

**ENCLOSURE 12**

**License Amendment Request**

**Callaway Unit No. 1  
Renewed Facility Operating License NPF-30  
NRC Docket No. 50-483**

**Revise Technical Specifications to Adopt Risk-Informed  
Completion Times TSTF-505, Revision 2, "Provide Risk-Informed  
Extended Completion Times – RITSTF Initiative 4b"**

**Risk Management Action Examples**

## **1.0 INTRODUCTION**

This enclosure describes the process for identification and implementation of Risk Management Actions (RMA) applicable during extended Completion Times (CT) and provides examples of RMAs. RMAs will be governed by plant procedures for planning and scheduling maintenance activities. These procedures will provide guidance for the determination and implementation of RMAs when entering the RICT Program and is consistent with the guidance set forth in NEI 06-09-A (Reference 2).

## **2.0 RESPONSIBILITIES**

For planned entries into the RICT Program, the Operations Department is responsible for developing the RMAs with assistance from the Work Management Department and Probabilistic Risk Assessment (PRA) group. Operations is responsible for approval and implementation of RMAs. For emergent entry into extended CTs, Operations is also responsible for developing the RMAs.

## **3.0 PROCEDURAL GUIDANCE**

For planned maintenance activities, implementation of RMAs will be required if it is anticipated that the risk management action time (RMAT) will be exceeded. For emergent activities, RMAs must be implemented if the RMAT is reached. Also, if an emergent event occurs requiring recalculation of an RMAT already in place, the procedure will require a reevaluation of the existing RMAs for the new plant configuration to determine if new RMAs are appropriate. These requirements of the RICT Program are consistent with the guidance of NEI 06-09-A. (Reference 2).

For emergent entry into a RICT, if the extent of condition is not known, RMAs related to the success of redundant and diverse structures, systems, or components (SSC) and reducing the likelihood of initiating events relying on the affected function will be developed to address the increased likelihood of a common cause event.

RMAs will be implemented in accordance with current procedures (e.g. References 7, 8, and 9) no later than the time at which an incremental core damage probability (ICDP) of  $1E-6$  is reached, or no later than the time when an incremental large early release probability (ILERP) of  $1E-7$  is reached. If, as the result of an emergent condition, the instantaneous core damage frequency (ICDF) or the instantaneous large early release frequency (ILERF) exceeds  $1E-3$  per year or  $1E-4$  per year, respectively, RMAs are also required to be implemented. These requirements are consistent with the guidelines of NEI 06-09-A. (Reference 2).

By determining which SSCs are most important from a CDF or LERF perspective for a specific plant configuration, RMAs may be created to protect these SSCs. Similarly, knowledge of the hazard, initiating event, and/or sequence contribution to the configuration-specific CDF or LERF allows development of RMAs that enhance the capability to mitigate such events. The guidance in NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making" (Reference 3) and EPRI TR-1026511, "Practical Guidance on the Use of PRA in Risk-Informed Applications with a Focus on the Treatment of Uncertainty" (Reference 4) will be used in examining PRA results for significant contributors for the configuration, to aid in identifying appropriate compensatory measures; e.g., related to risk-significant systems that may provide diverse protection, or important support systems, or human

actions. Enclosure 9 identifies several areas of uncertainty in the internal events, internal flooding, seismic, high winds and fire PRAs that will be considered in defining configuration-specific RMAs when entering a RICT.

It is possible to credit RMAs in RICT calculations, to the extent the associated plant equipment and operator actions are modeled in the PRA; however, such quantification of RMAs is neither required nor expected by NEI 06-09-A. Nonetheless, if RMAs will be credited to determine RICTs, the procedure instructions will be consistent with the guidance in NEI 06-09-A. (Reference 2).

#### **4.0 TYPES OF RISK MANAGEMENT ACTIONS**

NEI 06-09-A (Reference 2) classifies RMAs into three categories, as discussed below.

