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RA-19-0183 10 CFR 50.90

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

H.B. Robinson Steam Electric Plant, Unit No. 2
Docket Number 50-261
Renewed Facility Operating License No. DPR-23R-55

Subject: License Amendment Request to Add New Feedwater Bypass Valves to Technical Specification 3.7.3

Pursuant to 10 CFR 50.90, Duke Energy Progress, LLC (Duke Energy) proposes to amend Renewed Facility Operating License No. DPR-23 for H.B. Robinson Steam Electric Plant, Unit 2 (HBRSEP2). The License Amendment Request (LAR) proposes to modify Technical Specification (TS) 3.7.3, Main Feedwater Isolation Valves (MFIVs), Main Feedwater Regulation Valves (MFRVs), and Bypass Valves, by making the TS applicable to three new feedwater bypass isolation valves. This LAR also proposes to revise the Completion Time for Required Action C.1 for an inoperable bypass valve to reflect the redundancy added to the configuration and to align with Westinghouse Standard Technical Specifications.

The Enclosure to this letter provides an evaluation of the proposed TS change. A regulatory evaluation (including the Significant Hazards Consideration Determination Analysis) and Environmental Considerations are provided in Sections 4 and 5 of the Enclosure. Attachments 1 and 2 provide marked-up TS and TS Bases pages, respectively. Attachment 3 provides retyped (clean) TS pages. The marked-up TS Bases pages are provided for information only.

In accordance with Duke Energy administrative procedures that implement the Quality Assurance Program Topical Report, these proposed changes have been reviewed and approved by the On-Site Review Committee. A copy of this LAR is being sent to the State of South Carolina in accordance with 10 CFR 50.91 requirements.

Duke Energy requests approval of this license amendment request within one year of acceptance. The amendment will be implemented within 120 days of approval.

Inquiries on this proposed amendment request should be directed to Art Zaremba, Fleet Nuclear Licensing Manager, at (980) 373-2062.

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

Executed on 072919, 2019

Sincerely,

Ernest J. Kapopoulos, Jr.
Site Vice President

Enclosure: Evaluation of Proposed Change

Attachments:

1 Marked-Up Technical Specifications Pages
2 Marked-Up Technical Specification Bases Pages
3 Retyped Technical Specifications Pages

cc (w/ enclosure and attachments):

L. Dudes, USNRC Region II - Regional Administrator
M. Fannon, USNRC Senior Resident Inspector - HBRSEP
N. Jordan, USNRC NRR Project Manager - HBRSEP
A. Nair-Gimmi, Bureau of Environmental Health Services (SCDHEC)
A. Wilson, Attorney General (SC)

ENCLOSURE
EVALUATION OF PROPOSED CHANGE

Subject: License Amendment Request to Add New Feedwater Bypass Valves to Technical Specification 3.7.3

1 Summary Description

This License Amendment Request (LAR) proposes to modify Technical Specification (TS) 3.7.3, Main Feedwater Isolation Valves (MFIVs), Main Feedwater Regulation Valves (MFRVs), and Bypass Valves, to require that three additional bypass valves (for a total of six bypass valves) be included within the scope of the TS. This LAR also proposes to extend the Completion Time for TS 3.7.3 Required Action C.1 for an inoperable bypass valve from 8 hours to 72 hours.

This enclosure provides an evaluation of the proposed TS change. A regulatory evaluation (including the Significant Hazards Consideration Determination Analysis) and Environmental Considerations are provided in Sections 4 and 5 of the Enclosure. Attachments 1 and 2 provide marked-up TS and TS Bases pages, respectively. Attachment 3 provides retyped (clean) TS pages. The marked-up TS Bases pages are provided for information only.

2 Detailed Description

2.1 Main Feedwater System

The H.B. Robinson Steam Electric Plant, Unit 2 (HBRSEP2) feedwater system, described in UFSAR Section 10.4.6, is designed to supply water to the steam generators under all operating conditions. Feedwater regulator and bypass valves in the feedwater line to each steam generator maintain the proper water level in the steam generators for all load conditions. The feedwater bypass valves are used at low power levels to prevent erosion damage to the feedwater regulating valve and for finer feedwater flow control. At higher power levels, the feedwater regulating valve is in operation while the bypass valve is shut.

The MFRVs, MFIVs and bypass valves close upon receipt of a safety injection signal and they may be actuated manually. The MFRVs and bypass valves also close upon receipt of a feedwater isolation signal. In the event of a secondary side line rupture inside containment, the valves limit the quantity of high-energy fluid that enters containment through the break and they provide a pressure boundary for the controlled addition of auxiliary feedwater to the intact loops. Closure of the MFIVs or MFRVs and bypass valves effectively terminates the addition of feedwater to an affected steam generator, limiting the mass and energy release for steam line breaks or feedwater line breaks inside containment, and reducing the cooldown effects for steam line breaks.

Figure 1 below shows the configuration of the steam generator feedwater flow paths. Each steam generator's feedwater flow path currently has one MFRV, one MFIV and one bypass valve (as identified in the top flow path). HBRSEP2 is implementing a modification under 10 CFR 50.59 to replace the manual valve directly upstream of each bypass valve with an air-operated valve that will also receive a safety injection and feedwater isolation signal to close.

