AmerenUE
Callaway Plant

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March 29, 2010

ULNRC-05687

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop P1-137
Washington, DC 20555-0001

10 CFR 50.90

Ladies and Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT
UNION ELECTRIC CO.
APPLICATION FOR AMENDMENT TO
FACILITY OPERATING LICENSE NPF-30
REVISION TO TECHNICAL SPECIFICATION 3.3.2 FUNCTION 6.g
ENGINEERED SAFETY FEATURE ACTUATION SYSTEM
(ESFAS) INSTRUMENTATION:
AUXILIARY FEEDWATER ACTUATION
ON TRIP OF ALL MAIN FEEDWATER PUMPS (LDCN 10-0011)

AmerenUE herewith transmits an application for amendment to Facility Operating License Number NPF-30 for the Callaway Plant.

This amendment application submits proposed changes to Technical Specification (TS) 3.3.2, "Engineered Safety Feature Action System (ESFAS) Instrumentation," for function 6.g in TS Table 3.3.2-1. Function 6.g provides an auxiliary feedwater (AFW) start signal to the motor-driven AFW pumps in the event of a trip of both turbine-driven main feedwater (MFW) pumps. The changes would revise Condition J for ESFAS instrumentation function 6.g so that it addresses having one or more inoperable channel(s) on each turbine-driven MFW pump. Corresponding changes to Required Action J.1 and the Note above Required Actions J.1 and J.2 are also proposed for consistency with the revised Condition.

Attachments 1 through 4 provide the Evaluation, Markup of Technical Specifications, Retyped Technical Specifications, and Proposed Technical Specification Bases Changes, respectively, in support of this amendment request. Attachment 4 is provided for information only. Final TS Bases Changes will be processed under Callaway Plant's program for updates per TS 5.5.14, "Technical Specifications (TS) Bases Control Program," when the requested amendment is implemented.

It has been determined that this amendment application does not involve a significant hazard consideration as determined per 10 CFR 50.92. Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

The Callaway Plant Onsite Review Committee and a subcommittee of the Nuclear Safety Review Board have reviewed and approved the attached licensing evaluations and have approved the submittal of this amendment application. It should also be noted that no commitments are contained in this amendment application.

AmerenUE requests approval of this proposed license amendment prior to MODE 2 entry during the restart from the upcoming Refuel 17 outage. Entry into MODE 2 is currently scheduled to occur on May 14, 2010. AmerenUE further requests that the license amendment be made effective upon NRC issuance to be implemented within 30 days.

In accordance with 10 CFR 50.91, a copy of this amendment application is being provided to the designated Missouri State official. If you have any questions on this amendment application, please contact me at (314) 225-1054, or Mr. Scott Maglio at (573) 676-8719.

I declare under penalty of perjury that the foregoing is true and correct.

Very truly yours,

Executed on: 3-29-10

Keith A. Mills 29 March 10

Keith A. Mills
Manager, Nuclear Oversight

Attachments

1 - Evaluation
2 - Markup of Technical Specifications
3 - Retyped Technical Specifications
4 - Proposed Technical Specification Bases Changes (for information only)

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ATTACHMENT 1

EVALUATION

EVALUATION

1.0 DESCRIPTION

This amendment application submits proposed changes to Technical Specification (TS) 3.3.2, "Engineered Safety Feature Action System (ESFAS) Instrumentation," for function 6.g in TS Table 3.3.2-1. Function 6.g corresponds to the auxiliary feedwater (AFW) start signal that is provided to the motor-driven AFW pumps in the event of a trip of both turbine-driven main feedwater (MFW) pumps. The changes would revise Condition J for ESFAS instrumentation function 6.g to read "One or more Main Feedwater Pumps trip channel(s) inoperable" and make corresponding changes to Required Action J.1 and the Note above Required Actions J.1 and J.2 for consistency with the revised Condition.

2.0 PROPOSED CHANGES

The following discussion reflects the proposed changes indicated in Attachments 2 and 3 to this license amendment application.

The current wording of TS 3.3.2 Condition J is:

> "One Main Feedwater Pumps trip channel inoperable."

The proposed amendment would revise TS 3.3.2 Condition J to read:

> "One or more Main Feedwater Pumps trip channel(s) inoperable."

The current wording of TS 3.3.2 Required Action J.1 is:

> "Place channel in trip."

The proposed amendment would revise TS 3.3.2 Required Action J.1 to read:

> "Place channel(s) in trip."

The current wording of the Note above TS 3.3.2 Required Actions J.1 and J.2 is:

> "The inoperable channel may be bypassed for up to 2 hours for surveillance testing of other channels."

The proposed amendment would revise the Note above TS 3.3.2 Required Actions J.1 and J.2 to read:

> "One inoperable channel may be bypassed for up to 2 hours for surveillance testing of other channels."

Proposed Bases changes for the above are provided in Attachment 4 (for information only) and will be implemented under the provisions of TS 5.5.14, "Technical Specifications (TS) Bases Control Program." Several of the TS Bases clarifications in Attachment 4 are related to improving the understanding of this AFW actuation function which is associated with the turbine-driven MFW pumps (equipment tag numbers PAE01A and PAE01B).

3.0 BACKGROUND

In some places this amendment application refers to ESFAS instrumentation function 6.g by its title in TS Table 3.3.2-1 as taken from the Standard Technical Specification NUREG-1431 (e.g., trip of all MFW pumps); however, the original licensing of Callaway Plant was based on this AFW actuation function being initiated upon the trip of both turbine-driven MFW pumps (PAE01A and PAE01B) as depicted in FSAR Figure 7.3-1 (sheet 2, grid coordinates A-7 and A-8 through D-7 and D-8) and FSAR Figure 10.4-6 (sheets 7 and 8, grid coordinate E-6).

