

10 CFR 50.90
10 CFR 50.91(a)(5)

RS-20-046

April 1, 2020

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

Quad Cities Nuclear Power Station, Unit 2
Renewed Facility Operating License No. DPR-30
NRC Docket No. 50-265

Subject: Emergency License Amendment Request – Increase Technical Specifications Allowable MSIV Leakage Rates in TS 3.6.1.3

Reference: Letter from M. Banerjee (U.S. NRC) to C. Crane (Exelon Generation Company, LLC), "Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2 – Issuance of Amendments Re: Adoption of Alternative Source Term Methodology (TAC Nos. MB6530, MB6531, MB6532, MB6533, MC8275, MC8276, MC8277, and MC8278)," dated September 11, 2006

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (EGC) requests an amendment to the Technical Specifications (TS) for Quad Cities Nuclear Power Station (QCNPS), Unit 2. The proposed changes are being requested on an emergency basis pursuant to 10 CFR 50.91 (a)(5). Unit 2 is currently in a refueling outage. During the Main Steam Isolation Valve (MSIV) local leakage rate testing (LLRT) performed on March 30, 2020, marginal results were obtained on an outboard valve that led to the maximum combined leakage path limit of 86 standard cubic feet per hour (scfh) being exceeded. The requested TS amendment supports deferral of repairs until the next Unit 2 refueling outage.

The proposed change modifies the Unit 2 TS 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," Surveillance Requirement (SR) 3.6.1.3.10 by revising the combined MSIV leakage rate limit for all four steam lines from 86 to 93 standard cubic feet per hour (scfh) and the leakage rate through each MSIV leakage path from 34 to 37 scfh. The proposed change in the allowable limits are a one-time change intended to be used for a single cycle (Cycle 26). The proposed changes to the leakage rate limits are based on a change to the conversion factor used to equate the leakage rates at the test pressure to the corresponding leakage rate at the

accident pressure (P_a).

Emergency circumstances are present in that the Centers for Disease Control has issued recommendations advising "social distancing" or sequestering staff to prevent the spread of the COVID-19 Virus. The nature of the MSIV repair is in conflict with the recommendations in that it requires technicians to be in constant proximity to each other in a hot environment that exponentially increases the likelihood of individuals contracting COVID-19 and potentially inducing a rapid spread. Additionally, the majority of the specialty technicians that are needed to execute this repair are high risk candidates (based on age group) for contracting COVID-19. Losing resources due to a virus spread would cause a situation where the proper technical knowledge would not be available to satisfactorily complete this work (minimal 14 day isolation and likely to be more than one individual based on having to work in close proximity for the work). Additionally, if a seat replacement is needed it would require pre- and post-heat treatment which requires out of state vendors, which may not be able to travel based on individual state restrictions on travel. This leaves the possibility of not being able to properly repair the valve once disassembled due to the likelihood of having to swap specialty technicians out with little to no notice.

As a result of the current pandemic situation, removing some conservatism from the current TS allowable limit to allow deferral of the repair until the next Unit 2 refueling outage has been determined to involve less risk than performing the repair under the current situation. The above circumstances were beyond the ability of EGC to foresee and avoid.

Attachment 1 provides a description and assessment of the proposed changes. Attachment 2 provides the existing TS pages marked-up to show the proposed TS changes. Attachment 3 provides revised (clean) TS pages. Attachment 4 provides TS Bases pages marked up to show the associated TS Bases changes and is provided for information only.

The proposed change has been reviewed by the QCNPS Plant Operations Review Committee, in accordance with the requirements of the EGC Quality Assurance Program.

EGC requests approval of the proposed license amendment by April 10, 2020. Once approved, the amendment shall be implemented within 2 days.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), a copy of this application, with attachments, is being provided to the designated State Officials.

There are no regulatory commitments contained in this submittal. Should you have any questions concerning this submittal, please contact Ms. Rebecca L. Steinman at (630) 657-2831.

I declare under penalty of perjury that the foregoing is true and correct. This statement was executed on the 1st day of April 2020.

