

ATTACHMENT 6

License Amendment Request

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

**Revise Technical Specifications to Adopt Applicable Elements of
TSTF-439, Revision 2, "Eliminate Second Completion Times Limiting Time From
Discovery of Failure to Meet and LCO"**

Description and Assessment Specific to TSTF-439

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DESCRIPTION AND ASSESSMENT SPECIFIC TO TSTF-439

1.0 DESCRIPTION

As described in Attachment 1 of this LAR, the requested amendment would revise applicable Technical Specifications to implement risk-informed Completion Times and the RICT Program in accordance with the guidance of TSTF-505, Revision 2. In support of the adoption of TSTF-505, applicable portions of TSTF-439, Revision 2, which involves the elimination of second Completion Times," must also be adopted. The adoption of TSTF-439, Revision 2, is necessary because TSTF-505, Revision 2, was developed and subsequently approved using a version of the Improved Standard Technical Specifications that reflected incorporation of TSTF-439 (e.g., Administrative Revision 3.1 to NUREG-1431).

In the Improved Standard Technical Specifications (NUREGs 1430 through 1434) (ISTS) adopted for plants by licensees well before approval of TSTF-439, a "second Completion Time" was included for certain Required Actions to establish a limit on the maximum time allowed for any combination of Conditions that result in a single continuous failure to meet the LCO. These Completion Times (referred to as "second Completion Times") are joined by an "AND" logical connector to the Condition-specific Completion Time and state "X days from discovery of failure to meet the LCO" (where "X" varies by specification). The intent of the second Completion Time was to preclude entry into and out of the ACTIONS for an indefinite period of time without meeting the LCO by providing a limit on the amount of time that the LCO could not be met for various combinations of Conditions.

The proposed amendment would modify the Callaway Technical Specifications to adopt TSTF-439, Revision 2. TSTF-439 deletes the second Completion Times from specific Required Actions, revises the Improved Standard Technical Specification Example 1.3-3 to remove the second Completion Times, and revises the discussion in that Example to state that alternating between Conditions in such a manner that operation could continue indefinitely without ever restoring systems to meet the LCO is inconsistent with the basis of the Completion Times and is inappropriate. Administrative controls to limit the maximum time allowed for any combination of Conditions that result in a single contiguous occurrence of failing to meet the LCO will be implemented.

To clearly differentiate evaluation of the changes proposed per TSTF-505 from evaluation of the changes proposed per TSTF-439, the assessment and justification associated with adoption of TSTF-505, Revision 2 is provided in Attachment 1, Section 2, and the assessment and justification associated with adoption of TSTF-439, Revision 2 is presented here (in Attachment 6). Presentation in this manner preserves compliance with the format of the model application provided for TSTF-505. To assist the NRC staff in publishing the public notice for the proposed changes, however, the No Significant Hazards Consideration Determination and the Environmental Considerations evaluations for both TSTFs are combined and are provided in Attachment 1, Section 3, "Regulatory Analysis," and Section 4, "Environmental Consideration."

Attachments 2 through 5 provide a mark-up of the proposed Technical Specifications, the retyped Technical Specifications, a mark-up of the proposed TS Bases (provided for information only), and a cross-reference between the TSTF-505 changes and Callaway Technical Specifications, respectively, in support of this amendment request. The cross-reference document in Attachment 5 also identifies the changes associated with the adoption of TSTF-439.

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2.0 PROPOSED CHANGE

The second Completion Time specified in each of Technical Specification (TS) 3.6.6 Required Actions A.1 and C.1; TS 3.7.5 Required Actions A.1, B.1 and C.1; TS 3.8.1 Required Actions A.3 and B.4; and TS 3.8.9 Required Actions A.1, B.1, and C.1 is being deleted. The Bases associated with these Required Actions are also being revised to delete the discussion of the second Completion Time.