Condensate and Feedwater System

The function of the condensate and feedwater system is to supply a sufficient quantity of feedwater to the steam generator secondary side inlet during normal operating conditions and to guarantee that feedwater will not be delivered to the steam generators when feedwater isolation is required. The condensate pumps take suction from the condenser hotwell and the two turbine-driven MFW pumps deliver water to the steam generators at elevated temperatures and pressures. Additional information can be found in Final Safety Analysis Report (FSAR) Section 10.4.7, "Condensate and Feedwater System."

Auxiliary Feedwater System

The auxiliary feedwater (AFW) system automatically supplies feedwater to the steam generators to remove decay heat from the reactor coolant system upon the loss of the normal feedwater supply. The motor-driven AFW (MDAFW) pumps start automatically upon steam generator water level low-low in any steam generator, *upon trip of both turbine-driven MFW pumps*, upon actuation of AMSAC (anticipated transient without scram mitigation system actuation circuitry), and upon actuation by the LOCA sequencer or shutdown sequencer. The turbine-driven AFW pump is automatically started by steam generator water level low-low in any two steam generators, 4.16-kV safety-related bus NB01 or NB02 undervoltage, and upon actuation of AMSAC. All three AFW trains can also be manually actuated. Additional information can be found in FSAR Section 10.4.9, "Auxiliary Feedwater System."

Start of the MDAFW Pumps Upon Trip of Both Turbine-Driven MFW Pumps

A trip of both turbine-driven MFW pumps is an indication of a loss of MFW such that

there would be a subsequent need for some method of decay heat and sensible heat removal to bring the reactor back to no load temperature and pressure. Each turbine-driven MFW pump is equipped with two pressure switches that provide one actuation signal in separation group 1 and one in separation group 4 on the oil line for the speed control system. These pressure switches (FCPSL0025, FCPSL0026, FCPSL0125, and FCPSL0126) measure hydraulic oil trip header pressure for the turbine-driven MFW pump turbine stop valve control fluid. When a feedwater pump turbine trip signal is received by the turbine, the hydraulic trip fluid pressure is vented back to the oil reservoir and the pressure switches detect the low pressure condition. A low pressure signal from either of these pressure switches indicates a trip of that pump's turbine. Two OPERABLE channels per turbine-driven MFW pump satisfy redundancy requirements. When two channel inputs to the Balance of Plant (BOP) ESFAS from both turbine-driven MFW pumps in the same separation group are below the trip setpoint, BOP ESFAS will generate an AFW start signal to the motor-driven AFW pumps. The actuation logic for ESFAS instrumentation function 6.g in TS Table 3.3.2-1 is shown in FSAR Figure 7.3-1 (sheet 2).

Current Technical Specifications

ESFAS instrumentation function 6.g must be OPERABLE in MODES 1 and 2. In light of the automatic motor-driven AFW pump start signal provided by this function, actuation of function 6.g results in the intact steam generators being provided with water to serve as the heat sink to remove reactor decay heat and sensible heat in the event of a loss of normal feedwater transient. That event is typical of a reactor coolant system (RCS) heatup transient analyzed in FSAR Section 15.2.

In MODE 2, AFW actuation due to a trip of both turbine-driven MFW pumps may be blocked per footnote (n) of TS Table 3.3.2-1. The use of this footnote is needed during plant startups and shutdowns to avoid undesired AFW actuations as discussed in the NRC Safety Evaluation of Callaway Amendment 26 dated July 29, 1987. Specifically, blocking this AFW actuation function is permitted by footnote (n) using Block/Permit switches FCHS0025 and FCHS0026 just before shutdown of the last operating turbine-driven MFW pump and the restoration of this AFW actuation function is required just after the first turbine-driven MFW pump is put into service following its startup trip test.

In MODES 3, 4, and 5, the turbine-driven MFW pumps are normally shut down; therefore, a turbine-driven MFW pump trip is not indicative of a condition requiring automatic AFW initiation in these lower MODES.

ESFAS instrumentation function 6.g was part of the TSs when Callaway Plant was originally licensed. The original Callaway Plant TSs were based on NUREG-0452, Revision 4a, "Standard Technical Specifications for Westinghouse Pressurized Water Reactors." This anticipatory actuation function was included in the SNUPPS design by Callaway's Architect-Engineer (Bechtel) as early as 1975 and discussed in the SNUPPS Preliminary Safety Analysis Report.

With one turbine-driven MFW pump oil pressure channel inoperable, TS 3.3.2 Condition J must be entered, and the inoperable channel must be tripped in 1 hour per Required Action J.1 or the plant must be in MODE 3 in 7 hours per Required Action J.2.

Need for Proposed Changes

As discussed below in the Section 4.0 subsection titled Turbine-Driven MFW Pump Turbine Reset and Trip, with one turbine-driven MFW pump turbine in "reset" in MODES 1 and 2 (other than the allowance previously discussed to use the Block/Permit switches FCHS0025 and FCHS0026 in MODE 2 per footnote (n) to TS Table 3.3.2-1), the two channels on that turbine-driven MFW pump are inoperable. Separate Condition entry for Condition J of TS 3.3.2 allows separate entries for one inoperable channel per turbine-driven MFW pump. However, no Condition is provided within TS 3.3.2 for two inoperable channels on the same turbine-driven MFW pump for ESFAS instrumentation function 6.g in MODE 1. Therefore, LCO 3.0.3 would be applicable. The latter requires preparation for a plant shutdown in 1 hour and the plant to be in MODE 3 within 7 hours.

After the proposed changes are approved, TS 3.3.2 Condition J could be entered during normal plant operation with one inoperable channel per turbine-driven MFW pump in different separation groups placed in the tripped condition, as is currently allowed by separate Condition entry, or TS 3.3.2 Condition J could be entered at reduced power with both channels on the same turbine-driven MFW pump inoperable and placed in the tripped condition. If two channels in the same separation group are tripped, the motor-driven AFW pumps will start and steam generator levels will drop and eventually lead to a reactor trip since AFW can not support power operation. Since the Trip Actuating Device Operational Tests (TADOTs) performed on the ESFAS instrumentation function 6.g channels per Surveillance Requirement (SR) 3.3.2.8 test one channel at a time given the actuation logic, the revised Note above Required Actions J.1 and J.2 allows the status of only one inoperable channel to be changed from "tripped" to "bypassed" for surveillance testing of other channels.