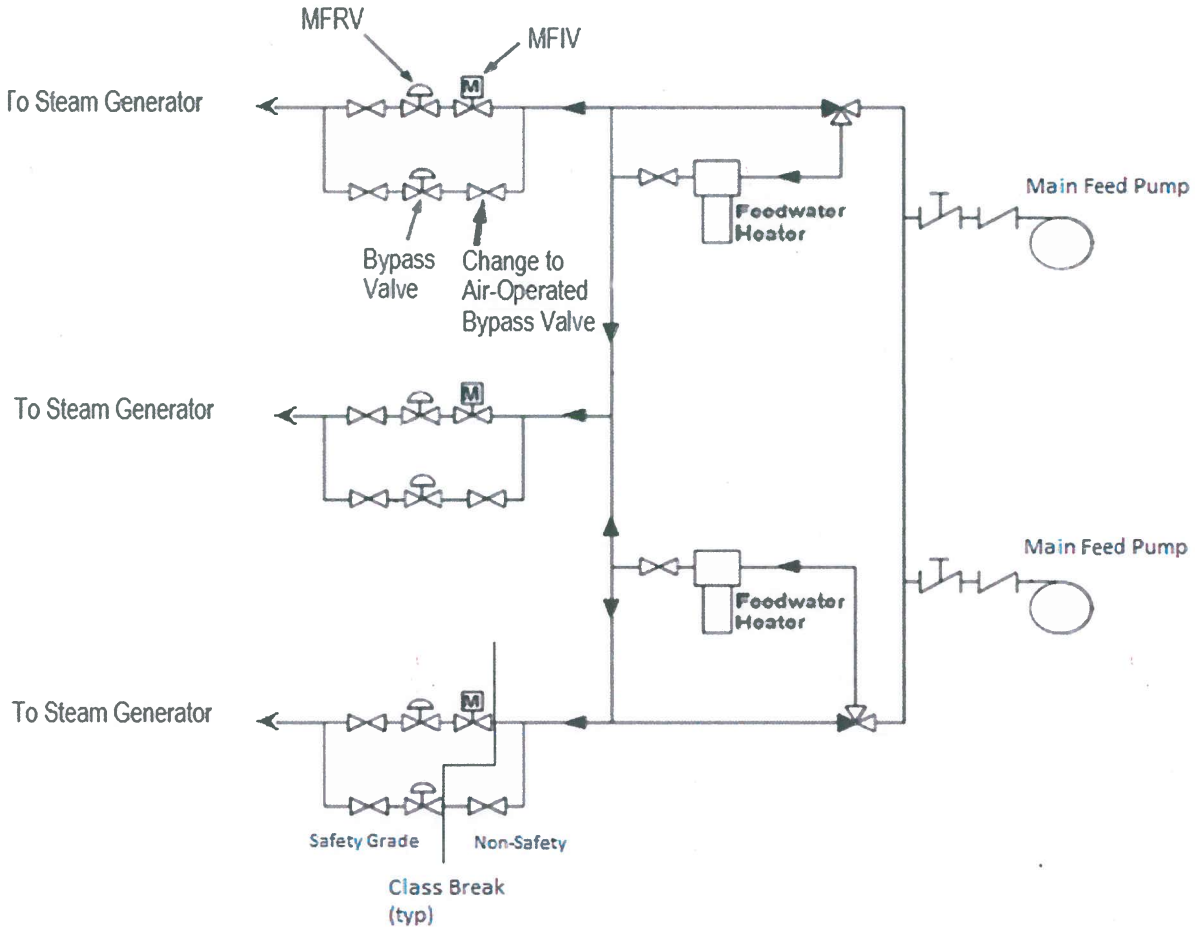

Figure 1
Feedwater System

2.2 Reason for the Proposed Change

The proposed change is associated with the resolution of a legacy plant design issue related to the main steam line break (MSLB) analysis. The analysis of record (AOR) for the UFSAR Chapter 6 containment analysis and for the UFSAR Chapter 15 Accident Analysis do not consider failure of a feedwater bypass valve to close for the faulted steam generator. This issue is documented in the HBRSEP2 Corrective Action Program and was reported to the Nuclear Regulatory Commission (NRC) via the Reference 1 Event Notification Report and the Reference 2 Licensee Event Report.

UFSAR requirements for the containment analysis and design basis event response include the capability to withstand the most limiting single active failure. The feedwater isolation valve failures assumed in the containment AOR and the MSLB AOR do not include failure of the feedwater bypass valves (FCV-479, FCV-489 and FCV-499) to close in the faulted steam generator feedline.

Upon a MSLB in containment, Engineered Safety Feature (ESF) actuation instrumentation is designed to isolate feedwater, including tripping the main feed pumps, closing the main feedwater control valves, closing the main feedwater bypass valves (BVs) and closing the main feedwater isolation valves. A single active failure of a BV to close will increase the secondary mass released to containment and is outside the assumptions of the existing analysis.

To resolve the single failure vulnerability, Duke Energy is installing a second BV in each of the three feedwater bypass lines under 10 CFR 50.59. The new valves will be air-operated valves (AOVs) installed in series with existing bypass valves FCV-479, 489 and 499. The new BVs will actuate to close on an ESF signal and will replace existing manual valves FW-9A, B & C in the non-safety portion of the system.

Duke Energy proposes to revise TS 3.7.3 to include the new BVs. The proposed TS changes are required to conform to 10 CFR 50.36(c)(2)(ii), Criterion 3.

2.3 Description of the Proposed Change

This amendment proposes to modify TS 3.7.3 to include the new BVs planned for installation during the Fall 2020 refueling outage. The modification is being implemented under 10 CFR 50.59. The following changes are proposed to TS 3.7.3, Main Feedwater Isolation Valves (MFIVs), Main Feedwater Regulation Valves (MFRVs), and Bypass Valves:

1. Limiting Condition for Operation (LCO) is revised to state that six bypass valves shall be OPERABLE in addition to the three MFIVs and three MFRVs required by the LCO. The current LCO wording requires three bypass valves to be OPERABLE. The planned modification will replace three existing manual valves in the bypass lines with ESF-actuated AOVs, one per bypass flow path, such that each of the three bypass flow paths will have two bypass valves.

2. Condition C is revised to note that it applies when one or more bypass valves in different flow paths are inoperable. The current wording, "One or more bypass valves inoperable" is changed to "One or more inoperable bypass valves in different flow paths." This change will help ensure the proper application of Condition C and its associated Required Action and Completion Time.

