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RS-18-049 10 CFR 50.90

May 29, 2018

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

Braidwood Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Byron Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: Supplemental Information to Correct an Error Related to License Amendment Request to Incorporate Changes Supported by TSTF-547, Revision 1, "Clarification of Rod Position Requirements"

References:

(1) Letter from D. M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request to Incorporate Changes Supported by TSTF-547, 'Clarification of Rod Position Requirements,'" dated June 30, 2017

(2) Email from J. S. Wiebe (U.S. Nuclear Regulatory Commission) to J. A. Bauer, (Exelon Generation Company, LLC, "Request for Additional Information Regarding TSTF-547 Supported Amendment," dated September 27, 2017

(3) Letter from K. Hsueh (U.S. Nuclear Regulatory Commission) to Technical Specification Task Force, "Final Safety Evaluation of Technical Specification Task Force Traveler TSTF-547, Revision 1, 'Clarification of Rod Position Requirements'" (TAC No. MF3570), dated March 4, 2016

(4) Letter from D. M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information Related to License Amendment Request to Incorporate Changes Supported by TSTF-547, 'Clarification of Rod Position Requirements,'" dated October 24, 2017

In Reference 1, Exelon Generation Company, LLC (EGC) requested an amendment to Renewed Facility Operating License Nos. NPF-72 and NPF-77 for Braidwood Station, Units 1 and 2, and Renewed Facility Operating License Nos. NPF-37 and NPF-66 for Byron Station, Units 1 and 2.

This amendment request proposed to revise Technical Specification (TS) 3.1.4, "Rod Group Alignment Limits," TS 3.1.5, "Shutdown Bank Insertion Limits," TS 3.1.6, "Control Bank Insertion Limits," and TS 3.1.7, "Rod Position Indication," consistent with the changes approved by the NRC in Reference 3.

In Reference 2, the NRC requested that EGC provide additional information to support their review of the subject License Amendment Request. The requested information was provided in Reference 4.

Subsequent to submittal of Reference 4, a generic error was discovered in the NRC-approved TSTF-547. TSTF-547, Revision 1, added to Limiting Condition for Operation (LCO) 3.1.7, "Rod Position Indication," Required Action A.2.2, which prohibits entering Mode 2 from Mode 3 with an inoperable Digital Rod Position Indication (DRPI). However, Required Action A.2.2 is joined by a logical "OR" connector with other Required Actions that do not include this requirement; these Required Actions permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time. Therefore, Mode 2 may be entered with one inoperable DRPI per group using the allowance provided by LCO 3.0.4.a by relying on the other permitted Required Actions. The allowance provided by LCO 3.0.4.a has the effect of making the newly added Required Action A.2.2 irrelevant. This situation is confusing and should be resolved. Attachment 1, "Supplemental Information," describes this issue in detail and presents an appropriate resolution.

Attachments 2A and 2B contain the marked-up revised TS pages for Braidwood Station and Byron Station, respectively. Attachments 3A and 3B contain the marked-up revised Bases pages for Braidwood Station and Byron Station, respectively. While the attached supplemental information addresses the subject error associated with the Braidwood Station and Byron Station submittal (i.e., Reference 1), the Technical Specification Task Force is aware of this error and is working to address the generic issue in TSTF-547, Revision 1.

EGC has reviewed the information supporting the No Significant Hazards Consideration and the Environmental Consideration that was previously provided to the NRC in Reference 1. The additional information provided in this submittal does not affect the conclusion that the proposed license amendment does not involve a significant hazards consideration. This additional information also does not affect the conclusion that neither an environmental impact statement nor an environmental assessment need be prepared in support of the proposed amendment.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), EGC is notifying the State of Illinois of this additional information by transmitting a copy of this letter and its attachment to the designated State Official.

In Reference 1, EGC requested approval of this proposed license amendment by June 30, 2018; however, based on this proposed revision to the original license amendment request, EGC understands that an extension to the review and approval schedule may be necessary.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this letter, please contact Ms. Lisa A. Simpson at (630) 657-2815.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 29th day of May 2018.

