MILLSTONE 3 2023 Initial License Exam Outline Review Comments

Simulator Scenario Outline Comments

- **GENERAL COMMENTS *(AUDIT EXAM)***

  - **NRC:** ES-1.3, Section C.6, *"Audit Examinations,"* states *"Implement appropriate controls to keep the comprehensive audit or screening examination that is given at or near the end of the license class from compromising the integrity of the licensing examination." Audit Exam Op Test Outline material has yet to be developed (Forms 3.2-1, 3.2-2, and 3.3-1).* Comparison between NRC and Audit Exam Op Test Outlines will be required in order to confirm no duplication/overlap.

    MILLSTONE: Audit outlines to be provided for verification.

    Chief Examiner review and evaluation of this item complete.

- **GENERAL COMMENTS *(ALL SCENARIOS)***

  - **NRC:** NUREG-1021, ES-3.3, requires each Critical Task (CT) possess the four elements listed below. For the 75-Day submittal, provide a CT information page/sheet with each scenario that identifies how the individual elements are met.

    a) Initiating Cue
    b) Performance Feedback
    c) Success Path
    d) Measurable Performance Standard, specifically:
       i. Expected action(s)
       ii. Safety-significant boundary conditions/criteria that clearly define at what point a CT must be accomplished

    In addition, please include an additional element for *"Safety Significance"* on the CT information page/sheet, that clearly identifies why the task is of significant importance to the safety of the plant and the public.

    MILLSTONE: All simulator guides have been revised to include the above information. This can be found in the front of each simulator guide.

    Chief Examiner review and evaluation of this item complete.

  - **NRC:** Include the following statement on the Critical Task information sheets of each scenario:

    "Per NUREG-1021, ES-3.3, if an applicant's actions or inactions create a challenge to plant safety, those actions or inactions may form the basis for a Critical Task identified in the post scenario review."

MILLSTONE: All simulator guides have been revised to include the above information. This can be found in the front of each simulator guide.

Chief Examiner review and evaluation of this item complete.

- **NRC:** For each scenario Event associated with, and requiring the accomplishment of Critical Task actions, include the applicable CT designator(s) (i.e., CT-1, CT-2, etc.) in the corresponding Event Description Column of Form 3.3-1 after the description provided.

  MILLSTONE: All four Form 3.3-1's have been revised accordingly and are identified as Rev. 1.

  Chief Examiner review and evaluation of this item complete.

- **SCENARIO #1**

  - **NRC:** In Scenario 1, Event 5, *"Inadvertent 'B' Train Containment Depressurization Actuation (CDA),"* the 'TS' designator is missing for the SRO position in the Event Type Column of Scenario Outline Form 3.3-1.

    MILLSTONE: Form 3.3-1 has been changed accordingly and is identified as Rev. 1.

    Chief Examiner review and evaluation of this item complete.

  - **NRC:** In Scenario 1, Event 5, *"Inadvertent 'B' Train Containment Depressurization Actuation (CDA),"* confirm that start of the Containment Spray Pumps is plausible for a single train actuation. If not, ensure that sufficient verifiable actions remain for both the RO and BOP positions (presently scripted for both on Form 3.3-1) and that RCS Leakage TS 3.4.6.1 remains applicable.

    MILLSTONE: AOP3583 Inadvertent Containment Depressurization was created several years ago to address single train or both trains of CDA inadvertently actuating. This is considered credible as it's unknown where the malfunction would occur (similar to the tin whisker inadvertent SI that occurred on a single train at Millstone Unit 3). The AOP and subsequent malfunctions built by the simulator group are meant to address this postulated event. The result of the inadvertent CDA causes significant impact for both the RO and BOP operators (as outlined in the provided simulator guide). TS 3.4.6.1 is called out in the AOP for applicability.

    Chief Examiner review and evaluation of this item complete.

  - **NRC:** In Scenario 1, Event 8, *"FWI Components Fail to Isolate Automatically,"* suggest that the FWI valves that fail to isolate, be associated with one or both of the Faulted SGs and that the actions to isolate these valves be appropriately identified as CT items under the CT to Isolate the Faulted SGs.

MILLSTONE: The Feedwater Isolation Valves (3FWS*CTV41A through D all do not close and require manual closure). As the comment suggests, two of these ('A' and 'D') become part of critical task for faulted SG isolation. The simulator guide and revised Form 3.3-1 reflect this.

Chief Examiner review and evaluation of this item complete.