3. The Completion Time associated with TS 3.7.3 Required Action C.1 is revised from 8 hours to 72 hours to reflect the redundancy added to the configuration and to adopt the Completion Time provided in Westinghouse Standard Technical Specifications, Revision 4 and to allow time for maintenance and repairs.

3 TECHNICAL EVALUATION

This LAR is associated with the resolution of the legacy design issue described in Section 2.2 above. LCO 3.7.3 is being revised to include three new additional BVs. Inclusion of the new BVs will ensure that no single active failure of a feedwater bypass valve to close will invalidate the containment or accident analyses. TS 3.7.3 Condition C is being revised to clarify its applicability. The Completion Time for TS 3.7.3 Required Action C.1 is being revised from 8 hours to 72 hours to adopt the Westinghouse Standard Technical Specification value and to allow time for maintenance and repairs. Although the new bypass valves will be included in the scope of TS Surveillance Requirement 3.7.3.1, no change is needed to the surveillance

wording because it already includes "each MFRV and bypass valve" within its scope. Each of these proposed changes is evaluated below.

Proposed Change to TS LCO 3.7.3

The proposed change is to include the new BVs, FW-9A, B & C, within the scope of TS 3.7.3. Thus, the LCO will be revised to require six bypass valves instead of the current three bypass valves.

Feedwater regulator valves and bypass valves in the feedwater line to each steam generator maintain the proper water level in the steam generators for all load conditions. The BVs are used at low power levels to prevent erosion damage to the feedwater regulating valves and for finer feedwater flow control. At higher power levels, the feedwater regulating valves are in operation while the BVs are shut.

The safety function of the BVs is to provide isolation of feedwater flow to the secondary side of the steam generators following a high energy line break. Closure of the MFIVs, MFRVs and BVs terminates flow to the steam generators, terminating the event for feedwater line breaks (FWLBs) occurring upstream of the MFIVs or MFRVs. The consequences of events occurring in the main steam lines or in the feedwater lines downstream from the MFIVs will be mitigated by their closure. Closure of the MFIVs or MFRVs and BVs effectively terminates the addition of feedwater to an affected steam generator, limiting the mass and energy release for steam line breaks (SLBs) or FWLBs inside containment and reduces the cooldown effects for SLBs.

The existing BVs, FCV-479, 489 & 499, are 4-inch, safety grade, Quality Class A, seismically qualified air-operated globe valves that fail-closed on a loss of air and receive an ESF signal to close. These valves are currently included, along with the MFRVs and MFIVs, within the scope of TS 3.7.3.

The new BVs, FW-9A, B & C, are 4-inch, non-safety grade, Quality Class B, seismically mounted (not seismically qualified), air-operated valves that fail-closed on a loss of air and receive an ESF signal to close. The safety-related ESF signal will be routed through fuses that serve as the Class 1E electrical isolation boundary. The new valves will replace manual valves FW-9A, B & C, which are located upstream of FCV-479, 489 & 499, respectively. The new BVs will be installed via 10 CFR 50.59, will be compliant with design requirements of the feedwater system and will provide a backup isolation function to the existing safety grade bypass valves. See Figure 1.

The existing safety grade BVs close on receipt of a safety injection (SI) signal or a feedwater isolation signal and credit is taken in the containment and accident analyses for these valves to close on demand. The new BVs will also close on receipt of those same ESF signals and are provided as highly reliable backups in the unlikely event a failure prevents the safety grade bypass valves from fully closing.

The new BVs will be included in the Inservice Testing Program and will be tested to the same standards (frequency and closure time) as the existing bypass valves (i.e., TS Surveillance Requirement 3.7.3.1 is applicable).

The new BVs are not seismically qualified; however, since an earthquake is not assumed to occur coincidently with a spontaneous break of safety-related secondary piping, the loss of the non-safety grade BVs is not assumed in addition to a single active failure. If the single active

failure postulated for a secondary pipe break event is the failure of a safety grade BV to close, then credit is taken for the new non-safety grade BV in that flow path to close.

The new BVs are designed for expected operating conditions of the feedwater system and are fully capable of closing to mitigate design basis events requiring feedwater isolation. The new valves are also required to meet the closure time and seat leakage requirements of the existing BVs.

The configuration of the bypass line and the crediting of the new non-safety grade bypass valves as a single-failure backup to the existing safety grade bypass valves aligns with the NRC Office of Nuclear Reactor Regulation (NRR) position described in NUREG-0138 (Reference 3), Issue No. 1 and in the Single Failure Analyses described in the NRC's Standard Review Plan (SRP) with respect to the analysis of secondary system pipe ruptures.

NUREG-0138 describes the NRR position on several issues associated with a November 3, 1976 memorandum to the NRR staff from the Director of NRR. Issue No. 1 in the NUREG is titled "Treatment of Non-Safety Grade Equipment in Evaluations of Postulated Steam Line Break Accidents" and it describes the NRC's position on the acceptability of crediting non-safety grade components as a backup to safety-grade components that may be assumed to fail. The NUREG states:

> *Consistent with the lesser safety importance of the secondary system boundary, the staff does not require that an earthquake be assumed to occur coincident with a postulated spontaneous break of the steamline piping; i.e., loss of equipment not designed to withstand a SSE is not assumed coincident with an assumed spontaneous steamline break accident...*
>
> *...In the event of a steamline break inside containment, it is necessary to isolate the main feedwater to the steam generator associated with the failed line to preclude overpressurizing the containment and to limit the reactivity transient. If the single active failure postulated for this accident is the failure of the appropriate safety grade main feedwater isolation valve to function, then credit is taken for closing the nonsafety grade main feedwater control valve or tripping the feedwater pump in that line. The rationale for reliance on these "nonsafety grade" feedwater components is similar to that presented above for the steamline valves.*
>
> *Thus, the staff believes that it is acceptable to rely on these non-safety grade components in the steam and feedwater systems because their design and performance are compatible with the accident conditions for which they are called upon to function. It is the staff position that utilization of these components as a <u>backup</u> to a single failure in safety grade components adequately protects the health and safety of the public.*

Section 6.2.1.4 of NUREG-0800 (Reference 4) describes criteria acceptable to the NRC related to the analysis of secondary system piping failures. The SRP position on single failures for these events is consistent with that of NUREG-0138 presented above and states:

> *<u>Single-Failure Analyses</u>. Steam and feedwater line break analyses should assume a single active failure in the steam or feedwater line isolation provisions or feedwater pumps to maximize the containment peak pressure and*

temperature. For the assumed failure of a safety-grade steam or feedwater line isolation valve, operation of nonsafety-grade equipment may be relied upon as a backup to the safety-grade equipment.