Respectfully,

David M. Gullott
Manager – Licensing
Exelon Generation Company, LLC

Attachments:
1) Supplemental Information
2A) Markup of Revised Technical Specification Pages – Braidwood Station
2B) Markup of Revised Technical Specification Pages – Byron Station
3A) Markup of Revised Bases Pages – Braidwood Station (For Information Only)
3B) Markup of Revised Bases Pages – Byron Station (For Information Only)

cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector, Braidwood Station
NRC Senior Resident Inspector, Byron Station
Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT 1
Supplemental Information

Summary

In Reference 1, Exelon Generation Company, LLC (EGC) requested an amendment to Renewed Facility Operating License Nos. NPF-72 and NPF-77 for Braidwood Station, Units 1 and 2, and Renewed Facility Operating License Nos. NPF-37 and NPF-66 for Byron Station, Units 1 and 2. This amendment request proposed to revise Technical Specification (TS) 3.1.4, "Rod Group Alignment Limits," TS 3.1.5, "Shutdown Bank Insertion Limits," TS 3.1.6, "Control Bank Insertion Limits," and TS 3.1.7, "Rod Position Indication," consistent with the changes approved by the NRC in Reference 3.

In Reference 2, the NRC requested that EGC provide additional information to support their review of the subject License Amendment Request. The requested information was provided in Reference 4.

Subsequent to submittal of Reference 4, a generic error was discovered in the NRC-approved TSTF-547. TSTF-547 added to Limiting Condition for Operation (LCO) 3.1.7, "Rod Position Indication," Required Action A.2.2, which prohibits entering Mode 2 from Mode 3 with an inoperable Digital Rod Position Indication (DRPI) (see TS page markups in Attachments 2A and 2B). However, Required Action A.2.2 is joined by a logical "OR" connector with other Required Actions that do not include this requirement; these Required Actions permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time. Therefore, Mode 2 may be entered with one inoperable DRPI per group using the allowance provided by LCO 3.0.4.a by relying on the other permitted Required Actions. The allowance provided by LCO 3.0.4.a has the effect of making the newly added Required Action A.2.2 irrelevant. This situation is confusing and should be resolved by deleting Required Action A.2.2. A detailed description of this issue and appropriate justification for deleting Required Action A.2.2 is presented below.

TSTF-547 Background and Initial Proposed TS Change

TSTF-547, "Clarification of Rod Position Requirements," Revision 1, was approved by the NRC on March 4, 2016 (Reference 3). TSTF-547 makes many improvements to LCO 3.1.4, "Rod Group Alignment Limits," LCO 3.1.5, "Shutdown Bank Insertion Limits," LCO 3.1.6, "Control Bank Insertion Limits," and LCO 3.1.7, "Rod Position Indication."

As discussed in Reference 1, Section 3.4, "Provide an Alternative to Frequent Verification of Rod Position," if one or more DRPIs are inoperable, the existing TS 3.1.7, Required Action A.1 requires verification of the position of the associated rods using either the movable incore detector system or the Power Distribution Monitoring System (PDMS) once per 8 hours as discussed in TS Bases 3.1.7. The proposed change revises TS 3.1.7 (see TS page markups in Attachments 2A and 2B) to provide an alternative to monitoring the associated rods every 8 hours (approximately 90 times per month) by utilizing a different monitoring method. This alternative method reduces potential wear on the movable incore detector system when PDMS is inoperable and also reduces the time required to perform the frequent rod position verifications. The potential wear of the movable incore detector system does not pose a reduction in the margin of safety; however, excessive wear could result in a loss of functionality of the system. This could lead to the inability to complete required Surveillances and result in a plant shutdown.

Reference 1 proposed to add two new Required Actions to LCO 3.1.7 (i.e., A.2.1 and A.2.2) as an alternative to the existing Condition A Required Actions. Required Actions A.2.1 and A.2.2 are joined to the existing Required Actions with a logical "OR" connector, and the existing Required Action A.2 was relabeled to A.3. Proposed Required Action A.2.1 requires verification of the position of rods associated with an inoperable DRPI and includes six new Completion Times as shown on TS pages 3.1.7-1 and 3.1.7-2 (see Attachments 2A and 2B). Periodic verification is less frequent, and additional verification is made following circumstances in which the rod may have moved. The initial position of the rod is determined within 8 hours and every 31 EFPD thereafter. The 8-hour initial Completion Time is the same as existing Required Action A.1 and the 31 EFPD period coincides with the Frequency of power distribution surveillances (specified in the Surveillance Frequency Control Program) that utilize the movable incore detector system when PDMS is inoperable. If there is unintended movement of a rod or if a rod with an inoperable DRPI is moved more than 12 steps, the movable incore detectors or PDMS are used to verify the rod position within 8 hours. If there are changes in core power, which could result in changes in rod position, the rod position must be verified before exceeding 50% RTP and within 8 hours of reaching full power. This confirms the position of the rod with an inoperable DRPI to ensure that power distribution requirements are not violated and to establish a starting point for the proposed alternate monitoring actions.

