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RS-18-020

10 CFR 50.90

June 15, 2018

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

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Dresden Nuclear Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-237 and 50-249

James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-59
NRC Docket No. 50-333

LaSalle County Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-11 and NPF-18
NRC Docket Nos. 50-373 and 50-374

Limerick Generating Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353

Nine Mile Point Nuclear Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-63 and NPF-69
NRC Docket Nos. 50-220 and 50-410

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

Quad Cities Nuclear Power Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Application to Revise Technical Specifications to Modify the APRM Channel Adjustment Surveillance Requirement

Pursuant to 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (EGC), is submitting a request for an amendment to the Technical Specifications (TS) for Clinton Power Station, Unit 1; Dresden Nuclear Power Station, Units 2 and 3; James A. FitzPatrick Nuclear Power Plant; LaSalle County Station, Units 1 and 2; Limerick Generating Station, Units 1 and 2; Nine Mile Point Nuclear Station, Units 1 and 2; Peach Bottom Atomic Power Station, Units 2 and 3; and Quad Cities Nuclear Power Station, Units 1 and 2.

The proposed amendments alter the Reactor Protection System (RPS) Instrumentation Surveillance Requirement (SR) for the Average Power Range Monitor (APRM) to adjust the APRM consistent with the heat balance power if the calculated power is more than 2% greater than the APRM channel output when operating above the specified Rated Thermal Power (RTP) level. This change revises the SR to distinguish between APRM indications that are consistent with the accident analyses and those that provide additional margin by requiring adjustment only if the APRM indication deviates from the calculated power in the non-conservative direction. The proposed change allows for a 2-hour period for adjustment of the APRM output gain to restore compliance with the SR limit before entering the associated Conditions and Required Actions.

EGC has concluded that the proposed changes present no significant hazards considerations under the standards set forth in 10 CFR 50.92, "Issuance of Amendment."

The proposed changes have been reviewed by each station's Plant Operations Review Committee in accordance with the requirements of the EGC Quality Assurance Program.

There are no regulatory commitments contained in this submittal.

Attachment 1 provides an evaluation of the proposed changes. Attachments 2a through 2k provide the existing TS pages marked up to show the proposed changes. Attachments 3a through 3k provide revised (clean) TS pages. Attachments 4a through 4k provide TS Bases pages marked up to show the associated TS Bases changes and are provided for information only.

EGC requests approval of the proposed amendments by June 14, 2019. Once approved, the amendments shall be implemented within 60 days.

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

If you should have any questions regarding this submittal, please contact Ms. Rebecca L. Steinman at (630) 657-2831.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 15th day of June 2018.

Respectfully,

Patrick Simpson
Manager – Licensing
Exelon Generation Company, LLC

Attachments:

1. Evaluation of Proposed Changes
2. Site-Specific Markup of Technical Specification Pages
   - 2a. Clinton Power Station, Unit 1
   - 2b. Dresden Nuclear Power Station, Units 2 and 3
   - 2c. James A. FitzPatrick Nuclear Power Plant
   - 2d. LaSalle County Station, Units 1 and 2
   - 2e. Limerick Generating Station, Unit 1
   - 2f. Limerick Generating Station, Unit 2
   - 2g. Nine Mile Point Nuclear Station, Unit 1
   - 2h. Nine Mile Point Nuclear Station, Unit 2
   - 2i. Peach Bottom Atomic Power Station, Unit 2
   - 2j. Peach Bottom Atomic Power Station, Unit 3
   - 2k. Quad Cities Nuclear Power Station, Units 1 and 2
3. Revised Technical Specification Pages
   - 3a. Clinton Power Station, Unit 1
   - 3b. Dresden Nuclear Power Station, Units 2 and 3
   - 3c. James A. FitzPatrick Nuclear Power Plant
   - 3d. LaSalle County Station, Units 1 and 2
   - 3e. Limerick Generating Station, Unit 1
   - 3f. Limerick Generating Station, Unit 2
   - 3g. Nine Mile Point Nuclear Station, Unit 1
   - 3h. Nine Mile Point Nuclear Station, Unit 2
   - 3i. Peach Bottom Atomic Power Station, Unit 2
   - 3j. Peach Bottom Atomic Power Station, Unit 3
   - 3k. Quad Cities Nuclear Power Station, Units 1 and 2
4. Markup of Technical Specification Bases Pages – For Information Only
   - 4a. Clinton Power Station, Unit 1
   - 4b. Dresden Nuclear Power Station, Units 2 and 3
   - 4c. James A. FitzPatrick Nuclear Power Plant
   - 4d. LaSalle County Station, Units 1 and 2
   - 4e. Limerick Generating Station, Unit 1
   - 4f. Limerick Generating Station, Unit 2
   - 4g. Nine Mile Point Nuclear Station, Unit 1
   - 4h. Nine Mile Point Nuclear Station, Unit 2
   - 4i. Peach Bottom Atomic Power Station, Unit 2
   - 4j. Peach Bottom Atomic Power Station, Unit 3

4k. Quad Cities Nuclear Power Station, Units 1 and 2

cc: NRC Regional Administrator - Region I
NRC Regional Administrator – Region III
NRC Senior Resident Inspector – Clinton Power Station
NRC Senior Resident Inspector – Dresden Nuclear Power Station
NRC Senior Resident Inspector – James A. FitzPatrick Nuclear Power Plant
NRC Senior Resident Inspector – LaSalle County Station
NRC Senior Resident Inspector – Limerick Generating Station
NRC Senior Resident Inspector – Nine Mile Point Nuclear Station
NRC Senior Resident Inspector – Peach Bottom Atomic Power Station
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station
Illinois Emergency Management Agency – Division of Nuclear Safety
Director, Bureau of Radiation Protection – Pennsylvania Department of Environmental Protection
A.L. Peterson, NYSERDA
Bridget Frymire, NYSPSC

**ATTACHMENT 1**
**Evaluation of Proposed Changes**

Subject: Application to Revise Technical Specifications to Modify the APRM Channel Adjustment Surveillance Requirement


**1.0 SUMMARY DESCRIPTION**

**2.0 DETAILED DESCRIPTION**

**3.0 TECHNICAL EVALUATION**

3.1 TSTF-546 Applicability

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**ATTACHMENT 1**
**Evaluation of Proposed Changes**

## 1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (EGC), is submitting a request for an amendment to the Technical Specifications (TS) for Clinton Power Station (CPS), Unit 1; Dresden Nuclear Power Station (DNPS), Units 2 and 3; James A. FitzPatrick (JAF) Nuclear Power Plant; LaSalle County Station (LSCS), Units 1 and 2; Limerick Generating Station (LGS), Units 1 and 2; Nine Mile Point (NMP) Nuclear Station, Units 1 and 2; Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3; and Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2.

The proposed amendments alter the Reactor Protection System (RPS) Instrumentation Surveillance Requirement (SR) for the Average Power Range Monitor (APRM) to adjust the APRM consistent with the heat balance power if the calculated power is more than 2% greater than the APRM channel output when operating above the specified Rated Thermal Power (RTP) level. This change revises the SR to distinguish between APRM indications that are consistent with the accident analyses and those that provide additional margin by requiring adjustment only if the APRM indication deviates from the calculated power in the non-conservative direction. This portion of the proposed change is consistent with the approved Technical Specifications Task Force (TSTF) Traveler 546, Revision 0, "Revise APRM Channel Adjustment Surveillance Requirement" (Reference 6.5) and the subsequent FirstEnergy Nuclear Operating Company submittal to adopt TSTF-546 for the Perry TS (Reference 6.6).

In addition to adopting the portion of TSTF-546 described above, EGC is proposing to adopt a period of two hours for restoration of an APRM channel discovered outside of the acceptable SR limit. This two-hour period provides an opportunity to correct the condition before entry into the associated Conditions and Required Actions. The U.S. Nuclear Regulatory Commission previously approved this provision for DNPS, LSCS (References 6.1 and 6.2), and QCNPS and more recently approved a similar provision for the Xcel Energy, Inc. Monticello Nuclear Generating Plant (References 6.3 and 6.4).

## 2.0 DETAILED DESCRIPTION

It is proposed to adopt the portion of TSTF-546 that only requires adjustment of non-conservative APRM channel outputs and to add a note (that is not part of TSTF-546) to the RPS Instrumentation Specification to provide 2-hours to make gain adjustments when the APRM functions of APRM Flow Biased Neutron Flux-High and APRM Fixed Neutron Flux-High are inoperable due to a failure to meet the SR specified limit. (Note these functions are called Simulated Thermal Power – Upscale and Neutron Flux – Upscale at LGS Units 1 and 2 and Upscale at NMP Unit 1.) This will be accomplished by revising SR 3.3.1.1.2 as shown below where strikeout shows proposed deletions and underlined text is a proposed addition. Note that the relevant numbering of the proposed SR change is different for the following sites: NMP, Unit 1 – Note (m) of Table 4.6.2a; NMP, Unit 2 - 3.3.1.1.3; and LGS, Units 1 and 2 – Note (d) of Table 4.3.1.1-1.

> Verify the ~~absolute difference between~~ <u>calculated power does not exceed</u> the average power range monitor (APRM) channels ~~and the calculated power is ≤~~ <u>by greater than</u> 2% RTP while operating at ≥ [25]% RTP.

TSTF-546 points out that Note 2 of the ISTS Surveillance Requirements Table allows entry into the TS Actions to be delayed for up to six hours when one or more RPS channels are rendered inoperable for Surveillance testing provided that RPS trip capability is maintained. The TSTF Traveler goes on to further state that no provision is provided to delay entry into the TS Actions to adjust the gain of a channel if the instrument channel is discovered outside the acceptance criteria, even if it remains conservative. However, three EGC sites (DNPS, LSCS, and QCNPS) currently have an Actions Table note that provides a two-hour delay specifically for the performance of the APRM gain adjustment. This note will be retained and modified, as shown below, to delete the twelve-hour period for adjustment of an APRM channel that is conservative with respect to the heat balance power for consistency with the proposed SR revision. The revised version of the note will be added to the plants that have adopted the Improved Standard Technical Specifications (ISTS) that do not already have the note. The plants whose TS are not based on the ISTS will also be modified to provide for a two-hour gain adjustment period.

> When Functions 2.b and 2.c channels are inoperable due to <u>the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ [25]% RTP</u>, entry into associated Conditions and Required Actions may be delayed for up to 2 hours ~~if the APRM is indicating a lower power value than the calculated power, and for up to 12 hours if the APRM is indicating a higher power value than calculated power~~.

See the applicable site-specific markups in Attachments 2a through 2k for the exact wording proposed for each site's TS. Attachments 3a through 3k provide revised (clean) TS pages.

CPS, PBAPS, Units 2 and 3, and NMP, Unit 2 use a different power level than 25% RTP. This is indicated using brackets, [ ], in the proposed mark-ups shown above. The currently approved site-specific numerical value will be reflected in each site-specific note (i.e., this amendment does not change the current value).

The corresponding TS Bases will be revised to describe the basis for the above changes. Attachments 4a through 4k provide these markups and are provided for information only.

## 3.0 TECHNICAL EVALUATION

### 3.1 TSTF-546 Applicability

The technical change of the proposed SR revision described in Section 2 aligns with the intent of TSTF-546, although, it implements the change differently. EGC has reviewed the safety evaluation for TSTF-546 provided to the Technical Specifications Task Force in a letter dated August 31, 2017 (NRC ADAMS Accession No. ML17206A431). This included a review of the NRC evaluation, as well as the information provided in TSTF-546. EGC has concluded that the justifications, plant design description, and safety analysis description presented in TSTF-546 and the safety evaluation prepared by the NRC are applicable to CPS, Unit 1; DNPS, Units 2 and 3; JAF; LSCS, Units 1 and 2; LGS, Units 1 and 2; NMP, Units 1 and 2; PBAPS, Units 2 and 3; and QCNPS, Units 1 and 2. The only differences between TSTF-546 and the EGC proposed changes are described in Section 3.2 below and have no impact on the conclusions of the NRC safety evaluation.

3.2 Variations from TSTF-546

EGC is proposing the following variations from the TS changes described in TSTF-546 or the applicable portions of the NRC safety evaluation for TSTF-546.

1. Use alternative wording for the SR to eliminate the requirement to adjust when the APRM output is conservative with respect to calculated power.
2. Maintain the gain adjustment separate from the performance of the SR.
3. Retain the existing or add a new Action Table note, as applicable, to provide for a delay of up to two hours for the performance of the adjustment. The SR is considered met if the channel can be adjusted to within the limit during the delay period.

These variations differ slightly from the specific wording proposed in TSTF-546, but do not affect the intent of the change, the basis for acceptability of the change, or the conclusions of the NRC safety evaluation dated August 31, 2017.

TSTF-546 uses 25% RTP as the typical power level above which the SR limit is applicable, but states in Section 3.2 of the TSTF justification package that the use of a different plant-specific value does not affect the applicability of the proposed change. CPS, PBAPS, Units 2 and 3, and NMP, Unit 2 use a different site-specific power level that is not altered by this amendment. Therefore, this difference has no impact on the specified change.

TSTF-546 and its corresponding Safety Evaluation discuss the applicable regulatory requirements and guidance, including the applicability of 10 CFR 50, Appendix A, General Design Criteria (GDC) 13, 20, 21, 22, and 29. DNPS, Units 2 and 3; NMP, Unit 1; and QCNPS, Units 1 and 2 were not licensed to the 10 CFR 50, Appendix A, GDC.

- The DNPS, Units 2 and 3 and QCNPS, Units 1 and 2 Updated Final Safety Analysis Report (UFSAR), Section 3.1, "Conformance with NRC General Design Criteria," provides an assessment against the 70 draft GDC published in 1967 and concluded that the plant specific requirements are sufficiently similar to the Appendix A GDC. The plant-specific requirements are unaffected by the proposed licensing change.