10 CFR 50.36 provides requirements for Technical Specifications. Criterion 3 of 10 CFR 50.36(c)(2)(ii) states that an LCO must be established for components that are part of the primary success path and which function or actuate to mitigate a design basis event that presents a challenge to a fission product barrier. New BVs FW-9A, B & C will be credited in HBRSEP2 analyses as the single failure backup to safety related feedwater bypass valves FCV-479, 489 & 499. As such, valves FW-9A, B & C satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii) and should be included within the scope of TS 3.7.3.

Proposed Change to TS 3.7.3 Condition C

The proposed change to TS 3.7.3 Condition C is to clarify the intent of the Condition and its associated Required Actions and Completion Times.

Currently there is only one bypass valve per flow path, so if more than one bypass valve is inoperable, they would have to be in different flow paths. The requirements associated with Condition C are thus based on a single inoperable bypass valve in any given flow path.

With the addition of a second bypass valve in each flow path it will be possible for two inoperable bypass valves to be in the same flow path. Should that unlikely event occur, Condition C would not be appropriate because it is based on a single inoperable valve in the flow path. The proposed change will clarify the applicability of Condition C. The current wording, "One or more bypass valves inoperable," is changed to "One or more inoperable bypass valves in different flow paths."

For two inoperable bypass valves in the same flow path Condition D will still be applicable. No change is needed to Condition D.

Proposed Change Completion Time for TS 3.7.3 Required Action C.1

TS 3.7.3 Required Action C.1 applies to one or more inoperable bypass valves in different flow paths. The action is to close or isolate the inoperable bypass valve within the Completion Time (CT) of 8 hours. This LAR proposes to extend that CT to 72 hours. The proposed change adopts the CT of TS 3.7.3 Condition C of the Westinghouse Standard Technical Specifications (STS) (Reference 5).

The current 8-hour CT is based on a configuration with the isolation capability of a single BV per bypass flow path, thus there is no backup automatic isolation valve when the BV is inoperable. Installation of a second BV per bypass flow path adds redundancy to the configuration such that, even with one inoperable BV in a flow path, a second operable BV is now available to provide the automatic isolation function.

The new BVs, FW-9A, B & C, will act as highly reliable backups to the existing safety grade BVs and will be subject to TS Surveillance Requirement 3.7.3.1, which will demonstrate their ability to initiate closure on the same ESF actuation signals and with the same closure requirements as existing bypass valves FCV-479, 489 & 499. Operating experience shows feedwater valves to be reliable and there is a low probability of an event occurring during this period that would

require isolation of the flow paths, coincident with a failure of the redundant BV. The extension of the CT would allow additional time to effect repairs on an inoperable valve and could prevent an unnecessary plant shutdown.

Because the TS requirements provide assurance that the BVs can perform the required isolation function and because the NRC has previously accepted this CT via the STS, the proposed 72-hour CT for one or more inoperable bypass valves is reasonable.

Licensing Precedent

Wolf Creek Generating Station (WCGS) submitted a LAR to the NRC in March 2007 that proposed the inclusion of new non-safety grade feedwater isolation valves within the scope of TS 3.7.3 (Reference 6). In their LAR, WCGS cited NUREG-0138 and the design and capability of the non-safety grade components to reliably function as a backup to safety grade isolation valves. The NRC subsequently approved the WCGS LAR in a Safety Evaluation dated April 3, 2008 (Reference 7).

Ameren Union Electric (AUE) submitted a LAR to the NRC for Callaway Plant in October 2004 that proposed the inclusion of existing non-safety grade main feedwater regulating valves and main feedwater regulating valve bypass valves to TS 3.7.3 (Reference 8). AUE also proposed to extend the CT for an inoperable main feed isolation valve from 4 hours to 72 hours and add TS requirements for non-safety bypass valves, including a CT of 72 hours for an inoperable bypass valve. In their LAR, AUE cited the design and capability of the non-safety grade components to reliably function as a backup to safety grade isolation valves. The NRC subsequently approved the AUE LAR in a Safety Evaluation dated May 31, 2005 (Reference 9).

PSEG Nuclear submitted a LAR to the NRC for Salem Generating Station Units 1 & 2 in March 2007 that, in part, included the crediting of non-safety feedwater isolation valve closure to reduce the mass and energy release to containment during a MSLB event (Reference 10). In their LAR, PSEG cited NUREG-0800, SRP Section 6.2.1.4 and NUREG-0138 for the crediting of non-safety related equipment for the specific case of a single active failure of a feedwater or main steam isolation valve. The NRC subsequently approved the Salem LAR in a Safety Evaluation dated February 27, 2008 (Reference 11).

Conclusion

The proposed changes are compliant with 10 CFR 50.36, are consistent with licensing precedent and comply with single failure requirements for secondary pipe rupture events described in NUREG-0138 and the Standard Review Plan. Inclusion of the new feedwater bypass valves in TS 3.7.3 will allow HBRSEP2 to credit the automatic isolation of the feedwater bypass lines in a MSLB event and eliminate the need for the administrative controls currently in place. This LAR is associated with the planned corrective actions described in the Reference 2 LER.

