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October 19, 2015

AEP-NRC-2015-85
10 CFR 50.90

Docket Nos. 50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Donald C. Cook Nuclear Plant Unit 2
License Amendment Request Regarding Technical Specification 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation

References:

1. Letter from J. P. Gebbie, Indiana Michigan Power Company (I&M), to U. S. Nuclear Regulatory Commission (NRC) Document Control Desk, "Donald C. Cook Nuclear Plant Unit 1, Exigent License Amendment Request Regarding Technical Specification 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation," dated June 29, 2015, Agencywide Documents Access and Management System (ADAMS) Accession Number ML15181A002.

2. Letter from J. P. Gebbie, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant Unit 1, Response to Request for Information Regarding Exigent License Amendment Request Regarding Technical Specification 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation," dated July 2, 2015, ADAMS Accession Number ML15187A336.

3. Letter from A.W. Dietrich, NRC, to L.J. Weber, I&M, "Donald C. Cook Nuclear Plant Unit 1, Issuance of Exigent Amendment Regarding Revision to Technical Specifications for Engineered Safety Features Actuation System Instrumentation (TAC No. MF6390)," dated July 10, 2015, ADAMS Accession Number ML15187A002.

Pursuant to 10 CFR 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 2, proposes to amend the Appendix A Technical Specifications (TS) to Renewed Facility Operating License DPR-74. I&M proposes to revise TS 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," to add a new Condition for one or more inoperable Required Channels for main feedwater pump trips and to add a footnote to TS Table 3.3.2-1, Function 6.g to revise Mode 2 applicability. I&M has evaluated the proposed change in accordance with 10 CFR 50.92 and concluded that there is no significant hazards consideration.

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NRR

By Reference 1 and 2, I&M previously proposed to amend TS 3.3.2 for CNP Unit 1, on an exigent basis, with a change that is similar to the change that this amendment is proposing for CNP Unit 2. By Reference 3, the U. S. Nuclear Regulatory Commission (NRC) approved the proposed change for CNP Unit 1. This proposed change for Unit 2 is to provide for consistency in format and function between the Unit 1 and Unit 2 TS.

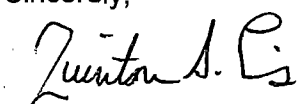
I&M requests approval of the proposed change by October 20, 2016, which would allow Unit 2 start up from the Fall 2016 Refueling Outage with Unit 2 TS 3.3.2 requirements for MFW pump trips consistent with the Unit 1 TS 3.3.2 for MFW pump trips. The proposed change will be implemented within 30 days of NRC approval.

Enclosure 1 to this letter provides an affirmation statement pertaining to the information contained herein. Enclosure 2 provides I&M's evaluation of the proposed TS change. Enclosure 3 to this letter provides Unit 2 TS pages marked to show the proposed change. Enclosure 4 to this letter provides Unit 2 TS Bases pages marked to show the changes that will be made upon implementation of the proposed amendment and are for informational purposes only. New, clean Unit 2 TS pages with the proposed change incorporated will be provided to the NRC Licensing Project Manager when requested. The associated TS Bases change will be made in accordance with TS 5.5.12, "Technical Specification (TS) Bases Control Program."

Copies of this letter and its enclosures are being transmitted to the Michigan Public Service Commission and Michigan Department of Environmental Quality, in accordance with the requirements of 10 CFR 50.91.

There are no new regulatory commitments in this letter. Should you have any questions, please contact Mr. Michael K. Scarpello, Regulatory Affairs Manager, at (269) 466-2649.

Sincerely,



Q. Shane Lies
Engineering Vice President

TLC/ams

Enclosures:

1. Affirmation
2. Evaluation of Proposed License Amendment Request Regarding Technical Specification 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation
3. Donald C. Cook Nuclear Plant Unit 2 Technical Specification Pages Marked to Show Proposed Changes
4. Donald C. Cook Nuclear Plant Unit 2 Technical Specification Bases Pages Marked To Show Proposed Changes

c: A. W. Dietrich, NRC, Washington, D.C.
J. T. King – MPSC
MDEQ – RMD/RPS
NRC Resident Inspector
C. D. Pederson, NRC Region III
A. J. Williamson, AEP Ft. Wayne, w/o enclosures

Enclosure 1 to AEP-NRC-2015-85

AFFIRMATION

I, Q. Shane Lies, being duly sworn, state that I am the Engineering Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the U. S. Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

Indiana Michigan Power Company

Q. Shane Lies
Engineering Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 19 DAY OF October, 2015

Notary Public

My Commission Expires 04-04-2018

DANIELLE BURGOYNE
Notary Public, State of Michigan
County of Berrien
My Commission Expires 04-04-2018
Acting in the County of Berrien

Enclosure 2 to AEP-NRC-2015-85

Evaluation of Proposed License Amendment Request Regarding Technical Specification 3.3.2, Engineered Safety Feature Actuation System Instrumentation

1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 2, proposes to amend the Appendix A Technical Specification (TS) to Facility Operating License DPR-74. I&M proposes to revise TS 3.3.2, "ESFAS Instrumentation," to add a new Condition for one or more inoperable Required Channels for main feedwater (MFW) pump trips, change Table 3.3.2-1 to add a footnote to the Applicable Mode Column for Mode 2, and to reflect the new Condition, and renumber some existing Conditions. This evaluation supports the request above for CNP Unit 2.