Safety Analysis

ESFAS instrumentation function 6.g is an anticipatory start signal for which no credit is taken in any safety analysis. The transients and design basis events for which actuation of the AFW system is credited are the main steam line break, loss of non-emergency AC power, loss of normal feedwater, main feed line break, and small break loss of coolant accident. These are RCS cooldown events (FSAR Section 15.1.5), RCS heatup events (FSAR Sections 15.2.6, 15.2.7, 15.2.8), and loss of RCS inventory events (FSAR Section 15.6.5). The analysis presented in FSAR Section 15.2.7 notes that the steam generator water level low-low signal is specifically credited in the event of a loss of normal feedwater transient.

4.0 TECHNICAL ANALYSIS

Industry operating experience OE30255 (Reference 1) identified that the oil pressure channels on each turbine-driven MFW pump can provide an incorrect status indication for the turbine-driven MFW pump when its turbine is "reset." Resetting the turbine-driven MFW pump turbine repressurizes the hydraulic oil trip header. Therefore, in this situation, the oil pressure channels would indicate that the turbine-driven MFW pump is in service when the pump may not actually be supplying water to the steam generators. If the operating turbine-driven MFW pump were to trip under this condition, the ESFAS function 6.g actuation logic would not be satisfied, and the motor-driven AFW pumps would not receive an auto-start signal as required by the Callaway Plant Technical Specifications. A turbine-driven MFW pump is considered to be in service for this function when the pump's stop valves are open, the governor control valves are either in manual or automatic control, and feedwater is being supplied to the steam generators.

In Reference 2 the NRC informed Tennessee Valley Authority (TVA) that plant operation did not conform to their TS 3.3.2 function 6.e, "Trip of All Turbine Driven Main Feedwater Pumps," when a non-operating turbine-driven MFW pump turbine is "reset" within the Applicability of that function in TS 3.3.2. TVA had considered the associated AFW auto-start channel (the Watts Bar design has one ESFAS function 6.e channel per turbine-driven MFW pump) to be OPERABLE; however, the NRC informed TVA that a non-operating MFW pump in the "reset" condition impacts OPERABILITY of the AFW auto-start channel due to the potentially false (i.e., invalid) indication of the turbine-driven MFW pump's status with respect to delivering feedwater flow to the steam generators.

A review of the above operating experience, summarized below, determined that the design and normal operation of the turbine-driven MFW pumps at Callaway Plant would likewise result in a condition that does not conform to the TS Table 3.3.2-1, ESFAS instrumentation function 6.g., "AFW Actuation on a Trip of All Main Feedwater Pumps," based on the NRC positions described in References 1 through 5. The proposed changes in this amendment request will address this issue for Callaway Plant.

Turbine-Driven MFW Pump Turbine Reset and Trip

The turbine-driven MFW pumps are powered from separate control power supplies. The control power to turbine-driven MFW pump PAE01A is supplied from the non-safety 120-Vac inverter PN09 and the control power to turbine-driven MFW pump PAE01B is supplied from non-safety 120-Vac inverter PN10. The turbine-driven MFW pumps are also both equipped with separate/independent control oil systems.

Resetting the PAE01A turbine (i.e., by manually placing the Trip/Reset switch FCHIS0018 in the "reset" position) allows the trip header hydraulic pressure to increase to approximately 200 psig. This resets the pressure switches FCPSL0025 (PS15 on vendor drawing M-012-00042) and FCPSL0026 (PS26 on vendor drawing M-012-00042)

to the nominal operating hydraulic fluid pressure. These are the PAE01A pressure switches that feed the anticipatory auto-start signal to the motor-driven AFW pumps. This turbine "reset" also supplies hydraulic pressure to the turbine stop and control valves and enables the control valves to be manually adjusted to the desired turbine-driven MFW pump speed.

When PAE01A is tripped from an automatic or manual trip function (such as by manually placing the Trip/Reset switch FCHIS0018 in the "trip" position), the trip header hydraulic oil is ported to the hydraulic oil reservoir reducing the header pressure to approximately 0 psig. With no hydraulic oil pressure in the trip header, the high and low pressure stop valves and control valves close. This also eliminates oil pressure to the pressure switches FCPSL0025 and FCPSL0026, which results in PAE01A providing tripped inputs (in each separation group) to the BOP ESFAS cabinets that process the auxiliary feedwater actuation signal to start the motor-driven AFW pumps.

Similarly for the 'B' train, resetting the PAE01B turbine (i.e., by manually placing the Trip/Reset switch FCHIS0118 in the "reset" position) allows the trip header hydraulic pressure to increase to approximately 200 psig. This resets the pressure switches FCPSL0125 (PS15 on vendor drawing M-012-00042) and FCPSL0126 (PS26 on vendor drawing M-012-00042) to the nominal operating hydraulic fluid pressure. These are the PAE01B pressure switches that feed anticipatory auto-start signal to the motor-driven AFW pumps. This turbine "reset" also supplies hydraulic pressure to the turbine stop and control valves and enables the control valves to be manually adjusted to the desired turbine-driven MFW pump speed.

When PAE01B is tripped from an automatic or manual trip function (such as by manually placing the Trip/Reset switch FCHIS0118 in the "trip" position), the trip header hydraulic oil is ported to the hydraulic oil reservoir reducing the header pressure to approximately 0 psig. With no hydraulic oil pressure in the trip header, the high and low pressure stop valves and control valves close. This also eliminates oil pressure to the pressure switches FCPSL0125 and FCPSL0126, which results PAE01B providing tripped inputs (in each separation group) to the BOP ESFAS cabinets that process the auxiliary feedwater actuation signal to start the motor-driven AFW pumps.