1. Actions to increase risk awareness and control.
  - Shift brief.
  - Pre-job brief.
  - Training (formal or informal).
  - Presence of system engineer or other subject matter expert related to the activity.
  - Special purpose procedure to identify risk sources and contingency plans.
2. Actions to reduce the duration of maintenance activities.
  - Pre-staging materials.
  - Conducting training on mock-ups.
  - Performing the activity around the clock.
  - Performing walkdowns on the actual system(s) to be worked on prior to beginning work.
3. Actions to minimize the magnitude of the risk increase.
  - Suspending or minimizing activities on redundant systems.
  - Suspending or minimizing activities on other systems that adversely affect the CDF or LERF.
  - Suspending or minimizing activities on systems that may cause a trip or transient to minimize the likelihood of an initiating event that the out-of-service component is meant to mitigate.
  - Using temporary equipment to provide backup power, ventilation, etc.
  - Rescheduling other maintenance activities.

#### **5.0 GENERIC RAI INFO**

The below criteria and insights (e.g., important fire areas, important operator actions) can be used to determine the compensatory measures and RMAs to apply in specific instances.

- a. Phoenix Risk Monitor (PRM) will calculate the most important equipment, and/or hazard areas, to protect based on the Risk Achievement Worth (RAW)

importance measure. This list of equipment, and/or hazard areas, can be referenced to choose suitable RMAs from the appropriate procedure(s).

- b. Similarly, PRM estimates important operator actions based on an approximate Fussel-Vesely (FV) value. Approximate values are utilized to speed the quantification time. These important operator actions can be used to brief operations crews on these proceduralized actions, throughout the maintenance window, thus decreasing the likelihood of cognition or execution failures of those operator actions.
- c. Common cause RMAs are additional RMAs focused on ensuring availability of redundant components, ensuring availability of diverse or alternate systems, reducing the likelihood of initiating events that require operation of the out-of-service components, and readiness of plant personnel to respond to additional failures.

## 6.0 EXAMPLE RMAs

Multiple example RMAs that may be considered during a RICT Program entry to reduce the risk impact and ensure adequate defense-in-depth are provided below. Specific examples are given for unavailability of one Diesel Generator (DG), one train of Component Cooling Water (CCW), or the Turbine Driven Aux Feed Pump (PAL02).

### **A. Diesel Generator (Using NE01 as an example):**

- 1. Actions to increase risk awareness and control.
  - i. For Risk Management Actions established during the current shift:
    - MAKE a plant announcement of the Risk Management Actions established.
    - In the Control Room narrative log, RECORD the time Risk Management Actions are established and EITHER of the following:
      - a. A list of all Risk Management Actions implemented.
      - b. A reference to the applicable section of the procedure including any exceptions or additions.
  - ii. Risk Management Actions established for the scheduled work that will extend into the next shift will be listed on the Shift Manager Operational Focus Items.
  - iii. ENSURE shift and plant briefs address any risk assessment resulting in a yellow, orange or red status.
  - iv. ENSURE shift and plant briefs address any Risk Management Actions which are to be performed during the shift.
  - v. ENSURE door postings per Checklist 1, Placing Postings for A Train ESW or EDG Out of Service.

- vi. Perform a walkdown of and confirm availability of applicable suppression, detection and fire barriers for the following Fire Walk down areas:
    - TB-1 (4301, 4302, 4303, 4316, 4318, 4319, 4321, 4322, 4351, 4401, 4501): TB 2000', 2015', 2033' and 2065' Elevation.
    - C-22 (3801): Upper Cable Spreading Room.
  - vii. For the above Fire Walk down areas, minimize the accumulation of transient combustibles in accordance with the station Fire Protection Program.
2. Actions to reduce the duration of maintenance activities.
- i. For preplanned RICT entry, create a sub schedule (fragnet) related to the specific evolution which is reviewed for personnel resource availability.
  - ii. Confirm parts availability prior to entry into a preplanned RICT.
3. Actions to minimize the magnitude of the risk increase.
- i. NO unscheduled safety work without performing a risk assessment per EDP-ZZ-01129, Callaway Energy Center Risk Assessment.
  - ii. FOLLOW established fragnets.
  - iii. MAINTAIN opposite train systems as the Protected OPERABLE Train.
  - iv. MAINTAIN TDAFP (PAL02) OPERABLE.
  - v. Only allow necessary switchyard work that has been evaluated for risk with necessary controls and mitigating actions established.
  - vi. MINIMIZE loose items in switchyard that could become airborne/missile hazards in high winds. ENSURE such items are properly secured or stored when NOT being used.  
[Ref: OTO-ZZ-00012, Severe Weather.]
  - vii. DO NOT allow work on AEPS system.
  - viii. LIMIT access to the AEPS Diesel Generators to just Operations and Security Personnel.
  - ix. DO NOT allow work on Security Diesel.
  - x. Implement 10 CFR 50.65(a)(4) fire-specific RMA's as required.

