

## Industry/TSTF Standard Technical Specification Change Traveler

### AFD Notes Rearranged

Classification: 2) Consistency/Standardization

NUREGs Affected:  1430  1431  1432  1433  1434

**Description:**

Collect the 3 LCO Notes and one Applicability Note into one "Notes" list in the LCO.

**Justification:**

Revised presentation enhances clarity and usability. The Applicability Note is inappropriately located. Since it takes exception to the LCO requirement, it is relocated to an LCO Note.

Many Westinghouse plant submittals have incorporated this change. The proposed presentation is consistent with that approved for Ginna. This change to NUREG-1431 should be made to provide consistency between the Westinghouse plants.

In addition, an error is corrected on page B3.2-31, first paragraph. The ISTS states "THERMAL POWER > 50% RTP", but should stated >= 50% RTP to be consistent with the Note.

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### Revision History

#### OG Revision 0

Revision Status: Active

Next Action:

Revision Proposed by: WOG Mini-Group

Revision Description:  
Original Issue

#### Owners Group Review Information

Date Originated by OG: 10-Oct-96

Owners Group Comments  
(No Comments)

Owners Group Resolution: Approved Date: 10-Oct-96

#### TSTF Review Information

TSTF Received Date: 11-Oct-96 Date Distributed for Review 29-Oct-96

OG Review Completed:  BWOG  WOG  CEOG  BWROG

**TSTF Comments:**

CEOG - Not applicable, accepts.

BWOG - Not applicable, accepts

BWROG - Not applicable, accepts

TSTF Resolution: Approved Date: 03-Dec-96

#### NRC Review Information

NRC Received Date: 27-Mar-97

NRC Comments:

3/8/99

**OG Revision 0**

**Revision Status: Active**

**Next Action:**

4/14/97 - Reviewer recommends approval.  
4/15/97 - Forwarded to C. Grimes for disposition.  
5/2/97 C. Grimes approved changes.

Final Resolution: NRC Approves

Final Resolution Date: 02-May-97

**TSTF Revision 1**

**Revision Status: Active**

**Next Action: TSTF**

Revision Proposed by: WOG

Revision Description:

Corrects an error on page B 3.2-31, first paragraph. The ITS states "THERMAL POWER > 50% RTP", but should be >= 50% RTP to be consistent with the Note.

**Owners Group Review Information**

Date Originated by OG: 19-Nov-96

Owners Group Comments  
(No Comments)

Owners Group Resolution: Approved Date: 19-Nov-96

**TSTF Review Information**

TSTF Received Date: 19-Nov-96 Date Distributed for Review

OG Review Completed:  BWOG  WOG  CEOG  BWROG

TSTF Comments:  
(No Comments)

TSTF Resolution: Date:

**Incorporation Into the NUREGs**

File to BBS/LAN Date:

TSTF Informed Date:

TSTF Approved Date:

NUREG Rev Incorporated:

**Affected Technical Specifications**

LCO 3.2.3A AFD (CAOC Methodology)

LCO 3.2.3A Bases AFD (CAOC Methodology)

Appl. 3.2.3A AFD (CAOC Methodology)

Appl. 3.2.3A Bases AFD (CAOC Methodology)

3/8/99

TSTF-164, Rev. 1--

3:2 POWER DISTRIBUTION LIMITS

3.2.3A AXIAL FLUX DIFFERENCE (AFD) (Constant Axial Offset Control (CAOC) Methodology)

LCO 3.2.3 The AFD:

a. Shall be maintained within the target band about the target flux difference. The target band is specified in the COLR.

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~~NOTE~~  
1. The AFD shall be considered outside the target band when two or more OPERABLE excore channels indicate AFD to be outside the target band.

b. May deviate outside the target band with THERMAL POWER < 90% RTP but ≥ 50% RTP, provided AFD is within the acceptable operation limits and cumulative penalty deviation time is ≤ 1 hour during the previous 24 hours. The acceptable operation limits are specified in the COLR.

~~NOTE~~  
2. Penalty deviation time shall be accumulated on the basis of a 1 minute penalty deviation for each 1 minute of power operation with AFD outside the target band.

With THERMAL POWER ≥ 50% RTP

c. May deviate outside the target band with THERMAL POWER < 50% RTP.

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With THERMAL POWER < 50% RTP, and > 15% RTP

1.  
2.

~~NOTE~~  
3. Penalty deviation time shall be accumulated on the basis of a 0.5 minute penalty deviation for each 1 minute of power operation with AFD outside the target band.

APPLICABILITY: MODE 1 with THERMAL POWER > 15% RTP.

~~NOTE~~  
4. A total of 16 hours of operation may be accumulated with AFD outside the target band without penalty deviation time during surveillance of power range channels in accordance with SR 3.3.1.6, provided AFD is maintained within acceptable operation limits.

BASES (continued)

LCO

The shape of the power profile in the axial (i.e., the vertical) direction is largely under the control of the operator, through either the manual operation of the control banks, or automatic motion of control banks responding to temperature deviations resulting from either manual operation of the Chemical and Volume Control System to change boron concentration, or from power level changes.