Operating Experience Review

As discussed above, during the process of placing a turbine-driven MFW pump into service in MODES 1 and 2, the pump turbine control circuitry is placed in a "reset" condition (via FCHIS0018 on turbine-driven MFW pump PAE01A or FCHIS0118 on turbine-driven MFW pump PAE01B) such that the two oil pressure switch channels on that reset pump (FCPSL0025 and FCPSL0026 on turbine-driven MFW pump PAE01A, FCPSL0125 and FCPSL0126 on turbine-driven MFW pump PAE01B) would experience the high oil pressures indicative of an operating pump prior to that turbine-driven MFW pump providing feedwater flow to the steam generators. In this status, the turbine-driven MFW pump that is not yet in service would not satisfy the AFW start function actuation

logic if the operating turbine-driven MFW pump were to trip at this time since it takes one tripped channel on each turbine-driven MFW pump in the same separation group to initiate an auxiliary feedwater actuation signal.

During low-power plant startup operations, or during operation with one turbine-driven MFW pump secured at reduced power levels (typically less than 65% rated thermal power), only one turbine-driven MFW pump is feeding flow to the steam generators. The other turbine-driven MFW pump turbine is placed in a "reset" condition with its stop valves open just prior to placing that pump into service. This condition utilizes hydraulic trip fluid to keep the stop valves open, which appears to the hydraulic pressure switches to reflect an operating turbine-driven MFW pump. In the event that the operating turbine-driven MFW pump turbine receives a trip signal, all main feedwater flow would cease. Since the turbine-driven MFW pump that is not yet in service has its turbine in the "reset" condition, the ESFAS instrumentation function 6.g actuation logic would not be satisfied, and an auto-start signal to the motor-driven AFW pumps would not be initiated.

A low hydraulic oil pressure is a "direct" indication that the turbine is tripped but an "indirect" indication of that pump's capability to supply feedwater to the steam generators. The turbine-driven MFW pump turbine hydraulic oil pressure potentially provides a false indication of a turbine-driven MFW pump's capability to supply feedwater to the steam generators when the turbine-driven MFW pump turbine is "reset" but the pump is not yet actively supplying flow to the steam generators. This situation is routinely created during normal plant startup when one turbine-driven MFW pump is in operation while the turbine for the other turbine-driven MFW pump has been "reset" for various maintenance and operational activities. Based on the position in References 1 and 2, when the turbine-driven MFW pump turbine has been "reset" but the pump is not providing flow to the steam generators, both pressure channels for that pump should be considered inoperable.

Declaring both oil pressure channels on the same turbine-driven MFW pump inoperable under such conditions is appropriate; however, it is recognized that doing so creates a compliance issue with respect to the current requirements of TS 3.3.2 Condition J. The proposed TS changes are intended to resolve this issue.

Precedents

In Reference 3 NRC approved the same changes for Wolf Creek Generating Station that are requested in this amendment application. Reference 3 was an emergency amendment request.

In Reference 4 NRC approved a similar amendment for Watts Bar Nuclear Plant, Unit 1. Section 3.5 of the NRC Safety Evaluation in that amendment discusses a similar change to the changes proposed herein regarding the revised TS 3.3.2 Condition J wording (i.e., one or more inoperable channels).

5.0 REGULATORY SAFETY ANALYSIS

This section addresses the standards of 10 CFR 50.92 as well as the applicable regulatory requirements and acceptance criteria.

This amendment application submits proposed changes to Technical Specification (TS) 3.3.2, "Engineered Safety Feature Action System (ESFAS) Instrumentation," for function 6.g in TS Table 3.3.2-1. Function 6.g corresponds to the auxiliary feedwater (AFW) start signal that is provided to the motor-driven AFW pumps in the event of a trip of both turbine-driven main feedwater (MFW) pumps. The changes would revise Condition J for ESFAS instrumentation function 6.g to read "One or more Main Feedwater Pumps trip channel(s) inoperable" and make corresponding changes to Required Action J.1 and the Note above Required Actions J.1 and J.2 for consistency with the revised Condition.

5.1 No Significant Hazards Consideration (NSHC)

AmerenUE has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," Part 50.92(c), as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

Overall protection system performance will remain within the bounds of the previously performed accident analyses since no design changes are proposed to the protection systems. The same reactor trip system (RTS) and engineered safety feature actuation system (ESFAS) instrumentation will continue to be used. The protection systems will continue to function in a manner consistent with the credited functions in the plant design and analysis basis. There will be no changes to the protection system surveillance and operating limits.

The proposed changes will not adversely affect accident initiators or precursors nor alter the design assumptions, conditions, and configuration of the facility or the manner in which the plant is operated and maintained. The proposed changes will not alter or prevent the ability of structures, systems, and components (SSCs) from performing their intended functions to mitigate the consequences of an initiating event within the assumed acceptance limits.

Therefore, the proposed changes will have no impact on the probability of occurrence of an accident previously evaluated in the FSAR.

The transients and design basis events for which the initiation of the AFW system is credited are the main steam line break, loss of non-emergency AC power, loss of normal

feedwater, main feed line break, and small break loss of coolant accident. The analyses of these events in FSAR Chapter 15 assume actuation of the AFW system due to a loss of offsite power signal (starts the turbine-driven AFW pump only), steam generator water level low-low signal (starts the motor-driven AFW pumps for low level in one steam generator, and starts the turbine-driven AFW pump for low level in two steam generators), or a safety injection signal (starts the motor-driven AFW pumps). The anticipatory motor-driven AFW pump auto-start signals from the turbine-driven MFW pumps are not credited in any design basis accidents and are, therefore, not part of the primary success path for postulated accident mitigation as defined by 10 CFR 50.36(c)(2)(ii), Criterion 3. Modifying TS 3.3.2 Condition J and its Required Actions for ESFAS instrumentation function 6.g will not impact any previously evaluated design basis accidents.

