  |
| 4   |           | C (BOP, SS)             | 11 RCP #1 Seal Failure  |
| 5   |           | C (ATC, SS)             | 11 RCP #2 Seal Failure  |
| 6   |           | M (ALL)                 | Loss of Feedwater ATWS with Bleed & Feed                          |
| 7   |           | C (BOP, SS)             | Main turbine fails to auto and manually trip manually close MSIVs |
| 8   |           | C (BOP, SS)<br>MC (BOP) | SI pumps fail to start on SI actuation                            |
|   |           |                         |   |
|   |           |                         |   |
|   |           |                         |   |
|   |           |                         |   |
|   |           |                         |   |
|   |           |                         |   |
|   |           |                         |   |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control |           |                         |   |



Form 3.3-1 Scenario Outline Rev. 2

|   |  |
|---|--|
| Facility: <b>PRARIE ISLAND</b>  | Scenario #: <b>5</b>   |
| <u>Scenario Source:</u><br><b>NEW</b>   | <u>Op. Test #:</u><br><b>PI-ILT-NRC-2205S</b>  |
| <u>Examiners:</u>   | <u>Applicants / Operators:</u><br><b>Shift Supervisor (SS)</b><br><b>Balance of Plant (LRO)</b><br><b>At the Controls (RO)</b> |
| <u>Initial Conditions:</u><br>Reactor Power: <b>100%</b><br>Boron Concentration: <b>1186 PPM</b><br>RCS temperature: <b>560°F</b><br>RCS pressure: <b>2235 PSIG</b><br>Xenon: <b>Equilibrium</b><br>Rods: <b>CBD @ 218 STEPS</b><br>Main Generator: <b>582 MW</b> |  |
| <u>Turnover:</u><br><b>12 CS Pump OOS</b><br><b>Swap reactor makeup pumps per C13.1</b><br><b>Reduce load from 100% to 90% per 1C1.4 Unit 1 Power Operation</b>   |  |
| <u>Critical Tasks:</u><br><b>PI-CT-15: Manually actuate containment cooling as necessary to prevent pressure from exceeding 46 psig.</b><br><br><b>PI-CT-19: Stop feed flow to the faulted Steam Generator prior to an ORANGE/RED Path in Containment CSF.</b>    |  |

| Event No.   | Malf. No. | Event Type*                           | Event Description  |
|---|-----------|---------------------------------------|--|
| 1   |           | N (BOP)                               | <b>Swap reactor makeup pumps</b> <ul style="list-style-type: none"> <li>The crew will start 12 Reactor Make-up Pump and secure 11 Reactor Make-up Pump per C13.1, and pre-job brief.</li> </ul>  |
| 2   |           | R (ATC)<br>N (SS)                     | <b>Perform load decrease from 100% to 90%</b> <ul style="list-style-type: none"> <li>The crew will place rods in manual.</li> <li>The crew will borate the RCS.</li> <li>The crew will operate the turbine to lower load.</li> <li><b>NEW EVENT, not used on past 2 exams</b></li> </ul>   |
| 3   | 1         | TS (SS)                               | <b>11 SG Steam Flow Red Channel Fails High</b> <ul style="list-style-type: none"> <li>1FI-464 Fails High</li> <li>The crew will respond to C47011-0405 &amp; C51.1</li> <li>The crew will enter T.S. LCO 3.3.2 Condition A &amp; D</li> <li><b>NEW EVENT, not used on past 2 exams</b></li> </ul>  |
| 4   | 2         | I (ATC,BOP,SS)<br>MC (ATC)<br>TS (SS) | <b>Blue channel (controlling) PRZR level fails high</b> <ul style="list-style-type: none"> <li>Charging will go to minimum.</li> <li>Backup heaters will energize</li> <li>The crew will select "2-1" (White-Red) on PRZR Level Control per 1C51.3</li> <li>The crew will return pressurizer heaters and charging pump speed control to auto per 1C51.3</li> <li>The crew will enter T.S. LCO 3.3.1 Condition A and K.</li> </ul>  |
| 5   | 3         | C (BOP, SS)                           | <b>B Condenser Air In-Leakage</b> <ul style="list-style-type: none"> <li>"B" condenser will develop in-leakage resulting in decreasing "B" condenser vacuum and increasing condenser vacuum differential pressure.</li> <li>The crew will diagnose the reduction in vacuum.</li> <li>The crew will respond to the condenser leak by placing the standby air ejectors in service on the "B" condenser.</li> <li><b>NEW EVENT, not used on past 2 exams</b></li> </ul>   |
| 6   | 4         | M (ALL)                               | <b>12 SG Fault to Containment</b> <ul style="list-style-type: none"> <li>The 12 SG will fault inside CTMT.</li> <li>The reactor will trip and SI will actuate.</li> <li>The 11 CS pump will fail to start automatically and all CFCUs will fail to start in slow.</li> <li>The crew will respond per 1E-0, 1E-2, and 1FR-Z.1.</li> <li><b>SIG MOD:</b> <ul style="list-style-type: none"> <li><b>2018 ILT #5 (spare not used or published)</b></li> <li><b>2020 ILT #1</b></li> <li><b>This event has a loss of CTMT cooling associated with it that leads to an ORANGE path in CTMT CSFST. The crew will transition to 1FR-Z.1 to mitigate and then go back to 1E-2 to isolate the faulted SG.</b></li> </ul> </li> </ul> |
| 7   | 5         | C (BOP, SS)                           | <b>D1 Fails to Auto start</b> <ul style="list-style-type: none"> <li>D1 fails to auto start.</li> <li>The crew will start D1 per 1E-0, Att L.</li> </ul>   |
| 8   | 6         | C (BOP,SS)<br>MC (BOP)                | <b>BKR 8H-16 Fails to Open</b> <ul style="list-style-type: none"> <li>8H16, 345 kV SUBSTATION BREAKER, will fail to open automatically after the turbine trip.</li> <li>The crew will open the breaker per Att. L of 1E-0.</li> <li><b>NEW EVENT, not used on past 2 exams</b></li> </ul>  |
| * (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control |           |                                       |  |

