ITS NRC Questions

Id	**941**
NRC Question Number	**GMW-001**
Category	**Technical**
ITS Section	**3.2**
ITS Number	**3.2.1**
DOC Number	
JFD Number	**2**
JFD Bases Number	
Page Number (s)	**17 of 102**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Add Name**
Conf Call Requested	**N**
NRC Question	**On page 17 of Attachment 1, Volume 7, the justification for deviation (JFD) from iSTS SR 3.2.1.2 Note "a" states that the iSTS requirement to increase the heat flux hot channel factor T(Z) by "the greater of a factor of [1.02] or by an appropriate factor specified in the COLR" has been changed to delete this requirement because the value is specified in the COLR and is consistent with the deleted value (1.02). Provide an explanation for this deletion with regards to 10 CFR 36(c)(3).**
Attach File 1	
Attach File 2	
Issue Date	**11/3/2009**
Added By	**Gerald Waig**
Date Modified	
Modified By	
Date Added	**11/3/2009 4:10 PM**
Notification	**NRC/LICENSEE Supervision**

Enclosure, Q&A to Attachment 1, Volume 7 (Section 3.2) Page 1 of 26

Licensee Response/NRC Response/NRC Question Closure

Id	**571**
NRC Question Number	**GMW-001**
Select Application	**Licensee Response**
Response Date/Time	**11/9/2009 8:05 AM**
Closure Statement	
Response Statement	**The 1.02 minimum penalty factor in the Note to ISTS SR 3.2.1.2 was not included in the Kewaunee Power Station (KPS) ITS submittal since the value is not in the KPS CTS. The NRC did not require this minimum penalty factor to be controlled in the KPS CTS when Kewaunee incorporated the COLR allowance in the CTS. The 1.02 factor is covered by the CTS, since it is specified in the references in the CTS COLR requirements in CTS 6.9.a.4.b (ITS 5.6.3.b).** **However, since the minimum penalty factor is 2% (i.e., 1.02) as stated in the KPS COLR, and it is expected that this minimum penalty factor will not change in the foreseeable future, KPS will include the minimum penalty factor in ITS SR 3.2.1.2. A draft markup regarding this change is attached. This change will be reflected in the supplement to this section of the ITS conversion amendment.**
Question Closure Date	
Attachment 1	**GMW-001 Markup.pdf** (1MB)
Attachment 2	
Notification	**NRC/LICENSEE Supervision** **Victor Cusumano** **Jerry Jones** **Bryan Kays** **Ray Schiele** **Gerald Waig**
Added By	**Robert Hanley**
Date Added	**11/9/2009 8:05 AM**
Modified By	
Date Modified	

ITS

A01

ITS 3.2.1

C. If a power distribution map measurement indicates that the $F_Q^N(Z)$ transient relationship's margin to the limit, as specified in the COLR, has decreased since the previous evaluation, then either of the following actions shall be taken:

L01

Add minimum penalty factor limit of 1.02

M02

SR 3.2.1.2 Note

i. $F_Q^N(Z)$ transient relationship shall be increased by the penalty factor specified in the COLR for comparison to the transient limit as specified in the COLR and reverified within the transient limit, or

ii. Repeat the determination of the $F_Q^N(Z)$ transient relationship once every seven effective full-power days until either i. above is met, or two successive maps indicate that the $F_Q^N(Z)$ transient relationship's margin to the transient limit has not decreased.

ACTION B

7. If, for a measured $F_Q^N(Z)$, the transient relationship of $F_Q^N(Z)$ specified in the COLR is not within limits, then take the following actions:

A. Reduce the axial flux difference limits $\geq$ 1% for each 1% the $F_Q^N(Z)$ transient relationship exceeds its limit within 4 hours after each determination and similarly reduce the Power Range Neutron Flux-High Trip Setpoints and Overpower ΔT Trip Setpoints within 72 hours by $\geq$ 1% that the maximum allowable power of the axial flux difference limits is reduced.

ACTION C

B. If the actions of TS 3.10.b.7.A are not completed within the specified time, then reduce thermal power to $\leq$ 5% of rated power within the next 6 hours.

Required Action B.4 and Note to Condition B

C. Verify the $F_Q^N(Z)$ equilibrium relationship and the $F_Q^N(Z)$ transient relationship are within limits prior to increasing thermal power above the reduced thermal power limit required by action A, above.

8. Axial Flux Difference

NOTE: The axial flux difference shall be considered outside limits when two or more operable excore channels indicate that axial flux difference is outside limits.