- **NRC:** Critical Task 1 (CT-1) states *"Manually trip the Reactor from the Control Room before transition out of E-0."* Revise the wording of the CT to more clearly specify that the Reactor must be manually tripped before transitioning to FR-S.1.

  MILLSTONE: The wording was taken from the document: Westinghouse PWROG-14043-NP "ERG Rev. 3 Based Critical Tasks". However, CT-1 has been changed as requested.

  Chief Examiner review and evaluation of this item complete.

- **NRC:** Critical Task 17 (CT-17) states *"Isolate the faulted SG before transition out of E-2."* Revise the wording of the CT to more clearly specify that the faulted SG must be isolated before transitioning to FR-P.1 on Orange Path.

  MILLSTONE: The wording was taken from the document: Westinghouse PWROG-14043-NP "ERG Rev. 3 Based Critical Tasks". The simulator guide and title has been changed to address the comment. The change made to the "Boundary Conditions" (contained in the simulator guide): now says: "Provide isolation before any of the following two conditions occur: (1) FR-P.1 conditions are met OR (2) transition out of E-2 is made."

  Chief Examiner review and evaluation of this item complete.

- **SCENARIO #2**

  - **NRC:** Scenario 2, Event 3, *"Rapid Downpower to 87% at 3%/Min,"* credits the BOP and SRO positions with a Normal Event. These positions should be credited with Component Failures given that the Rapid Power Reduction is the result of a Feedwater Tube Leak.

    MILLSTONE: Changed in accordance with comment above. Forms 3.3-1 and 3.4-1 have been changed accordingly and are identified as Rev. 1.

    Chief Examiner review and evaluation of this item complete.

  - **NRC:** Scenario 2, Event 5, *"Isolable RCS Leak Inside Containment,"* should be credited as a Tech Spec (TS) Event. A leak rate calculation will be performed prior

to successful isolation of the leak, which will identify that an Operational Leakage TS limit has been exceeded (TS 3.6.4.2), making the TS applicable.

MILLSTONE: Event 5 has been revised accordingly on Form 3.3-1 and in the simulator guide.

Chief Examiner review and evaluation of this item complete.

- **NRC:** Scenario 2, Event 7, *"B PORV Opens 20 Seconds After the Reactor Trip,"* was used as a post-EOP Entry Malfunction following the Loss of All AC Power Major Event in Scenario 3 of the 2021 NRC Exam. Recommend replacing this event with a different post-EOP Entry Malfunction that more significantly influences the operators' choice of mitigation strategy. *[Note that replacing the PORV Event will require CT-22 to be replaced].*

  MILLSTONE: Event 7 has been replaced with a new component failure / critical task ("Establish AFW flow during SBO"). Critical Task was chosen based on available, safety significant tasks for the given station blackout conditions.

  Additionally, the previous submittal had Event 1 : 'C' Service Water Pump trip. This event partially tested the US for a TS call. Because of overlap with the SRO written question 80 (K/A Service Water, ability to determine / interpret TS implementation), Event 1 has been replaced with 'B' PORV fails open.

  Chief Examiner review and evaluation of this item complete.

- **NRC:** NUREG 1021, ES-2.3, Form 2.3-2, Target Quantitative Attributes per Scenario Section, specifies a Target Range of *"1-2"* for Table item #4, "*EOPs entered/requiring substantive actions."* Review of the Scenario #2 Outline indicates that the scenario is built to directly transition from E-0 to Emergency Contingency Action (ECA) Procedure 0.0, *"Loss of All AC Power,"* and that Westinghouse Primary EOPs E-1, E-2, or E-3 will not be entered/used. Consequently, a value of "0" will be assigned for Table Attribute Item 4 on Form 2.3-2, which is outside of the Target Range. NUREG-1021, ES-3.3, Section B.2.g, *"EOP Operating Procedures Used,"* states *"Moreover, the primary scram response procedure that serves as the entry point for the EOPs is not counted." A determination of acceptability will be based upon Chief Examiner evaluation* of (a) the complexity of the Scenario, *i.e., the extent to which it exercises Contingency EOP Procedure ECA-0.0,* (b) the use of alternate decision paths and prioritization of actions within the EOP to mitigate the Loss of ALL AC Power condition, and (c) the measurable actions that must be taken by the crew. Ensure that Scenario 2 sufficiently addresses each of these evaluation criteria.

  MILLSTONE: The scenario is judged to be both significantly complex and meet the specified criteria.

  Chief Examiner review and evaluation of this item complete.