New Required Action A.2.2 requires the inoperable DRPI to be restored to Operable status prior to entering Mode 2 from Mode 3. Required Action A.2.2 allows use of the alternative monitoring scheme defined in Required Action A.2.1 to be used until the next shutdown, after which the DRPI must be restored to Operable status.

LCO 3.0.4 Background and Application

LCO 3.0.4 provides requirements for entering the Applicability of a specification with the LCO not met. LCO 3.0.4 states the following (excerpt from the Braidwood Station and Byron Station Technical Specifications):

> LCO 3.0.4 When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made:
>
> a. When the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time;
>
> b. After performance of a risk assessment addressing inoperable systems and components, consideration of the results, determination of the acceptability of entering the MODE or other specified condition in the Applicability, and establishment of risk management actions, if appropriate (exceptions to this Specification are stated in the individual Specifications); or
>
> c. When an allowance is stated in the individual value, parameter, or other Specification.

ATTACHMENT 1
Supplemental Information

The Braidwood Station and Byron Station Bases for LCO 3.0.4 add the following insights:

> LCO 3.0.4 establishes limitations on changes in MODES or other specified conditions in the Applicability when an LCO is not met. It allows placing the unit in a MODE or other specified condition stated in that Applicability (e.g., the Applicability desired to be entered) when unit conditions are such that the requirements of the LCO would not be met, in accordance with either LCO 3.0.4.a, LCO 3.0.4.b, or LCO 3.0.4.c.
>
> LCO 3.0.4.a allows entry into a MODE or other specified condition in the Applicability with the LCO not met when the associated ACTIONS to be entered following entry into the MODE or other specified condition in the Applicability will permit continued operation within the MODE or other specified condition for an unlimited period of time. Compliance with ACTIONS that permit continued operation of the unit for an unlimited period of time in a MODE or other specified condition provides an acceptable level of safety for continued operation. This is without regard to the status of the unit before or after the MODE change. Therefore, in such cases, entry into a MODE or other specified condition in the Applicability may be made and the Required Actions followed after entry into the Applicability.

For example, the Applicability of LCO 3.1.7 is Modes 1 and 2. If a DRPI was inoperable and the plant was in Mode 3, LCO 3.0.4 provides requirements that must be met to enter Modes 1 and 2. TS 3.1.7, Required Actions A.1, A.2.1, and A.3 all satisfy LCO 3.0.4.a, in that they permit continued operation in the Applicability for an unlimited period of time; therefore, the plant may enter Modes 1 and 2.

Use of Logical Connectors

Specific examples of the use of logical connectors are presented in Section 1.2, "Logical Connectors," of the Braidwood Station and Byron Station Technical Specifications. Example 1.2-2 (shown below) is very similar to the Required Actions in TS 3.1.7.

1.2 Logical Connectors

EXAMPLES (continued)

EXAMPLE 1.2-2

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LCO not met.	A.1 Trip . . .	
	OR	
	A.2.1 Verify . . .	
	AND	
	A.2.2.1 Reduce . . .	
	OR	
	A.2.2.2 Perform . . .	
	OR	
	A.3 Align . . .	

> This example represents a more complicated use of logical connectors. Required Actions A.1, A.2, and A.3 are alternative choices, only one of which must be performed as indicated by the use of the logical connector OR and the left justified placement. Any one of these three Actions may be chosen. If A.2 is chosen, then both A.2.1 and A.2.2 must be performed as indicated by the logical connector AND. Required Action A.2.2 is met by performing A.2.2.1 or A.2.2.2. The indented position of the logical connector OR indicates that A.2.2.1 and A.2.2.2 are alternative choices, only one of which must be performed.