4 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

The following requirements in Title 10 of the Code of Federal Regulations (10 CFR) apply to this LAR:

10 CFR 50.36, Technical Specifications, requires, in part, that a licensee establish TSs with limiting conditions for operation (LCOs) and surveillance requirements (SRs) for equipment that is credited to function to mitigate a design basis accident. New BVs are being installed at HBRSEP2 to address a legacy configuration issue. The new valves will be credited with providing the safety function of feedwater isolation. This LAR proposes to revise TS 3.7.3 to include the new BVs in order to comply with 10 CFR 50.36(c)(2)(ii), Criterion 3.

The following regulatory guidance applies to this LAR:

NUREG-1431, Standard Technical Specifications for Westinghouse Plants, is the NRC's approved standard TS for Westinghouse-designed nuclear power plants such as HBRSEP2. Standard TS 3.7.3 identifies a CT of 72 hours for one inoperable bypass valve in a flow path. The proposed change to the CT of TS 3.7.3 Required Action C.1 is to adopt the 72-hour CT of the Standard TS.

NUREG-0138, Staff Discussion of 15 Technical Issues Listed in Attachment to November 3, 1976 Memorandum from Director, NRR to NRR Staff, provides NRR guidance to staff on several issues. Issue No. 1 in the NUREG, Treatment of Non-Safety Grade Equipment in Evaluations of Postulated Steam Line Break Accidents, is directly relevant to this LAR, which proposes to credit non-safety grade BVs to be used for feedwater isolation as a backup to the safety-grade BVs, consistent with the position described in the NUREG.

NUREG-0800, Section 6.2.1.4, Mass and Energy Release Analysis for Postulated Secondary System Pipe Ruptures, identifies the NRC's Standard Review Plan's acceptance criteria associated with the analysis of secondary piping rupture events. The single failure analysis aligns with the position in Issue No. 1 of NUREG-0138 discussed above with respect to the crediting of non-safety grade components.

The following notable sections of the HBRSEP2 UFSAR apply to this LAR:

UFSAR Section 6.2.1.4 describes the containment analysis for postulated primary and secondary system pipe ruptures. Various cases were analyzed to determine the most limiting combination of single failure and initial reactor power level with respect to containment pressure and temperature. No changes are being proposed to the containment analysis.

UFSAR Section 7.3 describes the Engineered Safety Features (ESF) systems, including the Safety Injection and Main Feedwater Isolation functions of the ESF. The new BVs will receive the same ESF signals to close as the existing BVs. The safety-related ESF signal will be routed through fuses that serve as the Class 1E electrical isolation boundary.

UFSAR Section 10.4.6 provides a general description of the design and operation of the condensate and feedwater system, including the feedwater bypass valves. System

operation is not changed as a result of this LAR. The modification to install the new BVs will revise the UFSAR to reflect this added isolation capability.

UFSAR Section 15.0.11 describes single active failures assumed in design basis events. Crediting of the new BVs for feedwater isolation preserves the UFSAR single failure assumptions.

UFSAR Section 15.1 describes the analysis of events involving an increase in heat removal by the secondary system, including feedwater system malfunctions and steam system piping failures. This LAR does not propose any changes to UFSAR Chapter 15 analyses.

4.2 Significant Hazards Consideration Determination

Duke Energy Progress, LLC (Duke Energy) proposes to modify Technical Specification (TS) 3.7.3, Main Feedwater Isolation Valves (MFIVs), Main Feedwater Regulation Valves (MFRVs), and Bypass Valves, to include three new feedwater bypass valves (BVs) within the scope of the TS. The new BVs are being installed under 10 CFR 50.59 and will be subject to the same TS Limiting Condition for Operation (LCO), Conditions, Required Actions, Completion Times and Surveillance Requirements applicable to the existing BVs.

Duke Energy 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,” as discussed below:

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

   Response: No

   The proposed amendment does not modify the feedwater system, nor does it make any physical or operational changes to the facility. The new non-safety BVs are being installed under 10 CFR 50.59 to provide a backup isolation function to the existing safety grade BVs, consistent with NUREG-0138 and Section 6.2.1.4 of the NRC's Standard Review Plan. The new BVs will receive the same Engineered Safety Features signals to close and they will be subject to the same testing as the existing safety grade BVs. The proposed change has no impact on the containment or accident analyses. Inclusion of the new BVs within the scope of TS 3.7.3 subjects them to the same TS LCO and Surveillance Requirements as the existing BVs and allows them to be credited as backups to the existing BVs.

   Extending the Completion Time of TS 3.7.3, Required Action C.1 from 8 hours to 72 hours is not an accident initiator and thus does not change the probability that an accident will occur; however, it could potentially affect the consequences of an accident if the accident occurred during the extended unavailability of an inoperable BV. The new BVs provide redundant isolation in the feedwater bypass flow paths. This represents a safety improvement over the original single BV (per flow path) design. The proposed increase in time an inoperable BV is allowed to remain open/unisolated is small and the probability of an event requiring isolation of the feedwater flow path occurring during this period, coincident with a failure of the redundant BV in that flow path, is low.

Therefore, the proposed TS changes do not significantly increase 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

The proposed amendment does not modify the feedwater system, nor does it make any physical or operational changes to the facility. Neither the inclusion of the new BVs in TS 3.7.3 nor the extension of the Completion Time for TS 3.7.3 Required Action C.1 results in any new failure modes or affects. The new non-safety BVs are being installed under 10 CFR 50.59 to provide a backup isolation function to the existing safety grade BVs. Closure of the BVs is required to mitigate the consequences of steam line and feedwater line break events. The proposed changes allow for the new BVs to be credited in plant analyses for the isolation feedwater flow in the event of a failure of the existing BVs to close.