Callaway TS 3.7.5, "Auxiliary Feedwater (AFW) System," has an additional Condition, i.e., Condition B, that specifically addresses the situation where one Essential Service Water (ESW) supply to the turbine-driven AFW pump is inoperable. In the STS, this situation would be covered by TS 3.7.5 Condition B, i.e., "One AFW train inoperable in MODE 1, 2, or 3 [for reasons other than Condition A]." Given that the actions to be performed per Callaway TS 3.7.5 Required Action B.1 are equivalent to those that would be performed per STS 3.7.5 Condition B.1 for the condition where one AFW train (i.e., the one associated with the TDAFP) is rendered inoperable due to the loss of one ESW supply, Ameren Missouri views the elimination of the second Completion Time for Callaway TS 3.7.5 Required Action B.1 to be consistent with the scope of TSTF-439. This difference is depicted in the TS markup provided in Attachment 2 and the cross-reference table provided in Attachment 5.

3.0 BACKGROUND OF TSTF-439 REVISION 2

Between July and December of 1991, the NRC and the ISTS lead plants discussed an issue affecting a small number of Technical Specifications that could theoretically allow indefinite operation of the plant while not meeting an LCO.

Put simply, if an LCO requires OPERABILITY of two systems, it is possible to enter the Condition for one inoperable system and before restoring the first system, the second system becomes inoperable. With the second system inoperable, the first system is restored to OPERABLE status. Before restoring the second system, the first system becomes inoperable again, and so on. Under this scenario, it would be theoretically possible to operate indefinitely without ever meeting the LCO. This also could occur with LCOs that require one system to be OPERABLE, but for which the Conditions describe two or more mutually exclusive causes of inoperability.

An NRC internal memo dated August 5, 1991 described the issue. As stated in the memo, "In these Specifications the following phrase was added in the Completion Time column of the Conditions that could extend the AOT: '[10 days] from discovery of failure to meet the LCO.' The [10-day] Completion Time cap is found by adding the maximum Completion Times from the two Conditions that could extend the AOT."

The decision to add the second Completion Time is summarized in a memo from the NRC to the industry lead plant representatives dated December 16, 1991. Both memos are provided in the TSTF-439 documentation.

It is important to note that this issue of "flip flopping" between Conditions only applies if the LCO is not met. If the LCO requirements are met, even if for an instant, this issue does not occur. This is a highly unlikely scenario and the Industry argued that it would never occur, but the NRC

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believed it should be addressed when developing the ISTS because there were no other regulatory processes in place at that time that could prevent or respond to such a situation, should it occur.

Section 1.3 of the ISTS, Example 1.3-3, describes the use of this type of second Completion Time. The ISTS NUREGs contain these types of second Completion Times in the following Specifications:

- AC Sources - Operating (BWRs and PWRs)
- Distribution Systems - Operating. (BWRs and PWRs)
- Containment Spray and Cooling (PWRs)
- Auxiliary / Emergency Feedwater System (PWRs)
- Standby Liquid Control (SLC) System (BWRs)

The addition of these second Completion Times did not originally create an operational restriction because the likelihood of experiencing concurrent failures such that the second Completion Time is limiting is very remote.

However, these second Completion Times became a problem when the Industry proposed risk-informed Completion Times for some of the Specifications that contained the second Completion Times, specifically TSTF-409, "Containment Spray System Completion Time Extension (CE NPSD-1045-A)," and TSTF-430, "AOT Extension to 7 Days for LPI and Containment Spray (BAW-2295-A, Rev. 1)." Each of these Travelers extended a Completion Time, and following the methodology described in the August 5, 1991 memo, the second Completion Time was extended by the same amount (i.e., the second Completion Time continued to be the sum of the two Completion Times). However, in letters to the TSTF dated November 5, 2001 and September 10, 2002, the NRC stated that the extension of the second Completion Time in TSTF-409 and TSTF-430 was inappropriate because one of the two Completion Times added to obtain the second Completion Time limit was risk based and the other was deterministic. On September 10, 2002, the NRC provided a letter making a similar statement regarding TSTF-430. Eventually, the NRC accepted that it was acceptable to add these two Completion Times, and TSTF-409 and TSTF-430 were approved. However, second Completion Times complicate the presentation of the ISTS and complicate the implementation of risk-informed Completion Times. In addition, other regulatory requirements, not present when the ISTS NUREGs were originally developed, eliminate the need for these second Completion Times.