Note the statement in the above example:

> Required Actions A.1, A.2, and A.3 are alternative choices, only one of which must be performed as indicated by the use of the logical connector OR and the left justified placement. Any one of these three Actions may be chosen.

Applying this guidance to TS 3.1.7, Required Actions A.1, A.2, and A.3 are alternative choices and any of these three Actions may be chosen.

Justification for Deleting TS 3.1.7, Required Action A.2.2

If a DRPI is inoperable in Modes 1 or 2 and the plant subsequently enters Mode 3, TS 3.1.7 is no longer applicable. If the plant desires to enter Modes 1 or 2 while the DRPI is inoperable, LCO 3.0.4 must be applied. LCO 3.0.4.a states that Mode 2 may be entered if the associated actions to be entered permit continued operation for an unlimited period of time.

Section 1.2 of the TS (as discussed above) makes it clear that when given three Required Actions joined by a logical "OR", any one of those Required Actions may be chosen. In this case, Required Action A.1, A.3, or both A.2.1 and A.2.2, may be followed and that choice may be changed while maintaining compliance with the TS if within the allowed Completion Times.

Therefore, if a plant is in Mode 3 and desires to enter Mode 2 with an inoperable DRPI, the licensee may choose to utilize LCO 3.0.4.a and follow Required Action A.1 or A.3 to enter Modes 1 and 2. The licensee may later choose to follow Required Action A.2.1 and A.2.2 if within the allowed Completion Times; however, that choice does not retroactively limit the decision to enter Mode 2 with an inoperable DRPI. As a result, Required Action A.2.2, "Restore inoperable DRPIs to OPERABLE status," with a Completion Time of "Prior to entering MODE 2 from MODE 3," will never be limiting or implemented.

In addition, Required Action A.2.2 conflicts with LCO 3.0.2. LCO 3.0.2 states:

> If the LCO is met or is no longer applicable prior to expiration of the specified Completion Time(s), completion of the Required Action(s) is not required unless otherwise stated.

If a DRPI becomes inoperable and a licensee implements Required Action A.2.1 and subsequently enters Mode 3, the Applicability of LCO 3.1.7 is exited, and the associated Required Actions no longer apply (i.e., Required Action A.2.2 becomes not applicable). In order to invoke the "unless otherwise stated" provision of LCO 3.0.2 to impose Required Action A.2.2 while in Mode 3, TS 3.1.7 Condition A should have been modified by a Note that states, "Required Action A.2.2 shall be completed whenever this Condition is entered," similar to the

Note in LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," Condition A. Without the Note, Required Action A.2.2 is not applicable until after Mode 2 is entered, by which time the Required Action is moot.

Conclusion

Based on the above discussion, it is appropriate to delete Required Action A.2.2 as shown in Attachments 2A and 2B. Note that Attachments 2A and 2B provide TS page markups (for Braidwood Station and Byron Station, respectively) of the revised TS 3.1.7 pages originally submitted with Reference 1. Similarly, Attachments 3A and 3B provide associated Bases page markups (for Braidwood Station and Byron Station, respectively) of the revised Bases 3.1.7 pages originally submitted with Reference 1. The TS 3.1.7 pages supersede those provided in Reference 1. The other TS pages provided in Reference 1 (i.e., TS 3.1.4, TS 3.1.5, and TS 3.1.6) were not changed by this submittal and should continue to be reviewed as part of Reference 1.

References

1. Letter from D. M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request to Incorporate Changes Supported by TSTF-547, 'Clarification of Rod Position Requirements,'" dated June 30, 2017

2. Email from J. S. Wiebe (U.S. Nuclear Regulatory Commission) to J. A. Bauer, (Exelon Generation Company, LLC, "Request for Additional Information Regarding TSTF-547 Supported Amendment," dated September 27, 2017

3. Letter from K. Hsueh (U.S. Nuclear Regulatory Commission) to the Technical Specification Task Force, "Final Safety Evaluation of Technical Specification Task Force Traveler TSTF-547, Revision 1, 'Clarification of Rod Position Requirements'" (TAC No. MF3570), dated March 4, 2016

4. Letter from D. M. Gullott (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Response to Request for Additional Information Related to License Amendment Request to Incorporate Changes Supported by TSTF-547, 'Clarification of Rod Position Requirements,'" dated October 24, 2017