By Reference 1 and 2, I&M previously proposed to amend TS 3.3.2 for CNP Unit 1, on an exigent basis, with a change that is similar to the change that this amendment is proposing for CNP Unit 2. By Reference 3, the U. S. Nuclear Regulatory Commission (NRC) approved the proposed change for CNP Unit 1. This proposed change for Unit 2 is to provide for consistency in format and function between the Unit 1 and Unit 2 TSs.

2.0 DETAILED DESCRIPTION

The Auxiliary Feedwater (AFW) auto-start function on a trip of all MFW pumps is an anticipatory function in that it provides early actuation of the AFW system to mitigate the consequences of a loss of normal feedwater. Additionally, the current TS requires that this function be operable in Mode 2 prior to the availability of sufficient feedwater demand to run a MFW pump.

(1) I&M proposes adding the following new TS 3.3.2 Condition H:

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. One or more MFW Pump trip channel(s) inoperable.	H.1 ----------NOTE---------- One channel on one MFW pump may be inoperable for up to 4 hours during the process of removing the pump from service or placing the pump in service. ---------- Restore channel(s) to OPERABLE status.	48 hours

To reflect the new Condition H, Table 3.3.2-1, Function 6.g., will have the Conditions column changed from B to H. Additionally, the current Conditions H through K will be renumbered to be

Conditions I through L and the renumbered Condition I will be changed to reflect Condition H for Function 6.g.

(2) I&M proposes to change Table 3.3.2-1, Function 6.g. to add the following footnote to the Mode 2 Applicability:

"When one or more Main Feedwater pump(s) are supplying feedwater to steam generators."

Enclosure 3 to this letter provides the Unit 2 TS pages marked to show the proposed change. New text on these pages is marked with a single-line border. New, clean Unit 2 TS pages with the proposed change incorporated will be provided to the NRC Licensing Project Manager when requested. Enclosure 4 to this letter provides the Unit 2 TS Bases pages marked to show proposed changes. The TS Bases are provided for informational purposes. The TS Bases changes will be made in accordance with the TS 5.5.12, "Technical Specification (TS) Bases Control Program."

3.0 TECHNICAL EVALUATION

3.1 Description of Unit 2 MFW Pumps

The Feedwater System, in conjunction with the Condensate System, returns condensed steam from the condensers and the feedwater heater drains to the steam generators (SG) while maintaining the overall water inventory throughout the cycle. These systems maintain the water level of the SG during normal unit operation.

The Main Feedwater Pump Turbines (MFPTs) provide motive power to drive the MFW pumps. The Feedwater Differential Pressure Control System regulates the speed, and thereby the differential pressure across the feedwater regulating valves to maintain valve operation in the linear response region. The MFPT Control System provides control of a single MFPT stop valve which isolates steam flow to the respective MFPT for various equipment and plant conditions.

The control scheme for CNP Unit 2 MFW pumps considers the MFW pumps to be tripped when the stop valve on each MFPT is closed. A limit switch is mounted to the stop valve to provide an input to the circuitry that the stop valve is closed. This input is the signal that the respective MFW pump has tripped and to automatically start AFW when the stop valve on each MFPT is closed. The logic for auto actuation of AFW from MFW pump trips is 2-out-of-2 (AND logic, see Figure 1). There are two MFW pumps and each has a stop valve with a closed limit switch input making up the two logic inputs. There are other means to automatically start AFW, but for purposes of this discussion, focus will be upon the MFPT stop valves closing to automatically start AFW.

The scenarios discussed below are the typical normal operation of the MFW pumps for startup of the MFW pumps and normal post maintenance testing. For all of the scenarios, the following operating requirements and characteristics can affect the amount of time to place the MFW pumps in operation and subsequently affect the ability of the MFW pumps to provide a timely signal to automatically start AFW in Modes 1 and 2:

1. Prior to trip testing and warming the MFPT, the motor driven AFW pumps are verified not in Auto. This configuration does not defeat the auto-start provided by other Functions (i.e. Low-Low S/G level). The position of this switch is selected to avoid forwarding an unintended signal to automatically start AFW from MFW pump trips. Typically during this phase of start-up AFW is in service supporting unit operation and it would be redundant to send another AFW start signal.

2. During the warming of the MFPT, all the feedwater is recirculated back to the condenser with no feedwater forwarded to the SGs during this warm-up period at approximately 1000 revolutions per minute (rpm).

3. The following conditions are typical examples that may hold the MFW pump at 1000 rpm while recirculating the feedwater to the condenser for a period of time beyond what is required for warming the turbine. These include, but are not limited to:

   a. If the lubricating oil temperature is less than 110 degrees Fahrenheit. Feeding the SGs could be delayed while lubricating oil temperature is increased per the manufacturer's instruction.

   b. Each MFPT has a dedicated steam condenser and the time required to establish a stable condenser vacuum condition could delay forwarding feedwater to the SGs.

   c. Performing post maintenance testing.

Starting the First MFW pump:

In this scenario, the second MFW pump has its stop valve closed. Then, when the first MFW pump is started, its stop valve is opened to warm up the turbine by slowly rolling without the MFW pump providing any feedwater to the SGs. In the event of a MFW pump trip, the stop valve would be closed but the AFW Auto selector switch will not cause AFW to start. Due to this operational condition being the start of the first MFW pump, AFW is currently in service.