4.0 TECHNICAL ANALYSIS

The adoption of a second Completion Time was based on an NRC concern that a plant could continue to operate indefinitely with an LCO governing safety significant systems never being met by alternately meeting the requirements of separate Conditions. In 1991, the NRC could not identify any regulatory requirement or program which could prevent this misuse of the Technical Specifications. However, that is no longer the case. There are now two programs that would provide a strong disincentive to continued operation with concurrent multiple inoperabilities of the type the second Completion Times were designed to prevent.

The *Maintenance Rule*: 10 CFR 50.65 (a)(1), the Maintenance Rule, requires each licensee to monitor the performance or condition of SSCs against licensee-established goals to ensure that the SSCs are capable of fulfilling their intended functions. If the performance or condition of an

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SSC does not meet established goals, appropriate corrective action is required to be taken. The NRC Resident Inspectors monitor the licensee's Corrective Action process and could take action if the licensee's maintenance program allowed the systems required by a single LCO to become concurrently inoperable multiple times. Further, the performance and condition monitoring activities required by 10 CFR 50.65(a)(1) and (a)(2) would identify if poor maintenance practices resulted in multiple entries into the ACTIONS of the Technical Specifications and unacceptable unavailability of these SSCs. The effectiveness of these performance monitoring activities, and associated corrective actions, is evaluated at least every refueling cycle, not to exceed 24 months per 10 CFR 50.65(a)(3).

Under the Technical Specifications, the Completion Time for one system is not affected by other inoperable equipment. The second Completion Times were an attempt to influence the Completion Time for one system based on the condition of another system, if the two systems were required by the same LCO. However, 10 CFR 50.65(a)(4) is a much better mechanism to apply this influence, as the Maintenance Rule considers all inoperable risk-significant equipment, not just the one or two systems governed by the same LCO.

Under 10 CFR 50.65(a)(4), the risk impact of all inoperable risk-significant equipment is assessed and managed when performing preventative or corrective maintenance. The risk assessments are conducted using the procedures and guidance endorsed by Regulatory Guide 1.182, "Assessing and Managing Risk Before Maintenance Activities at Nuclear Power Plants." Regulatory Guide 1.182 endorses the guidance in Section 11 of NUMARC 93-01, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." These documents address general guidance for conduct of the risk assessment, quantitative and qualitative guidelines for establishing risk management actions, and examples of risk management actions. These include actions to plan and conduct other activities in a manner that controls overall risk, increased risk awareness by shift and management personnel, actions to reduce the duration of the condition, actions to minimize the magnitude of risk increases (establishment of backup success paths or compensatory measures), and determination that the proposed maintenance is acceptable. This comprehensive program provides much greater assurance of safe plant operation than the second Completion Times in the Technical Specifications.

The *Reactor Oversight Process*: NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," describes the tracking and reporting of performance indicators to support the NRC's Reactor Oversight Process (ROP). The NEI document is endorsed by RIS 2001-11, "Voluntary Submission of Performance Indicator Data." NEI 99-02, Section 2.2, describes the Mitigating Systems Cornerstone. NEI 99-02 specifically addresses emergency AC Sources (which encompasses the AC Sources and Distribution System LCOs), and the Auxiliary feedwater system. Extended unavailability of these systems due to multiple entries into the ACTIONS would affect the NRC's evaluation of the licensee's performance under the ROP.

In addition to these programs, a requirement is added to Section 1.3 of the Technical Specifications to require licensees to have administrative controls to limit the maximum time allowed for any combination of Conditions that result in a single contiguous occurrence of failing to meet the LCO. These administrative controls should consider plant risk and shall limit the maximum contiguous time of failing to meet the LCO. This Technical Specification requirement, when considered with the regulatory processes discussed above, provides an equivalent or superior level of plant safety without the unnecessary complication of the Technical