Respectfully,

A handwritten signature in black ink, appearing to read "Patrick R. Simpson". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Patrick R. Simpson
Senior Manager Licensing
Exelon Generation Company, LLC

Attachments:

1. Evaluation of Proposed Changes
2. Mark-up of QCNPS, Unit 2 Technical Specifications Pages
3. Clean QCNPS, Unit 2 Technical Specifications Pages
4. Mark-up of QCNPS, Unit 2 Technical Specifications Bases Pages – For Information Only

cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector, Quad Cities Nuclear Power Station
NRC Project Manager, Quad Cities Nuclear Power Station
Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT 1
Evaluation of Proposed Changes

Subject: Emergency License Amendment Request – Increase Technical Specifications
Allowable MSIV Leakage Rates in TS 3.6.1.3

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Evaluation of Proposed Changes

1.0 SUMMARY DESCRIPTION

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (EGC) requests an amendment to the Technical Specifications (TS) for Quad Cities Nuclear Power Station (QCNPS), Unit 2.

The proposed change modifies the Unit 2 TS 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," Surveillance Requirement (SR) 3.6.1.3.10 by revising the combined Main Steam Isolation Valve (MSIV) leakage rate limit for all four steam lines from 86 to 93 standard cubic feet per hour (scfh) and the leakage rate through each MSIV leakage path from 34 to 37 scfh.

The proposed change in the allowable limits are a one-time change intended to be used for a single cycle (Cycle 26). The proposed changes to the leakage rate limits are based on a change to the conversion factor used to equate the leakage rates at the test pressure to the corresponding leakage rate at the accident pressure (P_a).

2.0 DETAILED DESCRIPTION

The NRC approved the use of alternative source term (AST) for the evaluation of the onsite and offsite dose consequences for the following Design Basis Accidents: Loss of Coolant Accident (LOCA), Control Rod Drop Accident (CRDA), Fuel Handling Accident (FHA), and Main Steam Line Break (MSLB) at QCNPS in Reference 6.1. An accident pressure (P_a) of 48 psig was used to develop the TS allowable leakage limit. However, the current AST licensing basis loss-of-coolant accident (LOCA) dose analysis assumes the MSIV leakage rate occurs at an accident pressure of 43.9 psig. This amendment request aligns the TS allowable limit to use the same accident pressure basis as the dose analysis.

2.1 Reason for the Proposed Changes

The four main steam lines, which penetrate the drywell, are automatically isolated by the MSIVs. There are two MSIVs on each steam line, one inside containment (i.e., inboard) and one outside containment (i.e., outboard). The MSIVs are functionally part of the primary containment boundary and leakage through these valves provides a potential leakage path for fission products to bypass secondary containment and enter the environment as a ground level release.

During the MSIV local leakage rate testing (LLRT) performed on March 30, 2020, marginal results were obtained on an outboard valve that led to the maximum combined leakage path limit of 86 standard cubic feet per hour (scfh) to be exceeded. The outboard MSIV (2-0202-2C) with an as-found leakage of 32.9 scfh contributes to exceeding the combined leakage limit. This valve was flushed and retested at 31.3 scfh. This valve was last rebuilt in 2018 and was upgraded with a modified spherical main disc and an anti-rotation pilot.

The 2-0202-2C MSIV is a low-stellite seat margin valve (e.g., there is a high risk of seat replacement due to integrity of stellite valve seating surface) that requires specialty machinists (a small vendor group that is already experiencing a shortage) to repair. Initial estimates for the 2-0202-2C MSIV repair is 1.5 rem for normal overhaul and an additional 0.7 rem if seat replacement becomes necessary.

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The Centers for Disease Control has issued recommendations advising "social distancing" or sequestering staff to prevent the spread of the COVID-19 Virus. The nature of the 2-0202-2C MSIV repair is in conflict with the recommendations in that it requires technicians to be in constant proximity to each other in a hot environment that exponentially increases the likelihood of individuals contracting COVID-19 and potentially inducing a rapid spread. Additionally, the majority of the specialty technicians that are needed to execute this repair are high risk candidates (based on age group) for contracting COVID-19. Losing resources due to a virus spread would cause a situation where the proper technical knowledge would not be available to satisfactorily complete this work (minimal 14 day isolation and likely to be more than one individual based on having to work in close proximity for the work). Additionally, a seat replacement would require pre- and post-heat treatment which requires out of state vendors, which may not be able to travel based on individual state restrictions on travel. This leaves the possibility of not being able to properly repair the valve once disassembled due to the likelihood of having to swap specialty technicians out with little to no notice.

As a result of the current pandemic situation, removing some conservatism from the current TS allowable limit to allow deferral of the repair until the next Unit 2 refueling outage has been determined to involve less risk than performing the repair under the current situation.