ATTACHMENT 2A

Markup of Revised Technical Specifications Pages

BRAIDWOOD STATION
UNITS 1 AND 2

Docket Nos. 50-456 and 50-457

Renewed Facility Operating License Nos. NPF-72 and NPF-77

MARKED-UP REVISED TS PAGES

3.1.7-1
3.1.7-2
3.1.7-3 (no changes, included for continuity)
3.1.7-4 (no changes, included for continuity)

NOTE: Revisions to TS pages submitted in TSTF-547 LAR dated June 30, 2017, are highlighted yellow and indicated within clouds.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Rod Position Indication

LCO 3.1.7 The Digital Rod Position Indication (DRPI) System and the Demand Position Indication System shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each inoperable DRPI and each demand position indicator.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One DRPI per group inoperable ~~for~~ in one or more groups.	A.1 Verify the position of the rods with inoperable DRPIs.	Once per 8 hours
	OR	
	A.2.1 Verify the position of the rods with inoperable DRPIs.	8 hours AND Once per 31 EFPD thereafter AND 8 hours after discovery of each unintended rod movement AND (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)		8 hours after each movement of rod with inoperable DRPI > 12 steps AND Prior to THERMAL POWER exceeding 50% RTP AND 8 hours after reaching RTP
	~~AND~~ ~~A.2.2 Restore inoperable DRPIs to OPERABLE status.~~	~~Prior to entering MODE 2 from MODE 3~~
	OR A.3~~2~~ Reduce THERMAL POWER to ≤ 50% RTP.	8 hours
B. More than one DRPI per group inoperable in one or more groups.	B.1 Place the control rods under manual control. AND B.2 Restore inoperable DRPIs to OPERABLE status such that a maximum of one DRPI per group is inoperable.	Immediately 24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C~~B~~. One or more ~~rods with inoperable~~ DRPIs inoperable in one or more groups and associated rod has ~~have~~ been moved ~~in excess of~~ > 24 steps in one direction since the last determination of the rod's position.	C~~B~~.1 Initiate action to verify the position of the rods with inoperable DRPIs. OR C~~B~~.2 Reduce THERMAL POWER to ≤ 50% RTP.	Immediately 8 hours
D~~C~~. One or more demand position indicators per bank inoperable ~~for~~ in one or more banks.	D~~C~~.1.1 Verify by administrative means all DRPIs for the affected bank(s) are OPERABLE. AND D~~C~~.1.2 Verify the most withdrawn rod and the least withdrawn rod of the affected bank(s) are ≤ 12 steps apart. OR D~~C~~.2 Reduce THERMAL POWER to ≤ 50% RTP.	Once per 8 hours Once per 8 hours 8 hours
E~~D~~. Required Action and associated Completion Time not met.	E~~D~~.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	----------NOTE---------- Not required to be met for DRPIs associated with rods that do not meet LCO 3.1.4. ---------- Verify each DRPI agrees within 12 steps of the group demand position for the full indicated range of rod travel.	Prior to criticality after each removal of the reactor head~~.~~

ATTACHMENT 2B

Markup of Revised Technical Specifications Pages

BYRON STATION
UNITS 1 AND 2

Docket Nos. 50-454 and 50-455

Renewed Facility Operating License Nos. NPF-37 and NPF-66

MARKED-UP REVISED TS PAGES

3.1.7-1
3.1.7-2
3.1.7-3 (no changes, included for continuity)
3.1.7-4 (no changes, included for continuity)

NOTE: Revisions to TS pages submitted in TSTF-547 LAR dated June 30, 2017, are highlighted yellow and indicated within clouds.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Rod Position Indication

LCO 3.1.7 The Digital Rod Position Indication (DRPI) System and the Demand Position Indication System shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

