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RS-17-011

February 23, 2017

10 CFR 50.90

U.S. Nuclear Regulatory Commission ATTN: Document Control Desk Washington, DC 20555-001

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

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

Subject: License Amendment Request to Delete Obsolete License Conditions and Revise Technical Specifications

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (EGC) requests amendments 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.

The proposed amendment removes time, cycle, or modification-related items from the Operating Licenses (OLs) and Technical Specifications (TS). Additionally, the proposed amendment makes editorial and formatting changes. The time, cycle, or modification-related items have been implemented or superseded, are no longer applicable, and no longer need to be maintained in their associated OLs or TS.

Attachment 1 provides an evaluation of the proposed change. Attachments 2 and 3 provide the existing TS pages marked up to show the proposed changes. Attachments 4 and 5 provide the existing TS Bases pages marked up to show the proposed changes. The proposed Bases changes are provided for information only.

EGC requests approval of the proposed license amendment by February 23, 2018. Once approved, the amendment shall be implemented within 30 days.

The proposed changes have been reviewed and approved by the Braidwood Station and Byron Station Plant Operations Review Committees in accordance with the requirements of the EGC Quality Assurance Program.

February 23, 2017 U.S. Nuclear Regulatory Commission Page 2

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), EGC is notifying the State of Illinois of this application for license amendment by transmitting a copy of this application, with attachments, to the designated Illinois Official.

There are no regulatory commitments contained within this letter. Should you have any questions concerning this letter, please contact Ryan Sprengel at (630) 657-2814.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 23rd day of February 2017.

Respectfully,

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

Attachments:

- 1. Evaluation of Proposed Changes
- 2. Proposed Technical Specification Changes for Braidwood Station, Units 1 and 2
- 3. Proposed Technical Specification Changes for Byron Station, Units 1 and 2
- 4. Proposed Technical Specification Bases Changes for Braidwood Station, Units 1 and 2
- 5. Proposed Technical Specification Bases Changes for Byron Station, Units 1 and 2

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

- Subject: License Amendment Request to Delete Obsolete License Conditions and Revise Technical Specifications
- 1.0 SUMMARY DESCRIPTION
- 2.0 DETAILED DESCRIPTION
 - 2.1 REASON FOR THE PROPOSED CHANGES
 - 2.2 DESCRIPTION OF PROPOSED OPERATING LICENSE CONDITION DELETIONS
 - 2.3 DESCRIPTION OF PROPOSED TECHNICAL SPECIFICATION CHANGES
 - 2.4 DESCRIPTION OF PROPOSED EDITORIAL AND FORMATTING CHANGES
- 3.0 TECHNICAL EVALUATION
- 4.0 REGULATORY EVALUATION
 - 4.1 APPLICABLE REGULATORY REQUIREMENTS/CRITERIA
 - 4.2 NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION
 - 4.3 CONCLUSIONS
- 5.0 ENVIRONMENTAL CONSIDERATION
- 6.0 REFERENCES

License Amendment Request to Delete Obsolete License Conditions and Revise Technical Specifications

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 amendments 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. The proposed amendment removes time, cycle, or modification-related items from the Operating Licenses (OLs) and Technical Specifications (TS). The time, cycle, or modification-related items have been implemented or superseded, are no longer applicable, and no longer need to be maintained in their associated OLs or TS. Additionally, the proposed amendment makes editorial and formatting changes.

Specifically, the proposed amendment deletes obsolete License Conditions related to first performances of associated Control Room Envelope (CRE) habitability surveillance, assessment and measurement tests for both Braidwood Station and Byron Station. The other License Condition proposed for deletion includes removal of TS associated with AREVA NP Inc. (AREVA NP) fuel for Braidwood Station, Unit 1 only. The License Conditions proposed for deletion pertain to actions or dates that have been completed and are no longer applicable. Further, the proposed amendment deletes text tied to completed refueling outages, system outages, or operating cycles and are no longer needed.

- 2.0 DETAILED DESCRIPTION
- 2.1 Reason for the Proposed Changes

The proposed changes are meant to remove time, cycle, or modification-related items from the OLs and TS. These items have been implemented or superseded, are no longer applicable, and no longer need to be maintained in their associated OLs or TS. With each proposed change, other than changes editorial in nature, associated evidence is identified to support the implementation as appropriate.

Historically, conditions, exceptions, or exemptions that are date, cycle, or modification-related have been captured in the OLs or TS. Over time, the actions or requirements that these items prescribe are implemented, and the issues no longer need to be reflected in the OLs or TS. In an effort to clarify, and avoid any confusion regarding the current requirements contained in the OL or TS, EGC is proposing the administrative removal of these items from the OLs and the TS for Braidwood Station and Byron Station.

In addition, a review was performed to identify inconsistencies in format within the Braidwood Station and Byron Station TS. The review utilized the improved Standard Technical Specifications (STS), Revision 1 (Reference 1) and the Writer's Guide for Plant-Specific Improved Technical Specifications (WG), TSTF-GG-05-01 (Reference 2). STS Revision 1 is the basis for TS format for Braidwood Station and Byron Station. The WG utilized for the review incorporates updates since STS Revision 1, but also describes the STS Revision 1 format. The existing format, using STS Revision 1, will not be changed. The results of these reviews were used as input for the proposed editorial and formatting changes. A complete listing of all proposed changes is provided in Table 2-1.

License Amendment Request to Delete Obsolete License Conditions and Revise Technical Specifications

2.2 Description of Proposed Operating License Condition Deletions

Braidwood Station, Unit 1

Item ID 1, Table 2-1. Appendix C, page 1. Revise, "Additional Condition," removing text related to operation during Cycles 15, 16, and 17 with AREVA NP fuel. The proposed text to delete is as follows:

During operation in Cycles 15, 16, and 17, up to eight (8) AREVA NP Advanced Mark-BW(A) fuel assemblies containing fuel pellets incorporating homogeneous poisons may be placed in nonlimiting Unit 1 core locations provided the fuel cycle designs are developed such that the TS 2.1.1.3 Safety Limit equation for Westinghouse fuel is bounding. The design basis for the AREVA NP fuel rod centerline melt follows that given in BAW-10162P-A, "TACO3-Fuel Pin Thermal Analysis Computer Code," October 1989, and BAW-10184P-A, "GDTACO-Urania Gadolinia Fuel Pin Thermal Analysis Code," February 1995.

Cycles 15, 16, and 17 are complete for Braidwood Station, Unit 1; therefore, this OL Condition is no longer required and can be removed from this section of the OL.

Braidwood Station, Unit 1 and 2

Item ID 2, Table 2-1. Appendix C, page 2. Delete Braidwood Station Units 1 and 2 OL Conditions (Amendment 146). The first performances of the associated CRE habitability surveillance, assessment and measurement are complete, see Table 2-2. Successive performances of the surveillances, assessments, and measurements will follow the respective frequencies identified in TS 5.5.18.c and 5.5.18.d. With the first performances complete for Braidwood Station, Units 1 and 2, these OL Conditions are no longer required and can be removed from this section of the OLs.

Byron Station, Units 1 and 2

Item ID 3, Table 2-1. Appendix C, page 2. Delete Byron Station Units 1 and 2 OL Conditions (Amendment 151). The first performances of the associated CRE habitability surveillance, assessment and measurement are complete, see Table 2-2. Successive performances of the surveillances, assessments, and measurements will follow the respective frequencies identified in TS 5.5.18.c and 5.5.18.d. With the first performances complete for Byron Station, Units 1 and 2, these OL Conditions are no longer required and can be removed from this section of the OLs.

2.3 Description of Proposed Technical Specification Changes

Item ID 5, Table 2-1. Braidwood Station Unit 1 TS, page 2.0-1. Delete Safety Limits (SLs) 2.1.1.3.b and 2.1.1.3.c. AREVA NP fuel is no longer in the core (Braidwood Station Unit 1) and will not be reinserted into the core. This item is tied to Item ID 1 discussed previously, proposed for removal as Cycles 15, 16, and 17 are complete for Braidwood Station, Unit 1, therefore, this SL text is no longer required and can be removed. Associated editorial change to remove sub-item "a." break-out and make consistent with Byron Station TS. With AREVA NP fuel no longer

License Amendment Request to Delete Obsolete License Conditions and Revise Technical Specifications

utilized by Braidwood Station Unit 1, these SLs are no longer required and can be removed from this section of the TS.

Item ID 14, Table 2-1. Byron Station TS, pages 3.7.8-1 and 3.7.8-2. Delete the NOTE for CONDITION A, delete current CONDITION B in entirety, renumber CONDITIONS C and D to B and C respectively, and modify CONDITION C text to reference "A or B" vs. "A, B or C." Byron Station refueling outage 15 is complete, therefore, the NOTE and CONDITION B is no longer required and can be removed from this section of the TS. Corresponding TS Bases changes, Item ID 28, are provided for information and approval of the Bases is not requested.

Item ID 15, Table 2-1. Braidwood Station TS, pages 3.7.8-(all). Re-unite the Unit 1 and 2 TS pages, resulting in removal of changes implemented for a one-time 2A SX pump repair. The Braidwood Station Unit 2 planned SX System outage is complete, and the complete-by date of January 23, 2017 is passed making the changed implemented for the one-time 2A SX pump repair obsolete. Only proposed changes to the current Braidwood Station Unit 1 TS are to the footer identifying Units 1 & 2. Corresponding TS Bases changes, Item ID 27, are provided for information and approval of the Bases is not requested.

Item ID 22, Table 2-1. Braidwood Station TS, page 4.0-1. Revise the second sentence of 4.2.1, to remove ", with exceptions as noted below, ". Also, delete the second paragraph of 4.2.1. AREVA NP fuel is no longer in the core (Braidwood Station Unit 1) and will not be reinserted into the core. This item is tied to Item IDs 1 and 5 discussed previously, proposed for removal as Cycles 15, 16, and 17 are complete for Braidwood Station, Unit 1, therefore, this SL text is no longer required and can be removed.

Item ID 26, Table 2-1. Byron Station TS and Braidwood Station TS, page 5.5-21. Delete ", as modified by the following exceptions:" at the end of the first paragraph. Also, delete exceptions 1 and 2. The Type A tests have been completed, and the performance dates have passed, making this text obsolete. See Table 2-3 for the Type A test performance dates.

2.4 Description of Proposed Editorial and Formatting Changes

Table 2-1 identifies all changes including editorial and formatting changes and changes previously identified. The basis for the editorial and formatting changes is sourced from one or more of the following: STS Revision 1, WG, consistency within or among the respective station TS, or guidance from within the TS (e.g., Section 1.2 of TS). The editorial and formatting changes not previously identified, and with no additional discussion other than Table 2-1, are: Item IDs 4, 6-13, 16-21, and 23-25.