See ITS 3.2.3

A. During power operation with thermal power $\geq$ 50 percent of RATED POWER, the axial flux difference shall be maintained within the limits specified in the COLR.

i. If the axial flux difference is not within limits, reduce thermal power to less than 50% RATED POWER within 30 minutes.

≥ 10% RTP. This changes the CTS by requiring the Surveillance to be performed after a power change of ≥ 10% RTP, in lieu of > 10% RTP.

The purpose of this Surveillance Frequency is to determine the $F_Q^N(Z)$ transient relationship is within limit after a THERMAL POWER change that could affect the value. This change is acceptable since it requires the Surveillance to be performed after a slightly lower power change, i.e., ≥ 10% RTP in lieu of the current > 10% RTP. This change is more restrictive since it is now required to be performed under more conditions in the ITS than in the CTS.

INSERT 1

RELOCATED SPECIFICATIONS

None

REMOVED DETAIL CHANGES

LA01 *(Type 3 – Removing Procedural Details for Meeting TS Requirements or Reporting Requirements)* CTS 3.10.b.4 requires the $F_Q^N(Z)$ equilibrium relationship to be determined to be within its limit by using the movable incore detectors to obtain a power distribution map. ITS SR 3.2.1.1 just requires verification that $F_Q^C(Z)$ (i.e., the equilibrium relationship) is within its limit. CTS 3.10.b.6 requires the $F_Q^N(Z)$ transient relationship to be determined to be within its limit by using the movable incore detectors to obtain a power distribution map. ITS SR 3.2.1.2 just requires verification that $F_Q^T(Z)$ (i.e., the transient relationship) is within its limit. This changes the CTS by relocating to the ITS Bases the manner in which the $F_Q^N(Z)$ equilibrium and transient relationship determination is performed.

The removal of these details for performing actions and a Surveillance Requirement from the Technical Specifications is acceptable because this type of information is not necessary to be included in the Technical Specifications to provide adequate protection of public health and safety. The ITS still retains the requirement to determine $F_Q^C(Z)$ and $F_Q^T(Z)$ are within limits. Also, this change is acceptable because these types of procedural details will be adequately controlled in the ITS Bases. Changes to the Bases are controlled by the Technical Specification Bases Control Program in Chapter 5. This program provides for the evaluation of changes to ensure the Bases are properly controlled. This change is designated as a less restrictive removal of detail change because procedural details for meeting Technical Specification requirements are being removed from the Technical Specifications.

INSERT 1

M02 CTS 3.10.b.6.C.i states, in part, that the $F_Q^N(Z)$ transient relationship shall be increased by the penalty factor specified in COLR. ITS SR 3.2.1.2 is modified by a Note which requires, in part, that $F_Q^T(Z)$ (i.e., the $F_Q^N(Z)$ transient relationship) shall be increased by the greater of a factor of 1.02 or by an appropriate factor specified in the COLR. This changes the CTS by specifically requiring $F_Q^N(Z)$ transient relationship to be increased by a minimum factor of 1.02.

The purpose of CTS 3.10.b.6.C is to ensure that the $F_Q^N(Z)$ transient limit will not exceed the limit specified in the COLR prior to the next routine verification. This is done, in part, by applying a penalty factor that is specified in the COLR. This minimum penalty factor is allowed to be 1.02 at KPS. Therefore, the proposed change to include the minimum penalty factor is acceptable because it is applying the current factor specified in the COLR. This change is considered more restrictive because a minimum penalty factor is provided in the ITS that was not specified in the CTS.

$F_Q(Z)$ (RAOC-W(Z) Methodology) 1
3.2.1B

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.2.1.2 3.10.b.6.C ----------NOTE---------- If measurements indicate that the maximum over z [$F_Q^C(Z)$ / K(Z)] has increased since the previous evaluation of $F_Q^C(Z)$: a. Increase $F_Q^W(Z)$ by the greater of a factor of [1.02] or by an appropriate factor specified in the COLR and reverify $F_Q^W(Z)$ is within limits or ; STET STET w/changes 5 2 5 3 b. Repeat SR 3.2.1.2 once per 7 EFPD until either a. above is met or two successive flux maps indicate that the maximum over z [$F_Q^C(Z)$ / K(Z)] has not increased. ----------	
Verify $F_Q^W(Z)$ is within limit. 3.10.b.6, 3.10.b.6.A, 3.10.b.6.B	Once after each refueling prior to THERMAL POWER exceeding 75% RTP 5 AND Once within [12] hours after achieving equilibrium conditions after exceeding, by ≥ 10% RTP, the THERMAL POWER at which $F_Q^W(Z)$ was last verified 4 5 AND 31 EFPD thereafter

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.1, HEAT FLUX HOT CHANNEL FACTOR ($F_Q(Z)$)

1. The type of methodology (Relaxed Axial Offset Control (RAOC) - W(Z) Methodology) and the Specification designator "B" are deleted since they are unnecessary (only one $F_Q(Z)$ Specification is used in the Kewaunee Power Station (KPS) ITS). This information is provided in NUREG-1431, Revision 3.0, to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific implementation. In addition, the CAOC-F_{xy} and RAOC-W(Z) methodology Specifications (ISTS 3.2.1A and 3.2.1C) are not used and are not shown.