**B. Train of CCW OOS (Using 'A' train as an example)**

1. Actions to increase risk awareness and control.
- i. For Risk Management Actions established during the current shift:
    - MAKE a plant announcement of the Risk Management Actions established.
    - In the Control Room narrative log, RECORD the time Risk Management Actions are established and EITHER of the following:
      - a. A list of all Risk Management Actions implemented.
      - b. A reference to the applicable section of the procedure including any exceptions or additions.

- ii. Risk Management Actions established for the scheduled work that will extend into the next shift will be listed on the Shift Manager Operational Focus Items.
  - iii. ENSURE shift and plant briefs address any risk assessment resulting in a yellow, orange or red status.
  - iv. ENSURE shift and plant briefs address any Risk Management Actions which are to be performed during the shift.
  - v. Perform a walkdown of and confirm availability of applicable suppression, detection and fire barriers for the following Fire Walk down areas:
    - A-21 (1501): CTRL RM A/C UNIT 'B' Room,
    - C-10 (3302): NB02 SWGR Room,
    - TB-1 (4316): Condensate Polisher Area,
    - YD-1: Prohibit work on and within approximately 50 feet in the yard area around the Startup Transformer.
  - vi. For the above Fire Walk down areas, minimize the accumulation of transient combustibles in accordance with the station Fire Protection Program.
2. Actions to reduce the duration of maintenance activities.
- i. For preplanned RICT entry, creation of a sub schedule (fragnet) related to the specific evolution which is reviewed for personnel resource availability.
  - ii. Confirmation of parts availability prior to entry into a preplanned RICT.
3. Actions to minimize the magnitude of the risk increase
- i. NO unscheduled safety work without performing a risk assessment per EDP-ZZ-01129, Callaway Energy Center Risk Assessment.
  - ii. FOLLOW established fragnets.
  - iii. MAINTAIN opposite train systems as the Protected OPERABLE train.
  - iv. Only allow necessary switchyard work that has been evaluated for risk with necessary controls and mitigating actions established.
  - v. MINIMIZE loose items in switchyard that could become airborne/missile hazards in high winds. ENSURE such items are properly secured or stored WHEN NOT being used. (Reference OTO-ZZ-00012, Severe Weather.)
  - vi. DO NOT allow work on Alternate Emergency Power System (AEPS) system.
  - vii. LIMIT access to the AEPS Diesel Generators to just Operations and Security Personnel.
  - viii. DO NOT allow work on Security Diesel.
  - ix. MAINTAIN TDAFP (PAL02) OPERABLE.
  - x. Implement 10 CFR 50.65(a)(4) fire-specific RMA's as required.