All accident analysis acceptance criteria will continue to be met with the proposed changes. The proposed changes will not affect the source term, containment isolation, or radiological release assumptions used in evaluating the radiological consequences of an accident previously evaluated. The proposed changes will not alter any assumptions or change any mitigation actions in the radiological consequence evaluations in the FSAR. The applicable radiological dose acceptance criteria will continue to be met.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No

The proposed changes would provide a TS Condition for more than one inoperable channel within ESFAS instrumentation function 6.g. These changes involve an anticipatory motor-driven AFW pump auto-start function that is not credited in any accident analysis. The proposed changes do not affect the credited ESFAS functions that actuate AFW due to a loss of offsite power, steam generator water level low-low, or a safety injection signal.

The proposed changes will not affect the normal method of plant operation or change any operating parameters. No equipment performance requirements will be affected. The proposed changes will not alter any assumptions made in the safety analyses.

No new accident scenarios, transient precursors, failure mechanisms, or limiting single failures will be introduced as a result of this amendment. There will be no adverse effect or challenges imposed on any safety-related system as a result of this amendment.

The proposed amendment will not alter the design or performance of the 7300 Process Protection System, Nuclear Instrumentation System, Solid State Protection System, BOP

ESFAS, MSFIS, or LSELS used in the plant protection systems.

Therefore, the proposed changes do not create the possibility of a new or different accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No

The proposed changes involve the automatic start of the motor-driven AFW pumps after a trip of both turbine-driven MFW pumps which is not a credited start signal for any design basis event. This change does not modify any values or limits involved in a safety-related function or accident analysis.

There will be no effect on those plant systems necessary to assure the accomplishment of protection functions. There will be no impact on the overpower limit, departure from nucleate boiling ratio (DNBR) limits, heat flux hot channel factor (F_Q), nuclear enthalpy rise hot channel factor ($F\Delta H$), loss of coolant accident peak cladding temperature (LOCA PCT), peak local power density, or any other margin of safety. The applicable radiological dose consequence acceptance criteria will continue to be met.

The proposed changes do not eliminate any surveillances or alter the frequency of surveillances required by the Technical Specifications. No instrument setpoints or system response times are affected. None of the acceptance criteria for any accident analysis will be changed.

The proposed changes will have no impact on the radiological consequences of a design basis accident.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Conclusion:

Based on the above evaluation, AmerenUE concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c) and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements / Criteria

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include Technical Specifications (TSs) as part of the license. The

TSs ensure the operational capability of structures, systems, and components that are required to protect the health and safety of the public. The U.S. Nuclear Regulatory Commission's (NRC's) requirements related to the content of the TSs are contained in Section 50.36 of Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.36, "Technical Specifications." The TS requirements in 10 CFR 50.36 include the following categories: (1) safety limits, limiting safety systems settings and control settings, (2) limiting conditions for operation (LCOs), (3) surveillance requirements (SRs), (4) design features, and (5) administrative controls.

This amendment application is related to the second category above (LCOs) and is a less restrictive change since it precludes an LCO 3.0.3 entry; however, the requested changes still afford an adequate assurance of safety. 10 CFR 50.36 requires that a licensee's TSs be derived from the analyses and evaluations included in the safety analysis report.

As stated in 10 CFR 50.59(c)(1)(i), a licensee is required to submit a license amendment pursuant to 10 CFR 50.90 if a change to the TSs is required. Furthermore, the requirements of 10 CFR 50.59 necessitate that the NRC approve the TS changes before the changes are implemented. Callaway Plant's submittal meets the requirements of 10 CFR 50.59(c)(1)(i) and 10 CFR 50.90.

The following regulatory requirements (the General Design Criteria (GDC) are from Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50) and guidance documents apply to ESFAS instrumentation function 6.g:

- GDC 2 requires that structures, systems, and components important to safety be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without the loss of the capability to perform their safety functions.

- GDC 4 requires that structures, systems, and components important to safety be designed to accommodate the effects of, and to be compatible with, the environmental conditions associated with the normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. These structures, systems, and components shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, discharging fluids that may result from equipment failures, and from events and conditions outside the nuclear power unit. However, dynamic effects associated with postulated pipe ruptures in nuclear power units may be excluded from the design basis when analyses reviewed and approved by the Commission demonstrate that the probability of fluid system piping rupture is extremely low under conditions consistent with the design basis for the piping.

- GDC 13 requires that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure

adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems.

- GDC 20 requires that the protection system(s) shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.

- GDC 21 requires that the protection system(s) shall be designed for high functional reliability and testability.

- GDC 22 through GDC 25 and GDC 29 require various design attributes for the protection system(s), including independence, safe failure modes, separation from control systems, requirements for reactivity control malfunctions, and protection against anticipated operational occurrences.

- Regulatory Guide 1.22 discusses an acceptable method of satisfying GDC-20 and GDC-21 regarding the periodic testing of protection system actuation functions. These periodic tests should duplicate, as closely as practicable, the performance that is required of the actuation devices in the event of an accident.

- 10 CFR 50.55a(h) requires that the protection systems meet IEEE 279-1971. Section 4.2 of IEEE 279-1971 discusses the general functional requirement for protection systems to assure they satisfy the single failure criterion.

There are no changes being proposed in this amendment application such that commitments and obligations to the regulatory requirements and guidance documents above would come into question. The evaluations documented above confirm that Callaway Plant will continue to comply with all applicable regulatory requirements.

In conclusion, 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) issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

AmerenUE has evaluated the proposed amendment and has determined that the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational

radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. OE30225, "Main Feedwater Pump 'Reset' design feature provides incorrect Main Feedwater Pump Status to Emergency Feedwater Pump Initiation Circuitry Resulting in missed Technical Specification requirements," Oconee Nuclear Station, December 16, 2009.

2. NRC letter, "Watts Bar Nuclear Plant – NRC Integrated Inspection Report 05000390/2008003 and 05000391/2008003 and Annual Assessment Meeting Summary," August 7, 2008.