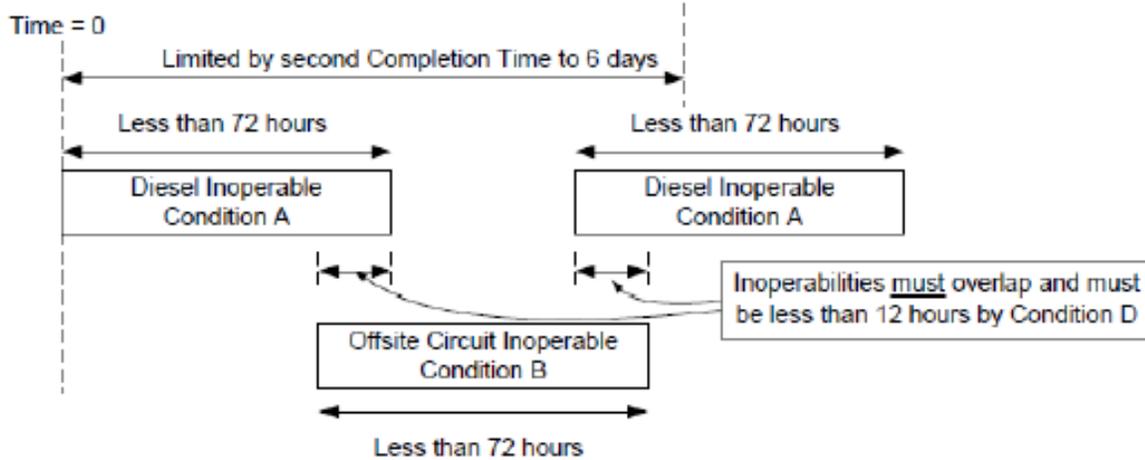
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Specifications caused by second Completion Times in some Specifications. Each of the Specifications affected by this Traveler is discussed below.

AC Sources - Operating (BWRs and PWRs)

Specification 3.8.1, "AC Sources - Operating," has a 72-hour Completion Time for one offsite circuit inoperable (Condition A) and a 72-hour Completion Time for one diesel generator inoperable (Condition B). Both Condition A and Condition B have a second Completion Time of "6 days from discovery of failure to meet the LCO." The second Completion Time limits plant operation when Condition A or B is entered, and before the inoperable system is restored, the other Condition is entered, and then the first inoperable system is restored, and before the remaining inoperable system is restored, the other Condition is entered again. This highly improbable scenario is further limited by Condition D which applies when an offsite circuit and a DG are inoperable. It limits plant operation in this Condition to 12 hours. See Example 1 for an illustration.



Example 1

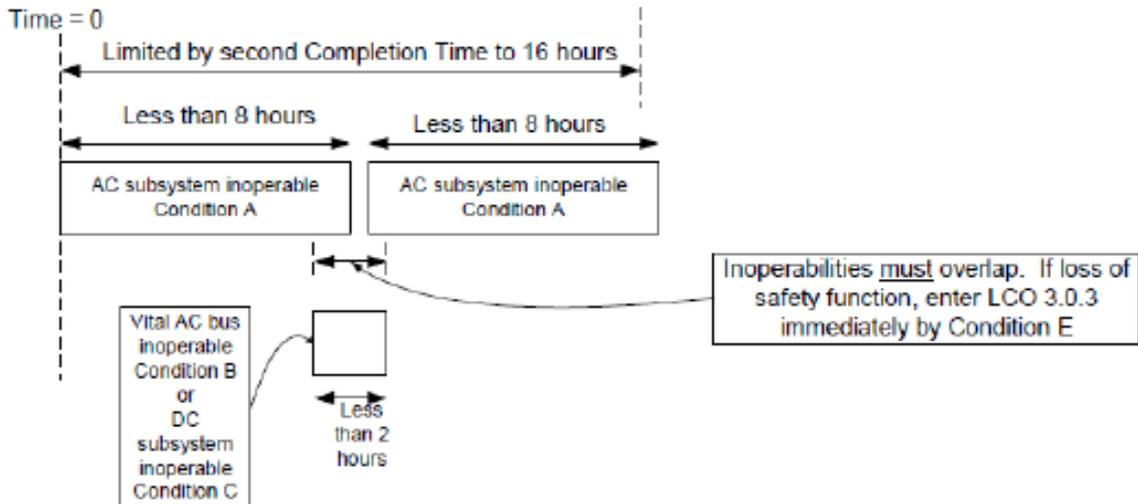
As stated above, the Reactor Oversight Process monitors the availability of mitigating systems, including the emergency AC sources (DG unavailability). Such frequent, repeated failures of the AC sources would be reported to the NRC and this represents a strong disincentive to such operation.