2. ~~The ISTS SR 3.2.1.2 Note, part "a" requirement to increase the limit by "the greater of a factor of [1.02] or by" an appropriate factor specified in the COLR has been changed to delete the 1.02 requirement. The CTS provides the value in the COLR, and it is currently 2% (i.e., 1.02). Thus, since the value is consistent with the value in the COLR, the additional limit is not required.~~

3. This punctuation correction has been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

4. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant requirements, as shown in CTS 3.10.b.4.A and 3.10.b.6.B.

5. KPS is changing from the Westinghouse RAOC methodology to the Dominion Relaxed Power Distribution Control (RPDC) methodology. The RPDC methodology, DOM-NAF-5-0.0.A, is one of the analytical methods listed in the COLR requirements (CTS 6.9.a.4.B.(16)). Therefore, the terminology has been changed to reflect the Dominion preferred terminology.

The ITS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic information/value is revised to reflect the current plant requirement.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.2.1.2

The nuclear design process includes calculations performed to determine that the core can be operated within the $F_Q(Z)$ limits. Because flux maps are taken in steady state conditions, the variations in power distribution resulting from normal operational maneuvers are not present in the flux map data. These variations are, however, conservatively calculated by considering a wide range of unit maneuvers in normal operation. The maximum peaking factor increase over steady state values, calculated as a function of core elevation, Z, is called W(Z). Multiplying the measured total peaking factor, $F_Q^C(Z)$, by W(Z) gives the maximum $F_Q(Z)$ calculated to occur in normal operation, $F_Q^W(Z)$. 10

The limit with which $F_Q^W(Z)$ is compared varies inversely with power above 50% RTP and directly with the function K(Z) provided in the COLR. 10

The W(Z) curve is provided in the COLR for discrete core elevations. Flux map data are typically taken for 30 to 75 core elevations. $F_Q^W(Z)$ evaluations are not applicable for the following axial core regions, measured in percent of core height: 10

a. Lower core region, from 0 to 15% inclusive and 3 2

b. Upper core region, from 85 to 100% inclusive. 3

The top and bottom 15% of the core are excluded from the evaluation because of the low probability that these regions would be more limiting in the safety analyses and because of the difficulty of making a precise measurement in these regions. 3

This Surveillance has been modified by a Note that may require that more frequent surveillances be performed. If $F_Q^W(Z)$ is evaluated, an evaluation of the expression below is required to account for any increase to $F_Q^M(Z)$ that may occur and cause the $F_Q(Z)$ limit to be exceeded before the next required $F_Q(Z)$ evaluation. 10

If the two most recent $F_Q(Z)$ evaluations show an increase in the expression maximum over z [$F_Q^C(Z)$ / K(Z)], it is required to meet the $F_Q(Z)$ limit with the last $F_Q^W(Z)$ increased by ~~the greater of a factor of [1.02] or by~~ an appropriate factor specified in the COLR (Ref. 5) 10 7

STET w/changes — STET

JUSTIFICATION FOR DEVIATIONS
ITS 3.2.1 BASES, HEAT FLUX HOT CHANNEL FACTOR ($F_Q(Z)$)

1. The type of methodology (Relaxed Axial Offset Control (RAOC) - W(Z) Methodology) and the Specification designator "B" are deleted since they are unnecessary (only one $F_Q(Z)$ Specification is used in the Kewaunee Power Station (KPS) ITS). This information is provided in NUREG-1431, Revision 3.0, to assist in identifying the appropriate Specification to be used as a model for a plant specific ITS conversion, but serves no purpose in a plant specific implementation. In addition, the CAOC-F_{xy} and RAOC-W(Z) methodology Bases (ISTS B 3.2.1A and B 3.2.1C) are not used and are not shown.

2. These punctuation corrections have been made consistent with the Writer's Guide for the Improved Standard Technical Specifications, TSTF-GG-05-01, Section 5.1.3.

3. Changes are made (additions, deletions, and/or changes) to the ISTS Bases which reflect the plant specific nomenclature, number, reference, system description, analysis, or licensing basis description.