3. Amendment No. 187 to Facility Operating License No. NPF-42 for Wolf Creek Generating Station, TAC No. ME3465, ADAMS Accession Number ML100630013, dated March 5, 2010.

4. Amendment No. 75 to Facility Operating License No. NPF-90 for Watts Bar Nuclear Plant, Unit 1, ADAMS Accession Number ML090480566, dated March 4, 2009.

5. Amendment No. 319 to Facility Operating License No. DPR-77 and Amendment No. 312 to Facility Operating License No. DPR-79 for the Sequoyah Nuclear Plant (SQN), Units 1 and 2, respectively, ADAMS Accession Number ML082401385, dated August 29, 2008.

ATTACHMENT 2

MARKUP OF TECHNICAL SPECIFICATIONS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. One channel inoperable.	---------- NOTE ---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ---------- I.1 Place channel in trip. OR I.2 Be in MODE 3.	 72 hours 78 hours
J. One Main Feedwater Pumps trip channel(s) inoperable.	---------- NOTE ---------- ~~The~~ One inoperable channel may be bypassed for up to 2 hours for surveillance testing of other channels. ---------- J.1 Place channel in trip. (5) OR J.2 Be in MODE 3.	 1 hour 7 hours

(continued)

ATTACHMENT 3

RETYPED TECHNICAL SPECIFICATIONS

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
I. One channel inoperable.	---------- NOTE ---------- The inoperable channel may be bypassed for up to 12 hours for surveillance testing of other channels. ----------	
	I.1 Place channel in trip.	72 hours
	OR	
	I.2 Be in MODE 3.	78 hours
J. One or more Main Feedwater Pumps trip channel(s) inoperable.	---------- NOTE ---------- One inoperable channel may be bypassed for up to 2 hours for surveillance testing of other channels. ----------	
	J.1 Place channel(s) in trip.	1 hour
	OR	
	J.2 Be in MODE 3.	7 hours

(continued)

ATTACHMENT 4

PROPOSED TECHNICAL SPECIFICATION BASES CHANGES
(for information only)

BASES

turbine-driven

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

14. Steam Generator Water Level – Low Low (continued)

Environmental Allowance Modifier (EAM) channels in the same protection sets are tripped since that enables the SG Water Level - Low Low (Adverse Containment Environment) channels with a higher water level trip setpoint. As such, the SG Water Level – Low Low (Normal Containment Environment) channels need not be OPERABLE when the Containment Pressure – EAM channels in the same protection sets are tripped, as discussed in a footnote to Table 3.3.1-1. The normal source of water for the SGs is provided by the Main Feedwater (MFW) Pumps (not safety related). The MFW Pumps are only in operation in MODE 1 or 2. The AFW System is the safety-related source of water to ensure that the SGs remain the heat sink for the reactor. During normal startups and shutdowns the MFW System or AFW System provides feedwater to maintain SG level. In MODE 3, 4, 5, or 6, the SG Water Level - Low Low Reactor Trip Function does not have to be OPERABLE because the reactor is not operating or even critical (see LCO 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," for Applicability of SG Water Level - Low Low ESFAS Functions).

15. Not used.

(PAE01A and PAE01B)

16. Turbine Trip

a. Turbine Trip – Low Fluid Oil Pressure

The Turbine Trip - Low Fluid Oil Pressure trip Function anticipates the loss of heat removal capabilities of the secondary system following a turbine trip. This trip Function acts to minimize the pressure/temperature transient on the reactor. Any turbine trip from a power level below the P-9 setpoint, 50% power, will not actuate a reactor trip. Three pressure switches monitor the control oil pressure in the Turbine Electrohydraulic Control System. A low pressure condition sensed by two-out-of-three pressure switches will actuate a reactor trip. These pressure switches do not provide any input to the control system. The unit is designed to withstand a complete loss of load and not sustain core damage or challenge the RCS pressure limitations. Core protection is provided by the Pressurizer Pressure - High trip Function and RCS integrity is ensured by the pressurizer safety valves.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY (continued)

5. Turbine Trip and Feedwater Isolation

The primary functions of the Turbine Trip and Feedwater Isolation signals are to prevent damage to the turbine due to water in the steam lines and to stop the excessive flow of feedwater into the SGs. These Functions are necessary to mitigate the effects of a high water level in the SGs, which could result in carryover of water into the steam lines and excessive cooldown of the primary system. The SG high water level is due to excessive feedwater flows.

The Function is actuated when the level in any SG exceeds the high high setpoint and performs the following functions:

- Trips the main turbine;
- Trips the MFW pumps, closing the pump discharge valves; and (PAE01A and PAE01B),
- Initiates feedwater isolation.

With the exception of feedwater isolation, these listed functions, which are actuated by SG Water Level - High High or by an SI signal, are not credited in the safety analysis. The RTS also initiates a turbine trip signal whenever a reactor trip (P-4) is generated. In the event of SI, the unit is taken off line and the turbine generator must be tripped. The MFW System is also taken out of operation and the AFW System is automatically started. The SI signal was previously discussed.

While the above discussion applies to both turbine trip and feedwater isolation in response to excessive feedwater in MODES 1 and 2, feedwater isolation on SG low-low level is required for events in MODES 1, 2, and 3 where the assurance of AFW delivery to the intact steam generators is paramount in the accident analysis. The analyses for the Loss of Non-Emergency AC Power, Loss of Normal Feedwater, and Feedwater System Pipe Break events credit feedwater isolation on SG low-low level. Given the location of the feedwater check valves inside containment downstream of the point where AFW connects to the main feedwater piping, closure of the main feedwater isolation valves (MFIVs) is required to assure AFW flow is not diverted. The Applicable MODES for the feedwater isolation function on SG low-low level are consistent with those for the MFIVs and Main Feedwater Regulating Valves (MFVRVs) and Main Feedwater

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

d. Turbine Trip and Feedwater Isolation - Safety Injection (continued)

the requirements for their SI function. Therefore, the requirements are not repeated in Table 3.3.2-1. Instead