First MFW pump in Service and Starting the Second MFW pump:

Starting the second MFW pump means that the first MFW pump is in service and providing feedwater to the SGs. In the event the second MFW pump were to trip during the start-up phase it would cause little to no perturbations because the feedwater would be recirculating to the main condenser with the first MFW pump in service. A trip of the second MFW pump when it is providing feedwater to the SGs will cause some perturbations, but will not trip the first MFW pump. But if, during the slow rolling of the second MFW pump, the first MFW pump should trip, then there will be no automatic start of the motor driven AFW pumps due to the stop valve of the second MFW pump being open.

First MFW pump in Service and Starting the Second MFW Pump Uncoupled:

Typically, the first MFW pump is in service and providing feedwater to the SGs. The unit is ascending in power while balancing is occurring on the turbine of the second MFW pump. An uncoupled run may be required due to this turbine receiving a major inspection that requires an uncoupled run to conduct a final balancing of the turbine rotor. In the event the second MFW pump were to trip during the start-up phase, it would cause no perturbations because the MFW pump is not providing feedwater to the SGs. But, if during the uncoupled operation of the second MFW pump the first MFW pump should trip, then there will be no automatic start of the motor driven AFW pumps due to the stop valve of the second MFW pump still being open.

Summary

The scenarios discussed for CNP Unit 2 above have not presented any type of challenges to the reliability of the affected equipment, nor have there been any challenges to safe unit operation. The first scenario does not pose any challenges to AFW automatically starting since AFW is in service during this operational phase of unit start-up. The following two scenarios can occur as a result of transitioning from a refueling, planned, or forced outage, as well as a downpower where one of the MFW pumps was removed from service due to, but not limited to, a planned or partial forced outage.

The Engineered Safety Feature Actuation System (ESFAS) instrumentation function 6.g is an anticipatory start signal for which no credit is taken in any safety analysis. The design basis events for which operation of the AFW system is required are the loss of all alternating current (AC) power to the plant auxiliaries, loss of normal feedwater, loss of electrical load, and small break loss of coolant accident (SBLOCA). The analyses presented in CNP Updated Final Safety Analysis Report (UFSAR) Sections 14.1.9, Loss of Normal Feedwater, and 14.1.12, Loss of All AC Power to the Plant Auxiliaries, state that the SG water level low-low AFW start signal is specifically credited in the analyses. Since the primary success path for accident mitigation is provided by SG low-low level signals, loss of both anticipatory trip channels does not place the plant in an unanalyzed condition and, therefore, the plant should not be required to enter TS Limiting Condition of Operation (LCO) 3.0.3.

3.2 Proposed TS 3.3.2 New Condition H for Function 6.g. of Table 3.3.2-1

The proposed change will add a new Condition H to LCO 3.3.2, which will read:

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

This provision is required to accurately reflect plant design bases. The design basis events, which impose AFW safety function requirements, are loss of all AC power to the plant auxiliaries, loss of normal feedwater, loss of electrical load, and SBLOCAs. These design bases events assume AFW auto-starts on a low-low SG level, safety injection, or loss of off-site power (LOOP) signal. These ESFAS signals are Class 1E, which means that they meet all requirements for reliable power supplies, separation, redundancy, testability, and seismic and environmental qualifications as specified in 10 CFR 50.55a(h)(2), Protection Systems.

The anticipatory AFW auto-start circuits associated with the MFW pumps do not meet the requirements specified in 10 CFR 50.55a(h)(2). The steam stop valve closed limit switches and relays that make up these circuits are not single failure proof, nor are they seismically qualified. These circuits do not interface with the ESFAS, which is an integral part of the Solid State Protection System. As such, these circuits are not part of the primary success path for postulated accident mitigation as defined by 10 CFR 50.36(c)(2)(ii), Criterion 3, and therefore, are not credited in the accident analysis. The safety grade signals credited in the accident analysis for loss of normal feedwater are SG low-low level.

Function 6.g. logic includes 2 channels arranged in a 2-out-of-2 logic. Therefore, the change to new Condition H allowing multiple channels to be inoperable results in no change in plant safety level since function is lost if any or all channels are inoperable.

Additionally, to reflect the new Condition H, Table 3.3.2-1, Function 6.g., will have the Conditions column changed from B to H and the current Conditions H through K will be renumbered to be Conditions I through L.

In conclusion, since the primary success path for accident mitigation is provided by SG low-low level signals, loss of both anticipatory trip channels does not place the plant in an unanalyzed condition and, therefore, the plant should not be required to enter TS LCO 3.0.3.

3.3 Proposed Required Action for TS 3.3.2 New Condition H

The proposed Required Action for TS 3.3.2, reads as follows

"H.1 Restore channel(s) to OPERABLE status."

The TS 3.3.2 new Condition H, applies to both anticipatory trip channels. The trip channels are combined using an "AND" logic circuit requiring 2-out-of-2 channels (see Figure 1). Failure of any one of the two (one per MFW pump) channels results in loss of AFW auto-start function. Therefore, the trip channels must be declared OPERABLE within 48 hours of entering Condition H. This Required Action is consistent with the previously applicable Condition B for Function 6.g. To reflect the new Condition, the current Condition H (renumbered to Condition I) will be changed to reflect the new Condition H for Function 6.g. This Condition has a Required Action to be in MODE 3 in 6 hours.