Therefore, the possibility of a new or different kind of accident from any kind of accident previously evaluated is not created.

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

Response: No

The proposed amendment does not involve: 1) a physical alteration of the plant, 2) a change to any set points for parameters associated with protection or mitigation actions nor 3) any impact on the fission product barriers or parameters associated with licensed safety limits. The new BVs are being installed under 10 CFR 50.59 to provide a backup isolation function to the existing BVs. There are no changes to either the containment analysis or to the analysis for any design basis event.

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

4.3 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 the proposed revision to TS 3.7.3 and operation of the unit in the proposed manner, (2) the proposed revision will be implemented in a manner consistent with the Commission's regulations, and (3) the issuance of the amendment will not be adverse to the common defense and security or to the health and safety of the public.

5 ENVIRONMENTAL CONSIDERATION

Duke Energy Progress, LLC (Duke Energy) has evaluated this license amendment request against the criteria for identification of licensing and regulatory actions requiring environmental assessment in accordance with 10 CFR 51.21. Duke Energy has determined that this license amendment request meets the criteria for a categorical exclusion as set forth in 10 CFR 51.22(c)(9). This determination is based on the fact that this change is being proposed as an

amendment to a license issued pursuant to 10 CFR 50 that changes a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or that changes an inspection or a surveillance requirement, and the amendment meets the following specific criteria:

(i) The amendment involves no significant hazards consideration.

As demonstrated in Section 4.2, this proposed change to TS 3.7.3 does not involve a significant hazards consideration.

(ii) There is no significant change in the types or significant increase in the amounts of any effluent that may be released offsite.

The proposed change will not change the types or amounts of any effluents that may be released offsite.

(iii) There is no significant increase in individual or cumulative occupational radiation exposure.

The proposed change will not increase the individual or cumulative occupational radiation exposure.

Therefore, neither an environmental impact statement nor environmental assessment is required pursuant to 10 CFR 51.22(b).

6 REFERENCES

1. H.B. Robinson Steam Electric Plant, Unit No. 2, Event Notification Report per 10 CFR 50.72(b)(3)(ii)(B), NRC Event Number 51864, dated April 13, 2016.

2. H.B. Robinson Steam Electric Plant, Unit No. 2, Licensee Event Report 2016-002-00, Unanalyzed Condition Related to Main Steam Line Break Inside Containment, dated June 13, 2016 (ML16165A311).

3. NUREG-0138, Staff Discussion of Fifteen Technical Issues Listed in Attachment to November 3, 1976 Memorandum from Director, NRR to NRR Staff, dated November 1976.

4. NUREG-0800, U.S. Nuclear Regulatory Commission Standard Review Plan, Section 6.2.1.4, Mass and Energy Release Analysis for Postulated Secondary System Pipe Ruptures, Revision 2, dated March 2007.

5. NUREG-1431, Standard Technical Specifications, Westinghouse Plants, Volume 1, Revision 4.0, April 2012.

6. Wolf Creek Nuclear Operating Corporation Letter to NRC, Revision to Technical Specification (TS) 3.3.2, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," TS 3.7.2, "Main Steam Isolation Valves (MSIVs)," and TS 3.7.3, "Main Feedwater Isolation Valves (MFIVs)," dated March 14, 2007 (ML070800193).

7. NRC Letter to Mr. Rick A. Muench, President and Chief Executive Officer, Wolf Creek Nuclear Operating Corporation, Wolf Creek Generating Station - Issuance of Amendment RE: Revision to Technical Specification 3.7.3, "Main Feedwater Isolation Valves," to Add Main Feedwater Regulating Valves (MFRV) and MFRV Bypass Valves, dated April 3, 2008 (ML080370117).

8. Callaway Plant Union Electric Company Letter to NRC, Proposed Revisions to Technical Specification 3.7.3. "Main Feedwater Isolation Valves (MFIVs)" to Add the Main Feedwater Regulating Valves (MFRVs) and MFRV Bypass Valves (MFRVBVs) and to Extend the MFIV Allowed Outage Time, dated October 27, 2004 (ML043140397).

9. NRC Letter to Mr. Charles D. Naslund, Senior Vice President and Chief Nuclear Officer, Union Electric Company, Callaway Plant, Unit 1 - Issuance of Amendment RE: Revision to Technical Specification 3.7.3, "Main Feedwater Isolation Valves," to Add Main Feedwater Regulating Valves and MFRV Bypass Valves and to Extend the Allowed Outage Time, dated May 31, 2005 (ML051190334).

10. PSEG Nuclear LLC Letter to NRC, License Change Request S06-010, Steam Generator Feedwater Pump Trip, Feedwater Isolation Valve Response Time Testing and Containment Cooling System, dated March 16, 2007 (ML070871105).

11. NRC Letter to Mr. William Levis, President & Chief Nuclear Officer, PSEG Nuclear LLC, Salem Nuclear Generating Station, Unit Nos. 1 and 2, Issuance of Amendments RE: Steam Generator Feedwater Pump Trip, Feedwater Isolation Valve Response Time Testing and Containment Cooling System, dated February 27, 2008 (ML080220404).

ATTACHMENT 1

MARKED-UP TECHNICAL SPECIFICATIONS PAGES
[2 pages follow this cover page]

NOTE: This attachment contains marked-up TS Pages 3.7-8 & 9.

3.7 PLANT SYSTEMS

3.7.3 Main Feedwater Isolation Valves (MFIVs), Main Feedwater Regulation Valves (MFRVs), and Bypass Valves

six

LCO 3.7.3 Three MFIVs, three MFRVs, and ~~three~~ bypass valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3 except when MFIV, MFRV, or bypass valve is closed or isolated by a closed manual valve.