- The NMP, Unit 1 UFSAR Table I-1 refers to the NMP, Unit 1 Technical Supplement to Petition for Conversion from Provisional Operating License to Full-Term Operating License, dated July 1972, for the details of an assessment of NMP, Unit 1 against the GDC current at that time. The review determined that the plant-specific requirements for NMP, Unit 1 are sufficiently similar to the Appendix A GDC. The proposed license change is consistent with the current NMP, Unit 1 licensing basis in that the design requirements are unaffected.

The above described GDC differences do not alter the conclusion that the proposed change is applicable to DNPS, Units 2 and 3; NMP, Unit 1; and QCNPS, Units 1 and 2.

3.3 Justification of a Two-Hour Completion Time

A two-hour completion time was selected based on the previously approved LSCS Units 1 and 2 amendments (References 6.1 and 6.2), which justified two hours as being reasonable since it is

consistent with power distribution limit related completion times in Specifications 3.2.2 and 3.2.3. Similarly, Monticello more recently (References 6.3 and 6.4) received approval for the same two-hour delay for non-conservative APRM adjustment citing the power distribution (thermal) limits as well as other completions times in the BWR ISTS for the restoration of parameters, subsystems, and channels within TS limits.

EGC confirms that two hours remains a reasonable time frame in which to restore multiple APRM channels to within the TS specified limit based on the low probability of a transient or DBA occurring simultaneously.

## 4.0 REGULATORY ANALYSIS

### 4.1 No Significant Hazards Consideration Analysis

Exelon Generation Company, LLC (EGC) requests adoption of an amendment to the Technical Specifications (TS) for Clinton Power Station (CPS), Unit 1; Dresden Nuclear Power Station (DNPS), Units 2 and 3; James A. FitzPatrick (JAF) Nuclear Power Plant; LaSalle County Station (LSCS), Units 1 and 2; Limerick Generating Station (LGS), Units 1 and 2; Nine Mile Point (NMP) Nuclear Station, Units 1 and 2; Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3; and Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2.

The proposed amendments alter the Reactor Protection System (RPS) Instrumentation Surveillance Requirement (SR) for the Average Power Range Monitor (APRM) to adjust the APRM consistent with the heat balance power if the calculated power is more than 2% greater than the APRM channel output when operating above the specified Rated Thermal Power (RTP) level. This change revises the SR to distinguish between APRM indications that are consistent with the accident analyses and those that provide additional margin by requiring adjustment only if the APRM indication deviates from the calculated power in the non-conservative direction. The proposed change allows for a two-hour period for adjustment of the APRM output gain to restore compliance with the SR limit before entering the associated Conditions and Required Actions.

EGC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

Response: No

The APRM system and the RPS are not initiators of any accidents previously evaluated. As a result, the proposed change does not affect the probability of any accident previously evaluated. The APRM system and the RPS functions act to mitigate the consequences of accidents previously evaluated. The reliability of the APRM system and the RPS is not significantly affected by removing the gain adjustment requirement on the APRM channels when the APRMs are calibrated conservatively with respect to the calculated heat balance. This is because the actual core thermal power at which the

reactor will automatically trip is lower, thereby increasing the margin to the core thermal limits and the limiting safety system settings assumed in the safety analyses. The consequences of an accident during the adjustment of the APRM instrumentation are no different from those during the existing surveillance testing period or the existing time allowed to restore the instruments to operable status. As a result, the ability of the APRM system and the RPS to mitigate any accident previously evaluated is not significantly affected.

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

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

Response: No

The proposed changes do not alter the protection system designs, create new failure modes, or change any modes of operation. The proposed change does not involve a physical alteration of the plant; no new or different kind of equipment will be installed. Consequently, there are no new initiators that could result in a new or different kind of accident.

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

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

Response: No

The margin of safety provided by the APRM system and the RPS is to ensure that the reactor is shut down automatically when plant parameters exceed the setpoints for the system. Any reduction in the margin of safety resulting from the adjustment of the APRM channels while continuing operation is considered to be offset by delaying a plant shutdown (i.e., a transient) for a short time with the APRM system, the primary indication of core power and an input to the RPS, not calibrated. Additionally, the short time period required for adjustment is consistent with the time allowed by TS to restore the core power distribution parameters to within limits and is acceptable based on the low probability of a transient or design basis accident occurring simultaneously with inaccurate APRM channels.

The proposed changes do not alter setpoints or limits established or assumed by the accident analyses. The TS continue to require operability of the RPS functions, which provide core protection for postulated reactivity insertion events occurring during power operating conditions consistent with the plant safety analyses.

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

Based on the above, EGC concludes that the proposed amendments present no significant hazards considerations under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

4.2 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 EVALUATION

The proposed amendments would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendments do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

## 6.0 REFERENCES

6.1 Letter from Commonwealth Edison Company to U.S. NRC, "LaSalle County Station Units 1 and 2, Proposed Amendments to Technical Specifications for Facility Operating License NPF-11 and NPF-18, APRM Calibration Gain Adjustment Factors, Dockets Nos. 50-373 and 50-374," dated August 28, 1985

6.2 Letter from U.S. NRC to Commonwealth Edison Company (D. Farrar), "Issuance of Amendment No. 30 to Facility Operating License NPF-11 and Amendment 17 to Facility Operating License NPF-18 – LaSalle County Station – Units 1 and 2," dated November 20, 1985 (ADAMS Accession No. 8511260318)

6.3 Letter from Xcel Energy to U.S. NRC, "License Amendment Request: Provide Restoration Period Before Declaring Average Power Range Monitors Inoperable When Surveillance Requirement 3.3.1.1.2 Not Met," dated May 8, 2012 (ADAMS Accession No. ML12131A406)

6.4 Letter from U.S. NRC to Xcel Energy (M. Schimmel), "Monticello Nuclear Generating Plant – Issuance of Amendment Regarding the Restoration Period Before Declaring Average Power Range Monitors Inoperable (TAC No. ME8571)," dated January 25, 2013 (ADAMS Accession No. ML12339A035)

6.5 TSTF-546-A Traveler, "Revise APRM Channel Adjustment Surveillance Requirement," Revision 0, dated August 31, 2017 (ADAMS Accession No. ML17206A431)

6.6 Letter from FENOC to U.S. NRC, "Application to Revise Technical Specifications to Adopt TSTF-546, 'Revise APRM Channel Adjustment Surveillance Requirement'," dated February 14, 2018 (ADAMS Accession No. ML18045A195)

**ATTACHMENT 2a**

**Markup of Technical Specifications Pages**

**Clinton Power Station, Unit 1**

**Facility Operating License No. NPF-62**

**NRC Docket No. 50-461**

**<u>Markup of Technical Specifications Page</u>**

3.3-1
3.3-3

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

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----------NOTE----------

1. Separate Condition entry is allowed for each Function.

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| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more Functions with one channel inoperable. | A.1 Place one channel in affected Function in trip. | 48 hours |
| B. One or more Functions with two channels inoperable. | B.1 Place one channel in affected Function in trip. | 6 hours |
| C. One or more Functions with three or more channels inoperable. | C.1 Restore two channels in affected Function to OPERABLE status. | 1 hour |
| D. Required Action and associated Completion Time of Condition A, B, or C not met. | D.1 Enter the Condition referenced in Table 3.3.1.1-1 for the channel. | Immediately |

(continued)

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 21.6% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

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| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | ----------NOTE----------<br>Not required to be performed until 12 hours after THERMAL POWER ≥ 21.6% RTP.<br>----------<br><br>Verify the ~~absolute difference between~~ calculated power does not exceed the average power range monitor (APRM) channels ~~and the calculated power~~ by greater than ≤ 2% RTP while operating at ≥ 21.6% RTP. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | Adjust the channel to conform to a calibrated flow signal. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.4 | ----------NOTE----------<br>Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST. | In accordance with the Surveillance Frequency Control Program |

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**ATTACHMENT 2b**

**Markup of Technical Specifications Pages**

**Dresden Nuclear Power Station, Units 2 and 3**

**Renewed Facility Operating License Nos. DPR-19 and DPR-25**

**NRC Docket Nos. 50-237 and 50-249**

**Markup of Technical Specifications Pages**

3.3.1.1-1
3.3.1.1-4

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 25% RTP,

---------- NOTES ----------

1. Separate Condition entry is allowed for each channel.

2. When Functions 2.b and 2.c channels are inoperable due to ~~APRM indication not within limits,~~ entry into associated Conditions and Required Actions may be delayed for up to 2 hours ~~if the APRM is indicating a lower power value than the calculated power, and for up to 12 hours if the APRM is indicating a higher power value than the calculated power~~.

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| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Place channel in trip. | 12 hours |
| | OR | | |
| | A.2 | Place associated trip system in trip. | 12 hours |
| B. One or more Functions with one or more required channels inoperable in both trip systems. | B.1 | Place channel in one trip system in trip. | 6 hours |
| | OR | | |
| | B.2 | Place one trip system in trip. | 6 hours |

(continued)

SURVEILLANCE REQUIREMENTS

----------NOTES ----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

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| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | ----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP. ---------- Verify the ~~absolute difference between~~ calculated power does not exceed the average power range monitor (APRM) channels ~~and the calculated power is~~ by greater than ≤ 2% RTP while operating at ≥ 25% RTP. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | Adjust the channel to conform to a calibrated flow signal. | In accordance with the Surveillance Frequency Control Program |

(continued)

**ATTACHMENT 2c**

**Markup of Technical Specifications Pages**

**James A. FitzPatrick Nuclear Power Plant**

**Renewed Facility Operating License No. DPR-59**

**NRC Docket No. 50-333**

**<u>Markup of Technical Specifications Page</u>**

3.3.1.1-1
3.3.1.1-3

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

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NOTE

1. Separate Condition entry is allowed for each channel.

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Place channel in trip. | 12 hours |
| | OR | | |
| | A.2 | Place associated trip system in trip. | 12 hours |
| B. One or more Functions with one or more required channels inoperable in both trip systems. | B.1 | Place channel in one trip system in trip. | 6 hours |
| | OR | | |
| | B.2 | Place one trip system in trip. | 6 hours |

(continued)

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 25% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | ----------NOTE----------<br>Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP.<br>----------<br>Verify the ~~absolute difference between~~ calculated power does not exceed the average power range monitor (APRM) channels ~~and the calculated power is ≤~~ by greater than 2% RTP while operating at ≥ 25% RTP. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | ----------NOTE----------<br>Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>----------<br>Perform CHANNEL FUNCTIONAL TEST. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.4 | Perform a functional test of each RPS automatic scram contactor. | In accordance with the Surveillance Frequency Control Program |

(continued)

**ATTACHMENT 2d**

**Markup of Technical Specifications Pages**

**LaSalle County Station, Units 1 and 2**

**Renewed Facility Operating License Nos. NPF-11 and NPF-18**

**NRC Docket Nos. 50-373 and 50-374**

**<u>Markup of Technical Specifications Pages</u>**

3.3.1.1-1
3.3.1.1-3

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 25% RTP,

---------- NOTES ----------

1. Separate Condition entry is allowed for each channel.

2. When Functions 2.b and 2.c channels are inoperable due to ~~the APRM indication not within limits,~~ entry into associated Conditions and Required Actions may be delayed for up to 2 hours ~~if the APRM is indicating a lower power value than the calculated power, and for up to 12 hours if the APRM is indicating a higher power value than the calculated power~~.

---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Place channel in trip. | 12 hours |
| | OR | | |
| | A.2 | Place associated trip system in trip. | 12 hours |
| B. One or more Functions with one or more required channels inoperable in both trip systems. | B.1 | Place channel in one trip system in trip. | 6 hours |
| | OR | | |
| | B.2 | Place one trip system in trip. | 6 hours |

(continued)

SURVEILLANCE REQUIREMENTS

---------- NOTES ----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | ----------NOTE----------<br>Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP.<br>----------<br>Verify the ~~absolute difference between~~ calculated power does not exceed the average power range monitor (APRM) channels ~~and the calculated power~~ by greater than ≤ 2% RTP while operating at ≥ 25% RTP. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | Adjust the channel to conform to a calibrated flow signal. | In accordance with the Surveillance Frequency Control Program |

(continued)

**ATTACHMENT 2e**

**Markup of Technical Specifications Pages**

**Limerick Generating Station, Unit 1**

**Renewed Facility Operating License No. NPF-39**

**NRC Docket No. 50-352**

**<u>Markup of Technical Specifications Page</u>**

3/4 3-1
3/4 3-8

## 3/4.3 INSTRUMENTATION

### 3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor protection system instrumentation channels shown in Table 3.3.1-1 shall be OPERABLE with the REACTOR PROTECTION SYSTEM RESPONSE TIME as shown in Table 3.3.1-2.

APPLICABILITY: As shown in Table 3.3.1-1.

ACTION:

Note: Separate condition entry is allowed for each channel.

a. With the number of OPERABLE channels in either trip system for one or more Functional Units less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, within one hour for each affected functional unit either verify that at least one* channel in each trip system is OPERABLE or tripped or that the trip system is tripped, or place either the affected trip system or at least one inoperable channel in the affected trip system in the tripped condition.

b. With the number of OPERABLE channels in either trip system less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, place either the inoperable channel(s) or the affected trip system** in the tripped conditions within 12 hours.

c. With the number of OPERABLE channels in both trip systems for one or more Functional Units less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, place either the inoperable channel(s) in one trip system or one trip system in the tripped condition within 6 hours**.

d. If within the allowable time allocated by Actions a, b or c, it is not desired to place the inoperable channel or trip system in trip (e.g., full scram would occur), Then no later than expiration of that allowable time initiate the action identified in Table 3.3.1-1 for the applicable Functional Unit.

---

*For Functional Units 2.a, 2.b, 2.c, 2.d, and 2.f, at least two channels shall be OPERABLE or tripped. For Functional Unit 5, both trip systems shall have each channel associated with the MSIVs in three main steam lines (not necessarily the same main steam lines for both trip systems) OPERABLE or tripped. For Function 9, at least three channels per trip system shall be OPERABLE or tripped.

**For Functional Units 2.a, 2.b, 2.c, 2.d, and 2.f, inoperable channels shall be placed in the tripped condition to comply with Action b. Action c does not apply for these Functional Units.