3.4 Proposed Note for Required Action for TS 3.3.2 New Condition H

The proposed change will revise the applicability for the Required Action for the new Condition H with the following note:

"One channel on one Main Feedwater pump may be inoperable for up to 4 hours during the process of removing the pump from service or placing the pump in service."

This provision will allow placing a MFW pump in service or removing a MFW pump from service during the Mode of Applicability without the requirement to enter LCO 3.3.2, Condition H

(renumbered Condition I), for an inoperable channel(s). Entering into an LCO Action to place a system into service or remove a system from service is atypical without express allowance in the TS (e.g. the allowance associated with emergency core cooling system and low temperature overpressure protection system). This change is limited to a short period of time (4 hours) to allow operational flexibility to align the MFW pumps. This time is well within the Completion Time of 48 hours as currently provided in Condition B for one inoperable channel and the proposed Completion Time for the new Condition H. In addition, plant safety is not compromised during this short period because the safety-related AFW auto-start channels, i.e., SG low-low levels, are operable.

The proposed TS allowance is justified because, as described above in the process for placing the MFW pump in service, the operating requirements and characteristics of MFW pump operation can require more than one hour, with 4 hours being sufficient time to complete placing a MFW pump in operation. During this time, the MFW pump is placed on turning gear and the auxiliary support systems such as injection water, gland steam sealing, steam drains, cooling water, and lube oil are aligned and placed into operation. Following those actions, the MFPT vacuum is established, the turbine rolled, and the MFW pump temperature increased to normal operating levels. When both MFW pumps are in service (i.e., both providing feed flow or capable of providing feed flow), the AFW auto-start Function 6.g is fully operational. During plant shutdown, the sequence of events is reversed.

Loss of the anticipatory trip circuits during plant startup or shutdown is of very low safety significance because the AFW system will automatically start on low-low SG level, LOOP, and safety injection, which are all Class 1E circuits. The MFW pump anticipatory trip circuits are not single failure proof, nor do they meet the requirements for Class 1E safety circuits as defined by 10 CFR 50.55a(h)(2).

The 4-hour provision specified in the proposed Note to Condition H would not apply during the start of the first MFW pump as both motor driven AFW pumps are running the entire time and the addition of the footnote to Table 3.3.2-1 for Function 6.g. modifies the Mode 2 applicability to start after MFW is supplying feedwater to the SGs. After the first MFW pump is feeding the SGs, the AFW pumps are removed from service.

Startup of the second MFW pump is conducted prior to reaching 60 percent (%) reactor power. When placing the second MFW pump in service, the point in time that the turbine stop valve on the second MFW pump is opened is when the 4-hour provision specified in the proposed Note to Condition H would start to apply. The proposed Note to Condition H would stop being applied for the second MFW pump when that MFW pump is either capable of feeding the SGs (i.e. discharge pressure of the MFW pump is just below SG pressure) or feeding the SGs. In this condition, both MFW pumps are in service and the one required channel (per pump) is functionally able to provide the required trip input for actuation of AFW.

The proposed Note to LCO 3.3.2, Required Action H.1, states, "One channel on one Main Feedwater pump may be inoperable for up to 4 hours during the process of removing the pump from service or placing the pump in service." As it indicates, this Note will not be applicable when both MFW pumps are in service (i.e. the first MFW pump is feeding the SGs and the

second MFW pump is capable of feeding or feeding the SGs). Therefore, this provision will not be used once both MFW pumps are in service.

To shutdown both MFW pumps, reactor power is verified low enough to be supplied by one MFW pump and the speed on the first MFW pump is lowered to just below the pressure of the second MFW pump until the first MFW pump is no longer feeding the SGs. The first MFW pump is maintained just below the second MFW pump discharge pressure, not feeding the SGs, but still in service. Reactor power is then lowered to approximately 17% and AFW is placed in service with the second MFW pump feeding the SGs. Then, both MFW pumps are removed from service by tripping the reactor at approximately 17% power. Tripping the reactor causes both MFW pumps to trip and allows the already running AFW pumps to supply feedwater to the SGs. The normal method for shutdown of the MFW pumps is to trip the pumps (i.e. both MFW turbine stop valves go closed). Therefore, the 4-hour provision would not typically be used for the shutdown of a MFW pump. However, if plant conditions warrant, a slower method for shutting down the MFW pump may be used and the MFW pump would be removed from service under the provision of the note.

3.5 Proposed Completion Time for TS 3.3.2 New Condition H

The proposed Completion Time for Required Action H.1 is 48 hours.

The Proposed Completion Time of 48 hours for Required Action H.1 is consistent with the previously applicable Condition B for Function 6.g. The previously applicable Condition B allowed 48 hours with one channel inoperable. The 2-out-of-2 logic means that any number of channels, either one channel or more than one channel, would render the auto-actuation function of AFW for Function 6.g. non-functional. Therefore, the Completion Time of 48 hours for new Condition H is consistent with the previously applicable Condition B Completion Time for Function 6.g.