Function 1, SI, is referenced for all initiating functions and requirements.

e. Feedwater Isolation - Steam Generator Water Level - Low Low

(i.e., loss of both PAE01A and PAE01B)

SG Water Level - Low Low provides protection against a loss of heat sink by ensuring the isolation of normal feedwater and AFW delivery to the steam generators. Given the location of the feedwater line check valves inside containment downstream of the point where AFW connects to the main feedwater piping, closure of the MFIVs is required to assure AFW flow is not diverted. A feedwater line break or a loss of MFW would result in a loss of SG water level. SG Water Level - Low Low provides input to the SG Water Level Control System. Therefore, the actuation logic must be able to withstand both an input failure to the control system, which may then require a protection function actuation, and a single failure in the other channels providing the protection function actuation. Thus, four OPERABLE channels are required to satisfy the requirements with two-out-of-four logic (the Environmental Allowance Modifier (EAM) function also uses a two-out-of-four logic). Two-out-of-four low level signals in any SG initiates feedwater isolation. As discussed in Reference 11, the SG Water Level - Low Low trip Function has been modified to allow a lower Trip Setpoint under normal containment environmental conditions.

The EAM circuitry reduces the potential for inadvertent trips via the EAM, enabled on containment pressure exceeding its setpoint as listed in Table B 3.3.2-1. Because the SG Water Level transmitters (d/p cells) are located inside containment, they may experience adverse environmental conditions due to a feedline break. The EAM function is used to monitor the presence of adverse containment conditions (elevated pressure) and enables the Steam Generator Water Level - Low Low (Adverse) trip setpoint to reflect the increased transmitter uncertainties

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

e. Feedwater Isolation - Steam Generator Water Level - Low Low (continued)

the SG Water Level – Low Low Adverse Containment Environment) channels with a higher water level trip setpoint. As such, the SG Water Level – Low Low (Normal Containment Environment) channels need not be OPERABLE when the Containment Pressure – EAM channels in the same protection sets are tripped, as discussed in a footnote to Table 3.3.2-1.

6. Auxiliary Feedwater

(i.e., loss of both PAE01A and PAE01B),

The AFW System is designed to provide a secondary side heat sink for the reactor in the event that the MFW System is not available. The system has two motor driven pumps and a turbine driven pump, making it available during normal unit operation, during a loss of AC power, a loss of MFW, and during a Feedwater System pipe break. The normal source of water for the AFW System is the condensate storage tank (CST). A loss of suction pressure, coincident with an auxiliary feedwater actuation signal (AFAS), will automatically realign the pump suctions to the safety related Essential Service Water (ESW) System. The AFW System is aligned so that upon a pump start, flow is initiated to the respective SGs immediately.

a. Auxiliary Feedwater - Manual Initiation

Manual initiation of Auxiliary Feedwater can be accomplished from the control room. Each of the three AFW pumps has a pushbutton for manual AFAS initiation. The LCO requires three channels to be OPERABLE.

b. Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays (SSPS)

Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for ESFAS Function 1.b.

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

6. Auxiliary Feedwater (continued)

c. Auxiliary Feedwater - Automatic Actuation Logic and Actuation Relays (BOP ESFAS)

Automatic actuation logic and actuation relays consist of similar features and operate in a similar manner as described for SSPS in ESFAS Function 1.b.

d. Auxiliary Feedwater - Steam Generator Water Level - Low Low

(i.e., loss of both PAE01A and PAE01B),

SG Water Level - Low Low provides protection against a loss of heat sink. A feed line break, inside or outside of containment, or a loss of MFW would result in a loss of SG water level. SG Water Level - Low Low provides input to the SG Water Level Control System. Therefore, the actuation logic must be able to withstand both an input failure to the control system, which may then require a protection function actuation, and a single failure in the other channels providing the protection function actuation. Thus, four OPERABLE channels are required to satisfy the requirements with two-out-of-four logic (the Environmental Allowance Modifier (EAM) function also uses a two-out-of-four logic). Two-out-of-four low level signals in any SG starts the motor-driven AFW pumps; in two SGs starts the turbine-driven AFW pump. As discussed in Reference 11, the SG Water Level - Low Low trip Function has been modified to allow a lower Trip Setpoint under normal containment environmental conditions.

The EAM circuitry reduces the potential for inadvertent trips via the EAM, enabled on containment pressure exceeding its setpoint as listed in Table B 3.3.2-1. Because the SG Water Level transmitters (d/p cells) are located inside containment, they may experience adverse environmental conditions due to a feedline break. The EAM function is used to monitor the presence of adverse containment conditions (elevated pressure) and enables the Steam Generator Water Level - Low Low (Adverse) trip setpoint to reflect the increased transmitter uncertainties due to this harsh environment. The EAM enables a lower Steam Generator Water Level - Low Low

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, AND APPLICABILITY

6. Auxiliary Feedwater (continued)

g. Auxiliary Feedwater - Trip of All Main Feedwater Pumps

A Trip of all MFW pumps is an indication of a loss of MFW and the subsequent need for some method of decay heat and sensible heat removal to bring the reactor back to no load temperature and pressure. Each turbine driven MFW pump is equipped with two pressure switches (one in separation group 1 and one in separation group 4) on the oil line for the speed control system. A low pressure signal from either of these pressure switches indicates a trip of that pump. Two OPERABLE channels per pump satisfy redundancy requirements with one-out-of-two logic on both pumps required for signal actuation. A trip of all MFW pumps starts the motor driven AFW pumps to ensure that ~~at least one SG is~~ available with water to act as the heat sink for the reactor.

Function 6.g must be OPERABLE in MODES 1 and 2. This ensures that ~~at least one SG is~~ provided with water to serve as the heat sink to remove reactor decay heat and sensible heat in the event of an accident. In MODES 3, 4, and 5, the MFW pumps may be normally shut down, and thus pump trip is not indicative of a condition requiring automatic AFW initiation. Note (n) of Table 3.3.2-1 allows the blocking of this ~~trip function~~ just before shutdown of the last operating main feedwater pump and the restoration of this trip function just after the first main feedwater pump is put into service following its startup trip test. This limits the potential for inadvertent AFW actuations during normal startups and shutdowns.