Distribution Systems - Operating (BWRs and PWRs)

Specification 3.8.9, "Distribution Systems - Operating," has an 8-hour Completion Time for one or more AC electrical power distribution subsystems inoperable (Condition A), and a 2-hour Completion Time for one or more AC vital buses (Condition B) or one or more DC electrical power subsystems (Condition C) inoperable. Conditions A, B, and C have a second Completion Time of 16 hours from discovery of failure to meet the LCO. Condition E applies if two or more electrical distribution subsystems are inoperable and, if it results in a loss of safety function, LCO 3.0.3 must be entered immediately. See Example 2.

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Example 2

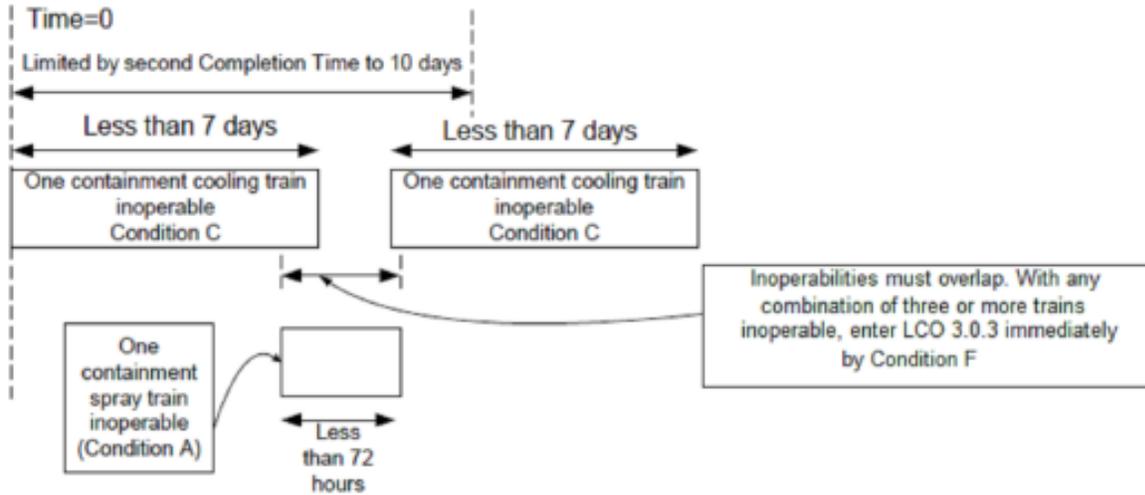
The second Completion Time is not needed. First, it is unusual for an AC electrical power subsystem or AC vital bus to be inoperable without causing a reactor trip. Secondly, Completion Times are very short (8 and 2 hours), providing little time to restore systems such that the Conditions overlap and multiple inoperabilities occur. Lastly, should any overlapping inoperabilities that result in a loss of safety function occur, a plant shutdown in accordance with LCO 3.0.3 is required.

Containment Spray and Cooling (PWRs)

Specification 3.6.6A, "Containment Spray and Cooling Systems (Credit taken for iodine removal)," has a 72-hour Completion Time for one containment spray train inoperable (Condition A) and a 7-day Completion Time for one containment cooling train inoperable (Condition B). Conditions A and B have a second Completion Time of 10 days from discovery of failure to meet the LCO. Condition F also states that if two containment spray trains are inoperable or any combination of three or more trains are inoperable, LCO 3.0.3 must be entered immediately. Specification 3.6.6B, "Containment Spray and Cooling Systems (Credit not taken for iodine removal)," has a 7-day Completion Time for one containment spray train inoperable (Condition A) and a 7-day Completion Time for one containment cooling train inoperable (Condition B). Conditions A and B have a second Completion Time of 14 days from discovery of failure to meet the LCO. Condition G also states that if any combination of three or more trains are inoperable, LCO 3.0.3 must be entered immediately. See Example 3 for an illustration of Specification 3.6.6A.