As described above, with one MFW pump in service, the second MFW pump turbine may be started uncoupled from the pump to facilitate some post maintenance testing activities. In this instance, Required Action H.1 would be entered and the 48-hour completion time would apply when the stop valve to the MFW pump is open. This post maintenance testing is not considered a normal plant startup or shutdown activity, but instead facilitates completion of maintenance activities that can be completed with one MFW pump in service.

Additionally, Required Action H.1 would be entered any time one or more MFW pump trip channels are inoperable due to an actual channel failure or degradation mechanism being present.

3.6 Proposed Footnote for Table 3.3.2-1, Function 6.g.

The proposed change will revise Mode 2 applicability for Function 6.g with the following note:

"When one or more Main Feedwater Pump(s) are supplying feedwater to steam generators."

Since the AFW pumps are already in service and used as the primary means of removing heat from the reactor core up to 4% power in Mode 2, the anticipatory AFW auto-start function serves no useful purpose. If an AFW pump were to fail during startup or shutdown, the redundant AFW pump(s) would start automatically on low-low SG level, if not already manually initiated by the operator in accordance with station operating procedures.

3.7 Summary

In summary, the proposed TS change will establish a new Condition to allow one or more MFW pump trip channels to be inoperable, will eliminate the requirement that LCO 3.3.2 Function 6.g. be met in Mode 2 when the MFW pumps are not running, and will allow one anticipatory AFW auto-start channels to be inoperable for a limited period in Mode 1 and 2 when placing a MFW pump in or out of service. In the unlikely event that an AFW pump trips during plant startup or shutdown (i.e. Mode 2), the redundant AFW pumps would start automatically on low-low SG level, if not already manually initiated by the operator in accordance with station operating procedures.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

Regulatory Requirements

10CFR 50.36(c)(2)(ii), stipulates that a TS LCO must be established for each item meeting one or more of the following criteria:

1. Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.
2. A process variable, design feature, or operating restriction that is an initial condition of a design basis accident (DBA) or transient analysis that either assumes the failure of, or presents a challenge to the integrity of a fission product barrier.
3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a DBA or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.
4. A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

The requirements for the initiation of AFW auto-start resulting from trip of all MFW pumps are included in the TS in accordance with 10 CFR 50.36(c)(2), "Limiting Conditions for Operation."

As described in UFSAR Section 1.4, the Plant Specific Design Criteria (PSDC) define the principal criteria and safety objectives for the CNP design. The following PSDC are relevant to the proposed amendment:

PSDC CRITERION 12 Instrumentation And Control Systems

> Instrumentation and controls shall be provided as required to monitor and maintain within prescribed operating ranges essential reactor facility operating variables.

The proposed operational change continues to provide system monitoring and proper actuation to satisfy the anticipatory trip function. No changes are proposed to the safety-related instrumentation (i.e., ESFAS).

PSDC CRITERION 37 Engineered Safety Features Basis For Design

> Engineered Safety Features shall be provided in the facility to back up the safety provided by the core design, the reactor coolant pressure boundary, and their protection systems. Such Engineered Safety Features shall be designed to cope with any size reactor coolant piping break up to and including the equivalent of a circumferential rupture of any pipe in that boundary, assuming unobstructed discharge from both ends.

PSDC CRITERION 38 Reliability And Testability Of Engineered Safety Features

> All Engineered Safety Features shall be designed to provide such functional reliability and ready testability as is necessary to avoid undue risk to the health and safety of the public.

The proposed change does not alter the ability for the reactor trip functions to actuate. The proposed operational allowance is consistent with the CNP Unit 2 design and analysis and ensures proper actuation to satisfy the anticipatory trip function. Therefore, the recommendations of these PSDC continue to be met with the proposed change.

4.2 Precedent

1. Amendment 77 to Watts Bar Nuclear Plant (Agencywide Documents Access and Management System (ADAMS) Accession No. ML090480566).
2. Amendment 187 to Wolf Creek Generating Station (ADAMS Accession No. ML100630013).
3. Amendment 198 to Callaway Plant (ADAMS Accession No. ML101110103).
4. Amendment 328 to D. C. Cook Nuclear Plant (ADAMS Accession No. ML15187A002)

4.3 No Significant Hazards Consideration Determination

A change is proposed to the CNP Unit 2 TS 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation." The proposed amendment would add a new Condition for one or more inoperable Required Channels for MFW pump trips, modify Completion Time clock activation requirements, and clarify Mode 2 Applicability.

As required by 10 CFR 50.91(a), the CNP analysis of the issue of no significant hazards consideration is presented below:

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

Response: No.

The design basis events which impose initiation of the AFW System requirements are loss of normal MFW, main steamline break, LOOP, and SBLOCA. These design bases event evaluations assume actuation of the AFW System due to LOOP signal, SG water level - low-low or a safety injection signal. The anticipatory motor driven AFW pump autostart signals from the MFW pumps are not credited in any DBAs 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 Completion Time clock activation requirements, providing a Condition and Required Actions for more than one inoperable channel for this function, and modifying Modes 1 and 2 Applicability for this function will not impact any previously evaluated design basis accidents.

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

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

Response: No.

This TS change allows for one or more MFW pump channels to be inoperable during Modes 1 and 2 and has an operational allowance during Modes 1 and 2 for placing MFW pumps in service or securing MFW pumps. This change involves an anticipatory AFW auto-start function that is not credited in the accident analysis. Since this change only affects the conditions at which this auto-start function needs to be operable and does not affect the function that actuates AFW due to LOOP, low-low steam generator level or a safety injection signal, it will not be an initiator to a new or different kind of accident from any accident previously evaluated.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

Response: No.