- **SCENARIO #3**

  - **NRC:** Scenario 3, Event 1, "*Energize All Pressurizer Heaters to Support Upcoming Downpower,"* appears to be insufficient in terms of substance, bringing into question its use on the NRC Exam as an effective evaluation tool for Normal Event type evolutions. Replace with a Normal Event that is more substantive.

    MILLSTONE: Because Event 1 had credited a normal RO evolution and a TS call for the US, this event has been replaced with two separate events. The two events are:
    Event 1: Shift SG Blowdown Tank vent path from atmosphere to the fourth point feedwater heaters (will credit RO with a Normal evolution)
    Event 2: SG Feed Isolation valve has low accumulator pressure (will credit SRO with a TS call)

    During OPS review, previous Event 2 "Steam Trap Bypass fails open to main condenser" was found to be flawed. During plant start-up, these Main Steam line trap bypass valves are now manually isolated per OP 3203. As such, this event was removed from the scenario and the Heater Drain event was modified to add complexity. Rather than a phone call to remove from service, The 'B' Heater Drain Pump is now tripped. Lastly, starting power level modified from 100% to 97%.

    Forms 3.3-1 and 3.4-1 have been changed accordingly and are identified as Rev. 1.

    Chief Examiner review and evaluation of this item complete.

  - **NRC:** Scenario 3, Event 4, *"B Heater Drain Pump Motor Condition Worsens, Rapid Downpower Required at 1%/Min,"* credits the BOP and SRO positions with a Normal Event. These positions should be credited with Component Failures given that the Rapid Power Reduction is the result of a Heater Drain Pump malfunction.

    MILLSTONE: Changed in accordance with comment above. Forms 3.3-1 and 3.4-1 have been changed accordingly and are identified as Rev. 1.

    Chief Examiner review and evaluation of this item complete.

  - **NRC:** Suggest replacing the words *"Containment Cooling"* in CT-3 with *"Containment Spray,"* to more accurately reflect the equipment that needs to actuated to satisfy the Critical Task.

    MILLSTONE: Changed in accordance with comment above. Form 3.3-1 has been changed and is identified as Rev. 1.

    Chief Examiner review and evaluation of this item complete.

- **NRC:** Critical Task 6 (CT-6) states *"Manually start at least one Charging Pump (by either – whichever condition occurs later): (1) Transition out of E-0 OR (2) Completion of E-0 Attachment B, Actuation Signal Verification."* Re-evaluate the existing Boundary Criteria for Starting the Charging Pump for actual consequence, to determine, if possible, a Preferred Boundary Criteria in lieu of the Alternative Boundary Criteria of merely exiting or transitioning from the procedure that first directs CT accomplishment (in this case E-0 or the E-0 Attachment).

  MILLSTONE: In the scenario, this critical task (Westinghouse CT-6) was the third proposed critical task. After running on the simulator, CT-6 has been removed due to timing and overall flowpath of the scenario. Events 5 -8 have been condensed to events 6 – 8 on Form 3.3-1 Rev. 1. Due to lack of substantial actions in ES-0.1 (before SBLOCA), the first Major was removed (ES-0.1). The resultant changes are reflected in Form 3.4-1 Rev. 1.

  Chief Examiner review and evaluation of this item complete.

- **SCENARIO #4**

  - **NRC:** Scenario 4, Event 5, *"A SG Develops a 30 GPM Tube Leak,"* credits the RO with a Component Failure. What verifiable action is being taken by the applicant in the RO position in response to this event?

    MILLSTONE: The RO will be tasked with monitoring and controlling pressurizer level using 3CHS*FK121. The RO will stabilize pressurizer level and provide a mass balance.

    Chief Examiner review and evaluation of this item complete.

  - **NRC:** Appears that starting the 'B' SI Pump in Scenario 4, Event 7, should be a stand-alone CT given the need to actuate SI during the SGTR Event. Evaluate this event for CT applicability. Ensure the use of Preferred Boundary Criteria based on actual consequence in lieu of Alternative Boundary Criteria if determined to be a viable CT.

    MILLSTONE: After evaluation, event 7 doesn't meet the criteria for a Critical Task. This event was run on the simulator and 'B' SI Pump was left in the off position ('A' SI pump was oos). RCS pressure held up at 1900 – 2000 psia due to the size of the tube rupture and capacity of the high head Charging Pumps. NOTE: SI pump shutoff head is ~ 1550 psia.

    Chief Examiner review and evaluation of this item complete.

  - **NRC:** Critical Task 1 (CT-1) states *"Isolate AFW flow to the affected SG between greater than 8% to less than or equal to 30% Narrow Range Level."* Revise the wording of the CT to include isolation of the Steam Outputs, in addition to isolating the AFW flow.