## CRITICAL TASK SHEET

|                                    |   |
|------------------------------------|---|
| Number:                            | PI-CT-15  |
| Critical Task:                     | Manually actuate containment cooling as necessary to prevent containment pressure from exceeding 46 psig.   |
| Safety Significance:               | Failure to actuate sufficient containment cooling during a high energy release into containment will result in containment pressure exceeding the design limit of 46 psig. Exceeding this limit will result in a loss of the Containment Barrier.   |
| Initiating Cue:                    | <ul style="list-style-type: none"> <li>• Containment pressure is rising.</li> <li>• Containment cooling equipment fails to start, actuate, or align to their safeguards alignment.</li> </ul>   |
| Performance Feedback:              | <ul style="list-style-type: none"> <li>• Containment pressure lowering or stable below 46 psig.</li> </ul>  |
| Plant Conditions/<br>Success Path: | <ul style="list-style-type: none"> <li>• At least one of the following accidents: <ul style="list-style-type: none"> <li>○ LOCA into Containment.</li> <li>○ Un-isolable Steam Line Break into Containment.</li> </ul> </li> <li>• Containment pressure will exceed 46 psig if no operator action is taken to start available containment cooling equipment. <ul style="list-style-type: none"> <li>○ Sufficient containment cooling equipment is available to start from the Control Room to prevent containment pressure from exceeding 46 psig.</li> </ul> </li> </ul> |
| Measurable Performance Standard:   | <ul style="list-style-type: none"> <li>• Starting, actuating, or aligning the following equipment, as necessary, to establish sufficient containment cooling to prevent containment pressure from exceeding 46 psig: <ul style="list-style-type: none"> <li>○ Containment Fan Coil Units (CFCUs)</li> <li>○ Cooling Water / Chilled Water supply to CFCUs.</li> <li>○ Containment Spray System</li> </ul> </li> </ul>   |

## CRITICAL TASK SHEET

|                                    |  |
|------------------------------------|--|
| Number:                            | PI-CT-19   |
| Critical Task:                     | Stop feed flow to the faulted Steam Generator prior to an ORANGE/RED Path in Containment CSF.  |
| Safety Significance:               | Failure to stop feed flow to a Steam Generator that is faulted into Containment and can NOT be isolated will result in a challenge to the Containment Barrier as well as challenging minimum feedwater flow to the intact Steam Generator.   |
| Initiating Cue:                    | <ul style="list-style-type: none"> <li>• A single Steam Generator depressurizing in an uncontrolled manner or completely depressurized.</li> <li>• Main feed water or auxiliary feed water continues to be delivered to the faulted SG.</li> </ul>   |
| Performance Feedback:              | <ul style="list-style-type: none"> <li>• AFW flow to the faulted Steam Generator is secured.</li> <li>• SG Feed Water Flow to the faulted Steam Generator is secured.</li> </ul>   |
| Plant Conditions/<br>Success Path: | <ul style="list-style-type: none"> <li>• One faulted Steam Generator.</li> <li>• The fault is into Containment.</li> <li>• The fault can NOT be isolated.</li> <li>• A Red/Orange Path in Integrity CSF is likely and can NOT be prevented by crew actions.</li> </ul>   |
| Measurable Performance Standard:   | <ul style="list-style-type: none"> <li>• Stop feed flow to the faulted Steam Generator by Closing/Securing the following valves and/or pumps aligned to the faulted Steam Generator (as necessary):             <ul style="list-style-type: none"> <li>○ AFW Pump Discharge Valve(s)</li> <li>○ AFW Pump(s)</li> <li>○ Main and Bypass Feed Water valve(s)</li> <li>○ MFW Pump(s)</li> </ul> </li> </ul> |