This TS change involves the automatic start of the AFW pumps due to trip of both MFW pumps, which is not an assumed start signal for design basis events. This change does not modify any values or limits involved in a safety related function or accident analysis.

Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

Based on the above I&M 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.

4.4 Conclusions

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 NRC's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATIONS

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, 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.

6.0 REFERENCES

1. Letter from J. P. Gebbie, Indiana Michigan Power Company (I&M), to U. S. Nuclear Regulatory Commission (NRC) Document Control Desk, "Donald C. Cook Nuclear Plant Unit 1, Exigent License Amendment Request Regarding Technical Specification 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation," dated June 29, 2015, Agencywide Documents Access and Management System (ADAMS) Accession Number ML15181A002.

2. Letter from J. P. Gebbie, I&M, to NRC Document Control Desk, "Donald C. Cook Nuclear Plant Unit 1, Response to Request for Information Regarding Exigent License Amendment Request Regarding Technical Specification 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation," dated July 2, 2015, ADAMS Accession Number ML15187A336.

3. Letter from A.W. Dietrich, NRC, to L.J. Weber, I&M, "Donald C. Cook Nuclear Plant Unit 1, Issuance of Exigent Amendment Regarding Revision to Technical Specifications for Engineered Safety Features Actuation System Instrumentation (TAC No. MF6390)," dated July 10, 2015, ADAMS Accession Number ML15187A002.