INSERT 1 (new q)

h. Auxiliary Feedwater - Pump Suction Transfer on Suction Pressure - Low

A low pressure signal in the AFW pump suction line protects the AFW pumps against a loss of the normal supply of water for the pumps, the CST. Three pressure switches are located on the AFW pump suction line from the CST. A low pressure signal sensed by any two of the

(continued)

INSERT 1

A turbine-driven MFW pump is in service when the pump's stop valves are open, the governor control valves are either in manual or automatic control, and feedwater is being supplied to the steam generators.

One cause of multiple channel inoperability which requires entry into Condition J occurs routinely during normal plant operation. A single turbine-driven MFW pump may be in service in MODE 1 at reduced power levels if the other turbine-driven MFW pump has not yet been placed into service during power ascension or has been removed from service for maintenance. Prior to placing a turbine-driven MFW pump into service, the status of its turbine control circuitry is changed from "tripped" to "reset" via its Trip/Reset handswitch (FCHIS0018 or FCHIS0118) such that the two oil pressure switch channels on that turbine-driven MFW pump experience the high oil pressures indicative of an operating pump prior to that turbine-driven MFW pump providing feedwater flow to the steam generators. In this status, the turbine-driven MFW pump that is not yet in service would not satisfy the AFW start function actuation logic if the operating turbine-driven MFW pump were to trip at this time since it takes one tripped channel on each turbine-driven MFW pump in the same separation group to initiate an auxiliary feedwater actuation signal. Therefore, with one turbine-driven MFW pump turbine in reset, Condition J must be entered for two inoperable oil pressure channels on that turbine-driven MFW pump. This Condition imposes a partial AFW actuation status (or partial trip) on the plant.

This ESFAS function is an anticipatory start signal for which no credit is taken in any accident analysis. The safety analyses credit actuation of the motor-driven AFW pumps upon a low-low steam generator water level signal in any steam generator and after a safety injection signal.

BASES

ACTIONS

I.1 and I.2 (continued)

The Required Actions are modified by a Note that allows the inoperable channel to be bypassed for up to 12 hours for surveillance testing of other channels. The 72 hours allowed to place the inoperable channel in the tripped condition, and the 12 hours allowed for an inoperable channel to be in the bypassed condition for testing, are justified in Reference 18.

J.1 and J.2

INSERT 2

Condition J applies to the AFW pump start on trip of all MFW pumps (PAE01A and PAE01B).

This action addresses the train orientation of the BOP ESFAS for the auto start function of the AFW System on loss of all MFW pumps. The OPERABILITY of the AFW System must be assured by providing automatic start of the AFW System pumps. ~~If a channel is inoperable, 1 hour is allowed to place it in the tripped condition. If the channel cannot~~ be tripped in 1 hour, 6 additional hours are allowed to place the unit in MODE 3. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems. In MODE 3, the unit does not have any analyzed transients or conditions that require the explicit use of the protection function noted above. The Required Actions are modified by a Note that allows ~~the~~ one inoperable channel to be bypassed for up to 2 hours for surveillance testing of other channels.

K.1, K.2.1, and K.2.2

Condition K applies to:

- RWST Level - Low Low Coincident with Safety Injection.

RWST Level - Low Low Coincident With SI provides actuation of switchover to the containment recirculation sumps. Note that this Function requires the bistables to energize to perform their required action. The failure of up to two channels will not prevent the operation of this Function. This Action Statement limits the duration that an RWST level channel could be inoperable in the tripped condition in order to limit the probability for automatic switchover to an empty containment sump upon receipt of an inadvertent safety injection signal (SIS), coincident with a single failure of another RWST level channel, or for premature switchover to the sump after a valid SIS. This sequence of events would start the RHR pumps, open the containment sump RHR suction valves

(continued)

INSERT 2

If one or more channel(s) are inoperable, 1 hour is allowed to place the inoperable channel(s) in the tripped condition. If the channel(s) cannot

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.2.7 (continued)

the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The trip actuating devices tested within the scope of SR 3.3.2.7 are the LSELS output relays and BOP ESFAS separation groups 1 and 4 logic associated with the automatic start of the turbine driven auxiliary feedwater pump on an ESF bus undervoltage condition The Frequency is adequate. It is based on industry operating experience and is consistent with the typical refueling cycle. The SR is modified by a Note that excludes verification of setpoints for relays. The trip actuating devices tested have no associated setpoint.

(PAE01A and PAE01B).

SR 3.3.2.8

SR 3.3.2.8 is the performance of a TADOT. This test is a check of the Manual Actuation Functions and AFW pump start on trip of all MFW pumps. The Manual Safety Injection TADOT shall independently verify OPERABILITY of the undervoltage and shunt trip handswitch contacts for both the Reactor Trip Breakers and Reactor Trip Bypass Breakers as well as the contacts for safety injection actuation. It is performed every 18 months. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable TADOT of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. The Frequency is adequate, based on industry operating experience and is consistent with the typical refueling cycle. The SR is modified by a Note that excludes verification of setpoints during the TADOT for manual initiation Functions. The manual initiation Functions have no associated setpoints. INSERT 3

SR 3.3.2.9

SR 3.3.2.9 is the performance of a CHANNEL CALIBRATION.

A CHANNEL CALIBRATION is performed every 18 months, or approximately at every refueling. CHANNEL CALIBRATION is a complete check of the instrument loop, including the sensor. The test

(continued)

INSERT 3

The Note exclusion does not explicitly apply to the AFW pump start on trip of both turbine-driven MFW pumps; however, the TADOT test procedures for that Function do not require the verification of a nominal trip setpoint or allowable value since none have ever been specified in the Technical Specifications for that anticipatory actuation signal which is not credited in any accident analysis.