**C. Turbine Driven Aux Feed Pump (PAL02) OOS:**

1. Actions to increase risk awareness and control.
  - i. For Risk Management Actions established during the current shift:
    - MAKE a plant announcement of the Risk Management Actions established.
    - In the Control Room narrative log, RECORD the time Risk Management Actions are established and EITHER of the following:
      - a. A list of all Risk Management Actions implemented.
      - b. A reference to the applicable section of the procedure including any exceptions or additions.
  - ii. Risk Management Actions established for the scheduled work that will extend into the next shift will be listed on the Shift Manager Operational Focus Items.
  - iii. ENSURE shift and plant briefs address any risk assessment resulting in a yellow, orange or red status.
  - iv. ENSURE shift and plant briefs address any Risk Management Actions which are to be performed during the shift.
  - v. ENSURE door postings per Checklist 9, Placing Postings for TDAFP (PAL02) being Out of Service.
  - vi. Perform a walkdown of and confirm availability of applicable suppression, detection and fire barriers for the following Fire Walk down areas:
    - YD-1 (C&S): Circ and Service Building.
    - C-27 (3601): Not required, The Control Room is continuously occupied and adjacent areas share HVAC, thus prompt manual detection is assumed.
  - vii. For the above Fire Walk down areas, minimize the accumulation of transient combustibles in accordance with the station Fire Protection Program.
2. Actions to reduce the duration of maintenance activities.
  - i. For preplanned RICT entry, creation of a sub schedule (fragnet) related to the specific evolution which is reviewed for personnel resource availability.
  - ii. Confirmation of parts availability prior to entry into a preplanned RICT.
3. Actions to minimize the magnitude of the risk increase
  - i. NO unscheduled safety work without performing a risk assessment per EDP-ZZ-01129, Callaway Energy Center Risk Assessment.
  - ii. FOLLOW established fragnets.
  - iii. Only allow necessary switchyard work that has been evaluated for risk with necessary controls and mitigating actions established.
  - iv. MINIMIZE loose items in switchyard that could become airborne/missile hazards in high winds. ENSURE such items are properly secured or stored WHEN NOT being used. (Reference OTO-ZZ-00012, Severe Weather.)

- v. IF TDAFP (PAL02) is NONFUNCTIONAL, MAINTAIN NSAFP (PAP01) as protected and posted in accordance with ODP-ZZ-00002 Appendix 1, Protected Equipment Program.
- vi. DO NOT allow work on Alternate Emergency Power System (AEPS) system.
- vii. LIMIT access to the AEPS Diesel Generators to just Operations and Security Personnel.
- viii. DO NOT allow work on Security Diesel.
- ix. MAINTAIN three of four AEPS Diesel Generators FUNCTIONAL.
- x. Implement 10 CFR 50.65(a)(4) fire-specific RMA's as required.

## **7.0 REFERENCES**

1. U.S. Nuclear Regulatory Commission (NRC) Letter from Jennifer M. Golder to Biff Bradley (Nuclear Energy Institute [NEI]), "Final Safety Evaluation for Nuclear Energy Institute (NEI) Topical Report (TR) NEI 06-09, 'Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines'," May 17, 2007 (ADAMS Accession No. ML071200238).
2. Nuclear Energy Institute (NEI) Topical Report NEI 06-09-A, "Risk-Informed Technical Specifications Initiative 4b, Risk-Managed Technical Specifications (RMTS) Guidelines," Revision 0, October 12, 2012 (ADAMS Accession No. ML12286A322).
3. NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decision Making," Revision 1, U.S. Nuclear Regulatory Commission, March 2017 (ADAMS Accession No. ML17062A466).
4. EPRI TR-1026511, "Practical Guidance on the Use of Probabilistic Risk Assessment in Risk-Informed Applications with a Focus on the Treatment of Uncertainty," Technical Update, Electric Power Research Institute (EPRI), December 2012.
5. TSTF-505-A, Revision 2, "Technical Specifications Task Force Improved Standard Technical Specifications Change Traveler," November 2018.
6. Southern Nuclear letter to NRC, "Vogtle Electric Generating Plant, Units 1 and 2 Response to Request for Additional Information on Technical Specifications Change to Adopt Risk Informed Completion Times," April 14, 2017 (ADAMS Accession No. ML17108A253).
7. CEC Procedure, ODP-ZZ-00002, APP 2, "Risk Management Actions for Planned Risk Significant Activities", Revision 019.
8. CEC Procedure, ODP-ZZ-00002, APP 3, "Risk Management Actions for Fire Risk Systems and Components", Revision 003.
9. CEC Procedure, APA-ZZ-00315, "Configuration Risk Management Program", Revision 015.