Simplified MFPT Functional Diagram for Anticipatory Trip Circuit

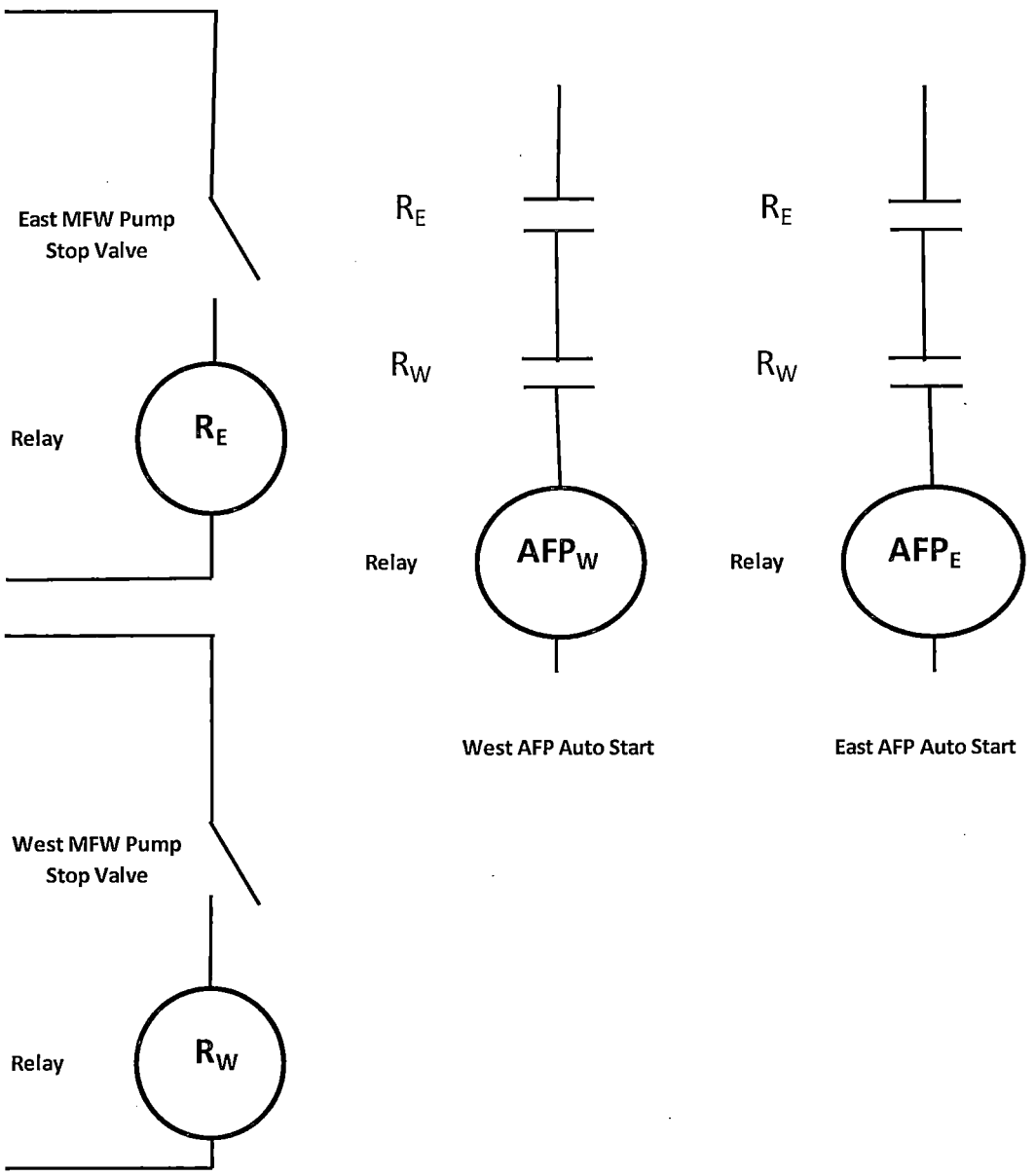


Figure 1

Enclosure 3 to AEP-NRC-2015-85

DONALD C. COOK NUCLEAR PLANT UNIT 2 TECHNICAL SPECIFICATION PAGES
MARKED TO SHOW PROPOSED CHANGES

TS 3.3.2, ESFAS Instrumentation

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
H. One or more Main Feedwater Pump trip channel(s) inoperable.	H.1 ----------NOTE---------- One channel on one MFW pump may be inoperable for up to 4 hours during the process of removing the pump from service or placing the pump in service. ---------- Restore channel(s) to OPERABLE status.	48 hours
~~H~~ I. Required Action and associated Completion Time of Condition ~~B~~ H not met for Function 6.g. OR Required Action and associated Completion Time of Condition D not met for Function 6.f.	~~H~~ I.1 Be in MODE 3.	6 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~I~~J. Required Action and associated Completion Time of Condition B not met for Function 8.a. OR Required Action and associated Completion Time of Condition C not met for Function 4.b, 5.a, 6.a, 6.b, or 7.b. OR Required Action and associated Completion Time of Condition D not met for Function 1.c, 1.d, 1.e.(1), 1.e.(2), 4.d, 4.e, 5.b, 6.c, 7.c, or 8.c. OR Required Action and associated Completion Time of Condition E not met for Function 2.c, 3.b.(3), or 4.c. OR Required Action and associated Completion Time of Condition F not met for Function 6.e. OR Required Action and associated Completion Time of Condition G not met for Function 8.b.	~~I~~J.1 Be in MODE 3. AND ~~I~~J.2 Be in MODE 4.	6 hours 12 hours

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~J~~K. Required Action and associated Completion Time of Condition B not met for Function 1.a, 2.a, 3.a.(1), 3.b.(1), or 7.a. OR Required Action and associated Completion Time of Condition C not met for Function 1.b, 2.b, 3.a.(2), or 3.b.(2).	~~J~~K.1 Be in MODE 3. AND ~~J~~K.2 Be in MODE 5.	6 hours 36 hours
~~K~~L. Required Action and associated Completion Time of Condition B not met for Function 4.a.	~~K~~L.1 Declare associated steam generator stop valve (SGSV) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

----------NOTE----------
Refer to Table 3.3.2-1 to determine which SRs apply for each ESFAS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.2.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.2.2	----------NOTE---------- Verification of relay setpoints not required. ---------- Perform TADOT.	 31 days

Table 3.3.2-1 (page 4 of 4)
Engineered Safety Feature Actuation System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
6. Auxiliary Feedwater					
c. SG Water Level - Low Low (per SG)	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≥ 20.8%
d. SI Input from ESFAS	1,2,3	Refer to Function 1 (Safety Injection) for all initiation functions and requirements.			
e. Loss of Voltage (per bus)	1,2,3	3	F	SR 3.3.2.1 SR 3.3.2.2 SR 3.3.2.7 SR 3.3.2.12	≥ 3207.2 V and ≤ 3302.7 V with ≥ 1.8 sec and ≤ 2.2 sec time delay
f. Undervoltage Reactor Coolant Pump	1,2	1 per bus	D	SR 3.3.2.5 SR 3.3.2.7 SR 3.3.2.12	≥ 2725 V
g. Trip of all Main Feedwater Pumps (per pump)	1,2[(g)]	1	~~B~~ H	SR 3.3.2.9 SR 3.3.2.12	NA
7. Containment Air Recirculation/Hydrogen Skimmer (CEQ) System					
a. Manual Initiation	1,2,3,4	1 per train	B	SR 3.3.2.9	NA
b. Automatic Actuation Logic and Actuation Relays	1,2,3	2 trains	C	SR 3.3.2.3 SR 3.3.2.4 SR 3.3.2.8	NA
c. Containment Pressure – High	1,2,3	3	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10 SR 3.3.2.12	≤ 1.17 psig
8. ESFAS Interlocks					
a. Reactor Trip, P-4	1,2,3	1 per train	B	SR 3.3.2.9	NA
b. Pressurizer Pressure, P-11	1,2,3	3	G	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≤ 1915 psig
c. T_{avg} - Low Low, P-12	1,2,3[(b)]	1 per loop	D	SR 3.3.2.1 SR 3.3.2.6 SR 3.3.2.10	≥ 538.8°F

(b) Above the P-12 (T_{avg} - Low Low) interlock.

(g) When one or more Main Feedwater pumps(s) are supplying feedwater to steam generators.

Enclosure 4 to AEP-NRC-2015-85

DONALD C. COOK NUCLEAR PLANT UNIT 2 TECHNICAL SPECIFICATION BASES PAGES MARKED TO SHOW PROPOSED CHANGES

TS Bases 3.3.2, ESFAS Instrumentation

(Informational Only)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

This Function must be OPERABLE in MODES 1, 2, and 3 (above P-12) when a secondary side break or stuck open valve could result in the rapid depressurization of the steam lines. This Function does not have to be OPERABLE in MODE 3 below P-12, and MODE 4, 5, or 6 because there is insufficient energy in the secondary side of the unit to have an accident.