----------NOTE----------
Separate Condition entry is allowed for each inoperable DRPI and each demand position indicator.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One DRPI per group inoperable ~~for~~ in one or more groups.	A.1 Verify the position of the rods with inoperable DRPIs.	Once per 8 hours
	OR	
	A.2~~.1~~ Verify the position of the rods with inoperable DRPIs.	8 hours AND Once per 31 EFPD thereafter AND 8 hours after discovery of each unintended rod movement AND (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)		8 hours after each movement of rod with inoperable DRPI > 12 steps AND Prior to THERMAL POWER exceeding 50% RTP AND 8 hours after reaching RTP
	~~AND~~ ~~A.2.2 Restore inoperable DRPIs to OPERABLE status.~~	~~Prior to entering MODE 2 from MODE 3~~
	OR A.3~~2~~ Reduce THERMAL POWER to ≤ 50% RTP.	8 hours
B. More than one DRPI per group inoperable in one or more groups.	B.1 Place the control rods under manual control. AND B.2 Restore inoperable DRPIs to OPERABLE status such that a maximum of one DRPI per group is inoperable.	Immediately 24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C~~B~~. One or more ~~rods with inoperable~~ DRPIs inoperable in one or more groups and associated rod has ~~have~~ been moved ~~in excess of~~ > 24 steps in one direction since the last determination of the rod's position.	C~~B~~.1 Initiate action to verify the position of the rods with inoperable DRPIs. OR C~~B~~.2 Reduce THERMAL POWER to ≤ 50% RTP.	Immediately 8 hours
D~~C~~. One or more demand position indicators per bank inoperable ~~for~~ in one or more banks.	D~~C~~.1.1 Verify by administrative means all DRPIs for the affected bank(s) are OPERABLE. AND D~~C~~.1.2 Verify the most withdrawn rod and the least withdrawn rod of the affected bank(s) are ≤ 12 steps apart. OR D~~C~~.2 Reduce THERMAL POWER to ≤ 50% RTP.	Once per 8 hours Once per 8 hours 8 hours
E~~D~~. Required Action and associated Completion Time not met.	E~~D~~.1 Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	----------NOTE---------- Not required to be met for DRPIs associated with rods that do not meet LCO 3.1.4. ---------- Verify each DRPI agrees within 12 steps of the group demand position for the full indicated range of rod travel.	Prior to criticality after each removal of the reactor head~~.~~

ATTACHMENT 3A

Markup of Revised Bases Pages
(For Information Only)

BRAIDWOOD STATION
UNITS 1 AND 2

Docket Nos. 50-454 and 50-455

Renewed Facility Operating License Nos. NPF-37 and NPF-66

MARKED-UP REVISED BASES PAGES

B 3.1.7-6
B 3.1.7-7

NOTE: Revisions to Bases pages submitted in TSTF-547 LAR dated June 30, 2017, are highlighted yellow and indicated within clouds.

BASES

ACTIONS (continued)

A.1~~, A.2.1,~~ and A.2~~.2~~

When one DRPI per group in one or more groups fails, (i.e., one rod position per group can not be determined by the DRPI System) the position of the rod can still be determined by use of the movable incore detectors or Power Distribution Monitoring System (PDMS). When PDMS is OPERABLE, the position of the rod may be determined from the difference between the measured core power distribution and the core power distribution expected to exist based on the position of the rod indicated by the group step counter demand position. Based on experience, normal power operation does not require excessive movement of banks. If a bank has been significantly moved, the Required Action of C~~B~~.1 or C~~B~~.2 below is required. Therefore, verification of RCCA position within the Completion Time of 8 hours is adequate for allowing continued full power operation, since the probability of simultaneously having a rod significantly out of position and an event sensitive to that rod position is small.

Required Action A.1 requires verification of the position of a rod with an inoperable DRPI once per 8 hours which may put excessive wear and tear on the moveable incore detector system when PDMS is inoperable; Required Action A.2~~.1~~ provides an alternative. Required Action A.2~~.1~~ requires verification of rod position every 31 EFPD, which coincides with the normal surveillance frequency for verification of core power distribution.

Required Action A.2~~.1~~ includes six distinct requirements for verification of the position of rods associated with an inoperable DRPI:

a. Initial verification within 8 hours of the inoperability of the DRPI;

b. Re-verification once every 31 Effective Full Power Days (EFPD) thereafter;

BASES

ACTIONS (continued)

c. Verification within 8 hours if rod control system parameters indicate unintended rod movement. An unintended rod movement is defined as the release of the rod's stationary gripper when no action was demanded either manually or automatically from the rod control system, or a rod motion in a direction other than the direction demanded by the rod control system. Verifying that no unintended rod movement has occurred is performed by monitoring the rod control system stationary gripper coil current for indications of rod movement;

d. Verification within 8 hours if the rod with an inoperable DRPI is intentionally moved greater than 12 steps;

e. Verification prior to exceeding 50% RTP if power is reduced below 50% RTP; and

f. Verification within 8 hours of reaching 100% RTP if power is reduced to less than 100% RTP.