License Amendment Request to Delete Obsolete License Conditions and Revise Technical Specifications

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ID	Page	BYR	BWD	Description of Proposed Change
				Delete second half of the Braidwood Station Unit 1 License Condition (Amendment 145). AREVA NP fuel is no longer in
	OL			the core (Braidwood Station, Unit 1) and not to be reinserted
	Appendix		Ň	into the core. Cycles 15, 16, and 17 are complete
1	C-1		X	(Braidwood Station, Unit 1).
				Delete Braidwood Station Units 1 and 2 License Conditions
				(Amenument 140). License Amenument 140 has been
	Appendix			CRE habitability surveillances assessments and
2	C-2		X	measurements are complete.
				Delete Byron Station Units 1 and 2 License Conditions
	OL			(Amendment 151). The first performances of the associated
	Appendix			CRE habitability surveillances, assessments and
3	C-2	Х		measurements are complete.
				Replace current bottom single line with double line, one
				space below last text. From the STS Revision 1 (Reference
4	2.0-1	X	X	1) and WG (Reference 2).
				Delete Safety Limits (SLs) 2.1.1.3.b and 2.1.1.3.c. AREVA
				NP fuel is no longer in the core (Braidwood Station Unit 1)
				and not to be reinserted into the core.
5	20-1		x	Ryron Station SLs
	2.0-1			Benlace current bottom single line with double line one
6	3.0-4	х	x	space below last text. From STS and WG
	0.0 1			Replace current bottom single line with double line, one
7	3.0-6	Х	Х	space below last text. From STS and WG.
				Delete the period "." at the end of SR 3.1.7.1 FREQUENCY.
8	3.1.7-2	Х	Х	From WG.
				Delete "(continued)" following SURVEILLANCE
				REQUIREMENTS as "(continued)" following SR 3.3.1.8, only,
9	3.3.1-13		X	is appropriate. From STS and WG.
				Delete "(continued)" following SURVEILLANCE
10	0.01.11	V		REQUIREMENTS as "(continued)" following SR 3.3.1.8, only,
10	3.3.1-14	X		Is appropriate. From SIS and WG.
11	3/15-3	Y	Y	
<u> </u>	0.4.10-0	~	~	Add "(continued)" below the table on the bottom right to
12	371-1	х	х	indicate continuation of table From STS and WG
	0.7.1	~		Add header at top of page "CONDITION BEOLIBED
13	3.7.1-2	х		ACTION, COMPLETION TIME". From STS and WG.

Table 2-1 Complete Listing of Proposed Changes

License Amendment Request to Delete Obsolete License Conditions and Revise Technical Specifications

Item				
	Page	BAH	RMD	Description of Proposed Change
				Delete the NOTE for CONDITION A, Byron refueling outage
				15 for Unit 2 is complete.
				Delete current CONDITION B In entirety, Byron refueling
				Popumber CONDITIONS C and D to D and C respectively
	378-1			Medify new CONDITIONS C and D to B and C respectively.
14	378-2	x		C" due to deleting CONDITION B
	0.7.0 2			Be-unite TS pages for Braidwood Station Units 1 and 2
				Remove 2A SX changes by deleting Braidwood Station Unit
				2 specific pages Current Unit 1 pages to become Units 1
15	3.7.8-(all)		X	and 2.
				Change left tab formatting of CONDITION C. left justify
				"AND" with the statement of the Condition. From Byron TS
16	3.7.9-2	Х		1.2, Logical Connectors, sub-section BACKGROUND.
				Change left tab formatting of CONDITION E, left justify "OR"
				with the statement of the Condition. From Byron and
				Braidwood TS 1.2, Logical Connectors, sub-section
17	3.7.10-3	Х	Х	BACKGROUND.
				Delete the period "." at the end of SR 3.7.10.4 FREQUENCY.
18	3.7.10-4	Х		From WG.
				Add header at top of page "CONDITION, REQUIRED
19	3.8.4-2	Х	X	ACTION, COMPLETION TIME". From STS and WG.
				Delete "(continued)" following ACTIONS as "(continued)"
				following CONDITION A., only, is appropriate. From STS
20	3.8.5-2	Х	X	and WG.
				Delete "(continued)" following ACTIONS as "(continued)"
01	0000		V	following CONDITION A., only, is appropriate. From STS
21	3.8.8-2		X	and WG.
				Revise 4.2.1, second sentence, remove ', with exceptions as
				APEVA ND fuel is no longer in the care (Proidwood Station
				Lipit 1) and not to be reinserted into the sere (related to TS
				2 1 1 3) Cycles 15 16 and 17 are complete (Praidwood
22	4 0-1		X	Station Unit 1)
	1.0 1		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Change heading to "4.0 DESIGN FEATURES" Note delete
				"(continued)" because section concluded on prior page
23	4.0-2	x	х	From STS and WG.
			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Replace current bottom single line with double line one
				space below last text. Note, Byron Station TS current page
24	4.0-2	x	Х	4.0-3, see next item. From STS and WG.
				Roll page 4.0-3 (section 4.3.2 and 4.3.3) to 4.0-2. delete page
				4.0-3. For consistency between Byron and Braidwood
25	4.0-3	X		Stations TS.

# License Amendment Request to Delete Obsolete License Conditions and Revise Technical Specifications

Item					
ID	Page	BYR	BWD	Description of Proposed Change	
				Delete ', as modified by the following exceptions:' at the end	
				of the first paragraph. Delete exception 1 and 2. Allowance	
26	5.5-21	Х	X	for 15 year periodicity of Type A tests has passed.	
				Re-unite Braidwood Station Units 1 and 2 pages in Bases	
	B 3.7.8			3.7.8, removing changes due to 2A SX repairs. Delete Unit 2	
27	(all)		Х	only bases pages. See item ID 12.	
				Remove Byron Station Bases 3.7.8 text tied to the	
	B 3.7.8-4,			corresponding TS changes in 3.7.8. Byron refueling outage	
28	5	X		15 for Unit 2 is complete. See item ID 11.	

# Table 2-2 CRE Habitability Completion

Specification	Byron Completion Date	Braidwood Completion Date
5.5.18.c.(i)	1/16/2009	1/9/2009
5.5.18.c.(ii)	4/3/2012	2/11/2011
5.5.18.d – Train A	6/26/2008	7/27/2008
5.5.18.d – Train B	8/7/2008	7/26/2008

# Table 2-3 Type A Test Performance Dates

Station/Unit	Performance Date
Byron Station Unit 1	9/27/2012
Byron Station Unit 2	9/26/2014
Braidwood Station Unit 1	9/27/2013
Braidwood Station Unit 2	5/13/2014

# 3.0 TECHNICAL EVALUATION

All proposed changes are administrative in nature and require no technical analysis.

4.0 REGULATORY EVALUATION

## 4.1 Applicable Regulatory Requirements/Criteria

10 CFR 50.36 details the information that must be included in each station's TS. The proposed changes modify or delete time, cycle, or modification-related items that have been implemented or superseded, and are no longer applicable. The proposed changes have no impact on current Safety Limits, Limiting Safety System Settings, Limiting Control Settings, Limiting Conditions for Operation, Surveillance Requirements, Design Features, or Administrative Controls. Therefore, EGC concludes that the methods used to comply with 10 CFR 50.36 are not modified by the proposed changes, and the requirements continue to be met.

## 4.2 No Significant Hazards Determination

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," EGC is requesting amendments to OL Nos. NPF-72 and NPF-77 for Braidwood Station, Units 1 and 2, and OL Nos. NPF-37 and NPF-66 for Byron Station, Units 1

# License Amendment Request to Delete Obsolete License Conditions and Revise Technical Specifications

and 2. The proposed amendments provide for the administrative removal of time, cycle, or modification-related items from the OLs at both stations. These items have been implemented or superseded, are no longer applicable, and therefore, no longer need to be maintained in their associated OL. Additionally, the proposed amendment makes editorial and formatting changes. EGC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment(s) 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 initial conditions and methodologies used in the accident analyses remain unchanged. The proposed changes do not change or alter the design assumptions for the systems or components used to mitigate the consequences of an accident. Therefore, accident analyses results are not impacted.

All changes proposed by EGC in this amendment request are administrative in nature, and are removing one-time requirements that have been satisfied, items that are no longer applicable, or are editorial. There are no physical changes to the facilities, nor any changes to the station operating procedures, limiting conditions for operation, or limiting safety system settings.

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

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

## Response: No

None of the proposed changes affect the design or operation of any system, structure, or component in the plants. The safety functions of the related structures, systems, or components are not changed in any manner, nor is the reliability of any structure, system, or component reduced by the revised surveillance or testing requirements. The changes do not affect the manner by which the facility is operated and do not change any facility design feature, structure, system, or component. No new or different type of equipment will be installed. Since there is no change to the facility or operating procedures, and the safety functions and reliability of structures, systems, or components are not affected, the proposed changes do 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.

# License Amendment Request to Delete Obsolete License Conditions and Revise Technical Specifications

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

Response: No

The proposed changes are administrative in nature and have no impact on the margin of safety of any of the TS. There is no impact on safety limits or limiting safety system settings. The changes do not affect any plant safety parameters or setpoints. The OL Conditions have been satisfied as required.

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

Based on the above, EGC concludes that the proposed changes do not involve a significant hazards consideration as set forth in 10 CFR 50.92(c), "Issuance of Amendment."

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

## 6.0 REFERENCES

- 1. NUREG-1431, "Standard Technical Specifications for Westinghouse Plants," Revision 1, dated April 1995. (NRC ADAMS Accession No. ML13196A405)
- 2. TSTF-GG-05-01, "Writer's Guide for Plant-Specific Improved Technical Specifications," Revision 1, dated August 2010.