ACTIONS

NOTE
Separate Condition entry is allowed for each valve.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more MFIVs inoperable.	A.1. Close or isolate MFIV. AND A.2. Verify MFIV is closed or isolated.	72 hours Once per 7 days
B. One or more MFRVs inoperable.	B.1. Close or isolate MFRV. AND B.2. Verify MFRV is closed or isolated.	72 hours Once per 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more bypass valves ~~inoperable~~ inoperable in different flow paths.	C.1 Close or isolate bypass valve. AND C.2 Verify bypass valve is closed or isolated.	~~8~~ 72 hours Once per 7 days
D Two valves in the same flow path inoperable.	D.1 Isolate affected flow path.	8 hours
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Verify the closure time of each MFRV and bypass valve is within limits on an actual or simulated actuation signal.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.7.3.2	Verify the closure time of each MFIV is within limits on an actual or simulated actuation signal.	In accordance with the INSERVICE TESTING PROGRAM

ATTACHMENT 2

MARKED-UP TECHNICAL SPECIFICATION BASES PAGES
[7 pages follow this cover page]

NOTE: This attachment contains marked-up TS Bases Pages B 3.7-14 through 20.

B 3.7 PLANT SYSTEMS

B 3.7.3 Main Feedwater Isolation Valves (MFIVs), Main Feedwater Regulation Valves (MFRVs), and Bypass Valves

BASES

BACKGROUND

The MFIVs isolate main feedwater (MFW) flow to the secondary side of the steam generators following a high energy line break (HELB). The safety related function of the MFRVs is to provide the second isolation of MFW flow to the secondary side of the steam generators following an HELB. Closure of the MFIVs or MFRVs, and bypass valves terminates flow to the steam generators, terminating the event for feedwater line breaks (FWLBs) occurring upstream of the MFIVs or MFRVs. The consequences of events occurring in the main steam lines or in the MFW lines downstream from the MFIVs will be mitigated by their closure. Closure of the MFIVs or MFRVs, and bypass valves, effectively terminates the addition of feedwater to an affected steam generator, limiting the mass and energy release for steam line breaks (SLBs) or FWLBs inside containment, and reducing the cooldown effects for SLBs.

safety grade

(FCV-479, 489 & 499)

The MFIVs or MFRVs, and bypass valves, isolate the nonsafety related portions from the safety related portions of the system. In the event of a secondary side pipe rupture inside containment, the valves limit the quantity of high energy fluid that enters containment through the break, and provide a pressure boundary for the controlled addition of auxiliary feedwater (AFW) to the intact loops.

Because an earthquake is not assumed to occur coincident with a spontaneous break of safety related secondary piping, loss of the non-safety grade bypass valves (FW-9A, B & C) is not assumed. If the single active failure postulated for a secondary pipe break is the failure of a safety grade bypass valve to close, then credit is taken for closing the non-safety grade bypass valve.

two

valves

line, with two bypass valves,

One MFIV, one MFRV, and ~~one~~ bypass ~~valve~~ are located on each MFW line, outside but close to containment. The ~~single~~ bypass ~~valve~~ bypasses both the MFIV and the MFRV. The MFIVs, MFRVs, and bypass valves are located upstream of the AFW injection point so that AFW may be supplied to the steam generators following MFIV or MFRV closure. The piping volume from these valves to the steam generators must be accounted for in calculating mass and energy releases, and refilled prior to AFW reaching the steam generator following either an SLB or FWLB.

The MFIVs, MFRVs, and bypass valves close on receipt of a safety injection signal. They may also be actuated manually. The MFRV and bypass ~~valve~~ for a specific steam generator will also close on a steam generator water level – high signal. In addition to

valves

(continued)

BASES

BACKGROUND (continued)

the MFIVs, MFRVs, and bypass valves, a check valve outside containment is available.

A description of the MFIVs and MFRVs is found in the UFSAR, Section 10.4.6 (Ref. 1).

APPLICABLE SAFETY ANALYSES

The design basis of the MFIVs and MFRVs is established by the analyses for the large SLB. It is also influenced by the accident analysis for the large FWLB. Closure of the MFIVs or MFRVs, and bypass valves, is relied on to terminate an SLB for core response analysis and excess feedwater event upon the receipt of a safety injection signal.

Failure of an MFIV, MFRV, or bypass valve to close following an SLB or FWLB can result in additional mass and energy being delivered to the steam generators, contributing to cooldown. This failure also results in additional mass and energy releases following an SLB or FWLB event.

The MFIVs, MFRVs, and bypass valves satisfy Criterion 3 of the NRC Policy Statement.

LCO

The MFIVs, MFRVs and one bypass valve in each line

This LCO ensures [illegible]s, and bypass valves will isolate MFW flow to the steam generators, following an FWLB or main steam line break. ~~These valves~~ will also isolate the nonsafety related portions from the safety related portions of the system.

six

This LCO requires that three MFIVs, three MFRVs, and ~~three~~ bypass valves be OPERABLE. The MFIVs, MFRVs, and bypass valves are considered OPERABLE when isolation times are within limits and they close on an isolation actuation signal.

Failure to meet the LCO requirements can result in additional mass and energy being released to containment following an SLB or FWLB inside containment.

APPLICABILITY

The MFIVs, MFRVs, and bypass valves must be OPERABLE whenever there is significant mass and energy in the Reactor

(continued)

BASES

APPLICABILITY (continued)

Coolant System and steam generators. This ensures that, in the event of an HELB, a single failure cannot result in the blowdown of more than one steam generator. In MODES 1, 2, and 3, the MFIVs, MFRVs, and bypass valves are required to be OPERABLE to limit the amount of available fluid that could be added to containment in the case of a secondary system pipe break inside containment, and to limit reactivity addition as a result of plant cooldown. When the valves are closed or isolated by a closed manual valve, ~~they are already performing their safety function.~~

the flowpath to the steam generator is

the safety function is satisfied.

In MODES 4, 5, and 6, steam generator energy is low. Therefore, the MFIVs, MFRVs, and bypass valves are normally closed since MFW is not required.