Chief Examiner review and evaluation of this item complete.

MILLSTONE: Critical task revised accordingly. Rather than reference a SFRM critical task, the WOG was used to adjust this critical task (CT-18 from WOG). This will satisfy the comment as the Westinghouse specifies feed and steam isolation in one task.

Chief Examiner review and evaluation of this item complete.

- **NRC:** Critical Task 19 (CT-19), Criteria #1, states *"Too high to maintain minimum required subcooling."* Revise the wording of CT Criteria #1 to specify the isolation of Feedwater Flow into and Steam Flow from the ruptured SG before transitioning to ECA-3.1.

  MILLSTONE: Change has been made as requested.

  Chief Examiner review and evaluation of this item complete.

JPM Outline Comments

- **Admin JPMs**
  - **NRC:** RO Admin JPM A.3, *Radiation Control,* is missing the associated K/A reference on Outline Form 3.2-1; should be K/A 2.3.5.

    MILLSTONE: Based on the inability to build a discriminating JPM, this JPM has been changed to RO A.3 "Assess Emergency Dose Limits". JPM and Form 3.2-1 revised accordingly.

    Chief Examiner review and evaluation of this item complete.

  - **NRC:** SRO Admin JPM A.3, *Radiation Control,* is missing the associated K/A reference on Outline Form 3.2-1; should be K/A 2.3.12.

    MILLSTONE: Form 3.2-1 revised accordingly and identified as Rev. 1.

    Chief Examiner review and evaluation of this item complete.

  - **NRC:** For SRO Admin JPM A.4, *Emergency Plan,* consider enhancing the JPM by requiring the applicant to reassess plant conditions and determine whether a PAR Upgrade is warranted.

MILLSTONE: Incorporated comments and changed title to reflect the change: "Evaluate Possible Change to Protective Action Recommendations". Form 3.2-1 revised accordingly and identified as Rev. 1.

Chief Examiner review and evaluation of this item complete.

- **Control Room Systems JPMs**
  - **NRC:** Sim JPMs **S.1, S.2, S.3,** and **S.4** are missing the associated K/A information on Outline Form 3.2-2. For JPM S.2, replace Safety Function 2-013, with 5-026 (Containment Integrity – Containment Spray System), and assign K/A A2.03, *"Failure of ESF."*

    MILLSTONE: Form 3.2-2 revised accordingly (with following exception) and identified as Rev. 1. The exception is that JPM S.2 was found to overlap with Simulator Scenario 3. Specifically, Step 8 RNO of FR-Z.1 would have tested the same knowledge as the JPM. S.2 has been replaced. Form 3.2-2 Rev. 1 and the submittal reflects this change.

    Chief Examiner review and evaluation of this item complete.

  - **NRC:** On Outline Form 3.2-2 for the Control Room System JPMs, retain the ***'a' through 'h'*** line item designators (includes the blank space placeholders) on both the SRO-I and SRO-U License Level forms (similar to what was done on the 2021 NRC Exam), to promote consistency and avoid confusion.

    MILLSTONE: Form(s) 3.2-2 revised accordingly and identified as Rev. 1.

    Chief Examiner review and evaluation of this item complete.

- **In-Plant Systems JPMs**
  - **NRC:** For In-Plant JPM **P.2**, Revise the title of the JPM to read *"Establish Alternate Charging Pump Cooling Using Fire Water,"* and replace Safety Function 2-004, with 8-086 (Plant Service Systems – FPS), on Outline Form 3.2-2.

    MILLSTONE: Revised title, safety function, and K/A to 086-K1.01. Form 3.2-2 Rev. 1 and JPM both reflect these changes.

    Chief Examiner review and evaluation of this item complete.

  - For In-Plant JPM **P.1**, change the Safety Function designator from 4.2-061 to 4 SEC - 061, on Outline Form 3.2-2.

    MILLSTONE: Form 3.2-2 Rev. 1 reflects desired change.

Chief Examiner review and evaluation of this item complete.

- **NRC:** On Outline Form 3.2-2 for the In-Plant System JPMs, retain the ***'i' through 'k'*** line item designators (includes the blank space placeholders) on both the SRO-I and SRO-U License Level forms (similar to what was done on the 2021 NRC Exam), to promote consistency and avoid confusion.

  MILLSTONE: Form(s) 3.2-2 revised accordingly and identified as Rev. 1.

  Chief Examiner review and evaluation of this item complete.