Note: When Functional Unit 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% of RATED THERMAL POWER while operating at ≥ 25% of RATED THERMAL POWER, entry into the associated Actions may be delayed up to 2 hours.

TABLE 4.3.1.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

| FUNCTIONAL UNIT | CHANNEL CHECK(n) | CHANNEL FUNCTIONAL TEST(n) | CHANNEL CALIBRATION(a)(n) | OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED |
|---|---|---|---|---|
| 9. Turbine Stop Valve - Closure | N.A. | | | 1 |
| 10. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low | N.A. | | | 1 |
| 11. Reactor Mode Switch Shutdown Position | N.A. | | N.A. | 1, 2, 3, 4, 5 |
| 12. Manual Scram | N.A. | | N.A. | 1, 2, 3, 4, 5 |

(a) Neutron detectors may be excluded from CHANNEL CALIBRATION.
(b) The IRM and SRM channels shall be determined to overlap for at least 1/2 decades during each startup after entering OPERATIONAL CONDITION 2 and the IRM and APRM channels shall be determined to overlap for at least 1/2 decades during each controlled shutdown, if not performed within the previous 7 days.
(c) Calibration includes verification that the OPRM Upscale trip auto-enable (not-bypass) setpoint for APRM Simulated Thermal Power is ≥ 29.5% and for recirculation drive flow is < 60%.
(d) The more frequent calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER ≥25% of RATED THERMAL POWER. ~~Adjust the APRM channel if the absolute difference is~~ greater than 2% of RATED THERMAL POWER.
(e) CHANNEL FUNCTIONAL TEST shall include the flow input function, excluding the flow transmitter.
(f) The LPRMs shall be calibrated at least once per 2000 effective full power hours (EFPH).
(g) The less frequent calibration includes the flow input function.
(h) This function is not required to be OPERABLE when the reactor pressure vessel head is removed per Specification 3.10.1.
(i) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.
(j) If the RPS shorting links are required to be removed per Specification 3.9.2, they may be reinstalled for up to 2 hours for required surveillance. During this time, CORE ALTERATIONS shall be suspended, and no control rod shall be moved from its existing position.
(k) DELETED
(l) Not required to be performed when entering OPERATIONAL CONDITION 2 from OPERATIONAL CONDITION 1 until 12 hours after entering OPERATIONAL CONDITION 2.
(m) With THERMAL POWER ≥ 25% of RATED THERMAL POWER.
(n) Frequencies are specified in the Surveillance Frequency Control Program unless otherwise noted in the table.

Verify the calculated power does not exceed the APRM channels by

**ATTACHMENT 2f**

**Markup of Technical Specifications Pages**

**Limerick Generating Station, Unit 2**

**Renewed Facility Operating License No. NPF-85**

**NRC Docket No. 50-353**

**<u>Markup of Technical Specifications Page</u>**

3/4 3-1
3/4 3-8

## 3/4.3 INSTRUMENTATION

### 3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor protection system instrumentation channels shown in Table 3.3.1-1 shall be OPERABLE with the REACTOR PROTECTION SYSTEM RESPONSE TIME as shown in Table 3.3.1-2.

APPLICABILITY: As shown in Table 3.3.1-1.

ACTION:

Note: Separate condition entry is allowed for each channel.

a. With the number of OPERABLE channels in either trip system for one or more Functional Units less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, within one hour for each affected functional unit either verify that at least one* channel in each trip system is OPERABLE or tripped or that the trip system is tripped, or place either the affected trip system or at least one inoperable channel in the affected trip system in the tripped condition.

b. With the number of OPERABLE channels in either trip system less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, place either the inoperable channel(s) or the affected trip system** in the tripped condition within 12 hours.

c. With the number of OPERABLE channels in both trip systems for one or more Functional Units less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, place either the inoperable channel(s) in one trip system or one trip system in the tripped condition within 6 hours**.

d. If within the allowable time allocated by Actions a, b or c, it is not desired to place the inoperable channel or trip system in trip (e.g., full scram would occur), Then no later than expiration of that allowable time initiate the action identified in Table 3.3.1-1 for the applicable Functional Unit.

---

* For Functional Units 2.a, 2.b, 2.c, 2.d, and 2.f, at least two channels shall be OPERABLE or tripped. For Functional Unit 5, both trip systems shall have each channel associated with the MSIVs in three main steam lines (not necessarily the same main steam lines for both trip systems) OPERABLE or tripped. For Function 9, at least three channels per trip system shall be OPERABLE or tripped.

** For Functional Units 2.a, 2.b, 2.c, 2.d, and 2.f, inoperable channels shall be placed in the tripped condition to comply with Action b. Action c does not apply for these Functional Units.

Note: When Functional Unit 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% of RATED THERMAL POWER while operating at ≥ 25% of RATED THERMAL POWER, entry into the associated Actions may be delayed up to 2 hours.

TABLE 4.3.1.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

| FUNCTIONAL UNIT | CHANNEL CHECK (n) | CHANNEL FUNCTIONAL TEST (n) | CHANNEL CALIBRATION(a)(n) | OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED |
|---|---|---|---|---|
| 9. Turbine Stop Valve - Closure | N.A. | | | 1 |
| 10. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low | N.A. | | | 1 |
| 11. Reactor Mode Switch Shutdown Position | N.A. | | N.A. | 1, 2, 3, 4, 5 |
| 12. Manual Scram | N.A. | | N.A. | 1, 2, 3, 4, 5 |

(a) Neutron detectors may be excluded from CHANNEL CALIBRATION.
(b) The IRM and SRM channels shall be determined to overlap for at least 1/2 decades during each startup after entering OPERATIONAL CONDITION 2 and the IRM and APRM channels shall be determined to overlap for a least 1/2 decades during each controlled shutdown, if not performed within the previous 7 days.
(c) Calibration includes verification that the OPRM Upscale trip auto-enable (not-bypass) setpoint for APRM Simulated Thermal Power is ≥ 29.5% and for recirculation drive flow is < 60%.
(d) The more frequent calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER ≥ 25% of RATED THERMAL POWER. ~~Adjust the APRM channel if the absolute difference is~~ greater than 2% of RATED THERMAL POWER.
(e) CHANNEL FUNCTIONAL TEST shall include the flow input function, excluding the flow transmitter.
(f) The LPRMs shall be calibrated at least once per 2000 effective full power hours (EFPH).
(g) The less frequent calibration includes the flow input function.
(h) This function is not required to be OPERABLE when the reactor pressure vessel head is removed per Specification 3.10.1.
(i) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.
(j) If the RPS shorting links are required to be removed per Specification 3.9.2, they may be reinstalled for up to 2 hours for required surveillance. During this time, CORE ALTERATIONS shall be suspended, and no control rod shall be moved from its existing position.
(k) DELETED
(l) Not required to be performed when entering OPERATIONAL CONDITION 2 from OPERATIONAL CONDITION 1 until 12 hours after entering OPERATIONAL CONDITION 2.
(m) With THERMAL POWER ≥ 25% of RATED THERMAL POWER.
(n) Frequencies are specified in the Surveillance Frequency Control Program unless otherwise noted in the table.



Verify the calculated power does not exceed the APRM channels by

**ATTACHMENT 2g**

**Markup of Technical Specifications Pages**

**Nine Mile Point Nuclear Station, Unit 1**

**Renewed Facility Operating License No. DPR-63**

**NRC Docket No. 50-220**

**<u>Markup of Technical Specifications Page</u>**

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| LIMITING CONDITION FOR OPERATION | SURVEILLANCE REQUIREMENT |
|---|---|
| b. During operation with the Core Maximum Fraction of Limiting Power Density (CMFLPD) greater than the Fraction of Rated Thermal Power (FRTP), either:<br><br>(1) The APRM scram and rod block settings shall be reduced to the values given by the equations in Specification 2.1.2a; or<br><br>(2) ~~The~~ APRM gain ~~shall be adjusted~~ in accordance with Specification 2.1.2a; or<br><br>(3) The power distribution shall be changed such that the CMFLPD no longer exceeds FRTP.<br><br>ction shall be taken within two (2) hours to adjust the | c. During reactor power operation at ≥25 percent rated thermal power, the Core Maximum Fraction of Limiting Power Density (CMFLPD) shall be checked in accordance with the Surveillance Frequency Control Program and the flow-referenced APRM scram and rod block signals shall be adjusted, if necessary, as specified by Specification 2.1.2a. |

## NOTES FOR TABLES 3.6.2a and 4.6.2a

(a) May be bypassed when necessary for containment inerting.

(b) May be bypassed in the refuel and shutdown positions of the reactor mode switch with a keylock switch.

(c) May be bypassed in the refuel and startup positions of the reactor mode switch when reactor pressure is less than 600 psi, or for the purpose of performing reactor coolant system pressure testing and/or control rod scram time testing with the reactor mode switch in the refuel position.

(d) No more than one of the four IRM inputs to each trip system shall be bypassed.

(e) No more than two C or D level LPRM inputs to an APRM shall be bypassed and only four LPRM inputs to an APRM shall be bypassed in order for the APRM to be considered operable. No more than one of the four APRM inputs to each trip system shall be bypassed provided that the APRM in the other instrument channel in the same core quadrant is not bypassed. A Traversing In-Core Probe (TIP) chamber may be used as a substitute APRM input if the TIP is positioned in close proximity to the failed LPRM it is replacing.

(f) Verify SRM/IRM channels overlap during startup after the mode switch has been placed in startup. Verify IRM/APRM channels overlap at least 1/2 decade during entry into startup from run (normal shutdown) if not performed within the previous 7 days.

(g) Within 24 hours before startup, if not performed within the previous 7 days. Not required to be performed during shutdown until 12 hours after entering startup from run.

(h) Each of the four isolation valves has two limit switches. Each limit switch provides input to one of two instrument channels in a single trip system.

(i) May be bypassed when reactor power level is below 45%.

(j) Trip upon loss of oil pressure to the acceleration relay.

(k) May be bypassed when placing the reactor mode switch in the SHUTDOWN position and all control rods are fully inserted.

(l) The trip circuit will be calibrated and tested in accordance with the Surveillance Frequency Control Program, the primary sensor will be calibrated and tested in accordance with the Surveillance Frequency Control Program.

(m) This calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during reactor operation when ~~THERMAL POWER~~ thermal power ≥ 25% of ~~RATED THERMAL POWER~~ rated thermal power. ~~Adjust the APRM channel if the difference is~~ Verify the calculated power does not exceed the APRM channels by greater than ~~±2.0/-1.9~~ 2% of ~~RATED THERMAL POWER.~~ Any APRM channel gain adjustment made in compliance with Specification 2.1.2a shall not be included in determining the difference.

(n) Neutron detectors are excluded.

**ATTACHMENT 2h**

**Markup of Technical Specifications Pages**

**Nine Mile Point Nuclear Station, Unit 2**

**Renewed Facility Operating License No. NPF-69**

**NRC Docket No. 50-410**

**Markup of Technical Specifications Page**

3.3.1.1-1
3.3.1.1-4

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

S

----------NOTE----------

1. Separate Condition entry is allowed for each channel.

---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more required channels inoperable. | A.1 Place channel in trip.<br><br>OR<br><br>A.2 Place associated trip system in trip. | 12 hours<br><br><br><br>12 hours |
| B. ----------NOTE----------<br>Not applicable for Functions 2.a, 2.b, 2.c, 2.d, and 2.e.<br>----------<br><br>One or more Functions with one or more required channels inoperable in both trip systems. | B.1 Place channel in one trip system in trip.<br><br>OR<br><br>B.2 Place one trip system in trip. | 6 hours<br><br><br><br>6 hours |

(continued)

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 23% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

SURVEILLANCE REQUIREMENTS

----------NOTE----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function Maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | ---------- NOTE ----------<br>Not required to be performed until 12 hours after THERMAL POWER ≥ 23% RTP.<br>----------<br>calculated power does not exceed<br>Verify the ~~absolute difference between~~ the average power range monitor (APRM) channels ~~and the calculated power~~ ≤ 2% RTP while operating at ≥ 23% RTP.<br>by greater than | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.4 | ---------- NOTE ----------<br>For Functions 1.a and 1.b, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>----------<br>Perform CHANNEL FUNCTIONAL TEST. | In accordance with the Surveillance Frequency Control Program |

(continued)

**ATTACHMENT 2i**

**Markup of Technical Specifications Pages**

**Peach Bottom Atomic Power Station, Unit 2**

**Renewed Facility Operating License No. DPR-44**

**NRC Docket No. 50-277**

**<u>Markup of Technical Specifications Page</u>**

3.3-1
3.3-3a

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

S

----------NOTE----------
1. Separate Condition entry is allowed for each channel.
---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more required channels inoperable. | A.1 Place channel in trip.<br><br>OR<br><br>A.2 --------NOTE--------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ---------- Place associated trip system in trip. | 12 hours<br><br><br><br>12 hours |
| B. --------NOTE--------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ---------- One or more Functions with one or more required channels inoperable in both trip systems. | B.1 Place channel in one trip system in trip.<br><br>OR<br><br>B.2 Place one trip system in trip. | 6 hours<br><br><br><br>6 hours |

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 22.6% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program. |
| SR 3.3.1.1.2 | ----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 22.6% RTP. ---------- Verify the ~~absolute difference between~~ calculated power does not exceed the average power range monitor (APRM) channels ~~and the calculated power is~~ by greater than ≤ 2% RTP while operating at ≥ 22.6% RTP. | In accordance with the Surveillance Frequency Control Program. |

(continued)

**ATTACHMENT 2j**

**Markup of Technical Specifications Pages**

**Peach Bottom Atomic Power Station, Unit 3**

**Renewed Facility Operating License No. DPR-56**

**NRC Docket No. 50-278**

**<u>Markup of Technical Specifications Page</u>**

3.3-1
3.3-3a

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

S

----------NOTE----------

1. Separate Condition entry is allowed for each channel.

---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Place channel in trip. | 12 hours |
| | OR | | |
| | A.2 | --------NOTE--------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. --- Place associated trip system in trip. | 12 hours |
| B. ---------NOTE--------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2f. --- One or more Functions with one or more required channels inoperable in both trip systems. | B.1 | Place channel in one trip system in trip. | 6 hours |
| | OR | | |
| | B.2 | Place one trip system in trip. | 6 hours |

(continued)

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 22.6% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program. |
| SR 3.3.1.1.2 | ----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 22.6% RTP. ---------- Verify the ~~absolute difference between~~ calculated power does not exceed the average power range monitor (APRM) channels ~~and the calculated power is~~ ≤ 2% RTP while operating at ≥ 22.6% RTP. (by greater than) | In accordance with the Surveillance Frequency Control Program. |

(continued)

**ATTACHMENT 2k**

**Markup of Technical Specifications Pages**

**Quad Cities Nuclear Power Station, Units 1 and 2**

**Renewed Facility Operating License Nos. DPR-29 and DPR-30**

**NRC Docket Nos. 50-254 and 50-265**

**Markup of Technical Specifications Pages**

3.3.1.1-1
3.3.1.1-3

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 25% RTP,

---------- NOTES ----------

1. Separate Condition entry is allowed for each channel.

2. When Functions 2.b and 2.c channels are inoperable due to ~~APRM indication not within limits,~~ entry into associated Conditions and Required Actions may be delayed for up to 2 hours ~~if the APRM is indicating a lower power value than the calculated power, and for up to 12 hours if the APRM is indicating a higher power value than calculated power~~.