ACTIONS

The ACTIONS table is modified by a Note indicating that separate Condition entry is allowed for each valve.

A.1 and A.2

With one MFIV in one or more flow paths inoperable, action must be taken to restore the affected valve(s) to OPERABLE status, or to close or isolate inoperable affected valve(s) within 72 hours. When these valve(s) are closed or isolated, they are performing their required safety function.

The 72 hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valve(s) and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The 72 hour Completion Time is reasonable, based on operating experience.

Inoperable MFIVs that are closed or isolated must be verified on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of valve status indications available in the control room, and other administrative controls, to ensure that these valves are closed or isolated.

(continued)

BASES

ACTIONS (continued)

B.1 and B.2

With one MFRV in one or more flow paths inoperable, action must be taken to restore the affected valve(s) to OPERABLE status, or to close or isolate inoperable affected valve(s) within 72 hours. When these valve(s) are closed or isolated, they are performing their required safety function.

The 72 hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valve(s) and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The 72 hour Completion Time is reasonable, based on operating experience.

Inoperable MFRVs that are closed or isolated must be verified on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of valve status indications available in the control room, and other administrative controls to ensure that the valves are closed or isolated.

C.1 and C.2

With one bypass valve in one or more flow paths inoperable, action must be taken to restore the affected valve(s) to OPERABLE status, or to close or isolate inoperable affected valve(s) within ~~8~~ 72 hours. When these valve(s) are closed or isolated, they are performing their required safety function.

The ~~8~~ 72 hour Completion Time takes into account the redundancy afforded by the remaining OPERABLE valves and the low probability of an event occurring during this time period that would require isolation of the MFW flow paths. The ~~8~~ 72 hour Completion Time is reasonable, based on operating experience.

Inoperable bypass valves that are closed or isolated must be verified on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view

(continued)

BASES

ACTIONS

C.1 and C.2 (continued)

of valve status indications available in the control room, and other administrative controls, to ensure that these valves are closed or isolated.

D.1

With two inoperable valves in the same flow path, there may be no redundant system to operate automatically and perform the required safety function. Although the containment can be isolated with the failure of two valves in parallel in the same flow path, the double failure can be an indication of a common mode failure in the valves of this flow path, and as such, is treated the same as a loss of the isolation capability of this flow path. Under these conditions, affected valves in each flow path must be restored to OPERABLE status, or the affected flow path isolated within 8 hours. This action returns the system to the condition where at least one valve in each flow path is performing the required safety function. The 8 hour Completion Time is reasonable, based on operating experience, to complete the actions required to close the MFIV or MFRV, or otherwise isolate the affected flow path.

E.1 and E.2

If the MFIV(s), MFRV(s), and bypass valve(s) cannot be restored to OPERABLE status, or closed, or isolated within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in 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.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

This SR verifies that the closure time of each MFRV and bypass valve is within limits (Ref. 4) on an actual or simulated actuation signal. The MFRV, and bypass valve closure times are assumed in the accident and containment analyses (Ref. 2). This Surveillance is normally performed upon returning the unit to operation following a refueling outage. These valves should not be tested at power since even a part stroke exercise increases the risk of a valve closure with the unit generating power. This is consistent with the ASME Code, Section XI (Ref. 3).

The Frequency for this SR is in accordance with the INSERVICE TESTING PROGRAM. The specified Frequency for valve closure is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the specified Frequency.

SR 3.7.3.2

This SR verifies that the closure time of each MFIV is within limits (Ref. 4) on an actual or simulated actuation signal. The MFIV closure times are assumed in the accident and containment analyses (Ref. 2). This Surveillance is normally performed upon returning the unit to operation following a refueling outage. These valves should not be tested at power since even a part stroke exercise increases the risk of a valve closure with the unit generating power. This is consistent with the ASME Code, Section XI (Ref. 3).

The Frequency for this SR is in accordance with the INSERVICE TESTING PROGRAM. The specified Frequency for valve closure is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the specified Frequency.

(continued)

BASES (continued)

REFERENCES

1. UFSAR, Section 10.4.6.
2. UFSAR, Chapter 15.
3. ASME, Boiler and Pressure Vessel Code, Section XI.
4. TRM, Section 4.0

ATTACHMENT 3

RETYPED TECHNICAL SPECIFICATIONS PAGES

[2 pages follow this cover page]

NOTE: This attachment contains retyped TS Pages 3.7-8 & 9.

3.7 PLANT SYSTEMS

3.7.3 Main Feedwater Isolation Valves (MFIVs), Main Feedwater Regulation Valves (MFRVs), and Bypass Valves

LCO 3.7.3 Three MFIVs, three MFRVs, and six bypass valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3 except when MFIV, MFRV, or bypass valve is closed or isolated by a closed manual valve.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each valve.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more MFIVs inoperable.	A.1. Close or isolate MFIV. AND A.2. Verify MFIV is closed or isolated.	72 hours Once per 7 days
B. One or more MFRVs inoperable.	B.1. Close or isolate MFRV. AND B.2. Verify MFRV is closed or isolated.	72 hours Once per 7 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more inoperable bypass valves in different flow paths.	C.1 Close or isolate bypass valve. AND C.2 Verify bypass valve is closed or isolated.	72 hours Once per 7 days
D Two valves in the same flow path inoperable.	D.1 Isolate affected flow path.	8 hours
E. Required Action and associated Completion Time not met.	E.1 Be in MODE 3. AND E.2 Be in MODE 4.	6 hours 12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.3.1	Verify the closure time of each MFRV and bypass valve is within limits on an actual or simulated actuation signal.	In accordance with the INSERVICE TESTING PROGRAM
SR 3.7.3.2	Verify the closure time of each MFIV is within limits on an actual or simulated actuation signal.	In accordance with the INSERVICE TESTING PROGRAM