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Example 3

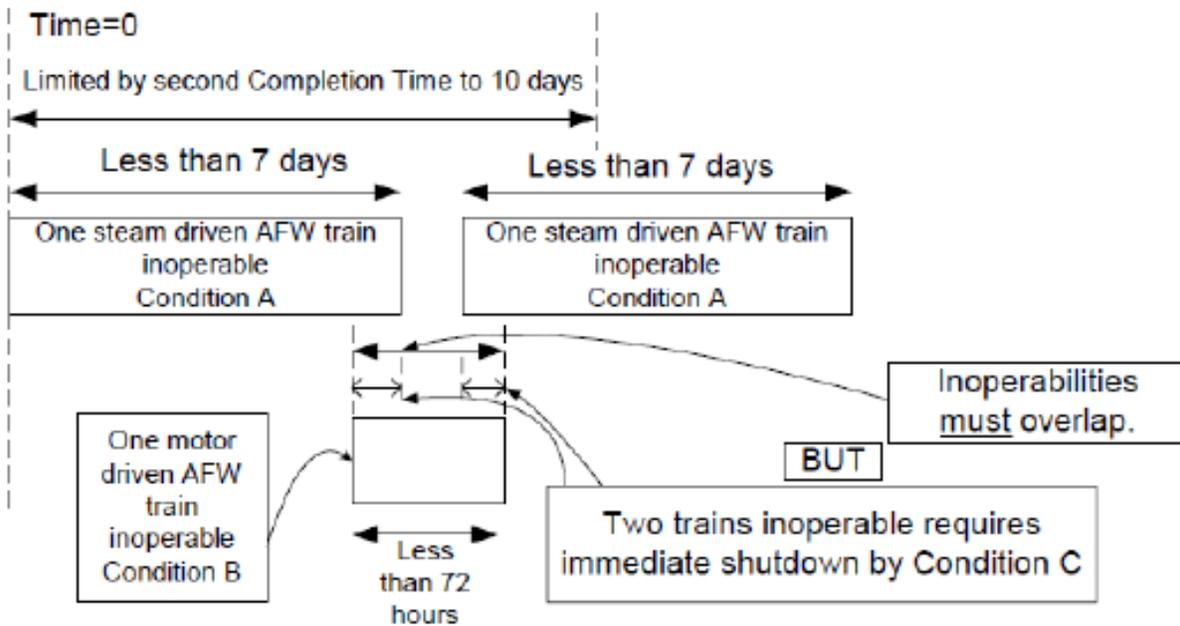
The second Completion Time is not needed. Any combination of two of the four trains can perform the safety function. Adverse combinations require entry into LCO 3.0.3. The second Completion Time restricts operation with only one train inoperable, but that is unnecessary because when one train is inoperable, there are still three operable trains and only two trains are needed to perform the safety function. Therefore, the second Completion Time is overly restrictive.

Auxiliary / Emergency Feedwater System (PWRs)

Specification 3.7.5, "Auxiliary Feedwater System (NUREG-1430 - Emergency Feedwater System)," has a 7-day Completion Time for one inoperable steam supply to a turbine driven AFW pump (rendering the turbine driven AFW pump inoperable) (Condition A) and a 72-hour Completion Time for one AFW train inoperable (Condition B). Conditions A and B have a second Completion Time of 10 days from discovery of failure to meet the LCO. In order for the second Completion Time to be limiting, entry into and out of Conditions A and B must occur, which requires the turbine driven and motor driven AFW pumps to be concurrently inoperable. However, Condition C states that if AFW trains are inoperable the plant must be in MODE 3 in 6 hours and MODE 4 in 18 hours. See Example 4.