---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Place channel in trip. | 12 hours |
| | OR | | |
| | A.2 | Place associated trip system in trip. | 12 hours |
| B. One or more Functions with one or more required channels inoperable in both trip systems. | B.1 | Place channel in one trip system in trip. | 6 hours |
| | OR | | |
| | B.2 | Place one trip system in trip. | 6 hours |

(continued)

SURVEILLANCE REQUIREMENTS

---------- NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | ----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP. ---------- Verify the ~~absolute difference between~~ calculated power does not exceed the average power range monitor (APRM) channels ~~and the calculated power is~~ by greater than ≤ 2% RTP. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | Adjust the channel to conform to a calibrated flow signal. while operating at ≥ 25% RTP | In accordance with the Surveillance Frequency Control Program |

(continued)

**ATTACHMENT 3a**

**Revised Technical Specifications Pages**

**Clinton Power Station, Unit 1**

**Facility Operating License No. NPF-62**

**NRC Docket No. 50-461**

**<u>Revised Technical Specifications Page</u>**

3.3-1
3.3-3

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

----------NOTES----------

1. Separate Condition entry is allowed for each Function.

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 21.6% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more Functions with one channel inoperable. | A.1 Place one channel in affected Function in trip. | 48 hours |
| B. One or more Functions with two channels inoperable. | B.1 Place one channel in affected Function in trip. | 6 hours |
| C. One or more Functions with three or more channels inoperable. | C.1 Restore two channels in affected Function to OPERABLE status. | 1 hour |
| D. Required Action and associated Completion Time of Condition A, B, or C not met. | D.1 Enter the Condition referenced in Table 3.3.1.1-1 for the channel. | Immediately |

(continued)

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | ----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 21.6% RTP. ---------- Verify the calculated power does not exceed the average power range monitor (APRM) channels by greater than 2% RTP while operating at ≥ 21.6% RTP. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | Adjust the channel to conform to a calibrated flow signal. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.4 | ----------NOTE---------- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ---------- Perform CHANNEL FUNCTIONAL TEST. | In accordance with the Surveillance Frequency Control Program |

(continued)

**ATTACHMENT 3b**

**Revised Technical Specifications Pages**

**Dresden Nuclear Power Station, Units 2 and 3**

**Renewed Facility Operating License Nos. DPR-19 and DPR-25**

**NRC Docket Nos. 50-237 and 50-249**

**Revised Technical Specifications Pages**

3.3.1.1-1
3.3.1.1-4

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

----------NOTES----------

1. Separate Condition entry is allowed for each channel.

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 25% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Place channel in trip. | 12 hours |
| | OR | | |
| | A.2 | Place associated trip system in trip. | 12 hours |
| B. One or more Functions with one or more required channels inoperable in both trip systems. | B.1 | Place channel in one trip system in trip. | 6 hours |
| | OR | | |
| | B.2 | Place one trip system in trip. | 6 hours |

(continued)

SURVEILLANCE REQUIREMENTS

----------NOTES ----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | ----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP. ---------- Verify the calculated power does not exceed the average power range monitor (APRM) channels by greater than 2% RTP while operating at ≥ 25% RTP. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | Adjust the channel to conform to a calibrated flow signal. | In accordance with the Surveillance Frequency Control Program |

(continued)

**ATTACHMENT 3c**

**Revised Technical Specifications Pages**

**James A. FitzPatrick Nuclear Power Plant**

**Renewed Facility Operating License No. DPR-59**

**NRC Docket No. 50-333**

**<u>Revised Technical Specifications Page</u>**

3.3.1.1-1
3.3.1.1-3

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

----------NOTES----------

1. Separate Condition entry is allowed for each channel.

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 25% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Place channel in trip. | 12 hours |
| | OR | | |
| | A.2 | Place associated trip system in trip. | 12 hours |
| B. One or more Functions with one or more required channels inoperable in both trip systems. | B.1 | Place channel in one trip system in trip. | 6 hours |
| | OR | | |
| | B.2 | Place one trip system in trip. | 6 hours |

(continued)

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for the performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | ----------NOTE----------<br>Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP.<br>----------<br><br>Verify the calculated power does not exceed the average power range monitor (APRM) channels by greater than 2% RTP while operating at ≥ 25% RTP. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | ----------NOTE----------<br>Not required to be performed when entering MODE 2 from MODE 1until 12 hours after entering MODE 2.<br>----------<br><br>Perform CHANNEL FUNCTIONAL TEST. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.4 | Perform a functional test of each RPS automatic scram contactor. | In accordance with the Surveillance Frequency Control Program |

(continued)

**ATTACHMENT 3d**

**Revised Technical Specifications Pages**

**LaSalle County Station, Units 1 and 2**

**Renewed Facility Operating License Nos. NPF-11 and NPF-18**

**NRC Docket Nos. 50-373 and 50-374**

**Revised Technical Specifications Pages**

3.3.1.1-1
3.3.1.1-3

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

---------- NOTES ----------

1. Separate Condition entry is allowed for each channel.

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 25% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Place channel in trip. | 12 hours |
| | OR | | |
| | A.2 | Place associated trip system in trip. | 12 hours |
| B. One or more Functions with one or more required channels inoperable in both trip systems. | B.1 | Place channel in one trip system in trip. | 6 hours |
| | OR | | |
| | B.2 | Place one trip system in trip. | 6 hours |

(continued)

SURVEILLANCE REQUIREMENTS

---------- NOTES ----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | ----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP. ----------<br><br>Verify the calculated power does not exceed the average power range monitor (APRM) channels by greater than 2% RTP while operating at ≥ 25% RTP. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | Adjust the channel to conform to a calibrated flow signal. | In accordance with the Surveillance Frequency Control Program |

(continued)

**ATTACHMENT 3e**

**Markup of Technical Specifications Pages**

**Limerick Generating Station, Unit 1**

**Renewed Facility Operating License No. NPF-39**

**NRC Docket No. 50-352**

**<u>Revised Technical Specifications Page</u>**

3/4 3-1
3/4 3-8

## 3/4.3 INSTRUMENTATION

### 3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor protection system instrumentation channels shown in Table 3.3.1-1 shall be OPERABLE with the REACTOR PROTECTION SYSTEM RESPONSE TIME as shown in Table 3.3.1-2.

APPLICABILITY: As shown in Table 3.3.1-1.

ACTION:

Note: Separate condition entry is allowed for each channel.

Note: When Functional Unit 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% of RATED THERMAL POWER while operating at ≥ 25% of RATED THERMAL POWER, entry into the associated Actions may be delayed up to 2 hours.

a. With the number of OPERABLE channels in either trip system for one or more Functional Units less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, within one hour for each affected functional unit either verify that at least one* channel in each trip system is OPERABLE or tripped or that the trip system is tripped, or place either the affected trip system or at least one inoperable channel in the affected trip system in the tripped condition.

b. With the number of OPERABLE channels in either trip system less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, place either the inoperable channel(s) or the affected trip system** in the tripped conditions within 12 hours.

c. With the number of OPERABLE channels in both trip systems for one or more Functional Units less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, place either the inoperable channel(s) in one trip system or one trip system in the tripped condition within 6 hours**.

d. If within the allowable time allocated by Actions a, b or c, it is not desired to place the inoperable channel or trip system in trip (e.g., full scram would occur), Then no later than expiration of that allowable time initiate the action identified in Table 3.3.1-1 for the applicable Functional Unit.

---

*For Functional Units 2.a, 2.b, 2.c, 2.d, and 2.f, at least two channels shall be OPERABLE or tripped. For Functional Unit 5, both trip systems shall have each channel associated with the MSIVs in three main steam lines (not necessarily the same main steam lines for both trip systems) OPERABLE or tripped. For Function 9, at least three channels per trip system shall be OPERABLE or tripped.

**For Functional Units 2.a, 2.b, 2.c, 2.d, and 2.f, inoperable channels shall be placed in the tripped condition to comply with Action b. Action c does not apply for these Functional Units.

TABLE 4.3.1.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

| FUNCTIONAL UNIT | CHANNEL CHECK(n) | CHANNEL FUNCTIONAL TEST(n) | CHANNEL CALIBRATION(a)(n) | OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED |
|---|---|---|---|---|
| 9. Turbine Stop Valve - Closure | N.A. | | | 1 |
| 10. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low | N.A. | | | 1 |
| 11. Reactor Mode Switch Shutdown Position | N.A. | | N.A. | 1, 2, 3, 4, 5 |
| 12. Manual Scram | N.A. | | N.A. | 1, 2, 3, 4, 5 |

(a) Neutron detectors may be excluded from CHANNEL CALIBRATION.
(b) The IRM and SRM channels shall be determined to overlap for at least 1/2 decades during each startup after entering OPERATIONAL CONDITION 2 and the IRM and APRM channels shall be determined to overlap for at least 1/2 decades during each controlled shutdown, if not performed within the previous 7 days.
(c) Calibration includes verification that the OPRM Upscale trip auto-enable (not-bypass) setpoint for APRM Simulated Thermal Power is ≥ 29.5% and for recirculation drive flow is < 60%.
(d) The more frequent calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER ≥25% of RATED THERMAL POWER. Verify the calculated power does not exceed the APRM channels by greater than 2% of RATED THERMAL POWER.
(e) CHANNEL FUNCTIONAL TEST shall include the flow input function, excluding the flow transmitter.
(f) The LPRMs shall be calibrated at least once per 2000 effective full power hours (EFPH).
(g) The less frequent calibration includes the flow input function.
(h) This function is not required to be OPERABLE when the reactor pressure vessel head is removed per Specification 3.10.1.
(i) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.
(j) If the RPS shorting links are required to be removed per Specification 3.9.2, they may be reinstalled for up to 2 hours for required surveillance. During this time, CORE ALTERATIONS shall be suspended, and no control rod shall be moved from its existing position.
(k) DELETED
(l) Not required to be performed when entering OPERATIONAL CONDITION 2 from OPERATIONAL CONDITION 1 until 12 hours after entering OPERATIONAL CONDITION 2.
(m) With THERMAL POWER ≥ 25% of RATED THERMAL POWER.
(n) Frequencies are specified in the Surveillance Frequency Control Program unless otherwise noted in the table.

**ATTACHMENT 3f**

**Markup of Technical Specifications Pages**

**Limerick Generating Station, Unit 2**

**Renewed Facility Operating License No. NPF-85**

**NRC Docket No. 50-353**

**<u>Revised Technical Specifications Page</u>**

3/4 3-1
3/4 3-8

## 3/4.3 INSTRUMENTATION

### 3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1 As a minimum, the reactor protection system instrumentation channels shown in Table 3.3.1-1 shall be OPERABLE with the REACTOR PROTECTION SYSTEM RESPONSE TIME as shown in Table 3.3.1-2.

APPLICABILITY: As shown in Table 3.3.1-1.

ACTION:

Note: Separate condition entry is allowed for each channel.

Note: When Functional Unit 2.b and 2.c channels are inoperable due the calculated power exceeding the APRM output by more than 2% of RATED THERMAL POWER while operating at ≥ 25% of RATED THERMAL POWER, entry into the associated Actions may be delayed up to 2 hours.

a. With the number of OPERABLE channels in either trip system for one or more Functional Units less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, within one hour for each affected functional unit either verify that at least one* channel in each trip system is OPERABLE or tripped or that the trip system is tripped, or place either the affected trip system or at least one inoperable channel in the affected trip system in the tripped condition.

b. With the number of OPERABLE channels in either trip system less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, place either the inoperable channel(s) or the affected trip system** in the tripped condition within 12 hours.

c. With the number of OPERABLE channels in both trip systems for one or more Functional Units less than the Minimum OPERABLE Channels per Trip System required by Table 3.3.1-1, place either the inoperable channel(s) in one trip system or one trip system in the tripped condition within 6 hours**.

d. If within the allowable time allocated by Actions a, b or c, it is not desired to place the inoperable channel or trip system in trip (e.g., full scram would occur), Then no later than expiration of that allowable time initiate the action identified in Table 3.3.1-1 for the applicable Functional Unit.

---

* For Functional Units 2.a, 2.b, 2.c, 2.d, and 2.f, at least two channels shall be OPERABLE or tripped. For Functional Unit 5, both trip systems shall have each channel associated with the MSIVs in three main steam lines (not necessarily the same main steam lines for both trip systems) OPERABLE or tripped. For Function 9, at least three channels per trip system shall be OPERABLE or tripped.

** For Functional Units 2.a, 2.b, 2.c, 2.d, and 2.f, inoperable channels shall be placed in the tripped condition to comply with Action b. Action c does not apply for these Functional Units.