4. The ISTS contains bracketed information and/or values that are generic to all Westinghouse vintage plants. The brackets are removed and the proper plant specific information/value is provided. This is acceptable since the generic specific information/value is revised to reflect the current plant design.

5. These changes have been made to be consistent with similar phrases in other parts of the ITS Bases. As written, the words imply that all Required Actions of a given ACTION must not be met prior to requiring entry into Condition C.

6. Typographical/grammatical error corrected.

7. The Bases have been changed to be consistent with changes made to the Specification. ~~As stated in ITS 3.2.1 JFD 2 the ISTS SR 3.2.1.2 Note, part "a" requirement to increase the limit by "the greater of a factor of [1.02] or by" an appropriate factor specified in the COLR has been changed to delete the 1.02 requirement. The CTS provides the value in the COLR, and it is currently 2% (i.e., 1.02). Thus, since the value is consistent with the value in the COLR, the additional limit is not required.~~

8. The Reviewer's Note has been deleted. This information is for the NRC reviewer to be keyed in to what is needed to meet this requirement. This is not meant to be retained in the final version of the plant specific submittal.

9. This generic statement is not necessary. The LCO Section of the Bases already states that certain values are specified in the COLR, and providing a "normal" value or Figure that is not the actual one in the COLR can lead to confusion that results in improper limits being applied. Furthermore, putting the actual value and Figure in the Bases is also not needed since it is in the COLR, and any changes to the COLR with respect to this value and Figure would necessitate a change to the Bases. Therefore, the statement and Figure B 3.2.1B-1 have been deleted.

10. KPS is changing from the Westinghouse RAOC methodology to the Dominion Relaxed Power Distribution Control (RPDC) methodology. The RPDC methodology, DOM-NAF-5-0.0.A, is one of the analytical methods listed in the COLR requirements

Licensee Response/NRC Response/NRC Question Closure

Id	**771**
NRC Question Number	**GMW-001**
Select Application	**NRC Question Closure**
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Response Statement	
Question Closure Date	**11/16/2009**
Attachment 1	
Attachment 2	
Notification	**NRC/LICENSEE Supervision**
Added By	**Gerald Waig**
Date Added	**11/16/2009 1:27 PM**
Modified By	
Date Modified	

Enclosure, Q&A to Attachment 1, Volume 7 (Section 3.2) Page 10 of 26

ITS NRC Questions

Id	**1971**
NRC Question Number	**GMW-008**
Category	**Technical**
ITS Section	**3.2**
ITS Number	**3.2.1**
DOC Number	
JFD Number	**5**
JFD Bases Number	
Page Number(s)	**13 of 102**
NRC Reviewer Supervisor	**Rob Elliott**
Technical Branch POC	**Ben Parks**
Conf Call Requested	**N**
NRC Question	**Reference: Attachment 1, Volume 7, Rev. 0, page 13 of 102**

The Kewaunee ITS TS 3.2.1, Power Distribution Limits, Heat Flux Hot Channel Factor (FQ(Z)) proposes to substitute the Westinghouse Relaxed Axial Offset Control methodology with an analogous Dominion power distribution control methodology. Proposed Technical Specification 3.2.1 is proposed to deviate from the STS to reflect the use of the Dominion methodology.

During a recent public meeting with the NRC, the Pressurized Water Reactor Owners Group (PWROG) discussed a Westinghouse Nuclear Safety Advisory Letter (NSAL) that identified that STS 3.2.1B, Power Distribution Limits, Heat Flux Hot Channel Factor (FQ(Z)), may potentially be non-conservative. Corrective actions, including planned revisions to TS 3.2.1B, were also discussed. Please provide the following information:

1) **Does the issue described in NSAL 09-5 apply also to the Dominion power distribution control methodology?**
2) **What corrective actions, if any, are currently being undertaken at Kewaunee to address any potential non-conservatisms?**
3) **Provide justification of the acceptability of adopting the proposed ITS 3.2.1, reflecting the Dominion power distribution control methodology in light of the issues identified in NSAL 09-5.**

Attach File 1	
Attach File 2	

Enclosure, Q&A to Attachment 1, Volume 7 (Section 3.2) Page 11 of 26

Issue Date	**5/10/2010**
Added By	**Gerald Waig**
Date Modified	
Modified By	
Date Added	**5/10/2010 3:45 PM**
Notification	**NRC/LICENSEE Supervision**

Enclosure, Q&A to Attachment 1, Volume 7 (Section 3.2) Page 12 of 26

Licensee Response/NRC Response/NRC Question Closure

Id	**2941**
NRC Question Number	**GMW-008**
Select Application	**Licensee Response**
Response Date/Time	**5/12/2010 2:50 PM**
Closure Statement	
Response Statement	**In this RAI, the NRC reviewer requested information related to the Westinghouse Relaxed Axial Offset Control methodology issue currently being discussed by the NRC and industry. Below are the Kewaunee Power Station (KPS) responses to the three, specific NRC questions. For clarity and ease of understanding, the NRC questions are repeated in this KPS response.**

NRC question 1: Does the issue described in NSAL 09-5 apply also to the Dominion power distribution control methodology?