Should the rod with the inoperable DRPI be moved more than 12 steps, or if reactor power is changed, the position of the rod with the inoperable DRPI must be verified.

~~Required Action A.2.2 states that the inoperable DRPI must be restored to OPERABLE status prior to entering MODE 2 from MODE 3. The repair of the inoperable DRPI must be performed prior to returning to power operation following a shutdown.~~

A.~~2~~3

Reduction of THERMAL POWER to ≤ 50% RTP puts the core into a condition where rod position will not cause core peaking factors to approach the core peaking factor limits.

The allowed Completion Time of 8 hours is reasonable, based on operating experience, for reducing power to ≤ 50% RTP from full power conditions without challenging plant systems and allowing for rod position determination by Required Action A.~~1~~ or A.2 above.

ATTACHMENT 3B

Markup of Revised Bases Pages
(For Information Only)

BYRON STATION
UNITS 1 AND 2

Docket Nos. 50-454 and 50-455

Renewed Facility Operating License Nos. NPF-37 and NPF-66

MARKED-UP REVISED BASES PAGES

B 3.1.7-6
B 3.1.7-7

NOTE: Revisions to Bases pages submitted in TSTF-547 LAR dated June 30, 2017, are highlighted yellow and indicated within clouds.

BASES

ACTIONS (continued)

A.1, A.2.1, and A.2.2

When one DRPI per group in one or more groups fails, (i.e., one rod position per group can not be determined by the DRPI System) the position of the rod can still be determined by use of the movable incore detectors or Power Distribution Monitoring System (PDMS). When PDMS is OPERABLE, the position of the rod may be determined from the difference between the measured core power distribution and the core power distribution expected to exist based on the position of the rod indicated by the group step counter demand position. Based on experience, normal power operation does not require excessive movement of banks. If a bank has been significantly moved, the Required Action of B.1 or B.2 below is required. Therefore, verification of RCCA position within the Completion Time of 8 hours is adequate for allowing continued full power operation, since the probability of simultaneously having a rod significantly out of position and an event sensitive to that rod position is small.

Required Action A.1 requires verification of the position of a rod with an inoperable DRPI once per 8 hours which may put excessive wear and tear on the moveable incore detector system when PDMS is inoperable; Required Action A.2.1 provides an alternative. Required Action A.2.1 requires verification of rod position every 31 EFPD, which coincides with the normal surveillance frequency for verification of core power distribution.

Required Action A.2.1 includes six distinct requirements for verification of the position of rods associated with an inoperable DRPI:

a. Initial verification within 8 hours of the inoperability of the DRPI;

b. Re-verification once every 31 Effective Full Power Days (EFPD) thereafter;

BASES

ACTIONS (continued)

c. Verification within 8 hours if rod control system parameters indicate unintended rod movement. An unintended rod movement is defined as the release of the rod's stationary gripper when no action was demanded either manually or automatically from the rod control system, or a rod motion in a direction other than the direction demanded by the rod control system. Verifying that no unintended rod movement has occurred is performed by monitoring the rod control system stationary gripper coil current for indications of rod movement;

d. Verification within 8 hours if the rod with an inoperable DRPI is intentionally moved greater than 12 steps;

e. Verification prior to exceeding 50% RTP if power is reduced below 50% RTP; and

f. Verification within 8 hours of reaching 100% RTP if power is reduced to less than 100% RTP.

Should the rod with the inoperable DRPI be moved more than 12 steps, or if reactor power is changed, the position of the rod with the inoperable DRPI must be verified.

~~Required Action A.2.2 states that the inoperable DRPI must be restored to OPERABLE status prior to entering MODE 2 from MODE 3. The repair of the inoperable DRPI must be performed prior to returning to power operation following a shutdown.~~

A.3~~2~~

Reduction of THERMAL POWER to ≤ 50% RTP puts the core into a condition where rod position will not cause core peaking factors to approach the core peaking factor limits.

The allowed Completion Time of 8 hours is reasonable, based on operating experience, for reducing power to ≤ 50% RTP from full power conditions without challenging plant systems and allowing for rod position determination by Required Action A.1 or A.2 above.