TABLE 4.3.1.1-1 (Continued)

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

| FUNCTIONAL UNIT | CHANNEL CHECK (n) | CHANNEL FUNCTIONAL TEST (n) | CHANNEL CALIBRATION(a)(n) | OPERATIONAL CONDITIONS FOR WHICH SURVEILLANCE REQUIRED |
|---|---|---|---|---|
| 9. Turbine Stop Valve - Closure | N.A. | | | 1 |
| 10. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low | N.A. | | | 1 |
| 11. Reactor Mode Switch Shutdown Position | N.A. | | N.A. | 1, 2, 3, 4, 5 |
| 12. Manual Scram | N.A. | | N.A. | 1, 2, 3, 4, 5 |

(a) Neutron detectors may be excluded from CHANNEL CALIBRATION.
(b) The IRM and SRM channels shall be determined to overlap for at least 1/2 decades during each startup after entering OPERATIONAL CONDITION 2 and the IRM and APRM channels shall be determined to overlap for a least 1/2 decades during each controlled shutdown, if not performed within the previous 7 days.
(c) Calibration includes verification that the OPRM Upscale trip auto-enable (not-bypass) setpoint for APRM Simulated Thermal Power is ≥ 29.5% and for recirculation drive flow is < 60%.
(d) The more frequent calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during OPERATIONAL CONDITION 1 when THERMAL POWER ≥ 25% of RATED THERMAL POWER. Verify the calculated power does not exceed the APRM channels by greater than 2% of RATED THERMAL POWER.
(e) CHANNEL FUNCTIONAL TEST shall include the flow input function, excluding the flow transmitter.
(f) The LPRMs shall be calibrated at least once per 2000 effective full power hours (EFPH).
(g) The less frequent calibration includes the flow input function.
(h) This function is not required to be OPERABLE when the reactor pressure vessel head is removed per Specification 3.10.1.
(i) With any control rod withdrawn. Not applicable to control rods removed per Specification 3.9.10.1 or 3.9.10.2.
(j) If the RPS shorting links are required to be removed per Specification 3.9.2, they may be reinstalled for up to 2 hours for required surveillance. During this time, CORE ALTERATIONS shall be suspended, and no control rod shall be moved from its existing position.
(k) DELETED
(l) Not required to be performed when entering OPERATIONAL CONDITION 2 from OPERATIONAL CONDITION 1 until 12 hours after entering OPERATIONAL CONDITION 2.
(m) With THERMAL POWER ≥ 25% of RATED THERMAL POWER.
(n) Frequencies are specified in the Surveillance Frequency Control Program unless otherwise noted in the table.

**ATTACHMENT 3g**

**Revised Technical Specifications Pages**

**Nine Mile Point Nuclear Station, Unit 1**

**Renewed Facility Operating License No. DPR-63**

**NRC Docket No. 50-220**

**<u>Revised Technical Specifications Page</u>**

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| LIMITING CONDITION FOR OPERATION | SURVEILLANCE REQUIREMENT |
| --- | --- |
| b. During operation with the Core Maximum Fraction of Limiting Power Density (CMFLPD) greater than the Fraction of Rated Thermal Power (FRTP), either:<br><br>(1) The APRM scram and rod block settings shall be reduced to the values given by the equations in Specification 2.1.2a; or<br><br>(2) Action shall be taken within two (2) hours to adjust the APRM gain in accordance with Specification 2.1.2a; or<br><br>(3) The power distribution shall be changed such that the CMFLPD no longer exceeds FRTP. | c. During reactor power operation at ≥25 percent rated thermal power, the Core Maximum Fraction of Limiting Power Density (CMFLPD) shall be checked in accordance with the Surveillance Frequency Control Program and the flow-referenced APRM scram and rod block signals shall be adjusted, if necessary, as specified by Specification 2.1.2a. |

## NOTES FOR TABLES 3.6.2a and 4.6.2a

(a) May be bypassed when necessary for containment inerting.

(b) May be bypassed in the refuel and shutdown positions of the reactor mode switch with a keylock switch.

(c) May be bypassed in the refuel and startup positions of the reactor mode switch when reactor pressure is less than 600 psi, or for the purpose of performing reactor coolant system pressure testing and/or control rod scram time testing with the reactor mode switch in the refuel position.

(d) No more than one of the four IRM inputs to each trip system shall be bypassed.

(e) No more than two C or D level LPRM inputs to an APRM shall be bypassed and only four LPRM inputs to an APRM shall be bypassed in order for the APRM to be considered operable. No more than one of the four APRM inputs to each trip system shall be bypassed provided that the APRM in the other instrument channel in the same core quadrant is not bypassed. A Traversing In-Core Probe (TIP) chamber may be used as a substitute APRM input if the TIP is positioned in close proximity to the failed LPRM it is replacing.

(f) Verify SRM/IRM channels overlap during startup after the mode switch has been placed in startup. Verify IRM/APRM channels overlap at least 1/2 decade during entry into startup from run (normal shutdown) if not performed within the previous 7 days.

(g) Within 24 hours before startup, if not performed within the previous 7 days. Not required to be performed during shutdown until 12 hours after entering startup from run.

(h) Each of the four isolation valves has two limit switches. Each limit switch provides input to one of two instrument channels in a single trip system.

(i) May be bypassed when reactor power level is below 45%.

(j) Trip upon loss of oil pressure to the acceleration relay.

(k) May be bypassed when placing the reactor mode switch in the SHUTDOWN position and all control rods are fully inserted.

(l) The trip circuit will be calibrated and tested in accordance with the Surveillance Frequency Control Program, the primary sensor will be calibrated and tested in accordance with the Surveillance Frequency Control Program.

(m) This calibration shall consist of the adjustment of the APRM channel to conform to the power values calculated by a heat balance during reactor operation when thermal power ≥ 25% of rated thermal power. Verify the calculated power does not exceed the APRM channels by greater than 2.0% of rated thermal power. Any APRM channel gain adjustment made in compliance with Specification 2.1.2a shall not be included in determining the difference.

(n) Neutron detectors are excluded.

**ATTACHMENT 3h**

**Revised Technical Specifications Pages**

**Nine Mile Point Nuclear Station, Unit 2**

**Renewed Facility Operating License No. NPF-69**

**NRC Docket No. 50-410**

**<u>Revised Technical Specifications Page</u>**

3.3.1.1-1
3.3.1.1-4

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

----------NOTES----------

1. Separate Condition entry is allowed for each channel.

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 23% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Place channel in trip. | 12 hours |
| | OR | | |
| | A.2 | Place associated trip system in trip. | 12 hours |
| B. ----------NOTE---------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, and 2.e. ---------- | | | |
| One or more Functions with one or more required channels inoperable in both trip systems. | B.1 | Place channel in one trip system in trip. | 6 hours |
| | OR | | |
| | B.2 | Place one trip system in trip. | 6 hours |

(continued)

SURVEILLANCE REQUIREMENTS

---------- NOTE ----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function Maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | ----------NOTE ----------<br>Not required to be performed until 12 hours after THERMAL POWER ≥ 23% RTP.<br>----------<br><br>Verify the calculated power does not exceed the average power range monitor (APRM) channels by greater than 2% RTP while operating at ≥ 23% RTP. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.4 | ----------NOTE ----------<br>For Functions 1.a and 1.b, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2.<br>----------<br>Perform CHANNEL FUNCTIONAL TEST. | In accordance with the Surveillance Frequency Control Program |

(continued)

**ATTACHMENT 3i**

**Revised Technical Specifications Pages**

**Peach Bottom Atomic Power Station, Unit 2**

**Renewed Facility Operating License No. DPR-44**

**NRC Docket No. 50-277**

**<u>Revised Technical Specifications Page</u>**

3.3-1
3.3-2
3.3-3
3.3-3a
3.3-3b

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

----------NOTES----------

1. Separate Condition entry is allowed for each channel.

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 22.6% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

---

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| A. One or more required channels inoperable. | A.1 Place channel in trip. | 12 hours |
| | OR | |
| | A.2 --------NOTE--------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ---------- Place associated trip system in trip. | 12 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. --------NOTE--------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f. ---------- One or more Functions with one or more required channels inoperable in both trip systems. | B.1 Place channel in one trip system in trip.<br><br>OR<br><br>B.2 Place one trip system in trip. | 6 hours<br><br>6 hours |
| C. One or more automatic Functions with RPS trip capability not maintained.<br><br>OR<br><br>Two or more manual Functions with RPS trip capability not maintained. | C.1 Restore RPS trip capability. | 1 hour |
| D. Required Action and associated Completion Time of Condition A, B, or C not met. | D.1 Enter the Condition referenced in Table 3.3.1.1-1 for the channel. | Immediately |
| E. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | E.1 Reduce THERMAL POWER to < 26.3% RTP. | 4 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| F. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | F.1 | Be in MODE 2. | 6 hours |
| G. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | G.1 | Be in MODE 3. | 12 hours |
| H. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | H.1 | Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |
| I. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | I.1 | Initiate action to implement the Manual Backup Stability Protection (BSP) Regions defined in the COLR. | Immediately |
| | AND | | |
| | I.2 | Implement the Automated BSP Scram Region using the modified APRM Simulated Thermal Power-High scram setpoints defined in the COLR. | 12 hours |
| | AND | | |
| | I.3 | Initiate action to submit an OPRM report in accordance with Specification 5.6.8. | Immediately |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| J. Required Action and associated Completion Time of Condition I not met. | J.1 Initiate action to implement the Manual BSP Regions defined in the COLR. | Immediately |
| | AND | |
| | J.2 Reduce operation to below the BSP Boundary defined in the COLR. | 12 hours |
| | AND | |
| | J.3 -------- NOTE -------- LCO 3.0.4 is not applicable. ---------- Restore required channel to OPERABLE. | 120 days |
| K. Required Action and associated Completion Time of Condition J not met. | K.1 Reduce THERMAL POWER to < 17.6% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program. |
| SR 3.3.1.1.2 | ----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 22.6% RTP. ---------- Verify the calculated power does not exceed the average power range monitor (APRM) channels by greater than 2% RTP while operating at ≥ 22.6% RTP. | In accordance with the Surveillance Frequency Control Program. |

(continued)

**ATTACHMENT 3j**

**Revised Technical Specifications Pages**

**Peach Bottom Atomic Power Station, Unit 3**

**Renewed Facility Operating License No. DPR-56**

**NRC Docket No. 50-278**

**<u>Revised Technical Specifications Page</u>**

3.3-1
3.3-2
3.3-3
3.3-3a
3.3-3b

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

----------NOTES----------

1. Separate Condition entry is allowed for each channel.

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 22.6% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Place channel in trip. | 12 hours |
| | <u>OR</u> | | |
| | A.2 | --------NOTE--------<br>Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2.f.<br>----------<br>Place associated trip system in trip. | 12 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | COMPLETION TIME |
|---|---|---|
| B. ---------NOTE--------- Not applicable for Functions 2.a, 2.b, 2.c, 2.d, or 2f. ---------- One or more Functions with one or more required channels inoperable in both trip systems. | B.1 Place channel in one trip system in trip.<br><br>OR<br><br>B.2 Place one trip system in trip. | 6 hours<br><br><br><br>6 hours |
| C. One or more automatic Functions with RPS trip capability not maintained.<br><br>OR<br><br>Two or more manual Functions with RPS trip capability not maintained. | C.1 Restore RPS trip capability. | 1 hour |
| D. Required Action and associated Completion Time of Condition A, B, or C not met. | D.1 Enter the Condition referenced in Table 3.3.1.1-1 for the channel. | Immediately |
| E. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | E.1 Reduce THERMAL POWER to < 26.3% RTP. | 4 hours |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| F. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | F.1 | Be in MODE 2. | 6 hours |
| G. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | G.1 | Be in MODE 3. | 12 hours |
| H. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | H.1 | Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies. | Immediately |
| I. As required by Required Action D.1 and referenced in Table 3.3.1.1-1. | I.1 | Initiate action to implement the Manual Backup Stability Protection (BSP) Regions defined in the COLR. | Immediately |
| | AND | | |
| | I.2 | Implement the Automated BSP Scram Region using the modified APRM Simulated Thermal Power-High scram setpoints defined in the COLR. | 12 hours |
| | AND | | |
| | I.3 | Initiate action to submit an OPRM report in accordance with Specification 5.6.8. | Immediately |

(continued)

ACTIONS (continued)

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| J. Required Action and associated Completion Time of Condition I not met. | J.1 | Initiate action to implement the Manual BSP Regions defined in the COLR. | Immediately |
| | AND | | |
| | J.2 | Reduce operation to below the BSP Boundary defined in the COLR. | 12 hours |
| | AND | | |
| | J.3 | ------ NOTE ---------- LCO 3.0.4 is not applicable. ---------- | |
| | | Restore required channel to OPERABLE. | 120 days |
| K. Required Action and associated Completion Time of Condition J not met. | K.1 | Reduce THERMAL POWER to < 17.6% RTP. | 4 hours |

SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program. |
| SR 3.3.1.1.2 | ----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 22.6% RTP. ---------- <br><br> Verify the calculated power does not exceed the average power range monitor (APRM) channels by greater than 2% RTP while operating at ≥ 22.6% RTP. | In accordance with the Surveillance Frequency Control Program. |

(continued)

**ATTACHMENT 3k**

**Revised Technical Specifications Pages**

**Quad Cities Nuclear Power Station, Units 1 and 2**

**Renewed Facility Operating License Nos. DPR-29 and DPR-30**

**NRC Docket Nos. 50-254 and 50-265**

**Revised Technical Specifications Pages**

3.3.1.1-1
3.3.1.1-3

## 3.3 INSTRUMENTATION

### 3.3.1.1 Reactor Protection System (RPS) Instrumentation

LCO 3.3.1.1 The RPS instrumentation for each Function in Table 3.3.1.1-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.1.1-1.