KPS Response: Yes, the issue described in NSAL 09-5 does apply to the Dominion power distribution control methodology which is the Relaxed Power Distribution Control (RPDC) methodology. The power distribution control methodology used for the Westinghouse Relaxed Axial Offset Control (RAOC) and the Dominion RPDC are very similar. Dominion has verified that when using RPDC it is theoretically possible, but unlikely, that the limit on FQ (Z)*P could be exceeded in the center axial region of the core and that the current Technical Specification actions may not always be sufficient to restore FQ (Z)*P margin.

NRC Question 2: What corrective actions, if any, are currently being undertaken at Kewaunee to address any potential non-conservatisms?

KPS Response: Dominion evaluated the issue on a cycle-specific basis when NSAL 09-5 was issued and documented the issue and the results of the evaluation in the Corrective Action System. The NSAL 09-5 conservative interim actions were implemented by procedure and remain in place pending long term resolution of the issue. A corrective action assignment was created to follow the development of a common industry response being pursued through the Westinghouse Owners Group (WOG) and to develop a Kewaunee LAR.

KPS performed an Operability Determination (OD)to respond to NSAL 09-5. As a result of the corrective actions coming out of the OD, KPS modified surveillance procedure SP-48-132 "Hot Channel Factor Determination" (see step 6.9.3 in the attached procedure). According to the revised surveillance procedure, if transient FQ (Z) is not within limits and thermal power is greater than or equal to 75% rated thermal power, then conservative actions consistent with NSAL 09-5 are performed.

NRC Question 3: Provide justification of the acceptability of adopting the proposed ITS 3.2.1, reflecting the Dominion power distribution control methodology in light of the issues identified in NSAL 09-5.

KPS Response: Adopting the proposed ITS 3.2.1 is consistent with other plants using RPDC or RAOC power distribution control methodologies. Because the final form of the WOG response is not known at this time, KPS will continue to operate with the administrative controls described above as a supplement to the Technical Specification actions pending resolution of the WOG response. Maintaining the current NSAL 09-5 administrative controls provides justification that adopting ITS 3.2.1 is safe. Furthermore, it should be noted that the proposed ITS 3.2.1 ACTIONS, with respect to this issue, are technically consistent with the CTS ACTIONS. Specifically, the ITS Amendment does not change the CTS ACTIONS; the only changes to the CTS ACTIONS are based upon converting to the ITS format.

Question Closure Date	
Attachment 1	**GMW-008 KW-PROC-SP-48-132.pdf** (63KB)
Attachment 2	
Notification	**NRC/LICENSEE Supervision** **Victor Cusumano** **Jerry Jones** **Bryan Kays** **Ray Schiele** **Gerald Waig**
Added By	**Robert Hanley**
Date Added	**5/12/2010 2:53 PM**
Modified By	
Date Modified	

DOMINION ENERGY KEWAUNEE, INC Kewaunee Power Station *Surveillance Procedure*	**No.** SP-48-132	**Rev.** 31
	Title Hot Channel Factor Determination	
	Date OCT 22 2009	**Page** 1 **of** 11
Reviewed By Andrew Kelliher	**Approved By** John Helfenberger	

1.0 Plant Initial Conditions

1.1 This procedure is performed either once every effective full power month or during target axial offset determination (RE-01), whichever occurs first.

1.2 This procedure is also performed upon achieving equilibrium conditions after reaching a thermal power level greater than 10% higher than the power level at which this procedure was last performed.

1.3 This procedure may also be performed as determined necessary by Reactor Engineering.

1.4 The reactor should be at steady state conditions during performance of this procedure.

1.5 100% Reactor Power and All Rods Out conditions are desired during performance of this procedure.

2.0 Precautions

2.1 None

3.0 Limiting Conditions for Operation

3.1 IF any Hot Channel Factor does NOT meet the Acceptance Criteria, THEN Technical Specification (TS) Section 3.0, "Limiting Conditions for Operation," (3.10.b) shall be referred to immediately.