The ESFAS instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

ACTIONS

A Note has been added in the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed on Table 3.3.2-1.

In the event a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the transmitter, instrument loop, signal processing electronics, or bistable is found inoperable, then all affected Functions provided by that channel must be declared inoperable and the LCO Condition(s) entered for the protection Function(s) affected.

When the number of inoperable channels in a trip function exceed those specified in one or other related Conditions associated with a trip function, then the unit is outside the safety analysis. Therefore, LCO 3.0.3 should be immediately entered if applicable in the current MODE of operation.

A.1

Condition A applies to all ESFAS protection functions.

Condition A addresses the situation where one or more channels or trains for one or more Functions are inoperable at the same time. The Required Action is to refer to Table 3.3.2-1 and to take the Required Actions for the protection functions affected. The Completion Times are those from the referenced Conditions and Required Actions.

B.1

Condition B applies to Manual Initiation~~, Trip of all Main Feedwater Pumps,~~ and the Reactor Trip P-4 interlock Functions.

The affected Manual Initiation Functions include:

- SI;
- Containment Spray;

BASES

ACTIONS (continued)

- Phase A Isolation;
- Phase B Isolation;
- Steam Line Isolation; and
- CEQ System.

If a required channel or train is inoperable, 48 hours is allowed to return it to an OPERABLE status. For the Manual Initiation and the Reactor Trip P-4 interlock Functions, the specified Completion Time is reasonable considering that there are two automatic actuation trains and another manual initiation train OPERABLE for each Function, and the low probability of an event occurring during this interval. ~~For the Trip of all Main Feedwater Pump Function, this action recognizes the lack of manual trip provisions for a failed channel.~~ The specified Completion Times ~~are~~ is reasonable~~,~~ considering that there are two automatic actuation trains and another manual initiation train OPERABLE for each manual Function ~~the nature of these Functions (i.e., Main Feedwater Pump Function is not credited in the safety analysis), the available redundancy,~~ and the low probability of an event occurring during this interval.

C.1

Condition C applies to the automatic actuation logic and actuation relays for the following functions:

- SI;
- Containment Spray;
- Phase A Isolation;
- Phase B Isolation;
- Steam Line Isolation;
- Turbine Trip and Feedwater Isolation;
- Auxiliary Feedwater; and
- CEQ System.

BASES

ACTIONS (continued)

a second channel in the bypass condition for up to 4 hours for testing purposes is acceptable based on the results of Reference 8.

F.1

Condition F applies to the Auxiliary Feedwater Loss of Voltage Function.

If one channel (on the associated bus) is inoperable, Required Action F.1 requires that channel to be placed in trip within 1 hour. With a channel in trip, the Auxiliary Feedwater Loss of Voltage instrumentation channels are configured to provide a one-out-of-two logic to start the associated motor driven feedwater pump.

The specified Completion Time was chosen to be consistent with the Completion Time for an inoperable Loss of Voltage channel in ITS 3.3.5.

G.1

Condition G applies to the P-11 interlock.

With one or more channels inoperable, the operator must verify that the interlock is in the required state for the existing unit condition. This action manually accomplishes the function of the interlock. Determination must be made within 1 hour. The 1 hour Completion Time is equal to the time allowed by LCO 3.0.3 to initiate shutdown actions in the event of a complete loss of ESFAS function.

H.1

Condition H applies to a Trip of all Main Feedwater Pumps.

If one or more required channels are inoperable, 48 hours is allowed to return it to an OPERABLE status. This action recognizes the lack of manual trip provisions for a failed channel. The specified Completion Time is reasonable, considering the nature of this Function (i.e., Main Feedwater Pump Function is not credited in the safety analysis), the available redundancy, and the low probability of an event occurring during this interval.

The required actions are modified by a note that allows both channels on the same Main Feedwater pump to be non-functional for up to 4 hours without a required entry into Action Condition H. This provision allows pump startup and shutdown to occur when the Main Feedwater pump is reset and/or not capable of feeding the steam generators.

~~H~~.1

If any Required Action and associated Completion Time cannot be met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to MODE 3 within 6 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

~~I~~J.1 and ~~I~~J.2

If any Required Action and associated Completion Time cannot be met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to MODE 3 within 6 hours and MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

BASES

ACTIONS (continued)

J.1 and J.2

If any Required Action and associated Completion Time cannot be met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to MODE 3 within 6 hours and MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

K.1

If any Required Action and associated Completion Time of Condition B cannot be met, the associated SGSV must be declared inoperable. This will require entry into the associated Conditions and Required Actions of LCO 3.7.2, "Steam Generator Stop Valves."

SURVEILLANCE REQUIREMENTS

The SRs for each ESFAS Function are identified by the SRs column of Table 3.3.2-1.

A Note has been added to the SR Table to clarify that Table 3.3.2-1 determines which SRs apply to which ESFAS Functions.

Note that each channel of process protection supplies both trains of the ESFAS. When testing channel I, train A and train B must be examined. Similarly, train A and train B must be examined when testing channel II, channel III, and channel IV (if applicable). The CHANNEL CALIBRATION and COTs are performed in a manner that is consistent with the assumptions used in analytically calculating the required channel accuracies.

SR 3.3.2.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.