ACTIONS

---------- NOTES ----------

1. Separate Condition entry is allowed for each channel.

2. When Functions 2.b and 2.c channels are inoperable due to the calculated power exceeding the APRM output by more than 2% RTP while operating at ≥ 25% RTP, entry into associated Conditions and Required Actions may be delayed for up to 2 hours.

---

| CONDITION | REQUIRED ACTION | | COMPLETION TIME |
|---|---|---|---|
| A. One or more required channels inoperable. | A.1 | Place channel in trip. | 12 hours |
| | OR | | |
| | A.2 | Place associated trip system in trip. | 12 hours |
| B. One or more Functions with one or more required channels inoperable in both trip systems. | B.1 | Place channel in one trip system in trip. | 6 hours |
| | OR | | |
| | B.2 | Place one trip system in trip. | 6 hours |

(continued)

SURVEILLANCE REQUIREMENTS

---------- NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

---

| SURVEILLANCE | | FREQUENCY |
|---|---|---|
| SR 3.3.1.1.1 | Perform CHANNEL CHECK. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.2 | ----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ 25% RTP. ---------- Verify the calculated power does not exceed the average power range monitor (APRM) channels by greater than 2% RTP while operating at ≥ 25% RTP. | In accordance with the Surveillance Frequency Control Program |
| SR 3.3.1.1.3 | Adjust the channel to conform to a calibrated flow signal. | In accordance with the Surveillance Frequency Control Program |

(continued)

**ATTACHMENT 4a**

**Markup of Technical Specifications Bases Pages – For Information Only**

**Clinton Power Station, Unit 1**

**Facility Operating License No. NPF-62**

**NRC Docket No. 50-461**

**<u>Markup of Technical Specifications Bases Page</u>**

B 3.3-19
B 3.3-23

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

12. Manual Scram

The Manual Scram push button channels provide signals, via the manual scram logic channels, to each of the four RPS trip logic divisions that are redundant to the automatic protective instrumentation channels and provide manual reactor trip capability. This Function was not specifically credited in the accident analysis, but it is retained for the RPS as required by the NRC approved licensing basis.

There is one Manual Scram push button channel for each of the four RPS trip logic divisions. In order to cause a scram it is necessary that at least two channels be actuated.

There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons.

One channel of Manual Scram associated with each of the four RPS trip logic divisions is required to be OPERABLE in MODES 1 and 2, and in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn.

ACTIONS

1

~~A~~ Note has been provided to modify the ACTIONS related to RPS instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable RPS instrumentation channels provide appropriate compensatory measures for separate, inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable RPS instrumentation channel.

(continued)

Note 2 has been provided to modify the ACTIONS for the RPS instrumentation functions of APRM Flow Biased Neutron-Flux High (Function 2.b) and APRM Fixed Neutron Flux-High (Function 2.c) when they are inoperable due to failure of SR 3.3.1.1.2 and gain adjustments are necessary. Note 2 allows entry into associated Conditions and Required Actions to be delayed for up to 2 hours if the APRM is indicating a lower power value than the calculated power (i.e., the gain adjustment factor (GAF) is high (non-conservative)). The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to OPERABLE status or the applicable Condition entered and the Required Actions taken. This Note is based on the time required to perform gain adjustments on multiple channels.

BASES

SURVEILLANCE REQUIREMENTS (continued)

analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RPS will trip when necessary.

SR 3.3.1.1.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift on one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

if the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP.

This Surveillance does not preclude making APRM channel adjustments, if desired, when the heat balance calculated reactor power is less than the APRM channel output. To provide close agreement between the APRM indicated power and to preserve operating margin, the APRM channels are normally adjusted to within +/- 2% of the heat balance calculated reactor power. However, this agreement is not required for OPERABILITY when APRM output indicates a higher reactor power than the heat balance calculated reactor power.

adjusted

SR 3.3.1.1.2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are ~~calibrated~~ to the reactor power calculated from a heat balance. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

Add blank line before new paragraph.

A restriction to satisfying this SR when < 21.6% RTP is provided that requires the SR to be met only at ≥ 21.6% RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER consistent with a heat balance when < 21.6% RTP. At low power levels, a high degree

(continued)

**ATTACHMENT 4b**

**Markup of Technical Specifications Bases Pages – For Information Only**

**Dresden Nuclear Power Station, Units 2 and 3**

**Renewed Facility Operating License Nos. DPR-19 and DPR-25**

**NRC Docket Nos. 50-237 and 50-249**

**Markup of Technical Specifications Bases Pages**

B 3.3.1.1-22
B 3.3.1.1-27

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

12. Manual Scram (continued)

Two channels of Manual Scram with one channel in each manual trip system are available and required to be OPERABLE in MODES 1 and 2, and in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn.

ACTIONS

Note 1 has been provided to modify the ACTIONS related to RPS instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable RPS instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable RPS instrumentation channel.

Note 2 has been provided to modify the ACTIONS for the RPS instrumentation functions of APRM Flow Biased Neutron Flux–High (Function 2.b) and APRM Fixed Neutron Flux–High (Function 2.c) when they are inoperable due to failure of SR 3.3.1.1.2 and gain adjustments are necessary. Note 2 allows entry into associated Conditions and Required Actions to be delayed for up to 2 hours if the APRM is indicating a lower power value than the calculated power (i.e., the gain adjustment factor (GAF) is high (non-conservative))~~, and for up to 12 hours if the APRM is indicating a higher power value than the calculated power (i.e., the GAF is low (conservative))~~. The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to OPERABLE status or the applicable Condition entered and the Required Actions taken. This Note is based on the time required to perform gain adjustments on multiple channels ~~and additional time is allowed when the GAF is out of limits but conservative~~.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RPS will trip when necessary.

SR 3.3.1.1.1

if the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP.

This Surveillance does not preclude making APRM channel adjustments, if desired, when the heat balance calculated reactor power is less than the APRM channel output. To provide close agreement between the APRM indicated power and to preserve operating margin, the APRM channels are normally adjusted to within +/- 2% of the heat balance calculated reactor power. However, this agreement is not required for OPERABILITY when APRM output indicates a higher reactor power than the heat balance calculated reactor power.

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.1.1.2

adjusted

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are ~~calibrated~~ to the reactor power calculated from a heat balance.

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

(continued)

**ATTACHMENT 4c**

**Markup of Technical Specifications Bases Pages – For Information Only**

**James A. FitzPatrick Nuclear Power Plant**

**Renewed Facility Operating License No. DPR-59**

**NRC Docket No. 50-333**

**<u>Markup of Technical Specifications Bases Page</u>**

B 3.3.1.1-22
B 3.3.1.1-26

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

11. Manual Scram (continued)

Two channels of Manual Scram, with one channel in each manual scram trip system, are available and required to be OPERABLE in MODES 1 and 2, and in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn.

ACTIONS

A Note has been provided to modify the ACTIONS related to RPS instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition unless specifically stated. Section 1.3 also specifies that the Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable RPS instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable RPS instrumentation channel.

Note 2 has been provided to modify the ACTIONS for the RPS instrumentation functions of APRM Flow Biased Neutron-Flux High (Function 2.b) and APRM Fixed Neutron Flux-High (Function 2.c) when they are inoperable due to failure of SR 3.3.1.1.2 and gain adjustments are necessary. Note 2 allows entry into associated Conditions and Required Actions to be delayed for up to 2 hours if the APRM is indicating a lower power value than the calculated power (i.e., the gain adjustment factor (GAF) is high (non-conservative)). The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to OPERABLE status or the applicable Condition entered and the Required Actions taken. This Note is based on the time required to perform gain adjustments on multiple channels.

A.1 and A.2

Because of the diversity of sensors available to provide trip signals and the redundancy of the RPS design, an allowable out of service time of 12 hours has been shown to be acceptable (Ref. 18) to permit restoration of any inoperable channel to OPERABLE status. However, this out of service time is only acceptable provided the associated Function's inoperable channel is in one trip system and the Function still maintains RPS trip capability (refer to Required Actions B.1, B.2, and C.1 Bases). If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel or the associated trip system must be placed in the tripped condition per Required Actions A.1 and A.2. Placing the inoperable channel in trip (or the associated trip system in trip) would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternatively, if it is not desired to place the channel (or trip system) in trip (e.g., as in the case where placing the inoperable channel in trip would result in a full scram), Condition D must be entered and its Required Action taken.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION. For Functions 8 and 9, this SR is associated with the enabling circuit sensing first stage pressure.

Channel agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

if the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP.

This Surveillance does not preclude making APRM channel adjustments, if desired, when the heat balance calculated reactor power is less than the APRM channel output. To provide close agreement between the APRM indicated power and to preserve operating margin, the APRM channels are normally adjusted to within +/- 2% of the heat balance calculated reactor power. However, this agreement is not required for OPERABILITY when APRM output indicates a higher reactor power than the heat balance calculated reactor power.

adjusted

SR 3.3.1.1.2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are calibrated to the reactor power calculated from a heat balance. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

A restriction to satisfying this SR when < 25% RTP is provided that requires the SR to be met only at ≥ 25% RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER consistent with a heat

(continued)

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**ATTACHMENT 4d**

**Markup of Technical Specifications Bases Pages – For Information Only**

**LaSalle County Station, Units 1 and 2**

**Renewed Facility Operating License Nos. NPF-11 and NPF-18**

**NRC Docket Nos. 50-373 and 50-374**

**Markup of Technical Specifications Bases Pages**

B 3.3.1.1-21
B 3.3.1.1-22
B 3.3.1.1-26

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

11. Manual Scram (continued)

There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the push buttons.

Four channels of Manual Scram with two channels in each trip system arranged in a one-out-of-two logic, are available and required to be OPERABLE in MODES 1 and 2, and in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn.

ACTIONS

Note 1 has been provided to modify the ACTIONS related to RPS instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable RPS instrumentation channels provide appropriate compensatory measures for separate, inoperable channels. As such, Note 1 has been provided that allows separate Condition entry for each inoperable RPS instrumentation channel.

Note 2 has been provided to modify the ACTIONS for the RPS instrumentation functions of APRM Flow Biased Simulated Thermal Power—Upscale (Function 2.b) and APRM Fixed Neutron Flux—High (Function 2.c) when they are inoperable due to failure of SR 3.3.1.1.2 and gain adjustments are necessary. Note 2 allows entry into associated Conditions and Required Actions to be delayed for up to 2 hours if the APRM is indicating a lower power value than the calculated power (i.e., the gain adjustment factor (GAF) is high (non-conservative)), ~~and for up to 12 hours if the APRM is indicating a higher power value than the calculated power~~

(continued)

BASES

ACTIONS (continued)

~~(i.e., the GAF is low (conservative))~~. The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to OPERABLE status or the applicable Condition entered and the Required Actions taken. This Note is based on the time required to perform gain adjustments on multiple channels~~ and additional time is allowed when the GAF is out of limits but conservative~~.

A.1 and A.2

Because of the diversity of sensors available to provide trip signals and the redundancy of the RPS design, an allowable out of service time of 12 hours has been shown to be acceptable (Ref. 10) to permit restoration of any inoperable required channel to OPERABLE status. However, this out of service time is only acceptable provided the associated Function's inoperable channel is in one trip system and the Function still maintains RPS trip capability (refer to Required Actions B.1, B.2, and C.1 Bases.) If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel or the associated trip system must be placed in the tripped condition per Required Actions A.1 and A.2. Placing the inoperable channel in trip (or the associated trip system in trip) would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel (or trip system) in trip (e.g., as in the case where placing the inoperable channel in trip would result in a scram or recirculation pump trip (RPT)), Condition D must be entered and its Required Action taken.

B.1 and B.2

Condition B exists when, for any one or more Functions, at least one required channel is inoperable in each trip system. In this condition, provided at least one channel per trip system is OPERABLE, the RPS still maintains trip capability for that Function, but cannot accommodate a single failure in either trip system.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

entered and Required Actions taken. This Note is based on the RPS reliability analysis (Ref. 10) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RPS will trip when necessary.

SR 3.3.1.1.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift on one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

if the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP.

This Surveillance does not preclude making APRM channel adjustments, if desired, when the heat balance calculated reactor power is less than the APRM channel output. To provide close agreement between the APRM indicated power and to preserve operating margin, the APRM channels are normally adjusted to within +/- 2% of the heat balance calculated reactor power. However, this agreement is not required for OPERABILITY when APRM output indicates a higher reactor power than the heat balance calculated reactor power.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

adjusted

SR 3.3.1.1.2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are ~~calibrated~~ to the reactor power calculated from a heat balance. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

(continued)

Add blank line before new paragraph.

**ATTACHMENT 4e**

**Markup of Technical Specifications Pages**

**Limerick Generating Station, Unit 1**

**Renewed Facility Operating License No. NPF-39**

**NRC Docket No. 50-352**

**<u>Markup of Technical Specifications Bases Page</u>**

B 3/4 3-1a
B 3/4 3-1e

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION (continued)

Action b, so the voter Function 2.e must be declared inoperable if any of its functionality is inoperable. The voter Function 2.e does not need to be declared inoperable due to any failure affecting only the APRM Interface hardware portion of the Two-Out-Of-Four Logic Module.

Three of the four APRM channels and all four of the voter channels are required to be OPERABLE to ensure that no single failure will preclude a scram on a valid signal. To provide adequate coverage of the entire core, consistent with the design bases for the APRM Functions 2.a, 2.b, and 2.c, at least 20 LPRM inputs, with at least three LPRM inputs from each of the four axial levels at which the LPRMs are located, must be operable for each APRM channel. In addition, no more than 9 LPRMs may be bypassed between APRM calibrations (weekly gain adjustments). For the OPRM Upscale Function 2.f, LPRMs are assigned to "cells" of 3 or 4 detectors. A minimum of 23 cells (Reference 9), each with a minimum of 2 OPERABLE LPRMs, must be OPERABLE for each APRM channel for the OPRM Upscale Function 2.f to be OPERABLE in that channel. LPRM gain settings are determined from the local flux profiles measured by the TIP system. This establishes the relative local flux profile for appropriate representative input to the APRM System. The 2000 EFPH frequency is based on operating experience with LPRM sensitivity changes.