4.0 General Instructions

4.1 Reactor Engineering will utilize the CECOR code to reduce the data obtained from flux mapping.

4.2 Reactor Engineering will review the results from CECOR and incorporate them into this procedure.

DATE PERFORMED _____ INITIALS

5.0 Equipment Required

5.1 See RE-01, "Flux Mapping at Power."

6.0 Procedure

Note

The same flux map may provide data for several surveillance procedures including SP-48-045, "Nuclear Power Range Axial Offset Check," SP-48-004E, "Nuclear Power Range Channel Quarterly Cal-Data Requisition," and SP-48-004F, "One Point Nuclear Power Range Channel Quarterly Cal Data Acquisition."

Note

The flux map of the reactor at steady state conditions should be used with this procedure when data from the performance of SP-48-004E is being used with this procedure.

6.1 PERFORM an incore flux map per RE-01, "Flux Mapping at Power." _____

6.2 $F_Q^N(z)$, $F_Q^N(z)$ limit, and $F_Q^N(z)$ percent margin to limit documentation.

Note

Data for this subsection is taken from the output of the CECOR computer application and recorded on Data Sheet 1. Some useful CECOR output edits are FQ(Z) VERSUS AXIAL LPOSITION, TOP 40 FQ AND FDH COUNTDOWN, SUMMARY, RPDC CALCULATION SUMMARY, AVERAGE AXIAL OFFSET. These edits are just suggestions. The data may also be found elsewhere in the CECOR output.

6.2.1 RECORD the average calorimetric power (MWth) calculated during the flux map on Data Sheet 1. _____

Enclosure, Q&A to Attachment 1, Volume 7 (Section 3.2) Page 16 of 26

DATE PERFORMED _____ INITIALS

6.2.2 RECORD the following information for the fuel assembly with the highest raw measured $F_Q^N(z)$ on Data Sheet 1: _____

- Measured $F_Q^N(z)$ Including Uncertainties
- $F_Q^N(z)$ Peaking Factor Limit for the Fuel Type
- Margin to the Technical Specification Acceptance Criteria (COLR and TRM)

6.2.3 VERIFY the measured $F_Q^N(z)$ with uncertainties is less than the $F_Q^N(z)$ Peaking Factor Limit AND RECORD this result (Yes/No) on Data Sheet 1. _____

6.3 $F_{\Delta H}^N$, $F_{\Delta H}^N$ limit, and $F_{\Delta H}^N$ percent margin to limit documentation.

6.3.1 RECORD the following information for the fuel assembly with the highest raw measured $F_{\Delta H}^N$ on Data Sheet 1: _____

- Measured $F_{\Delta H}^N$ Including Uncertainties
- $F_{\Delta H}^N$ Peaking Factor Limit for the Fuel Type
- Margin to the Technical Specification Acceptance Criteria (COLR and TRM)

6.3.2 VERIFY the measured $F_{\Delta H}^N$ with uncertainties is less than the $F_{\Delta H}^N$ Peaking Factor Limit AND RECORD this result (Yes/No) on Data Sheet 1. _____

DATE PERFORMED _____ INITIALS

6.4 $F_Q^N(z)$ transient , $F_Q^N(z)$ transient limit, and $F_Q^N(z)$ transient percent margin to limit documentation.

6.4.1 RECORD the following information regarding $F_Q^N(z)$ transient on Data Sheet 1: _____

- Measured $F_Q^N(z)$ transient Including Uncertainties at the Point of Minimum $F_Q^N(z)$ transient Percent Margin to Limit
- $F_Q^N(z)$ transient Peaking Factor Limit
- Percent Margin to the Technical Specification Acceptance Criteria (COLR and TRM) for $F_Q^N(z)$ transient

6.4.2 VERIFY the measured $F_Q^N(z)$ transient with uncertainties is less than the $F_Q^N(z)$ transient Limit AND RECORD this result (Yes/No) on Data Sheet 1. _____

6.5 IF a previous $F_Q^N(z)$ transient exists for this cycle, THEN RECORD the $F_Q^N(z)$ transient relationship's percent margin to limit from the previous performance of this procedure (last flux map). _____

$F_Q^N(z)$ Transient Margin = _____ % Flux Map Number _____

6.6 RECORD the $F_Q^N(z)$ Transient relationship's percent margin to limit from the current flux map. _____ _____

Note

If Step 6.5 was not performed OR for first comparison of a new cycle, assume decreasing margin.

6.7 Circle the margin direction, either increasing or decreasing for the current flux map. _____

Increasing Decreasing

Enclosure, Q&A to Attachment 1, Volume 7 (Section 3.2) Page 18 of 26

DATE PERFORMED _____ INITIALS

6.8 IF the margin is decreasing as identified in Step 6.7, THEN TS 3.10.b.6.C requires one of the following options to be applied. CIRCLE the option below which will be used.