2.2 Description of the Proposed Changes

The allowable leakage rate limits specified in SR 3.6.1.3.10 for Unit 2 will be changed to 93 scfh for all four steam lines and 37 scfh through each MSIV leakage path. The existing limits will remain in place for Unit 1. The MSIV leakage rate assumed in the LOCA dose consequence analysis is 150 scfh and 60 scfh, respectively, at 43.9 psig. The TS leakage rates are calculated using a conversion factor of 1.603 per the extrapolation factor formula for laminar flow from Equation 10.39 of ORNL-NSIC-5 (Reference 6.3) to convert the leakage at the design pressure of 43.9 psig to a TS leakage rate at the test pressure of 25 psig. However, the current TS allowable limits were based on a conversion factor of 1.73, which is based on an accident pressure of 48 psig. The proposed changes reflect a higher allowable limit due to the lower accident pressure but are consistent with the MSIV leakage assumed in the current offsite and control room operator dose calculations for the limiting QCNPS design basis accident. The following change to SR 3.6.1.3.10 is proposed. Underlined text indicates proposed additions.

Current SR 3.6.1.3.10	Proposed SR 3.6.1.3.10
Verify the leakage rate through each MSIV leakage path is \leq 34 scfh when tested at \geq 25 psig, and the combined leakage rate for all MSIV leakage paths is \leq 86 scfh when tested at \geq 25 psig.	Verify the leakage rate through each MSIV leakage path is \leq 34 scfh <u>for Unit 1 and 37 scfh for Unit 2*</u> when tested at \geq 25 psig, and the combined leakage rate for all MSIV leakage paths is \leq <u>86 scfh for Unit 1 and 93 scfh for Unit 2*</u> when tested at \geq 25 psig. * The Unit 2 values are only applicable during Cycle 26.

Attachment 2 contains a marked-up version of the QCNPS, Units 1 and 2 TS showing the proposed changes. Attachment 3 provides the revised (clean) TS pages.

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EGC will make supporting change to the TS Bases in accordance with TS 5.5.10, "Technical Specifications (TS) Bases Control Program." Attachment 4 provides the marked-up TS Bases pages. The TS Bases mark-up pages are being submitted for information only.

3.0 TECHNICAL EVALUATION

On September 11, 2006 (Reference 6.1) the NRC issued Amendments Nos. 233 and 229 to the Renewed Facility Operating Licenses for QCNPS, Units 1 and 2, respectively. These amendments adopt the full implementation of the AST methodology in accordance with 10 CFR 50.67, "Accident Source Term." An accident pressure (P_a) of 48 psig was used to develop the TS allowable leakage limit. However, the current AST licensing basis loss-of-coolant accident (LOCA) dose analysis assumes the MSIV leakage rate occur at 43.9 psig. This amendment request aligns the TS allowable limit to use the same accident pressure basis as the dose analysis.

Utilizing the conversion factor for the P_a value of 43.9 psig results in a small increase to the allowable MSIV leakage during test conditions that correspond to a value of 60 scfh (highest line) and 150 scfh (total) during the accident. These test values (at 25 psig or greater) are 37 scfh and 93 scfh, respectively. The current radiological consequence analysis of the design basis LOCA was performed in accordance with Regulatory Guide (RG) 1.183 (Reference 6.2) to confirm compliance with the acceptance criteria in 10 CFR 50.67 using a P_a value of 43.9 psig. Therefore, the proposed change to the TS limit (which is based on the test pressure value) has no impact on this analysis because the analysis leakage is based on the accident pressure of 43.9 psig.

Additionally, since the dose evaluation assumes a release from the Unit 1 MSIV room there is additional margin for Control Room dose. This additional margin exists because the atmospheric dispersion factors (χ/Q) for the Unit 2 MSIV leakage pathway is less than 40% of the bounding Unit 1 value.

For offsite dose, the Exclusion Area Boundary (EAB) dose remains 8.85 rem and the Low Population Zone (LPZ) dose remains 2.45 rem, with both values having margin to the limit of 25 rem per 10 CFR 50.67 for AST.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

The licensing basis loss of coolant accident (LOCA) radiological dose analysis is performed using the Alternative Source Term methodology and demonstrate that the regulatory requirements provided in 10 CFR 50.67 and guidance in RG 1.183 and Standard Review Plan 15.0.1 are met. The calculated Total Effective Dose Equivalent (TEDE) doses to the Control Room, Exclusion Area Boundary (EAB), and to the Low Population Zone (LPZ) are all below the regulatory dose limits. The proposed change to the TS allowable leakage limit has no impact on the existing licensing basis analysis so there is no change in the evaluated dose consequences.