# **ATTACHMENT 2**

Proposed Technical Specification Changes for Braidwood Station, Units 1 and 2

#### APPENDIX C

#### ADDITIONAL CONDITIONS

#### FACILITY OPERATING LICENSE NO. NPF-72

The licensee shall comply with the following conditions on the schedules noted below:

Amendment Number

#### Additional Condition

145

Item ID - 1

The safety limit equation specified in TS 2.1.1.3 regarding fuel centerline melt temperature (i.e., less than 5080 °F, decreasing by 58 °F per 10,000 MWD/MTU burnup as described in WCAP-12610-P-A, "VANTAGE+ Fuel Assembly Reference Core Report," April 1995) is valid for uranium oxide fuel without the presence of poisons mixed homogeneously into the fuel pellets. If fuel pellets incorporating homogeneous poisons are used, the topical report documenting the fuel centerline melt temperature basis must be reviewed and approved by the NRC and referenced in this license condition. TS 2.1.1.3 must be modified to also include the fuel centerline melt temperature limit for the fuel with homogeneous poison. During operation in Cycles 15. 16, and 17, up to eight (8) AREVA NP Advanced Mark-BW(A) fuel assemblies containing fuel pellets incorporating homogeneous poisons may be placed in nonlimiting Unit 1 core locations provided the fuel cycle designs are developed such that the TS 2.1.1.3 Safety Limit equation for Westinghouse fuel is bounding. The design basis for the AREVA NP fuel rod centerline melt follows that given in BAW-10162P-A, "TACO3 - Fuel Pin Thermal Analysis Computer Code," October 1989, and BAW-10184P-A, "GDTACO -- Urania Gadolinia Fuel Pin Thermal Analysis Code," February 1995.

Implementation Date

With implementation of the amendment

AMENDMENT NO. 160

# ltem ID - 2

-2-

#### ADDITIONAL CONDITIONS

#### FACILITY OPERATING LICENSE NO. NPF-72

The licensee shall comply with the following conditions on the schedules noted below:

#### Amendment Number 146

#### Additional Condition

(c)

Upon implementation of Amendment No. 146 adopting TSTF-448, Revision 3, the determination of control room envelope (CRE) unfiltered air inleakage as required by SR 3.7.10.4, in accordance with TS 5.5.18.c.(i), the assessment of CRE habitability as required by Specification 5.5.18.c.(ii), and the measurement of CRE pressure as required by Specification 5.5.18.d, shall be considered met. Following implementation:

(a) The first performance of SR 3.7.10.4, in accordance with Specification 5.5.18.c.(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3.0.2, as measured from November/7, 2004, the date of the most recent successful tracer gas test, as stated in the February 7, 2005 letter response to Generic Letter 2003/01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.

(b) The first performance of the periodic assessment of CRE habitability. Specification 5.5.18.c.(ii), shall be within 3 years, plus the 9month allowance of SR 3.0.2, as measured from November 7, 2004, the date of the most recent successful tracer gas test, as stated in the February 7, 2005 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas lest is greater than 3 years.

The first performance of the periodic measurement of CRE pressure, Specification 5.5.18.d, shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from the date of the most recent successful pressure measurement test, or within 138 days if not performed previously. Implementation Date

With implementation of the amendment

AMENDMENT NO. 160

Item ID - 2

#### ADDITIONAL CONDITIONS

-2-

#### FACILITY OPERATING LICENSE NO. NPF-77

The licensee shall comply with the following conditions on the schedules noted below:

#### Amendment Number

146

#### **Additional Condition**

(c)

Upon Implementation of Amendment No. 146 adopting TSTF-448, Revision 3, the determination or control room. envelope (CRE) unfittered air inleakage as required by SR 3.7.10.4, in accordance with TS 5.5.18.c.(i), the assessment of CRE habitability as required by Specification 5.5.18.c.(ii), and the measurement of CRE pressure as required by Specification 5.5.18.d, shall be considered met. Following implementation:

- (a) The first performance of SR 3.7.10.4, in accordance with Specification 5.5.18.c.(I), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3.0.2, as measured from November 7, 2004, the date of the most recent successful tracer gas test, as stated in the February 7, 2005 letter response to Generic Letter 2003-01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.
- (b) The first performance of the periodic assessment of CRE habitability, Specification 5.5.18.c.(ii), shall be within 3 years, plus the 9month allowance of SR 3.0.2, as measured from November 7, 2004, the date of the most recent successful tracer gas test, as stated in the February 7, 2005 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.

The first performance of the periodic measurement of CRE pressure, Specification 5.5.18:d; shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from the date of the most recent successful pressure measurement test, or within 138 days if not performed previously. Implementation Date

With Implementation of the amendment

AMENDMENT NO. 160

### 2.0 SAFETY LIMITS (SLs)

# 2.1 SLs

tem ID - 5

Item ID - 4

2.1.1 <u>Reactor Core SLs</u>

In MODES 1 and 2, the combination of THERMAL POWER, Reactor Coolant System (RCS) highest loop average temperature, and pressurizer pressure shall not exceed the limits specified in the COLR; and the following SLs shall not be exceeded.

SLs 2.0

- 2.1.1.1 In MODE 1, the Departure from Nucleate Boiling Ratio (DNBR) shall be maintained  $\geq 1.24$  for the WRB-2 DNB correlation for a thimble cell,  $\geq 1.25$  for the WRB-2 DNB correlation for a typical cell and  $\geq 1.19$  for the ABB-NV DNB correlation for a thimble cell and a typical cell.
- 2.1.1.2 In MODE 2, the DNBR shall be maintained  $\geq$  1.17 for the WRB-2 DNB correlation, and  $\geq$  1.13 for the ABB-NV DNB correlation and  $\geq$  1.18 for the WLOP DNB correlation.
- ⇒ 2.1.1.3 In MODES 1 and 2, the peak fuel centerline temperature shall be maintained as follows:
  - a. < 5080°F decreasing by 58°F per 10,000 MWD/MTU burnup for Westinghouse fuel,
  - b. < 5173°F decreasing by 65°F per 10,000 MWD/MTU burnup for AREVA NP fuel (Unit 1 only), and

c. < 5189°F decreasing by 65°F per 10,000 MWD/MTU burnup for AREVA NP fuel containing Gadolinia (Unit 1 only).

2.1.2 RCS Pressure SL

In MODES 1, 2, 3, 4, and 5, the RCS pressure shall be maintained  $\leq$  2735 psig.

- 2.2 SL Violations
  - 2.2.1 If SL 2.1.1 is violated, restore compliance and be in MODE 3 within 1 hour.
  - 2.2.2 If SL 2.1.2 is violated:
    - 2.2.2.1 In MODE 1 or 2, restore compliance and be in MODE 3 within 1 hour.

2.2.2.2 In MODE 3, 4, or 5, restore compliance within 5 minutes

BRAIDWOOD - UNITS 1 & 2 2.0 - 1 Amendment 174

# 3.0 LCO Applicability

LCO 3.0.7 Exception LCOs allow specified Technical Specification (TS) requirements to be changed to permit performance of special tests and operations. Unless otherwise specified, all other TS requirements remain unchanged. Compliance with Exception LCOs is optional. When an Exception LCO is desired to be met but is not met, the ACTIONS of the Exception LCO shall be met. When an Exception LCO is not desired to be met, entry into a MODE or other specified condition in the Applicability shall be made in accordance with the other applicable Specifications.

LCO 3.0.8 LCOs, including associated ACTIONs, shall apply to each unit individually, unless otherwise indicated. Whenever the LCO refers to a system or component that is shared by both units, the ACTIONs will apply to both units simultaneously.



### 3.0 SR APPLICABILITY

SR 3.0.3 If it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is greater. This delay period is permitted to allow performance of the Surveillance. A risk evaluation shall be performed for any Surveillance delayed greater than 24 hours and the risk impact shall be managed.

> If the Surveillance is not performed within the delay period, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.

When the Surveillance is performed within the delay period and the Surveillance is not met, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.

SR 3.0.4 Entry into a MODE or other specified condition in the Applicability of an LCO shall only be made when the LCO's Surveillances have been met within their specified Frequency, except as provided by SR 3.0.3. When an LCO is not met due to Surveillances not having been met, entry into a MODE or other specified condition in the Applicability shall only be made in accordance with LCO 3.0.4

This provision shall not prevent entry into MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.

SR 3.0.5 SRs shall apply to each unit individually, unless otherwise indicated.



ACTIONS (continued)

CONDITION		REQUIRED ACTION		COMPLETION TIME
С.	One demand position indicator per bank inoperable for one or more banks.	C.1.1	Verify by administrative means all DRPIs for the affected bank(s) are OPERABLE.	Once per 8 hours
		<u>AND</u>		
		C.1.2	Verify the most withdrawn rod and the least withdrawn rod of the affected bank(s) are ≤ 12 steps apart.	Once per 8 hours
		<u>OR</u>		
		C.2	Reduce THERMAL POWER to $\leq$ 50% RTP.	8 hours
D.	Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	6 hours

# SURVEILLANCE REQUIREMENTS

		FREQUENCY	
SR	3.1.7.1	Prior to criticality after each removal of the reactor head.	
		Item ID - 8	

BRAIDWOOD - UNITS 1 & 2 3.1.7 - 2



SURVEILLANCE REQUIREMENTS (continued)

		FREQUENCY	
SR	3.3.1.8	(continued)	In accordance with the Surveillance Frequency Control Program
SR	3.3.1.9	Verification of setpoint is not required.	
		Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR	3.3.1.10	This Surveillance shall include verification that the time constants are adjusted to the prescribed values.	
		Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR	3.3.1.11	Neutron detectors are excluded from CHANNEL CALIBRATION.	
		Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

(continued)

Item ID - 1 Insert table	1 e hea	ider		RCS Leakage Detecti	on Instrumentation 3.4.15	
		MISY (continued)		~~~~~~	~~~~~~	$\sim$
	-D,	Required Action and	Bill	Berin MODE 3.	6 hours	, j
	associated Completion Time not met.		AND			
			D.2	Be in MODE 5.	36 hours	I
_	Ε.	All required monitors inoperable.	E.1	Enter LCO 3.0.3.	Immediately	I

# SURVEILLANCE REQUIREMENTS

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		SURVEILLANCE	FREQUENCY
SR	3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR	3.4.15.2	Perform COT of the required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR	3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump monitor.	In accordance with the Surveillance Frequency Control Program
SR	3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program

BRAIDWOOD - UNITS 1 & 2 3.4.15 - 3

# 3.7 PLANT SYSTEMS

3.7.1 Main Steam Safety Valves (MSSVs)

LCO 3.7.1 Five MSSVs per steam generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

# ACTIONS

Separate Condition entry is allowed for each MSSV.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more steam generators with one or more MSSVs inoperable.	A.1 Reduce THERMAL POWER to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs.	4 hours
	AND	
	A.2NOTE Only required in Mode 1.	
	Reduce the Power Range Neutron Flux - High reactor trip setpoint to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs.	36 hours
	(Item ID - 12	(continued)
BRAIDWOOD — UNITS 1 & 2	(Insert '(continued)') 3.7.1 – 1	Amendment 128