6.8.1 Increase measured $F_Q^N(z)$ transient by 2 percent (TRM 2.1 (COLR) Figure 6). VERIFY that all $F_Q^N(z)$ limits are met for axial nodes 7 through 55. _____

6.8.2 MEASURE $F_Q^N(z)$ transient every 7 EFPD. _____

6.9 IF $F_Q^N(z)$ transient does NOT have positive margin to the limit as determined in Step 6.6 or, if applicable, Step 6.8, THEN according to TS 3.10.b.7.A, the following shall be applied:

6.9.1 Reduce the AFD limits greater than or equal to 1% for each 1% that the $F_Q^N(z)$ transient exceeds its limits within 4 hours after this determination has been made. _____

6.9.2 Similarly reduce the Power Range Neutron Flux-High Trip Setpoints and Overpower ΔT Trip Setpoints within 72 hours by greater than or equal to 1% for the maximum allowable power based on these new axial flux difference limits. _____

6.9.3 Additionally, IF $F_Q^N(z)$ is not within limits and thermal power greater than or equal to 75% rated thermal power, THEN per OD 315:

6.9.3.1 Reduce the maximum allowable power by 3% for each 1% $F_Q^N(z)$ exceeds limit within 4 hours. _____

6.9.3.2 Reduce the AFD limits greater than or equal to 1% for each 1% that the $F_Q^N(z)$ transient exceeds its limits within 4 hours after this determination has been made. _____

6.9.3.3 Reduce power range neutron flux - high trip setpoint greater than or equal to 1% for each 1% that the maximum allowable power level is reduced within 72 hours. _____

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6.9.3.4 Reduce Overpower Delta T trip setpoints by greater than or equal to 1% for each 1% that the maximum allowable power level is reduced within 72 hours. _____

6.10 If actions are required in Step 6.9 and they cannot be completed within the specified time, then reduce thermal power to less than or equal to 5% of rated power within the next 6 hours (TS 3.10.b.7.B). _____

6.11 Verify the $F_Q^N(Z)$ equilibrium relationship and the $F_Q^N(z)$ transient relationships are within limits prior to increasing thermal power above the reduced thermal power limit required by Step 6.9. _____

Note

The AO criteria is valid for full core flux maps near equilibrium xenon conditions.

The AO criteria is waived for full core flux maps at less than 90% RTP.

The AO criteria is waived for full core flux maps performed during a power or Tave coastdown.

6.12 Using the current cycle's Nuclear Design Report or COLR, DETERMINE the N(z) applicability limits by interpolation. _____

6.12.1 Flux Map Burnup _____

6.12.2 Predicted Axial Offset= _____

6.12.3 Upper N(z) AO Limit (NZLU)= _____

6.12.4 Lower N(z) AO Limit (NZLL)= _____

6.13 Using the CECOR output, DETERMINE the difference between the CECOR measured axial offset (AO) and the predicted axial offset. _____

Measured Axial Offset (MAO) = _____ Flux Map Number _____

Difference (MAO-Predicted Axial Offset) = _____

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Note

IF absolute difference between measured and predicted axial offset is less than 3%, THEN the remaining steps are NOT applicable.

6.14 IF the absolute difference between measured and predicted axial offset from CECOR exceeds 3%, CONTACT Nuclear Core Design to assess safety analysis and plant operational data following the guidelines of reference 9.8. _____

6.14.1 Consult with Nuclear Core Design and DETERMINE if the AO deviation is being caused by Crud Induced Power Shift (CIPS). _____

6.14.2 DETERMINE a $F_Q^N(z)$ transient penalty using the N(z) applicability limit that was exceeded and one of the following formulas: _____

6.14.2.1 FQP = 2 x | MAO – NZL | = _____ (CIPS not present)

6.14.2.2 FQP = 2 x (| MAO – NZL | + 3) = _____ (CIPS present)

6.15 Using the CECOR output "RPDC CALCULATION SUMMARY", DETERMINE the minimum transient margin for axial nodes 7 through 31 if NZLL is exceeded or axial nodes 32 through 55 if NZLU is exceeded. Include the 2% penalty if applied in Step 6.8 above. _____