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Example 4

The second Completion Time is not needed. For the second Completion Time to be limiting, Conditions A and B must be entered concurrently. However, Condition C requires an immediate shutdown when two trains are inoperable. Therefore, the second Completion Time will never be limiting and can be removed. In addition, the Reactor Oversight Process monitors the availability of the AFW system. Such frequent, repeated failures of the AFW system would be reported to the NRC and this represents a strong disincentive to such operation.

TSTF-439 includes discussion of the Standby Liquid Control (SLC) System in boiling water reactors, with associated Example 5. However, this discussion and example are omitted here because they are not applicable to Callaway which is a pressurized water reactor.

In addition to these regulatory programs, Section 1.3 of the Technical Specifications is to be revised to require administrative controls to limit the maximum time allowed for any combination of Conditions that result in a single contiguous occurrence of failing to meet the LCO. These administrative controls shall ensure that the Completion Times for those Conditions are not inappropriately extended.

Ameren Missouri has an action in the Callaway action item tracking program to revise Operations procedure ODP-ZZ-00001, "Operations Department – Code of Conduct," to include a statement similar to the following: "Alternating between LCO Conditions, in order to allow indefinite continued operation while not meeting the LCO, is not allowed."

Based on the above discussions, the concern regarding multiple continuous entries into Conditions without meeting the LCO is addressed by the system unavailability monitoring programs described above and the administrative controls required by Section 1.3 of the Technical Specifications. Therefore, this potential concern is no longer an issue and the

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Technical Specifications can be simplified by eliminating the second Completion Times with no detriment to plant safety.

5.0 REGULATORY ANALYSIS

5.1 Applicability of Published Safety Evaluation

Ameren Missouri has reviewed TSTF-439, Revision 2, and the model safety evaluation dated November 21, 2018 (ADAMS Accession No. ML18267A259), including applicable supporting information, and has concluded that the technical basis is applicable to Callaway and supports incorporation of this proposed amendment in the Callaway Technical Specifications.

As stated in TSTF-505, Revision 2, it is necessary to adopt TSTF-439, Revision 2, "Eliminate Second Completion Times Limiting Time from Discovery of Failure to Meet an LCO," in order to adopt TSTF-505 for those Required Actions that are affected by both travelers.

5.2 Applicable Regulatory Requirements

10 CFR 50.36, "Technical Specifications." 10 CFR 50.36(c)(2) states, "When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met." The revised Actions, as proposed, would continue to meet the requirements of this regulation.

10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." The overall objective of this performance-based rule is to ensure that nuclear power plant structures, systems, and components (SSCs) will be maintained so that they will perform their intended function when required. Adoption of the applicable TS changes per TSTF-439 would not adversely affect Callaway's compliance with this regulation.

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the approval of the proposed changes will not be inimical to the common defense and security or to the health and safety of the public.

5.3 No Significant Hazards Determination

The No Significant Hazards Determination for adoption of TSTF-439 is presented along with that for adoption of TSTF-505 in Section 3.1 of Attachment 1.

6.0 ENVIRONMENTAL CONSIDERATION

The environmental evaluation for adoption of TSTF-439 is presented along with that for adoption of TSTF-505 in Section 4.0 of Attachment 1.

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7.0 REFERENCES

1. Memorandum from Gordon Vytlačil (NRC) to TSPS (NRC), dated August 5, 1991, "Summary of potential Allowed Outage Time (AOT) extension issue."
2. Gordon M. Vytlačil (NRC) to Lee Bush (WOG), et al, dated December 16, 1991, "Information on the Completion Time Cap – to be discussed at Wednesdays meeting with Chris Grimes."
3. TSTF-439-A, "Eliminate Second Completion Times Limiting Time From Discovery of Failure To Meet an LCO," Revision 2.
4. TSTF Letter to NRC, TSTF-14-10, "Revision of References to Regulatory Guide 1.182 in Approved Travelers," dated September 16, 2014 (ADAMS Accession No. ML14328A433).
5. NRC Letter to TSTF, "Status of TSTF 439, 'Eliminate Second Completion Times Limiting Time From Discovery of Failure to Meet an LCO,'" dated January 11, 2006 (ADAMS Accession No. ML060120272).