References 4, 5 and 6 describe three algorithms for detecting thermal-hydraulic instability related neutron flux oscillations: the period based detection algorithm, the amplitude based algorithm, and the growth rate algorithm. All three are implemented in the OPRM Upscale Function, but the safety analysis takes credit only for the period based detection algorithm. The remaining algorithms provide defense in depth and additional protection against unanticipated oscillations. OPRM Upscale Function OPERABILITY for Technical Specification purposes is based only on the period based detection algorithm.

An OPRM Upscale trip is issued from an APRM channel when the period based detection algorithm in that channel detects oscillatory changes in the neutron flux, indicated by the combined signals of the LPRM detectors in any cell, with period confirmations and relative cell amplitude exceeding specified setpoints. One or more cells in a channel exceeding the trip conditions will result in a channel trip. An OPRM Upscale trip is also issued from the channel if either the growth rate or amplitude based algorithms detect growing oscillatory changes in the neutron flux for one or more cells in that channel.

The OPRM Upscale Function is required to be OPERABLE when the plant is at ≥ 25% RATED THERMAL POWER. The 25% RATED THERMAL POWER level is selected to provide margin in the unlikely event that a reactor power increase transient occurring while the plant is operating below 29.5% RATED THERMAL POWER causes a power increase to or beyond the 29.5% RATED THERMAL POWER OPRM Upscale trip auto-enable point without operator action. This OPERABILITY requirement assures that the OPRM Upscale trip automatic-enable function will be OPERABLE when required.

Actions a, b and c define the Action(s) required when RPS channels are discovered to be inoperable. For those Actions, separate entry condition is allowed for each inoperable RPS channel. Separate entry means that the allowable time clock(s) for Actions a, b or c start upon discovery of inoperability for that specific channel. Restoration of an inoperable RPS channel satisfies only the action statements for that particular channel. Action statement(s) for remaining inoperable channel(s) must be met according to their original entry time.

nsert 1

Because of the diversity of sensors available to provide trip signals and the redundancy of the RPS design, an allowable out of service time of 12 hours has been shown to be acceptable (NEDC-30851P-A and NEDC-32410P-A) to permit restoration of any inoperable channel to OPERABLE status. However, this out of service time is only acceptable provided that the associated Function's (identified as a "Functional Unit" in Table 3.3.1-1) inoperable channel is in one trip system and the Function still maintains RPS trip capability.

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION (continued)

10% of RATED THERMAL POWER. Plant operational experience has shown that this flow correlation methodology is consistent with the guidance and intent in Reference 8. Changes throughout the cycle in the drive flow / core flow relationship due to the changing thermal hydraulic operating conditions of the core are accounted for in the margins included in the bases or analyses used to establish the setpoints for the APRM Simulated Thermal Power - Upscale Function and the OPRM Upscale Function.

For the Simulated Thermal Power - Upscale Function (Function 2.b), the CHANNEL CALIBRATION surveillance requirement is modified by two Notes. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be within the as-left tolerance of the Trip Setpoint. The as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the Trip Setpoint, then the channel shall be declared inoperable. The as-left tolerance for this function is calculated using the square-root-sum-of-squares of the reference accuracy and the measurement and test equipment error (including readability). The as-found tolerance for this function is calculated using the square-root-sum-of-squares of the reference accuracy, instrument drift, and the measurement and test equipment error (including readability).

Insert 2

As noted in Table 3.3.1-2, Note "*", the redundant outputs from the 2-Out-Of-4 Voter channel are considered part of the same channel, but the OPRM and APRM outputs are considered to be separate channels, so N = 8 to determine the interval between tests for application of Specification 4.3.1.3 (REACTOR PROTECTION SYSTEM RESPONSE TIME). The note further requires that testing of OPRM and APRM outputs shall be alternated.

Each test of an OPRM or APRM output tests each of the redundant outputs from the 2-Out-Of-4 Voter channel for that function, and each of the corresponding relays in the RPS. Consequently, each of the RPS relays is tested every fourth cycle. This testing frequency is twice the frequency justified by References 2 and 3.

Automatic reactor trip upon receipt of a high-high radiation signal from the Main Steam Line Radiation Monitoring System was removed as the result of an analysis performed by General Electric in NEDO-31400A. The NRC approved the results of this analysis as documented in the SER (letter to George J. Beck, BWR Owner's Group from A.C. Thadani, NRC, dated May 15, 1991).

Insert 1

A Note has been provided to modify the Actions when Functional Unit 2.b and 2.c channels are inoperable due to failure of SR 4.3.1.1 and gain adjustments are necessary. The Note allows entry into associated Actions to be delayed for up to 2 hours if the APRM is indicating a lower power value than the calculated power (i.e., the gain adjustment factor (GAF) is high (non-conservative)). The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to OPERABLE status or the applicable Actions taken. This Note is based on the time required to perform gain adjustments on multiple channels.

Insert 2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are adjusted to the reactor power calculated from a heat balance if the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP.

This Surveillance does not preclude making APRM channel adjustments, if desired, when the heat balance calculated reactor power is less than the APRM channel output. To provide close agreement between the APRM indicated power and to preserve operating margin, the APRM channels are normally adjusted to within +/- 2% of the heat balance calculated reactor power. However, this agreement is not required for OPERABILITY when APRM output indicates a higher reactor power than the heat balance calculated reactor power.

**ATTACHMENT 4f**

**Markup of Technical Specifications Pages**

**Limerick Generating Station, Unit 2**

**Renewed Facility Operating License No. NPF-85**

**NRC Docket No. 50-353**

**<u>Markup of Technical Specifications Bases Page</u>**

B 3/4 3-1a
B 3/4 3-1e

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION (continued)

Action b, so the voter Function 2.e must be declared inoperable if any of its functionality is inoperable. The voter Function 2.e does not need to be declared inoperable due to any failure affecting only the APRM Interface hardware portion of the Two-Out-Of-Four Logic Module.

Three of the four APRM channels and all four of the voter channels are required to be OPERABLE to ensure that no single failure will preclude a scram on a valid signal. To provide adequate coverage of the entire core, consistent with the design bases for the APRM Functions 2.a, 2.b, and 2.c, at least 20 LPRM inputs, with at least three LPRM inputs from each of the four axial levels at which the LPRMs are located, must be operable for each APRM channel. In addition, no more than 9 LPRMs may be bypassed between APRM calibrations (weekly gain adjustments). For the OPRM Upscale Function 2.f, LPRMs are assigned to "cells" of 3 or 4 detectors. A minimum of 23 cells (Reference 9), each with a minimum of 2 OPERABLE LPRMs, must be OPERABLE for each APRM channel for the OPRM Upscale Function 2.f to be OPERABLE in that channel. LPRM gain settings are determined from the local flux profiles measured by the TIP system. This establishes the relative local flux profile for appropriate representative input to the APRM System. The 2000 EFPH frequency is based on operating experience with LPRM sensitivity changes.

References 4, 5 and 6 describe three algorithms for detecting thermal-hydraulic instability related neutron flux oscillations: the period based detection algorithm, the amplitude based algorithm, and the growth rate algorithm. All three are implemented in the OPRM Upscale Function, but the safety analysis takes credit only for the period based detection algorithm. The remaining algorithms provide defense in depth and additional protection against unanticipated oscillations. OPRM Upscale Function OPERABILITY for Technical Specification purposes is based only on the period based detection algorithm.

An OPRM Upscale trip is issued from an APRM channel when the period based detection algorithm in that channel detects oscillatory changes in the neutron flux, indicated by the combined signals of the LPRM detectors in any cell, with period confirmations and relative cell amplitude exceeding specified setpoints. One or more cells in a channel exceeding the trip conditions will result in a channel trip. An OPRM Upscale trip is also issued from the channel if either the growth rate or amplitude based algorithms detect growing oscillatory changes in the neutron flux for one or more cells in that channel.

The OPRM Upscale Function is required to be OPERABLE when the plant is at ≥ 25% RATED THERMAL POWER. The 25% RATED THERMAL POWER level is selected to provide margin in the unlikely event that a reactor power increase transient occurring while the plant is operating below 29.5% RATED THERMAL POWER causes a power increase to or beyond the 29.5% RATED THERMAL POWER OPRM Upscale trip auto-enable point without operator action. This OPERABILITY requirement assures that the OPRM Upscale trip automatic-enable function will be OPERABLE when required.

Actions a, b and c define the Action(s) required when RPS channels are discovered to be inoperable. For those Actions, separate entry condition is allowed for each inoperable RPS channel. Separate entry means that the allowable time clock(s) for Actions a, b or c start upon discovery of inoperability for that specific channel. Restoration of an inoperable RPS channel satisfies only the action statements for that particular channel. Action statement(s) for remaining inoperable channel(s) must be met according to their original entry time.

Insert 1

Because of the diversity of sensors available to provide trip signals and the redundancy of the RPS design, an allowable out of service time of 12 hours has been shown to be acceptable (NEDC-30851P-A and NEDC-32410P-A) to permit restoration of any inoperable channel to OPERABLE status. However, this out of service time is only acceptable provided that the associated Function's (identified as a "Functional Unit" in Table 3.3.1-1) inoperable channel is in one trip system and the Function still maintains RPS trip capability.

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION (continued)

core flow relationship. The drive flow / core flow relationship is established once per refuel cycle, while operating within 10% of rated core flow and within 10% of RATED THERMAL POWER. Plant operational experience has shown that this flow correlation methodology is consistent with the guidance and intent in Reference 8. Changes throughout the cycle in the drive flow / core flow relationship due to the changing thermal hydraulic operating conditions of the core are accounted for in the margins included in the bases or analyses used to establish the setpoints for the APRM Simulated Thermal Power - Upscale Function and the OPRM Upscale Function.

For the Simulated Thermal Power - Upscale Function (Function 2.b), the CHANNEL CALIBRATION surveillance requirement is modified by two Notes. The first Note requires evaluation of channel performance for the condition where the as-found setting for the channel setpoint is outside its as-found tolerance but conservative with respect to the Allowable Value. Evaluation of channel performance will verify that the channel will continue to behave in accordance with safety analysis assumptions and the channel performance assumptions in the setpoint methodology. The purpose of the assessment is to ensure confidence in the channel performance prior to returning the channel to service. For channels determined to be OPERABLE but degraded, after returning the channel to service the performance of these channels will be evaluated under the plant Corrective Action Program. Entry into the Corrective Action Program will ensure required review and documentation of the condition. The second Note requires that the as-left setting for the channel be within the as-left tolerance of the Trip Setpoint. The as-left and as-found tolerances, as applicable, will be applied to the surveillance procedure setpoint. This will ensure that sufficient margin to the Safety Limit and/or Analytical Limit is maintained. If the as-left channel setting cannot be returned to a setting within the as-left tolerance of the Trip Setpoint, then the channel shall be declared inoperable. The as-left tolerance for this function is calculated using the square-root-sum-of-squares of the reference accuracy and the measurement and test equipment error (including readability). The as-found tolerance for this function is calculated using the square-root-sum-of-squares of the reference accuracy, instrument drift, and the measurement and test equipment error (including readability).

nsert 2

As noted in Table 3.3.1-2, Note "*", the redundant outputs from the 2-Out-Of-4 Voter channel are considered part of the same channel, but the OPRM and APRM outputs are considered to be separate channels, so N = 8 to determine the interval between tests for application of Specification 4.3.1.3 (REACTOR PROTECTION SYSTEM RESPONSE TIME). The note further requires that testing of OPRM and APRM outputs shall be alternated.

Each test of an OPRM or APRM output tests each of the redundant outputs from the 2-Out-Of-4 Voter channel for that function, and each of the corresponding relays in the RPS. Consequently, each of the RPS relays is tested every fourth cycle. This testing frequency is twice the frequency justified by References 2 and 3.

Automatic reactor trip upon receipt of a high-high radiation signal from the Main Steam Line Radiation Monitoring System was removed as the result of an analysis performed by General Electric in NEDO-31400A. The NRC approved the results of this analysis as documented in the SER (letter to George J. Beck, BWR Owner's Group from A.C. Thadani, NRC, dated May 15, 1991).

Insert 1

A Note has been provided to modify the Actions when Functional Unit 2.b and 2.c channels are inoperable due to failure of SR 4.3.1.1 and gain adjustments are necessary. The Note allows entry into associated Actions to be delayed for up to 2 hours if the APRM is indicating a lower power value than the calculated power (i.e., the gain adjustment factor (GAF) is high (non-conservative)). The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to OPERABLE status or the applicable Actions taken. This Note is based on the time required to perform gain adjustments on multiple channels.

Insert 2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are adjusted to the reactor power calculated from a heat balance if the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP.

This Surveillance does not preclude making APRM channel adjustments, if desired, when the heat balance calculated reactor power is less than the APRM channel output. To provide close agreement between the APRM indicated power and to preserve operating margin, the APRM channels are normally adjusted to within +/- 2% of the heat balance calculated reactor power. However, this agreement is not required for OPERABILITY when APRM output indicates a higher reactor power than the heat balance calculated reactor power.

**ATTACHMENT 4g**

**Markup of Technical Specifications Bases Pages – For Information Only**

**Nine Mile Point Nuclear Station, Unit 1**

**Renewed Facility Operating License No. DPR-63**

**NRC Docket No. 50-220**

**<u>Markup of Technical Specifications Bases Page</u>**

251

The set points on the generator load rejection and turbine stop valve closure scram trips are set to anticipate and minimize the consequences of turbine trip with failure of the turbine bypass system as described in the bases for Specification 2.1.2. Since the severity of the transients is dependent on the reactor operating power level, bypassing of the scrams below the specified power level is permissible.

Although the operator will set the setpoints at the values indicated in Tables 3.6.2.a-1, the actual values of the various set points can differ appreciably from the value the operator is attempting to set. The deviations include inherent instrument error, operator setting error and drift of the set point. These errors are compensated for in the transient analyses by conservatism in the controlling parameter assumptions as discussed in the bases for Specification 2.1.2. The deviations associated with the set points for the safety systems used to mitigate accidents have negligible effect on the initiation of these systems. These safety systems have initiation times which are orders of magnitude greater than the difference in time between reaching the nominal set point and the worst set point due to error. The maximum allowable set point deviations are listed below:

Insert 1 before the current paragraph.