# 3.7 PLANT SYSTEMS

3.7.8 Essential Service Water (SX) System

- The following SX trains shall be OPERABLE: LCO 3.7.8
  - Two unit-specific SX trains; and a.
  - One opposite-unit SX train for unit-specific support. b.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION		REQUIRED ACTION	COMPLETION TIME	
A. One unit-specific SX train inoperable.	A.1	<pre>1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources- Operating," for Emergency Diesel Generator made inoperable by SX.</pre>		
		2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops- MODE 4," for Residual Heat Removal loops made inoperable by SX.		
		Restore unit-specific SX train to OPERABLE status.	72 hours	
		La construction de la constructi	(continued)	
Item ID - 15				
Re-unite Units 1 and 2 pages				

BRAIDWOOD  $\neq$  UNITS 1 8

ACTIONS (continued)							
	CONDITION		REQUIRED ACTION	COMPLETION TIME			
Β.	Opposite-unit SX train inoperable.	B.1	Restore opposite-unit SX train to OPERABLE status.	7 days			
С.	Required Action and associated Completion Time of Condition A or	C.1 <u>AND</u>	Be in MODE 3.	6 hours			
	B NOT MET.	C.2	Be in MODE 5.	36 hours			

Item ID - 15 Re-unite Units 1 and 2 pages BRAIDWOOD - UNITS 1 & 2

SURVEILLANCE REQUIREMENTS

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			SURVEILLANCE	FREQUENCY
	SR	3.7.8.1	NOTE- Isolation of SX flow to individual components does not render the SX System inoperable. Verify each unit-specific SX manual, power operated, and automatic valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
	SR	3.7.8.2	Not required when opposite unit is in MODE 1, 2, 3, or 4.	
			Operate the opposite-unit SX pump for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program
	SR	3.7.8.3	Cycle each opposite-unit SX crosstie valve that is not secured in the open position with power removed.	In accordance with the Surveillance Frequency Control Program
	SR	3.7.8.4	Verify each unit-specific SX automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
~~~~~	SR	3.7.8.5	Verify each unit-specific SX pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
Item ID - 1	5 Inite	1 and 2 name		
	BRAI	DWOOD - UN	ÎT <u>§</u> 1 <u>& 2</u> 3.7.8 – 3	Amendment 16

3.7 PLANT SYSTEMS

3.7.8 Essential Service Water (SX) System

- LCO 3.7.8 The following SX trains shall be OPERABLE:
 - a. Two unit-specific SX trains; and
 - b. One opposite unit SX train for unit-specific support.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One unit-specific SX train-inoperable.	NOTES 1. Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources-Operating," for Emergency Diesel Generator made inoperable by SX.	
	2. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops-MODE 4," for Residual Heat Removal loops made inoperable by SX.	
		(continued)



BRAIDWOOD UNIT 2

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.1 Not applicable to Unit 2 during repair of the 2A SX pump during the one-time Unit 2 planned SX System outage to be completed no later than January 23, 2017. Restore unit-specific SX train to OPERABLE status.	72 hours
	<u>OR</u>	
	A.2 Applicable to Unit 2 during repair of the 2A SX pump during the one-time planned SX System outage to be completed no later than January 23, 2017. Allowance of the extended completion time is contingent on meeting the compensatory measures described in EGC submittal letter RS-16-197.	
	Restore unit-specific SX train to OPERABLE status.	200 hours
B. Opposite-unit SX train inoperable.	B.1 Restore opposite-unit SX train to OPERABLE status.	7 days
/ Item ID - 15	II	(continued)
Re-unite Units 1 and 2 pages		
BRAIDWOOD UNIT 2	3.7.8 2	Amendment 191

ACTIONS (continued)

CONDITION		REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or	C.1 <u>AND</u>	Be in MODE 3.	6 hours
B-HOL-HICL.	C.2	Be-in-MODE-5.	36 hours

SURVEILLANCE REQUIREMENTS

			SURVEILLA	NCE	FREQUENCY
	SR	3.7.8.1	Isolation of SX f components does n inoperable.	NOTE low to individual ot render the SX System	
			Verify each unit- operated, and aut path servicing sa that is not locked secured in position.	specific SX manual, power omatic valve in the flow fety related equipment, d, sealed, or otherwise on, is in the correct	In accordance with the Surveillance Frequency Control Program
	SR	3.7.8.2	Not required when MODE 1, 2, 3, or	NOTE opposite unit is in 4.	
			Operate the oppos ≥ 15 minutes.	ite-unit SX pump for	In accordance with the Surveillance Frequency Control Program
-	SR	3.7.8.3	Cycle each opposi that is not secure with power removed	te-unit SX crosstie valve ed in the open position d.	In accordance with the Surveillance Frequency Control Program
Item ID	- 15	YYYY	<u>}</u>		(continued)
Re-unite	Uni	ts 1 and 2 pa	ges		
}	BRAI	DWOOD UNI	7_2	3.7.8 3	Amendment-191

SURVEILLANCE REQUIREMENTS (continued)

		FREQUENCY	
SR	3.7.8.4	Verify each unit specific SX automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR	3.7.8.5	Verify each unit-specific SX pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

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BRAIDWOOD UNIT 2

, ltem ID - 17

Further indent 'OR'

ACTIONS (continued)		
CONDITION	REQUIRED ACTION	COMPLETION TIME
E. Two VC Filtration System trains inoperable in MODE 5 or 6, or during movement of irradiated	E.1 Suspend movement of irradiated fuel assemblies.	Immediately
<u>OR</u> OR One or more VC Filtration System trains inoperable due to an inoperable CRE boundary in MODE 5 or 6, or during movement of irradiated fuel assemblies.	E.2 Suspend positive reactivity additions.	Immediately
F. Two VC Filtration System trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	F.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

	FREQUENCY		
SR 3.7.10.1	Oper with a. b.	rate each VC Filtration System train Flow through the makeup system filters for ≥ 15 continuous minutes with the heaters operating; and Flow through the recirculation charcoal adsorber for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program
			(+

(continued)

BRAIDWOOD - UNITS 1 & 2

Amendment 177

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-	Ins	ser	t ta	ble	he	ead	ler											
-	(C	on	ditio	on,	Re	equ	iire	d A	Actio	on,	Сс	om	ole	tior	n Ti	me	÷)	

ζ	ACTY	OWS (continued)	\sim			$\mathbf{}$
(B	One DC electricat power division crosstied to opposite-unit DC electrical power subsystem that has an inoperable battery charger, while opposite unit is in MODE 1, 2, 3, or 4.	rBitre	Open at least one crosstie breaker between the crosstied divisions.	-204 Hours	Ć
	С.	One DC electrical power division crosstied to opposite-unit DC electrical power subsystem with an inoperable source, while opposite unit is in MODE 5, 6, or defueled.	C.1 <u>AND</u> C.2	Only required when opposite unit has an inoperable battery. Verify opposite-unit DC bus load ≤ 200 amps. Open at least one crosstie breaker between the crosstied divisions.	Once per 12 hours 7 days	
_	D.	One DC electrical power subsystem inoperable for reasons other than Condition A, B, or C.	D.1	Restore DC electrical power subsystem to OPERABLE status.	2 hours	
	Ε.	Required Action and Associated Completion Time not met.	E.1 <u>AND</u>	Be in MODE 3.	6 hours	
=			E.2	Be in MODE 5.	36 hours	

Item ID - 20

DC Sources-Shutdown 3.8.5

ACTIONS (continued)

CONDITION		REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.1 Suspend CORE ALTERATIONS.		Immediately
	<u>AND</u>		
	A.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
	AND		
	A.2.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND		
	A.2.4	Initiate action to restore required DC electrical power subsystem to OPERABLE status.	Immediately
	AND		
	A.2.5	Declare affected Low Temperature Overpressure Protection feature(s) inoperable.	Immediately

(continued)

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ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	A.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
	AND		
	A.2.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND		
	A.2.4	Initiate action to restore required inverters to OPERABLE status.	Immediately
	AND		
	A.2.5	Declare affected Low Temperature Overpressure Protection feature(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE			FREQUENCY
SR	3.8.8.1	Verify correct inverter voltage and breaker alignment to required AC instrument buses.	In accordance with the Surveillance Frequency Control Program

4.0 DESIGN FEATURES

4.1 Site

· Item ID - 22

4.1.1 <u>Site Location</u>

The site is located in Reed Township, approximately 20 mi (32 km) south-southwest of the city of Joliet in northern Illinois.

4.1.2 Exclusion Area Boundary (EAB)

The EAB shall not be less than 1591 ft (485 meters) from the outer containment wall.

4.1.3 Low Population Zone (LPZ)

The LPZ shall be a 1.125 mi (1811 meter) radius measured from the midpoint between the two reactors.

4.2 Reactor Core

1

4.2.1 Fuel Assemblies

The reactor shall contain 193 fuel assemblies. Each assembly, with exceptions as noted below, shall consist of a matrix of Zircaloy, ZIRLO[®], or Optimized ZIRLO^M clad fuel rods with an initial composition of natural or slightly enriched uranium dioxide (UO_2) as fuel material. Limited substitutions of zirconium alloy or stainless steel filler rods or vacancies for fuel rods, in accordance with approved applications of fuel rod configurations, may be used. Fuel assemblies shall be limited to those fuel designs that have been analyzed with applicable NRC staff approved codes and methods and shown by tests or analyses to comply with all fuel safety design bases. A limited number of lead test assemblies that have not completed representative testing may be placed in nonlimiting core regions.

Up to 8 AREVA NP Advanced Mark-BW(A) fuel assemblies containing M5 alloy may be placed in nonlimiting Unit 1 core regions for evaluation during Cycles 15, 16, and 17.

4.2.2 Control Rod Assemblies

The reactor core shall contain 53 control rod assemblies. The control material shall be silver indium cadmium, hafnium, or a mixture of both types.



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- 4.3 Fuel Storage
 - 4.3.1 <u>Criticality</u>

The spent fuel storage racks are designed and shall be maintained, as applicable, with:

- a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent;
- b. For Holtec spent fuel pool storage racks, $k_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Holtec International Report HI-982094, "Criticality Analysis for Byron/Braidwood Rack Installation Project," Project No. 80944, 1998;
- c. For Holtec spent fuel pool storage racks, a nominal 10.888 inch north-south and 10.574 inch east-west center to center distance between fuel assemblies placed in Region 1 racks; and
- d. For Holtec spent fuel pool storage racks, a nominal 8.97 inch center to center distance between fuel assemblies placed in Region 2 racks.
- 4.3.2 Drainage

The spent fuel pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 410 ft, 0 inches.

4.3.3 <u>Capacity</u>

The spent fuel pool is designed and shall be maintained with a storage capacity limited to no more than 2984 fuel assemblies.



5.5 Programs and Manuals

5.5.15 <u>Safety Function Determination Program (SFDP)</u> (continued)

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

5.5.16 <u>Containment Leakage Rate Testing Program</u>

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, September 1995 and NEI 94-01, Revision 0, as modified by the following exceptions:

- 1. NEI 94-01 1995, Section 9.2.3: The first Unit 1 Type A test performed after the October 5, 1998 Type A test shall be performed no later than October 5, 2013.