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Based on this consideration, it is concluded that, (1) there is a reasonable assurance that the health and safety of the public will not be endangered by operating in the proposed manner, (2) activities will be conducted in compliance with NRC regulations, and (3) the approval and issuance of this proposed amendment will not be inimical to the common defense and security of the health and safety of the public.

4.2 No Significant Hazards Consideration

Overview

Exelon Generation Company, LLC (EGC) requests an emergency amendment to revise Technical Specifications (TS) Section 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," by revising Surveillance Requirement (SR) 3.6.1.3.10 for main steam isolation valve (MSIV) leakage rates. The proposed amendment would increase on a one-time basis the Unit 2 allowable leakage rate through each MSIV leakage path and the combined leakage rate limit for all four steam lines.

EGC has evaluated the proposed change against the criteria of 10 CFR 50.92(c) to determine if the proposed changes result in any significant hazards. The following is the evaluation of each of the 10 CFR 50.92(c) criteria:

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

Response: No

The increase in the total MSIV leakage rate limit has no impact on the radiological consequence analysis of the Loss of Coolant Accident (LOCA) so the dose consequences of this limiting Design Basis Accident (DBA) remain within the acceptance criteria provided by the NRC for use with the Alternative Source Term (AST) methodology in 10 CFR 50.67 and 10 CFR 50, Appendix A, GDC 19. Additional guidance is provided in Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors" and Standard Review Plan (SRP) Section 15.0.1.

The proposed change to the MSIV leakage limit does not involve physical change to any plant structure, system, or component. As a result, no new failure modes of the MSIVs have been introduced.

The proposed change does not affect the normal design or operation of the facility before the accident; rather, it potentially affects leakage limit assumptions that constitute inputs to the evaluation of the consequences. The radiological consequences of the analyzed LOCA are unchanged from the approved AST doses and continue to have adequate margin to the regulatory limits specified in 10 CFR 50.67 for offsite doses and 10 CFR 50, Appendix A, GDC 19 for control room operator doses is still available.

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

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

Response: No

The change in the MSIV leakage rate limits does not affect the design, functional performance, or normal operation of the facility. Similarly, it does not affect the design or operation of any component in the facility such that new equipment failure modes are created. This is supported by operating experience at other EGC sites that have increased their MSIV leakage limits. As such the proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

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

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

Response: No

This proposed license amendment involves changes in the MSIV leakage rate limits. The revised leakage rate limits remain consistent with the LOCA radiological consequence evaluation assumptions. The dose consequences of this limiting event are unchanged by this amendment and remain within the acceptance criteria presented in 10 CFR 50.67 for offsite doses and 10 CFR 50, Appendix A, GDC 19 for control room operator doses. The margin of safety is that provided by meeting the applicable regulatory limits.

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

4.3 Conclusion

Based on the considerations discussed above: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) 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 CONSIDERATION

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 effluents 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.

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6.0 REFERENCES

- 6.1. Letter from Maitri Banerjee (U.S. NRC) to Christopher M. Crane, Dresden Nuclear Power Station, Units 2 and 3, and Quad Cities Nuclear Power Station, Units 1 and 2 - Issuance of Amendments Re: Adoption of Alternative Source Term Methodology (TAC Nos. MB6530, MB6531, MB6532, MB6533, MC8275, MC8276, MC8277 AND MC8278), dated September 11, 2006 (ADAMS Accession No. ML062070290)
- 6.2. Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," dated July 2000 (ADAMS Accession No. ML003716792)
- 6.3. ORNL-NSIC-5, U.S. Reactor Containment Technology, Oak Ridge National Laboratory and Bechtel Corporation, "A Compilation of Current Practice in Analysis, Design, Construction, Test, and Operation, Volume II," dated August 1965 available for download as of February 2019 from https://digital.library.unt.edu/ark:/67531/metadc101034/m2/1/high_res_d/metadc101034.pdf

ATTACHMENT 2

**QUAD CITIES NUCLEAR POWER STATION
UNIT 2**

Docket No. 50-265

Facility Operating License No. DPR-30

MARK-UP OF QCNPS, UNIT 2 TECHNICAL SPECIFICATIONS PAGES

for Unit 1 and 37 scfh
for Unit 2*

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.1.3.10 Verify the leakage rate through each MSIV leakage path is ≤ 34 scfh when tested at ≥ 25 psig, and the combined leakage rate for all MSIV leakage paths is ≤ 86 scfh when tested at ≥ 25 psig.	In accordance with the Primary Containment Leakage Rate Testing Program

for Unit 1 and 93 scfh for Unit 2*

* The Unit 2 values are only applicable during Cycle 26.