Neutron Flux

The APRM and IRM scram and rod block setpoints have been derived based on GE setpoint methodology as outlined in NEDC-31336, "GE Instrumentation Setpoint Methodology." In this methodology, the setpoints are defined as three values, Nominal Trip Setpoints, Allowable Values, and Analytical Limits. The established analytical limits are listed in Specification 2.1.2a and 2.1.2b. The derived allowable values are listed below:

APRM

The minimum of:

For $W \geq 0\%$:

$S \leq (0.55W + 64.46\%)\ T$ with a maximum value of 119.5%
$S_{RB} \leq (0.55W + 59.46\%)\ T$ with a maximum value of 114.5%

AND:

For $14.42\% \leq W \leq 45\%$:

$S \leq (1.287W + 16.6\%)$
$S_{RB} \leq (1.287W + 9.312\%)$

WHERE:

S or $S_{RB}$ = The respective scram or rod block allowable value
W = Loop Recirculation Flow as a percentage of the loop recirculation flow which produces a rated core flow of 67.5 MLB/HR
T = FRTP/CMFLPD (T is applied only if less than or equal to 1.0)
FRTP = Fraction of Rated Thermal Power where Rated Thermal Power equals 1850 MW
CMFLPD = Core Maximum Fraction of Limiting Power Density

Insert 1

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are adjusted to the reactor power calculated from a heat balance if the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP. This does not preclude making APRM channel adjustments, if desired, when the heat balance calculated reactor power is less than the APRM channel output.

Entry into the Action required by Specification 3.6.2a may be delayed for up to 2 hours for the performance of the gain adjustment if the calculated reactor power exceeds the APRM channel output by more than 2% RTP (i.e., the gain adjustment factor (GAF) is high (non-conservative)). The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to Operable status or the applicable Action taken. The delay period is based on the time required to perform gain adjustments on multiple channels and is consistent with completion times associated with restoration of other parameters, subsystems, and channels within TS limits.

**ATTACHMENT 4h**

**Markup of Technical Specifications Bases Pages – For Information Only**

**Nine Mile Point Nuclear Station, Unit 2**

**Renewed Facility Operating License No. NPF-69**

**NRC Docket No. 50-410**

**<u>Markup of Technical Specifications Bases Page</u>**

B 3.3.1.1-23
B 3.3.1.1-30

BASES (continued)

1

ACTIONS

~~A~~ Note has been provided to modify the ACTIONS related to RPS instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable RPS instrumentation channels provide appropriate compensatory measures for separate, inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable RPS instrumentation channel.

Note 2 has been provided to modify the ACTIONS for the RPS instrumentation functions of APRM Flow Biased Neutron-Flux High (Function 2.b) and APRM Fixed Neutron Flux-High (Function 2.c) when they are inoperable due to failure of SR 3.3.1.1.2 and gain adjustments are necessary. Note 2 allows entry into associated Conditions and Required Actions to be delayed for up to 2 hours if the APRM is indicating a lower power value than the calculated power (i.e., the gain adjustment factor (GAF) is high (non-conservative)). The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to OPERABLE status or the applicable Condition entered and the Required Actions taken. This Note is based on the time required to perform gain adjustments on multiple channels.

A.1 and A.2

Because of the diversity of sensors available to provide trip signals and the redundancy of the RPS design, an allowable out of service time of 12 hours has been shown to be acceptable (Refs. 10 and 11) to permit restoration of any inoperable required channel to OPERABLE status. However, this out of service time is only acceptable provided the associated Function's inoperable channel is in one trip system (except for Functions 2.a, 2.b, 2.c, 2.d, and 2.e) and the Function still maintains RPS trip capability (refer to Required Actions B.1, B.2, and C.1 Bases.) If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel or the associated trip system must be placed in the tripped condition per Required Actions A.1 and A.2. Placing the inoperable channel in trip (or the associated trip system in trip) would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue. Alternately, if it is not desired to place the channel (or trip system) in trip (e.g., as in the case where placing the inoperable channel in trip would result in a scram or recirculation pump trip (RPT)), Condition D must be entered and its Required Action taken.

B.1 and B.2

Condition B exists when, for any one or more Functions, at least one required channel is inoperable in each trip

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.1.1 and SR 3.3.1.1.2

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift on one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

if the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP.

This Surveillance does not preclude making APRM channel adjustments, if desired, when the heat balance calculated reactor power is less than the APRM channel output. To provide close agreement between the APRM indicated power and to preserve operating margin, the APRM channels are normally adjusted to within +/- 2% of the heat balance calculated reactor power. However, this agreement is not required for OPERABILITY when APRM output indicates a higher reactor power than the heat balance calculated reactor power.

adjusted

SR 3.3.1.1.3

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are ~~calibrated~~ to the reactor power calculated from a heat balance. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

An allowance is provided that requires the SR to be performed only at ≥ 23% RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER

(continued)

Add blank line before new paragraph.

**ATTACHMENT 4i**

**Markup of Technical Specifications Bases Pages – For Information Only**

**Peach Bottom Atomic Power Station, Unit 2**

**Renewed Facility Operating License No. DPR-44**

**NRC Docket No. 50-277**

**<u>Markup of Technical Specifications Bases Page</u>**

B 3.3-23
B 3.3-28

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

14. RPS Channel Test Switch (continued)

RPS Functions, described in Reference 9, were not affected by the difference in configuration, since each automatic RPS channel has a test switch which is functionally the same as the manual scram switches in the generic model. As such, the RPS Channel Test Switches are retained in the Technical Specifications.

There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the switches.

Four channels of RPS Channel Test Switch with two channels in each trip system arranged in a one-out-of-two logic are available and required to be OPERABLE in MODES 1 and 2, and in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn.

Note 2 has been provided to modify the ACTIONS for the RPS instrumentation functions of APRM Flow Biased Neutron-Flux High (Function 2.b) and APRM Fixed Neutron Flux-High (Function 2.c) when they are inoperable due to failure of SR 3.3.1.1.2 and gain adjustments are necessary. Note 2 allows entry into associated Conditions and Required Actions to be delayed for up to 2 hours if the APRM is indicating a lower power value than the calculated power (i.e., the gain adjustment factor (GAF) is high (non-conservative)). The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to OPERABLE status or the applicable Condition entered and the Required Actions taken. This Note is based on the time required to perform gain adjustments on multiple channels.

1

~~A~~ Note has been provided to modify the ACTIONS related to RPS instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable RPS instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable RPS instrumentation channel.

A.1 and A.2

Because of the diversity of sensors available to provide trip signals and the redundancy of the RPS design, an allowable out of service time of 12 hours has been shown to be acceptable (Refs. 9, 12 & 13) to permit restoration of any inoperable channel to OPERABLE status. However, this out of service time is only acceptable provided the associated

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs for each RPS instrumentation Function are located in the SRs column of Table 3.3.1.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains RPS trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Refs. 9, 12 & 13) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RPS will trip when necessary.

SR 3.3.1.1.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.1.1.2

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are ~~calibrated~~ to the reactor power calculated from a heat balance. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

if the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP.

This Surveillance does not preclude making APRM channel adjustments, if desired, when the heat balance calculated reactor power is less than the APRM channel output. To provide close agreement between the APRM indicated power and to preserve operating margin, the APRM channels are normally adjusted to within +/- 2% of the heat balance calculated reactor power. However, this agreement is not required for OPERABILITY when APRM output indicates a higher reactor power than the heat balance calculated reactor power.

adjusted

Add blank line before new paragraph.

(continued)

**ATTACHMENT 4j**

**Markup of Technical Specifications Bases Pages – For Information Only**

**Peach Bottom Atomic Power Station, Unit 3**

**Renewed Facility Operating License No. DPR-56**

**NRC Docket No. 50-278**

**<u>Markup of Technical Specifications Bases Page</u>**

B 3.3-23
B 3.3-28

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

14. RPS Channel Test Switch (continued)

RPS Functions, described in Reference 9, were not affected by the difference in configuration, since each automatic RPS channel has a test switch which is functionally the same as the manual scram switches in the generic model. As such, the RPS Channel Test Switches are retained in the Technical Specifications.

There is no Allowable Value for this Function since the channels are mechanically actuated based solely on the position of the switches.

Four channels of RPS Channel Test Switch with two channels in each trip system arranged in a one-out-of-two logic are available and required to be OPERABLE in MODES 1 and 2, and in MODE 5 with any control rod withdrawn from a core cell containing one or more fuel assemblies, since these are the MODES and other specified conditions when control rods are withdrawn.

Note 2 has been provided to modify the ACTIONS for the RPS instrumentation functions of APRM Flow Biased Neutron-Flux High (Function 2.b) and APRM Fixed Neutron Flux-High (Function 2.c) when they are inoperable due to failure of SR 3.3.1.1.2 and gain adjustments are necessary. Note 2 allows entry into associated Conditions and Required Actions to be delayed for up to 2 hours if the APRM is indicating a lower power value than the calculated power (i.e., the gain adjustment factor (GAF) is high (non-conservative)). The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to OPERABLE status or the applicable Condition entered and the Required Actions taken. This Note is based on the time required to perform gain adjustments on multiple channels.

1

~~A~~ Note has been provided to modify the ACTIONS related to RPS instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable RPS instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable RPS instrumentation channel.

A.1 and A.2

Because of the diversity of sensors available to provide trip signals and the redundancy of the RPS design, an allowable out of service time of 12 hours has been shown to be acceptable (Refs. 9, 12 & 13) to permit restoration of any inoperable channel to OPERABLE status. However, this out of service time is only acceptable provided the associated

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs for each RPS instrumentation Function are located in the SRs column of Table 3.3.1.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours, provided the associated Function maintains RPS trip capability. Upon completion of the Surveillance, or expiration of the 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken. This Note is based on the reliability analysis (Refs. 9, 12 & 13) assumption of the average time required to perform channel Surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the RPS will trip when necessary.

SR 3.3.1.1.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

if the heat balance calculated reactor power exceeds the APRM channel output by more than 2% RTP.

This Surveillance does not preclude making APRM channel adjustments, if desired, when the heat balance calculated reactor power is less than the APRM channel output. To provide close agreement between the APRM indicated power and to preserve operating margin, the APRM channels are normally adjusted to within +/- 2% of the heat balance calculated reactor power. However, this agreement is not required for OPERABILITY when APRM output indicates a higher reactor power than the heat balance calculated reactor power.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.1.1.2

adjusted

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are ~~calibrated~~ to the reactor power calculated from a heat balance. The Surveillance Frequency is controlled under the Surveillance Frequency Control Program.

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(continued)

**ATTACHMENT 4k**

**Markup of Technical Specifications Bases Pages – For Information Only**

**Quad Cities Nuclear Power Station, Units 1 and 2**

**Renewed Facility Operating License Nos. DPR-29 and DPR-30**

**NRC Docket Nos. 50-254 and 50-265**

**Markup of Technical Specifications Bases Pages**

B 3.3.1.1-23
B 3.3.1.1-28

BASES

ACTIONS (continued)

entry into the Condition. However, the Required Actions for inoperable RPS instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, a Note has been provided that allows separate Condition entry for each inoperable RPS instrumentation channel.

Note 2 has been provided to modify the ACTIONS for the RPS instrumentation functions of APRM Flow Biased Neutron Flux—High (Function 2.b) and APRM Fixed Neutron Flux—High (Function 2.c) when they are inoperable due to failure of SR 3.3.1.1.2 and gain adjustments are necessary. Note 2 allows entry into associated Conditions and Required Actions to be delayed for up to 2 hours if the APRM is indicating a lower power value than the calculated power (i.e., the gain adjustment factor (GAF) is high (non-conservative))~~, and for up to 12 hours if the APRM is indicating a higher power value than the calculated power (i.e., the GAF is low (conservative))~~. The GAF for any channel is defined as the power value determined by the heat balance divided by the APRM reading for that channel. Upon completion of the gain adjustment, or expiration of the allowed time, the channel must be returned to OPERABLE status or the applicable Condition entered and the Required Actions taken. This Note is based on the time required to perform gain adjustments on multiple channels~~ and additional time is allowed when the GAF is out of limits but conservative~~.

A.1 and A.2

Because of the diversity of sensors available to provide trip signals and the redundancy of the RPS design, an allowable out of service time of 12 hours has been shown to be acceptable (Ref. 13) to permit restoration of any inoperable required channel to OPERABLE status. However, this out of service time is only acceptable provided the associated Function's inoperable channel is in one trip system and the Function still maintains RPS trip capability (refer to Required Actions B.1, B.2, and C.1 Bases). If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel or the associated trip system must be placed in the tripped condition per Required Actions A.1 and A.2. Placing the inoperable channel in trip (or the associated trip system in

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.1 (continued)

approximately the same value. Significant deviations between instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant staff based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit.

The Surveillance Frequency is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the channels required by the LCO.

the heat balance calculated
actor power exceeds the APRM
nannel output by more than 2%
TP.

his Surveillance does not
eclude making APRM channel
djustments, if desired, when the
eat balance calculated reactor
ower is less than the APRM
nannel output. To provide close
greement between the APRM
dicated power and to preserve
perating margin, the APRM
nannels are normally adjusted to
ithin +/- 2% of the heat balance
alculated reactor power.
owever, this agreement is not
quired for OPERABILITY when
RPM output indicates higher
actor power than the heat
alance calculated reactor power.

SR 3.3.1.1.2

adjusted

To ensure that the APRMs are accurately indicating the true core average power, the APRMs are ~~calibrated~~ to the reactor power calculated from a heat balance.

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

An allowance is provided that requires the SR to be performed only at ≥ 25% RTP because it is difficult to accurately maintain APRM indication of core THERMAL POWER

(continued)