- 2. NEI 94-01 1995, Section 9.2.3: In support of the Spring 2014 refueling outage, Unit 2 shall be placed in a MODE of operation where containment is not required to be OPERABLE in accordance with Technical Specification 3.6.1, "Containment," no later than May 4, 2014. The first Unit 2 Type A test performed after the May 4, 1999 Type A test shall be performed prior to entering MODE 4 at the start of Unit 2, Cycle 18.

The peak calculated containment internal pressure for the design basis loss of coolant accident, $P_{\rm a},$ is 42.8 psig for Unit 1 and 38.4 psig for Unit 2

The maximum allowable containment leakage rate, L_a , at P_a , shall be 0.20% of containment air weight per day.

Leakage Rate acceptance criteria are:

a. Containment leakage rate acceptance criterion is $\leq 1.0~L_a.$ During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $< 0.60~L_a$ for the Type B and C tests and $< 0.75~L_a$ for Type A tests; and

tem ID - 26
ATTACHMENT 3

Proposed Technical Specification Changes for Byron Station, Units 1 and 2



ADDITIONAL CONDITIONS

-2-

FACILITY OPERATING LICENSE NO. NPF-37

The licensee shall comply with the following conditions on the schedules noted below:

Amendmeni			Implementation
Number	<u>Additi</u>	onal Condition	Date
Number 151	Addition Upon adopti of con inleak accord CRE I 5.5.18 as rec consid (a)	implementation of Amendment No. 151 ing TSTF-448, Revision 3, the determination trol room envelope (CRE) unfiltered air age as required by SR 3.7.10.4, in dance with TS 5.5.18.c.(i), the assessment of nabitability as required by Specification c.(ii), and the measurement of CRE pressure uired by Specification 5.5.18.d, shalf be dered met. Following implementation: The first performance of SR 3.7.10.4, in accordance with Specification 5.5.18.c.(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3.0.2, as measured from November 1, 2004, the date of the most recent successful tracer gas test, as stated in the January 31, 2005 letter response to Generic Letter 2003-01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.	Uate With imple- mentation of the amendment
	(b) (c)	The first performance of the periodic assessment of CRE habitability, Specification 5.5.18.c.(ii), shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from November 1, 2004, the date of the most recent successful tracer gas test, as stated in the January 31, 2005 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years. The first performance of the periodic measurement of CRE pressure, Specification 5.5.18.d, shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.	
			AMENDMENT NO.

165

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- 2 -

Item ID - 3

ADDITIONAL CONDITIONS

FACILITY OPERATING LICENESE NO. NPF-66

The licensee shall comply with the following conditions on the schedules noted below:

Amendment		Implementation
Number Addition	onal Condition	Date
151 Upon TSTF envelo 3.7.10 of CR and th Speci impler	implementation of Amendment No. 151 adopting 448, Revision 3, the determination of control room ope (CRE) unfiltered air inleakage as required by SR 0.4, in accordance with TS 5.5.18.c.(i), the assessment E habitability as required by Specification 5.5.18.c.(ii), he measurement of CRE pressure as required by fication 5 5.18.d, shall be considered met. Following mentation:	With implementation of the amendment
(a)	The first performance of SR 3.7.10.4, in accordance with Specification 5.5.18.c.(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 3 0.2, as measured from November 1, 2004, the date of the most recent successful tracer gas test, as stated in the January 31, 2005 letter response to Generic Letter 2003-01, or within the next 18 months if the time period since the most recent successful tracer gas test is greater than 6 years.	
(b)	The first performance of the periodic assessment of CRE habitability, Specification 5.5.18.c.(ii), shall be within 3 years, plus the 9-month allowance of SR 3.0.2, as measured from November 1, 2004, the date of the most recent successful tracer gas test, as stated in the January 31, 2005 letter response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.	
(с)	The first performance of the periodic measurement of CRE pressure, Specification 5.5.18.d, shall be within 18 months, plus the 138 days allowed by SR 3.0.2, as measured from the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.	
	Renewed L	icense No. NPF-66.

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 <u>Reactor Core SLs</u>

In MODES 1 and 2, the combination of THERMAL POWER, Reactor Coolant System (RCS) highest loop average temperature, and pressurizer pressure shall not exceed the limits specified in the COLR; and the following SLs shall not be exceeded.

- 2.1.1.1 In MODE 1, the Departure from Nucleate Boiling Ratio (DNBR) shall be maintained ≥ 1.24 for the WRB-2 DNB correlation for a thimble cell, ≥ 1.25 for the WRB-2 DNB correlation for a typical cell and ≥ 1.19 for the ABB-NV DNB correlation for a thimble cell and a typical cell.
- 2.1.1.2 In MODE 2, the DNBR shall be maintained \geq 1.17 for the WRB-2 DNB correlation, and \geq 1.13 for the ABB-NV DNB correlation and \geq 1.18 for the WLOP DNB correlation.
- 2.1.1.3 In MODES 1 and 2, the peak fuel centerline temperature shall be maintained < 5080°F, decreasing by 58°F per 10,000 MWD/MTU burnup.
- 2.1.2 RCS Pressure SL

In MODES 1, 2, 3, 4, and 5, the RCS pressure shall be maintained \leq 2735 psig.

2.2 SL Violations

- 2.2.1 If SL 2.1.1 is violated, restore compliance and be in MODE 3 within 1 hour.
- 2.2.2 If SL 2.1.2 is violated:
 - 2.2.2.1 In MODE 1 or 2, restore compliance and be in MODE 3 within 1 hour.



3.0 LCO Applicability

LCO 3.0.7 Exception LCOs allow specified Technical Specification (TS) requirements to be changed to permit performance of special tests and operations. Unless otherwise specified, all other TS requirements remain unchanged. Compliance with Exception LCOs is optional. When an Exception LCO is desired to be met but is not met, the ACTIONS of the Exception LCO shall be met. When an Exception LCO is not desired to be met, entry into a MODE or other specified condition in the Applicability shall be made in accordance with the other applicable Specifications.

LCO 3.0.8 LCOs, including associated ACTIONs, shall apply to each unit individually, unless otherwise indicated. Whenever the LCO refers to a system or component that is shared by both units, the ACTIONs will apply to both units simultaneously.



3.0 SR APPLICABILITY

SR 3.0.3 If it is discovered that a Surveillance was not performed within its specified Frequency, then compliance with the requirement to declare the LCO not met may be delayed, from the time of discovery, up to 24 hours or up to the limit of the specified Frequency, whichever is greater. This delay period is permitted to allow performance of the Surveillance. A risk evaluation shall be performed for any Surveillance delayed greater than 24 hours and the risk impact shall be managed.

If the Surveillance is not performed within the delay period, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.

When the Surveillance is performed within the delay period and the Surveillance is not met, the LCO must immediately be declared not met, and the applicable Condition(s) must be entered.

SR 3.0.4 Entry into a MODE or other specified condition in the Applicability of an LCO shall only be made when the LCO's Surveillances have been met within their specified Frequency, except as provided by SR 3.0.3. When an LCO is not met due to Surveillances not having been met, entry into a MODE or other specified condition in the Applicability shall only be made in accordance with LCO 3.0.4.

This provision shall not prevent entry into MODES or other specified conditions in the Applicability that are required to comply with ACTIONS or that are part of a shutdown of the unit.



ntinued)	
1	itinued)

CONDITION			REQUIRED ACTION	COMPLETION TIME
С.	One demand position indicator per bank inoperable for one or more banks.	C.1.1	Verify by administrative means all DRPIs for the affected bank(s) are OPERABLE.	Once per 8 hours
		AND		
		C.1.2	Verify the most withdrawn rod and the least withdrawn rod of the affected bank(s) are ≤ 12 steps apart.	Once per 8 hours
		<u>OR</u>		
		C.2	Reduce THERMAL POWER to \leq 50% RTP.	8 hours
D.	Required Action and associated Completion Time not met.	D.1	Be in MODE 3.	6 hours

SURVEILLANCE REQUIREMENTS

		FREQUENCY	
SR	3.1.7.1	Prior to criticality after each removal of the reactor head.	
		Item ID - 8	

BYRON - UNITS 1 & 2



SURVEILLANCE REQUIREMENTS (continued)

		FREQUENCY	
SR	3.3.1.8	(continued)	In accordance with the Surveillance Frequency Control Program
SR	3.3.1.9	Verification of setpoint is not required.	
		Perform TADOT.	In accordance with the Surveillance Frequency Control Program
SR	3.3.1.10	This Surveillance shall include verification that the time constants are adjusted to the prescribed values.	
		Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR	3.3.1.11	Neutron detectors are excluded from CHANNEL CALIBRATION.	
		Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

(continued)

Item ID - 1 Insert table (Condition	1 e head , Req	der uired Action, Completion Time		RCS Leakage Detecti	on Instrumentation 3.4.15	
AE	<u>ACTI</u>	Required Action and associated Completion Time not met.	0.1 <u>AND</u> D.2	Be in MODE 5.	36 hours	
	Ε.	All required monitors inoperable.	E.1	Enter LCO 3.0.3.	Immediately	l

SURVEILLANCE REQUIREMENTS

		SURVEILLANCE	FREQUENCY
SR	3.4.15.1	Perform CHANNEL CHECK of the required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR	3.4.15.2	Perform COT of the required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR	3.4.15.3	Perform CHANNEL CALIBRATION of the required containment sump monitor.	In accordance with the Surveillance Frequency Control Program
SR	3.4.15.4	Perform CHANNEL CALIBRATION of the required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.1 Main Steam Safety Valves (MSSVs)

LCO 3.7.1 Five MSSVs per steam generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

Separate Condition entry is allowed for each MSSV.

CONDITION			REQUIRED ACTION	COMPLETION TIME
Α.	One or more steam generators with one or more MSSVs inoperable.	A.1	Reduce THERMAL POWER to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs.	4 hours
		AND		
		A.2	Only required in Mode 1.	
			Reduce the Power Range Neutron Flux- High reactor trip setpoint to less than or equal to the Maximum Allowable % RTP specified in Table 3.7.1-1 for the number of OPERABLE MSSVs.	36 hours
		1		(continued)
			ltem ID - 1	23

BYRON - UNITS 1 & 2

- Item ID - 13	\mathcal{Z}		MSSVs
 Insert table header 	5		3.7.1
- (Condition, Required Action, Completion Time	e)		
ACTIONS (continued)	\mathcal{L}		
Auron	\sim		
B. Required Action and associated Completion	B.P	Betin MOBE 3.	6 hours
Time not met.	AND		
<u>OR</u>	В.2	Be in MODE 4.	12 hours
One or more steam generators with ≥ 4 MSSVs inoperable.			

SURVEILLANCE REQUIREMENTS

		FREQUENCY	
SR	3.7.1.1	Only required to be performed in MODES 1 and 2. Verify each required MSSV lift setpoint per Table 3.7.1-2 in accordance with the	In accordance
		Inservice Testing Program. Following testing, lift setting shall be within $\pm 1\%$.	Inservice Testing Program

3.7 PLANT SYSTEMS

3.7.8 Essential Service Water (SX) System

LCO 3.7.8 The following SX trains shall be OPERABLE:

- a. Two unit-specific SX trains; and
- b. One opposite-unit SX train for unit-specific support.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

Item