ATTACHMENT 3

**QUAD CITIES NUCLEAR POWER STATION
UNIT 2**

Docket No. 50-265

Facility Operating License No. DPR-30

CLEAN QCNPS, UNIT 2 TECHNICAL SPECIFICATIONS PAGES

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.6.1.3.10 Verify the leakage rate through each MSIV leakage path is \leq 34 scfh for Unit 1 and 37 scfh for Unit 2* when tested at \geq 25 psig, and the combined leakage rate for all MSIV leakage paths is \leq 86 scfh for Unit 1 and 93 scfh for Unit 2* when tested at \geq 25 psig.</p> <p>* The Unit 2 values are only applicable during Cycle 26.</p>	<p>In accordance with the Primary Containment Leakage Rate Testing Program</p>

ATTACHMENT 4

**QUAD CITIES NUCLEAR POWER STATION
UNIT 2**

Docket No. 50-265

Facility Operating License No. DPR-30

**MARK-UP OF QCNPS, UNIT 2 TECHNICAL SPECIFICATIONS BASES PAGES
(For Information Only)**

BASES

SURVEILLANCE
REQUIREMENTS
(continued)

SR 3.6.1.3.8

This SR requires a demonstration that a representative sample of reactor instrumentation line excess flow check valves (EFCVs) are OPERABLE by verifying that the valves actuate to the isolation position on an actual or simulated instrument line break condition. This test is performed by blowing down the instrument line during an inservice leak or hydrostatic test and verifying a distinctive "click" when the poppet valve seats or a quick reduction in flow. This SR provides assurance that the instrumentation line EFCVs will perform as designed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.



SR 3.6.1.3.9

The TIP shear isolation valves are actuated by explosive charges. An in place functional test is not possible with this design. The explosive squib is removed and tested to provide assurance that the valves will actuate when required. The replacement charge for the explosive squib shall be from the same manufactured batch as the one fired or from another batch that has been certified by having one of the batch successfully fired. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. Other administrative controls, such as those that limit the shelf life and operating life, as applicable, of the explosive charges must be followed.



SR 3.6.1.3.10

NOTE: The Unit 2 values are only applicable during Cycle 26.

The analyses in References 2 and 3 are based on leakage that is less than the specified leakage rate. In accordance with the Primary Containment Leakage Rate Testing Program, the as-left leakage rate of each main steam isolation valve path is assumed to be the maximum pathway leakage (larger leakage of two valves in series), and the as-found leakage rate of each main steam isolation valve path is assumed to be the minimum pathway leakage (smaller of either the inboard or outboard isolation valve's individual leakage rates). The combined leakage rate limit through all MSIV leakage paths must be ≤ 86 scfh when tested at ≥ 25 psig for both as-left and as-found leakage rate tests. Additionally, the leakage rate limit through each MSIV leakage path is ≤ 34 scfh when tested at ≥ 25 psig. These values correspond to a combined leakage rate of 150 scfh and an individual MSIV leakage rate

for Unit 1 and 93 scfh for Unit 2

BASES

at an accident pressure of 48 psig for Unit 1 and 43.9 psig for Unit 2.

SURVEILLANCE SR 3.6.1.3.10 (continued)

of 60 scfh, ~~when tested at 48 psig.~~ This ensures that MSIV leakage is properly accounted for in determining the overall impacts of primary containment leakage. The Frequency is required by the Primary Containment Leakage Rate Testing Program.

MSIV leakage is considered part of L_a .

REFERENCES

1. Technical Requirements Manual.
2. UFSAR, Section 15.6.5.
3. UFSAR, Section 15.6.4.
4. UFSAR, Chapter 15.
5. UFSAR, Section 5.2.2.2.3.
6. UFSAR, Section 6.2.4.1.