6.15.1 N(z) applicability limit exceeded (Circle one) Upper Lower

6.15.2 Minimum Margin (%) = _____

6.15.3 At axial point = _____

6.15.4 $F_Q^N(z)$ transient limit = _____

6.15.5 Measured $F_Q^N(z)$ = _____

6.16 DETERMINE the new $F_Q^N(z)$ transient including FQP penalty: _____

6.16.1 Measured $F_Q^N(z)$ transient * [1 + FQP/100] = _____

6.17 IF new $F_Q^N(z)$ transient > $F_Q^N(z)$ transient limit, THEN go to Step 6.9. _____

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6.18 CONTACT Nuclear Core Design or Westinghouse to determine if the original COLR N(z) factors remain conservative or if new N(z) factors are required to be generated. _____

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7.0 Problems

7.1 Complete a Condition Report (CR) for any problems encountered during the performance of this procedure and for any corrective action(s) taken. Refer to Kewaunee Nuclear Power Plant Technical Specifications Section 3.0, Limiting Conditions for Operation, for required corrective action(s).

8.0 Acceptance Criteria

8.1 Review Criteria

8.1.1 IF the hot channel factor determination results in less than a 2 percent margin to the limit AND has remained greater than 2 percent to limits previously in current cycle, THEN develop an Action Plan AND write a Condition Report (CR).

8.1.2 IF hot channel factor determination results in a margin between 1 percent and 2 percent, THEN increase tracking and trending.

8.1.3 IF hot channel factor determination results in a margin less than 1 percent to limits, THEN perform flux mapping with approximately a 15 EFPD frequency.

8.2 The Hot Channel Factor Determination will be considered acceptable when the Hot Channel Factor criteria located in the Kewaunee Nuclear Power Plant Technical Requirements Manual and Core Operating Limits Report (COLR) have been satisfied.

9.0 References

9.1 RE-01, Flux Mapping at Power

9.2 SP-48-004E, Nuclear Power Range Channel Quarterly Cal-Data Requisition

9.3 SP-48-004F, One Point Nuclear Power Range Channel Quarterly Cal Data Acquisition

9.4 SP-48-045, Nuclear Power Range Axial Offset Check

9.5 Technical Specification 3.0, Limiting Conditions for Operation

9.6 Dominion CECOR Computer Code

9.7 Technical Requirement Manual 3.11.1

9.8 Westinghouse Letter NF-NEU-07-71, "Dominion Generation, Surry, Kewaunee and Millstone Unit 3, Axial Offset Validity Guidance Revision 4," dated October 1, 2007.

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10.0 Records

10.1 The following QA records and non-QA records are identified in this directive/procedure and are listed on the KPS Records Retention Schedule. These records shall be maintained according to the KPS Records Management Program.

10.1.1 QA Records

- Completed Procedure

10.1.2 Non-QA Records

None

Are all Hot Channel Factors within the Acceptance Criteria? _____

Were there any problems encountered during the performance of this procedure. _____

If yes, then initiate a CR. CR Number: _____

Performed By: _____ Initials: _____ Date: _____
(Print / Sign)

Noted by SM: _____ Date: _____
(Print / Sign)

Technical Review: _____ Date: _____
(Print / Sign)

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Data Sheet 1

Page ____ of ____

Date Performed: _____ Flux Map #: _____

Average Calorimetric Power (MWth): _____ Fuel Type: _____

Measured F_Q^N including uncertainties: _____

F_Q^N Peaking Factor Limit for the Fuel Type: _____

% Margin to Technical Specification Limit: _____

Is the measured F_Q^N with uncertainties less than the F_Q^N Peaking Factor Limit? Yes / No

---

Measured $F_{\Delta H}^N$ including uncertainties: _____

$F_{\Delta H}^N$ Peaking Factor Limit for the Fuel Type: _____

% Margin to Technical Specification Limit: _____

Is the measured $F_{\Delta H}^N$ with uncertainties less than the $F_{\Delta H}^N$ Peaking Factor Limit? Yes / No

---

Measured F_Q^N transient including uncertainties at the point of minimum F_Q^N transient % Margin to Limit: _____

F_Q^N transient Peaking Factor Limit: _____

% Margin to Technical Specification Limit: _____

Is the measured F_Q^N transient with uncertainties less than the F_Q^N transient Peaking Factor Limit? Yes / No

Licensee Response/NRC Response/NRC Question Closure

Id	**3641**
NRC Question Number	**GMW-008**
Select Application	**NRC Question Closure**
Response Date/Time	
Closure Statement	**This question is closed and no further information is required at this time to draft the Safety Evaluation.**
Response Statement	
Question Closure Date	**7/1/2010**
Attachment 1	
Attachment 2	
Notification	**NRC/LICENSEE Supervision**
Added By	**Gerald Waig**
Date Added	**7/1/2010 8:23 AM**
Modified By	
Date Modified	

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