CONDITION	CONDITION REQUIRED ACTION	
A. Not applicable to Unit 1 during replacement of the SX-suction isolation valves (i.e., 1SX001A and 2SX001A) during Unit 2 Refueling 15 while Unit 2 is in MODE 5, 6, or defueled. One unit-specific SX train inoperable.	 A.1NOTES	72 hours

(continued)

ACTI	ONS (continued)			
Item ID - 14	CONDITION		REQUIRED ACTION	COMPLETION TIME
B.	NOTE Only applicable to Unit 1 during replacement of the SX suction isolation valves (i.e., 1SX001A and 2SX001A) during Unit 2 Refueling 15 while Unit 2 is in MODE 5, 6, or defueled. One unit-specific SX train inoperable.	8.1	 NOTES Enter applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources- Operating," for Emergency Diesel Generator made inoperable by SX. Enter applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops- MODE 4," for Residual Heat Removal loops made inoperable by SX. 	
			Restore unit-specific SX train to OPERABLE status.	144 hours
<u>B</u> C .	Opposite-unit SX train inoperable.	C.1	Restore opposite-unit SX train to OPERABLE status.	7 days
C B. T	Required Action and associated Completion Time of Condition A , B	D.1 <u>AND</u>	Be in MODE 3.	6 hours
	or that met. or B	ĴD.2	Be in MODE 5.	36 hours
(Item ID - 14	Litem ID	- 14		
Renumber CC	ONDITIONs C and D Change	e 'A, B or C	' to 'A or B'	

BYRON — UNITS 1 & 2

Item ID - 16 Further			UHS 3.7.9
ACTIONS (continued)	I		
CONDITION		REQUIRED ACTION	COMPLETION TIME
C. Outside air wet bulb temperature > 76°F. <u>AND</u> <u>AND</u> Any electrical division not capable	C.1 <u>AND</u>	Verify OPERABLE SXCT fans are capable of being powered by an OPERABLE emergency power source.	1 hour
at least one OPERABLE SXCT fan.	C.2	Restore SXCT fan configuration such that each electrical division is capable of providing power to at least one OPERABLE SXCT fan.	72 hours
D. SX pump discharge water temperature	D.1	Be in MODE 3.	6 hours
- 301.	AND		
	D.2	Be in MODE 5.	36 hours
E. One or more basin level(s) < 60%.	E.1	Restore both basin levels to \geq 60%.	6 hours

(continued)

Item ID - 17

Further indent 'OR'

ACTIONS (continued)

	CONDITION		REQUIRED ACTION		COMPLETION TIME
E	E.	E. Two VC Filtration System trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies. OR OR One or more VC Filtration System trains inoperable due to an inoperable CRE boundary in MODE 5 or 6, or during movement of irradiated fuel assemblies.		Suspend movement of irradiated fuel assemblies. Suspend positive reactivity additions.	Immediately Immediately
	F.	Two VC Filtration System trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	F.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

		FREQUENCY		
SR	3.7.10.1	Oper with a.	ate each VC Filtration System train : Flow through the makeup system filters for ≥ 15 continuous minutes with the heaters operating; and	In accordance with the Surveillance Frequency Control Program
		b.	Flow through the recirculation charcoal adsorber for \geq 15 minutes.	
				(continued)

<u>SURV</u>	'EILLANCE RE	QUIREMENTS (continued)	
		SURVEILLANCE	FREQUENCY
SR	3.7.10.2	Perform required VC Filtration System filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR	3.7.10.3	Verify each VC Filtration System train actuates on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR	3.7.10.4	Perform required CRE unfiltered air inleakage testing in accordance with the Control Room Envelope Habitability Program.	In accordance with the Control Room Envelope Habitability Program . A
		Item ID - 18	

6	* * * * * * * * * * * * * * * * * * * *	
5	Item ID - 19	-
5	Insert table header	-
4	(Condition, Required Action, Completion Time)	-

B: OF B: OF CI OF CI OF CI OF OF OF OF OF OF OF OF OF OF		One DC electrical power division crosstied to opposite-unit DC electrical power subsystem that has an inoperable battery charger, while opposite unit is in MODE 1, 2, 3, or 4.	Bili	Opèn at lèast òne crosstie breaker between the crosstied divisions.	204 Hours
	С.	One DC electrical power division crosstied to opposite-unit DC electrical power subsystem with an inoperable source, while opposite unit is in MODE 5, 6, or defueled.	C.1 <u>AND</u> C.2	Only required when opposite unit has an inoperable battery. Verify opposite-unit DC bus load ≤ 200 amps. Open at least one crosstie breaker between the crosstied divisions.	Once per 12 hours 7 days
	D.	One DC electrical power subsystem inoperable for reasons other than Condition A, B, or C.	D.1	Restore DC electrical power subsystem to OPERABLE status.	2 hours
	Ε.	Required Action and Associated Completion Time not met.	E.1 <u>AND</u> E.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours

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> Item ID - 20	~
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	١.
	V

DC Sources-Shutdown 3.8.5

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2.1	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
	A.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
	AND		
	A.2.3	Initiate action to suspend operations involving positive reactivity additions.	Immediately
	AND		
	A.2.4	Initiate action to restore required DC electrical power subsystem to OPERABLE status.	Immediately
	<u>AND</u>		
	A.2.5	Declare affected Low Temperature Overpressure Protection feature(s) inoperable.	Immediately

(continued)



- 4.3 Fuel Storage
 - 4.3.1 Criticality

The spent fuel storage racks are designed and shall be maintained, as applicable, with:

- a. Fuel assemblies having a maximum U-235 enrichment of 5.0 weight percent;
- b. A $k_{eff} \leq 0.95$ if fully flooded with unborated water, which includes an allowance for uncertainties as described in Holtec International Report HI-982094, "Criticality Analysis for Byron/Braidwood Rack Installation Project," Project No. 80944, 1998;
- c. A nominal 10.888 inch north-south and 10.574 inch east-west center to center distance between fuel assemblies placed in Region 1 racks; and
- d. A nominal 8.97 inch center to center distance between fuel assemblies placed in Region 2 racks.



DESIGN FEATURES (continued)

4.3.2 Drainage The spent fuel pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 410 ft, 0 inches. 4.3.3 <u>Capacity</u> The spent fuel pool is designed and shall be maintained with a storage capacity limited to no more than 2984 fuel assemblies. 1 1 Item ID - 25 Roll 4.3.2 and 4.3.3 to page 4.0-2 λ



5.5 Programs and Manuals

5.5.15 <u>Safety Function Determination Program (SFDP)</u> (continued)

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

5.5.16 <u>Containment Leakage Rate Testing Program</u>

A program shall be established to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50, Appendix J, Option B, as modified by approved exemptions. This program shall be in accordance with the guidelines contained in Regulatory Guide 1.163, September 1995 and NEI 94-01, Revision 0, as modified by the following exceptions:

- 1. NEI 94-01 1995, Section 9.2.3: The first Unit 1 Type A test performed after the February 19, 1998 Type A test shall be performed no later than February 19, 2013.
- 2. NEI 94-01 1995, Section 9.2.3: The first Unit 2 Type A test performed after the November 2, 1999 Type A test shall be performed no later than November 2, 2014.

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a , is 42.8 psig for Unit 1 and 38.4 psig for Unit 2

The maximum allowable containment leakage rate, L_a , at P_a , shall be 0.20% of containment air weight per day.

Leakage Rate acceptance criteria are:

a. Containment leakage rate acceptance criterion is $\leq 1.0 L_a$. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are < 0.60 L_a for the Type B and C tests and < 0.75 L_a for Type A tests; and

tem ID - 26

ATTACHMENT 4

Proposed Technical Specification Bases Changes for Braidwood Station, Units 1 and 2

B 3.7 PLANT SYSTEMS

B 3.7.8 Essential Service Water (SX) System

BASES

BACKGROUND The SX System provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation, and a normal shutdown, the SX System also provides this function for various safety related and nonsafety related components. The safety related function is covered by this LCO.

> The unit-specific SX System consists of two separate, electrically independent, 100% capacity, safety related, cooling water trains. Each train consists of a 100% capacity pump, piping, valving, and instrumentation. The pumps and valves are remote and manually aligned, except in the unlikely event of a Loss Of Coolant Accident (LOCA). The pumps are automatically started upon receipt of a safety injection signal or an undervoltage on the ESF bus, and all essential valves are aligned to their post accident positions (Diesel Generator (DG) supply valves are opened once the DG has reached sufficient rpm). The SX System is the backup water supply to the Auxiliary Feedwater System.

> The SX System includes provisions to crosstie the trains (unit-specific crosstie), as well as provisions to crosstie the units (opposite-unit crosstie). The opposite-unit crosstie valves (1SX005 and 2SX005) must both be open to accomplish the opposite-unit crosstie. The system is normally aligned with the unit-specific crosstie valves open and the opposite-unit crosstie valves closed.

Additional information about the design and operation of the SX System, along with a list of the components served, is presented in the UFSAR, Section 9.2.1 (Ref. 1). Some of the functions served by the SX System are the removal of decay heat from the reactor via the Component Cooling Water (CC) System, the removal of heat from containment via the reactor containment fan coolers, and cooling of the DGs.

Item ID - 27 BRAIDWOOD >- UNITS 1 &

APPLICABLE SAFETY ANALYSES The design basis of the SX System is for one SX train, in conjunction with the CC System and a 100% capacity containment cooling system, to remove core decay heat following a design basis LOCA as discussed in the UFSAR, Section 6.2 (Ref. 2). This prevents the containment sump fluid from increasing in temperature during the recirculation phase following a LOCA and provides for a gradual reduction in the temperature of this fluid as it is supplied to the Reactor Coolant System by the Emergency Core Cooling System pumps. The SX System is designed to perform its function with a single failure of any active component, assuming the loss of offsite power.

> The SX System, in conjunction with the CC System, also cools the unit from Residual Heat Removal (RHR) entry conditions, as discussed in the UFSAR, Section 5.4.7, (Ref. 3) to MODE 5 during normal and post accident operations. The time required for this evolution is a function of the number of CC and RHR System trains that are operating. One SX train is sufficient to remove decay heat during subsequent operations in MODES 5 and 6.

Generic Letter 91-13 (Ref. 4) included risk-based recommendations for enhancing the availability of SX Systems, in the case of a loss of all SX to a particular unit. Crediting the opposite-unit SX System with an opposite-unit pump and the opposite-unit crosstie valves, was a part of the response to this Generic Letter.

The unit-specific SX System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). The opposite-unit SX System satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii).

Item ID - 27 BRAIDWOOD ≻ UNITS 1

LCO	Two prov func the the	unit-specific SX trains are required to be OPERABLE to vide the required redundancy to ensure that the system ctions to remove post accident heat loads, assuming that worst case single active failure occurs coincident with loss of offsite power.