Signals are available to the operator from the Nuclear Instrumentation System (NIS) excore neutron detectors (Ref. 4). Separate signals are taken from the top and bottom detectors. The AFD is defined as the difference in normalized flux signals between the top and bottom excore detector in each detector well. For convenience, this flux difference is converted to provide flux difference units expressed as a percentage and labeled as  $\% \Delta$  flux or  $\% \Delta I$ .

*The* *four Notes.* *1*  
~~Part A of this LCO is modified by Note that~~ states the conditions necessary for declaring the AFD outside of the target band. The required target band varies with axial burnup distribution, which in turn varies with the core average accumulated burnup. The target band defined in the COLR may provide one target band for the entire cycle or more than one band, each to be followed for a specific range of cycle burnup.

With THERMAL POWER  $\geq$  90% RTP, the AFD must be kept within the target band. With the AFD outside the target band with THERMAL POWER  $\geq$  90% RTP, the assumptions of the accident analyses may be violated.

*2 and 3*  
~~Parts B and C of this LCO are modified by Notes that~~ describe how the cumulative penalty deviation time is calculated. It is intended that the unit is operated with the AFD within the target band about the target flux difference. However, during rapid THERMAL POWER reductions, control bank motion may cause the AFD to deviate outside of the target band at reduced THERMAL POWER levels. This deviation does not affect the xenon distribution sufficiently to change the envelope of peaking factors that may be reached on a subsequent return to RTP with the AFD within the target band, provided the time duration of the deviation is limited. Accordingly, while THERMAL POWER is  $\geq$  50% RTP and  $<$  90% RTP (i.e., Part B of this LCO), a 1 hour cumulative penalty deviation time limit, cumulative during the preceding 24 hours, is allowed during which the unit may

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BASES

LCO  
(continued)

be operated outside of the target band but within the acceptable operation limits provided in the COLR. This penalty time is accumulated at the rate of 1 minute for each 1 minute of operating time within the power range of Part B of this LCO (i.e., THERMAL POWER  $\geq$  50% RTP but  $<$  90% RTP). The cumulative penalty time is the sum of penalty times from Parts B and C of this LCO. (Note 2)

For THERMAL POWER levels  $>$  15% RTP and  $<$  50% RTP (i.e., Part C of this LCO), deviations of the AFD outside of the target band are less significant. The accumulation of 1/2 minute penalty deviation time per 1 minute of actual time outside the target band reflects this reduced significance. With THERMAL POWER  $<$  15% RTP, AFD is not a significant parameter in the assumptions used in the safety analysis and, therefore, requires no limits. Because the xenon distribution produced at THERMAL POWER levels less than RTP does affect the power distribution as power is increased, unanalyzed xenon and power distribution is prevented by limiting the accumulated penalty deviation time. Note 3 allows and

The frequency of monitoring the AFD by the unit computer is once per minute providing an essentially continuous accumulation of penalty deviation time that allows the operator to accurately assess the status of the penalty deviation time.

Violating the LCO on the AFD could produce unacceptable consequences if a Condition 2, 3, or 4 event occurs while the AFD is outside its limits.

Figure B 3.2.3A-1 shows a typical target band and typical AFD acceptable operation limits.

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APPLICABILITY

AFD requirements are applicable in MODE 1 above 15% RTP. Above 50% RTP, the combination of THERMAL POWER and core peaking factors are the core parameters of primary importance in safety analyses (Ref. 1).

Between 15% RTP and 90% RTP, this LCO is applicable to ensure that the distributions of xenon are consistent with safety analysis assumptions.

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BASES

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APPLICABILITY  
(continued)

At or below 15% RTP and for lower operating MODES, the stored energy in the fuel and the energy being transferred to the reactor coolant are low. The value of the AFD in these conditions does not affect the consequences of the design basis events.

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*Note 4 allows*

For surveillance of the power range channels performed according to SR 3.3.1.6, deviation outside the target band ~~is permitted~~ for 16 hours and no penalty deviation time ~~is~~ accumulated. Some deviation in the AFD is required for doing the NIS calibration with the incore detector system. This calibration is performed every 92 days.

Low signal levels in the excore channels may preclude obtaining valid AFD signals below 15% RTP.

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ACTIONS

A.1

With the AFD outside the target band and THERMAL POWER  $\geq 90\%$  RTP, the assumptions used in the accident analyses may be violated with respect to the maximum heat generation. Therefore, a Completion Time of 15 minutes is allowed to restore the AFD to within the target band because xenon distributions change little in this relatively short time.

B.1

If the AFD cannot be restored within the target band, then reducing THERMAL POWER to  $< 90\%$  RTP places the core in a condition that has been analyzed and found to be acceptable, provided that the AFD is within the acceptable operation limits provided in the COLR.

The allowed Completion Time of 15 minutes provides an acceptable time to reduce power to  $< 90\%$  RTP without allowing the plant to remain in an unanalyzed condition for an extended period of time.

C.1

With THERMAL POWER  $< 90\%$  RTP but  $\geq 50\%$  RTP, operation with the AFD outside the target band is allowed for up to 1 hour

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