	A ur MODE	nit-specific SX train is considered OPERABLE during TS 1, 2, 3, and 4 when:
	a.	The pump is OPERABLE; and
	b.	The associated piping, valves, and instrumentation and controls required to perform the safety related function are OPERABLE.
	An c MODE	pposite-unit SX train is considered OPERABLE during S 1, 2, 3, and 4 when:
	a.	An opposite-unit pump is capable of performing its required unit-specific function (manually start and supply SX to the flow path);
	b.	A flow path from the opposite unit is established, or capable of being established (including the opposite-unit crosstie valves 1SX005 and 2SX005); and
	С.	The associated piping, valves, and instrumentation and controls are capable of performing the crosstie function



BASES

APPLICABILITY	In MODES 1, 2, 3, and 4, the unit-specific SX System is a normally operating system that is required to support the OPERABILITY of the equipment serviced by the SX System and required to be OPERABLE in these MODES.
	While a specific unit is in MODES 1, 2, 3, or 4, the opposite-unit SX System must be available (independent of the opposite unit's MODE or condition) for unit-specific support. This minimizes the risk associated with loss of all unit-specific SX.
	In MODES 5 and 6 the OPERABILITY requirements of the unit-specific SX System are determined by the systems it supports and there are no opposite-unit SX System requirements.
ACTIONS	<u>A.1</u>

If one unit-specific SX train is inoperable, action must be taken to restore OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE SX train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE SX train could result in loss of the SX System function in the short term. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources-Operating," should be entered if an inoperable SX train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops-MODE 4," should be entered if an inoperable SX train results in an inoperable decay heat removal train. These are exceptions to LCO 3.0.6 and ensure the proper actions are taken for these components.

Item ID - 27 BRAIDWOOD \rightarrow UNITS 1 <u>& 2</u>

BASES

ACTIONS (continued)

<u>B.1</u>

If the opposite-unit SX train is not OPERABLE for unit-specific support, action must be taken to restore OPERABLE status within 7 days. In this Condition, if a complete loss of unit-specific SX were to occur, the SX System function would be lost. The 7 day Completion Time is based on the capabilities of the unit-specific SX System and the low probability of a DBA with a loss of all unit-specific SX occurring during this time period.

<u>C.1 and C.2</u>

If the unit-specific SX train or the opposite-unit SX train cannot be restored to OPERABLE status 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 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

Item ID - 27 BRAIDWOOD > UNITS 1 & 2

SURVEILLANCE REQUIREMENTS SR 3.7.8.1

Verifying the correct alignment for manual, power operated, and automatic valves in the unit-specific SX flow path provides assurance that the proper flow paths exist for unit-specific SX operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note indicating isolation of the SX components does not affect the OPERABILITY of the SX System. Isolation of components may render those components inoperable.

SR 3.7.8.2

This SR verifies that the opposite-unit SX pump can be run for ≥ 15 minutes. This SR does not require the opposite-unit pump to supply SX to the specific unit. SR 3.7.8.2 is modified by a note that only requires this surveillance to be performed when the opposite unit is in MODE 5 or 6 or has no fuel in the reactor vessel. If the opposite unit is in MODE 1, 2, 3, or 4, its SX System is normally operating. If the opposite unit is shut down, the credited SX pump may not be operating. Therefore, the Note requires the surveillance to be performed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Item ID - 27 BRAIDWOOD UNITS 1 & 2

BASES

SURVEILLANCE REQUIREMENTS (continued)

<u>SR 3.7.8.3</u>

This SR verifies proper operation of the opposite-unit SX crosstie valves (1SX005 and 2SX005). This Surveillance is not required if the opposite-unit SX crosstie valve is secured in the open position with power removed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

<u>SR 3.7.8.4</u>

This SR verifies proper automatic operation of the unit-specific SX System valves on an actual or simulated actuation signal. The SX System is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

<u>SR 3.7.8.5</u>

This SR verifies proper automatic operation of the unit-specific SX pumps on an actual or simulated actuation signal. The SX System is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.



REFERENCES 1. UFSAR, Section 9.2.1.

2. UFSAR, Section 6.2.

3. UFSAR, Section 5.4.7.

4. Generic Letter 91-13.

Item ID - 27 BRAIDWOOD + UNITS 1 & 2

B 3.7 PLANT SYSTEMS

B 3.7.8 Essential Service Water (SX) System

BASES

BACKGROUND The SX System provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation, and a normal shutdown, the SX System also provides this function for various safety related and nonsafety related components. The safety related function is covered by this LCO.

> The unit-specific SX System consists of two separate, electrically independent, 100% capacity, safety related, cooling water trains. Each train consists of a 100% capacity pump, piping, valving, and instrumentation. The pumps and valves are remote and manually aligned, except in the unlikely event of a Loss Of Coolant Accident (LOCA). The pumps are automatically started upon receipt of a safety injection signal or an undervoltage on the ESF bus, and all essential valves are aligned to their post accident positions (Diesel Generator (DG) supply valves are opened once the DG has reached sufficient rpm). The SX System is the backup water supply to the Auxiliary Feedwater System.

> The SX System includes provisions to crosstie the trains (unit-specific crosstie), as well as provisions to crosstie the units (opposite-unit crosstie). The opposite-unit crosstie valves (15X005 and 25X005) must both be open to accomplish the opposite-unit crosstie. The system is normally aligned with the unit-specific crosstie valves open and the opposite-unit crosstie valves closed.

Additional information about the design and operation of the SX System, along with a list of the components served, is presented in the UFSAR, Section 9.2.1 (Ref. 1). Some of the functions served by the SX System are the removal of decay heat from the reactor via the Component Cooling Water (CC) System, the removal of heat from containment via the reactor containment fan coolers, and cooling of the DGs.

Item ID - 27

APPLICABLE SAFETY ANALYSES The design basis of the SX System is for one SX train, in conjunction with the CC System and a 100% capacity containment cooling system, to remove core decay heat following a design basis LOCA as discussed in the UFSAR, Section 6.2 (Ref. 2). This prevents the containment sump fluid from increasing in temperature during the recirculation phase following a LOCA and provides for a gradual reduction in the temperature of this fluid as it is supplied to the Reactor Coolant System by the Emergency Core Cooling System pumps. The SX System is designed to perform its function with a single failure of any active component, assuming the loss of offsite power.

> The SX System, in conjunction with the CC System, also cools the unit from Residual Heat Removal (RHR) entry conditions, as discussed in the UFSAR, Section 5.4.7, (Ref. 3) to MODE 5 during normal and post accident operations. The time required for this evolution is a function of the number of CC and RHR System trains that are operating. One SX train is sufficient to remove decay heat during subsequent operations in MODES 5 and 6.

Generic Letter 91-13 (Ref. 4) included risk-based recommendations for enhancing the availability of SX Systems, in the case of a loss of all SX to a particular unit. Crediting the opposite-unit SX System with an opposite-unit pump and the opposite-unit crosstie valves, was a part of the response to this Generic Letter.

The unit-specific SX System satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). The opposite unit SX System satisfies Criterion 4 of 10 CFR 50.36(c)(2)(ii).

Item ID - 27

-	LCO	Two prov func the the	unit specific SX trains are required to be OPERABLE to ide the required redundancy to ensure that the system tions to remove post accident heat loads, assuming that worst case single active failure occurs coincident with loss of offsite power.
		A un MODE	it-specific SX train is considered OPERABLE during S 1, 2, 3, and 4 when:
		d.	The pump is OPERABLE; and
		þ.	The associated piping, valves, and instrumentation and controls required to perform the safety related function are OPERABLE.
		An o MODE	pposite-unit SX train is considered OPERABLE during S 1, 2, 3, and 4 when:
		d.	An opposite-unit pump is capable of performing its required unit-specific function (manually start and supply SX to the flow path);
		þ.	A flow path from the opposite unit is established, or capable of being established (including the opposite-unit crosstie valves 1SX005 and 2SX005); and
		C.	The associated piping, valves, and instrumentation and controls are capable of performing the crosstie function.



APPLICABILITY	In MODES 1, 2, 3, and 4, the unit-specific SX System is a normally operating system that is required to support the OPERABILITY of the equipment serviced by the SX System and required to be OPERABLE in these MODES.
	While a specific unit is in MODES 1, 2, 3, or 4, the opposite unit SX System must be available (independent of the opposite unit's MODE or condition) for unit-specific support. This minimizes the risk associated with loss of all unit-specific SX.
	In MODES 5 and 6 the OPERABILITY requirements of the unit-specific SX System are determined by the systems it supports and there are no opposite-unit SX System requirements.
ACTIONS	A.1 and A.2
	If one unit-specific SX train is inoperable, action must be taken to restore OPERABLE status. In this Condition, the remaining OPERABLE SX train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE SX train could result in loss of the SX System function in the short term.
	Required Action A.1 requires restoring the unit-specific SX train to OPERABLE status within 72 hours. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of DBA occurring during this time period. Required Action A.1 is modified by a Note that indicates that this Required Action is not applicable to Unit 2 during the repair of the 2A SX pump during the one-time Unit 2 planned SX System outage to be completed no later than January 23, 2017.
	Required Action A.2 requires restoring the unit-specific SX train to OPERABLE status within 200 hours. Required Action A.2 is modified by a Note that indicates that this Required Action is applicable to Unit 2 during repair of the 2A SX pump during the one-time planned SX System outage to be completed no later than January 23, 2017. Additionally, th note indicates that allowance of the extended completion time is contingent on meeting the compensatory measures described in EGC submittal letter RS-16-197 (Reference 5). This Completion Time is based upon a risk-informed assessment that concludes that the associated risk with the units in the specified configuration is accentable.

BASES

ACTIONS (continued)

The compensatory measures described in RS-16-197 are as follows:

- 1. There will be no elective maintenance work on the remaining SX pumps, (1A, 1B, 2B) during the 2A SX extended CT. Additionally, this equipment will be protected for this one-time outage. This supports the maintenance assumptions in the risk analysis.
- 2. There will be no elective maintenance work on the emergency diesel generators (1A, 1B, 2A, 2B) during the 2A SX extended CT. Additionally, this equipment will be protected for this one-time outage. This supports the maintenance assumptions in the risk analysis and also supports mitigation of a loss of offsite power during the maintenance window.
- 3. There will be no elective maintenance work on the Unit 2 auxiliary feed pumps (2A, 2B). This equipment will be protected for the one-time outage. This supports the maintenance assumptions in the risk analysis.
- 4. There will be no elective maintenance on the 1/2SX16A/B (i.e., RCFC SX inlet valves) and 1/2SX27A/B (RCFC SX outlet valves) due to interlocks that could prevent use of the remaining SX pumps. This supports the maintenance assumptions in the risk analysis.
- 5. There will be no elective maintenance on the 211, 212, 213, or 214 instrument busses or their associated inverters and transformers. Additionally, this equipment will be protected for the one-time outage. This supports the maintenance assumptions in the risk analysis.
- 6. There will be no elective maintenance on the startup feedwater pump, 2FW02P.
- 7. There will be no elective maintenance activities on the Unit 2 Station Auxiliary Transformers.
- 8. The extended weather forecast will be examined to ensure severe weather conditions are not predicted prior to entry into the CT. In the event of an unforeseen severe weather condition due to rapidly changing conditions, such as severe high winds, a briefing with crew operators will be performed to reinforce operator actions and responses in the event of a loss of offsite

Item ID - 27

BASES

ACTIONS (continued)

power.

9. Fire Risk Management Actions (RMAs) applicable for the 2A SX pump will be completed per OP AA 201-012-1001 "OPERATIONS ON LINE FIRE RISK MANAGEMENT" (these actions protect against fire impacting key redundant equipment).

10. Operations will hold briefings on the following actions:

- On a loss of all Reactor Coolant Pump (RCP) seal cooling, Operations trips RCPs in time to prevent damage to the Shutdown Seals relied on for extended loss of seal cooling events.
- On a post-trip loss of AF, Operations initiates flow from either the motor driven feedwater pump (2FW01PA) or the startup feedwater pump (2FW02P) to at least one SG prior to reaching dry SG conditions.
- Operators manually throttle 0/2SX007 valves when the Residual Heat Removal (RHR) heat exchangers are used for ECCS recirculation.
- On a loss of Unit 2 SX, Operations opens the 1/2SX005 valve(s) to crosstie SX between the units.
- Operations refills the diesel-driven AF day tank from the 125K Fuel Oil Storage Tank in order to maintain operation of the diesel-driven AF pump.
- On loss of Vital Instrument Bus (120 VAC) 211 or 214, Operations opens the AF flow control valves 2AF005A-D ("A" train) or 2AF005E-H ("B" train) by locally failing air to the valve operators, then Operations throttles 2AF013A-D ("A" train) or 2AF013E-H ("B" train) from the Main Control Room (MCR) to control SG levels.
- 11. Prior to entering the TS 3.7.8 Action Statement for repair of the 2A SX pump, an operating crew shift briefing and pre-job walkdowns will be conducted to reduce and manage transient combustibles and to alert the staff about the increased sensitivity to fires in the following fire zones during the extended 2A SX outage window. Operating crew shift briefings will continue to be conducted every shift throughout the duration of the CT period. Additionally, planned hot

Item ID - 27
ACTIONS (continued)

work activities in the following fire zones will be prohibited during the time within the extended 2A SX CT. In the event of an emergent issue requiring hot work in one of the listed zones, additional compensatory actions will be developed to minimize the risk of fire. The listed fire zones were identified based on risk significance in the FPRA results (generally zones with Division 2 equipment that impact SX). (The purpose of these walkdowns is to reduce the likelihood of fires in these zones by limiting transient combustibles, ensuring transients, if required to be present, are located away from fixed ignition sources and eliminating or isolating potential transient ignition sources, e.g., energized temporary equipment and associated cables).

Fire Zone ⁽¹⁾	Fire Zone Description		
5.1-2	Division 22 ESF Switchgear Room		
5.1-1	Division 12 ESF Switchgear Room		
3.2-0	Auxiliary Building El. 439'-0"		
11.4-0	Auxiliary Building General Area, El. 383'		
11.6-2	Division 22 Containment Electrical Penetration Area, El. 426'		
11.2C-2	Containment Spray Pump 2B Room		
11.1B 0	Unit 2 Auxiliary Building Basement El. 330'		
18.10D 2	Unit Auxiliary Transformer 241-2		
18.10E_2	System Auxiliary Transformers 242-1/242-2		

(1) For larger fire zones walkdowns may be focused on specific fire sensitive areas within the larger firezones. Walkdowns are judged as not being required for areas with continuous operator occupation (e.g. MCR). Fire Risk Management Actions (RMAs) where they occur may address the need for walkdowns in some of these areas. ALARA principles apply when reviewing radiological areas such as RHR.

Item ID - 27

ACTIONS (continued)

Required Actions A.1 and A.2 have been modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources-Operating," should be entered if an inoperable SX train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops MODE 4," should be entered if an inoperable SX train results in an inoperable decay heat removal train. These are exceptions to LCO 3.0.6 and ensure the proper actions are taken for these components.

<u>B.1</u>

If the opposite unit SX train is not OPERABLE for unit specific support, action must be taken to restore OPERABLE status within 7 days. In this Condition, if a complete loss of unit specific SX were to occur, the SX System function would be lost. The 7 day Completion Time is based on the capabilities of the unit specific SX System and the low probability of a DBA with a loss of all unit specific SX occurring during this time period.

<u>C.1 and C.2</u>

If the unit-specific SX train or the opposite-unit SX train cannot be restored to OPERABLE status 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 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.



SURVEILLANCE REQUIREMENTS

<u>SR 3.7.8.1</u>

Verifying the correct alignment for manual, power operated, and automatic valves in the unit specific SX flow path provides assurance that the proper flow paths exist for unit-specific SX operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note indicating isolation of the SX components does not affect the OPERABILITY of the SX System. Isolation of components may render those components inoperable.

<u>SR 3.7.8.2</u>

This SR verifies that the opposite unit SX pump can be run for ≥ 15 minutes. This SR does not require the opposite unit pump to supply SX to the specific unit. SR 3.7.8.2 is modified by a note that only requires this surveillance to be performed when the opposite unit is in MODE 5 or 6 or has no fuel in the reactor vessel. If the opposite unit is in MODE 1, 2, 3, or 4, its SX System is normally operating. If the opposite unit is shut down, the credited SX pump may not be operating. Therefore, the Note requires the surveillance to be performed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Item ID - 27

SURVEILLANCE REQUIREMENTS (continued)

<u>SR 3.7.8.3</u>

This SR verifies proper operation of the opposite-unit SX crosstie valves (15X005 and 25X005). This Surveillance is not required if the opposite-unit SX crosstie valve is secured in the open position with power removed. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

<u>SR 3.7.8.4</u>

This SR verifies proper automatic operation of the unit-specific SX System valves on an actual or simulated actuation signal. The SX System is a normally operating system that cannot be fully actuated as part of normal testing. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

<u>SR 3.7.8.5</u>

This SR verifies proper automatic operation of the unit-specific SX pumps on an actual or simulated actuation signal. The SX System is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Item ID - 27

REFERENCES	1	HESAR	Section 9,21
	- ·	or or it,	JCCC01011 J.L.I.

- 2. UFSAR, Section 6.2.
- 3. UFSAR, Section 5.4.7.
- 4. Generic Letter 91-13.
- 5. RS-16-197, "License Amendment Request for One-Time Extension of the Essential Service Water (SX) Train Completion Time to Support 2A SX Pump Repair," dated September 30, 2016.

Item ID - 27

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ATTACHMENT 5

Proposed Technical Specification Bases Changes for Byron Station, Units 1 and 2

ACTIONS

A.1

B.1

If one unit-specific SX train is inoperable, action must be taken to restore OPERABLE status within 72 hours. In this Condition, the remaining OPERABLE SX train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE SX train could result in loss of the SX System function in the short term. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE train, and the low probability of a DBA occurring during this time period.

Condition A is modified by a Note. The Note indicates that this Condition is not applicable to Unit 1 during replacement of the SX suction isolation valves (i.e., 1SX001A and 2SX001A) during Unit 2 Refueling 15 while Unit 2 is in MODE 5, 6, or defueled.

Required Action A.1 is modified by two Notes. The first Note indicates that the applicable Conditions and Required Actions of LCO 3.8.1, "AC Sources-Operating," should be entered if an inoperable SX train results in an inoperable emergency diesel generator. The second Note indicates that the applicable Conditions and Required Actions of LCO 3.4.6, "RCS Loops-MODE 4," should be entered if an inoperable SX train results in an inoperable decay heat removal train. These are exceptions to LCO 3.0.6 and ensure the proper actions are taken for these components.

During replacement of the SX suction isolation valves (i.e., 1SX001A and 2SX001A) during Unit 2 Refueling 15, if one unit-specific SX train is inoperable, action must be taken to restore OPERABLE status within 144 hours. This Completion Time is based upon a risk-informed assessment that concluded that the associated risk with the units in the specified configuration is acceptable.

Condition B is modified by a Note. The Note indicates that this Condition is only applicable to Unit 1 during replacement of the SX suction isolation valves (i.e., 1SX001A and 2SX001A) during Unit 2 Refueling 15 while Unit 2 is in MODE 5, 6, or defueled.

Required Action B.1 is modified by two Notes as described in Action A.1 above.

ltem ID - 28



If the unit-specific SX train or the opposite-unit SX train cannot be restored to OPERABLE status 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 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

Verifying the correct alignment for manual, power operated, and automatic valves in the unit-specific SX flow path provides assurance that the proper flow paths exist for unit-specific SX operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to being locked, sealed, or secured. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. This SR does not apply to valves that cannot be inadvertently misaligned, such as check valves.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.