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10 CFR 50.90

RS-06-167

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

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

Subject: Request for a License Amendment to Revise Local Power Range Monitor Calibration Frequency

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," AmerGen Energy Company, LLC (AmerGen) requests an amendment to Appendix A, Technical Specifications (TS), of Facility Operating License No. NPF-62 for Clinton Power Station (CPS), Unit 1. Specifically, the proposed changes will revise Surveillance Requirement (SR) 3.3.1.1.8 and SR 3.3.1.3.2 to increase the interval between Local Power Range Monitor (LPRM) calibrations from 1000 megawatt-days per ton (MWD/T) average core exposure to 2000 MWD/T average core exposure. Increasing the interval between required LPRM calibrations is acceptable due to improvements in fuel analytical bases, core monitoring processes, and nuclear instrumentation.

The attached amendment request is subdivided as follows.

Attachment 1 provides an evaluation of the proposed change.

Attachment 2 includes the marked-up TS pages with the proposed changes indicated.

Attachment 3 includes the associated marked-up TS Bases pages. The TS Bases pages are provided for information only and do not require NRC approval.

AmerGen requests approval of the proposed change by December 14, 2007, with the amendment being implemented within 60 days of issuance. The requested approval date and implementation period will allow sufficient time for effective planning and scheduling of affected activities associated with LPRM gain calibration.

There are no regulatory commitments contained in this letter.

The proposed changes have been reviewed by the CPS Plant Operations Review Committee and approved by the Nuclear Safety Review Board in accordance with the requirements of the Quality Assurance Program.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," AmerGen is notifying the State of Illinois of this application for changes to the TS by transmitting a copy of this letter and its attachments to the designated State Official.

Should you have any questions concerning this letter, please contact Mr. Timothy A. Byam at (630) 657-2804.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 12th day of December 2006.

Respectfully,

Keith R. Jury

Keith R. Jury
Director - Licensing and Regulatory Affairs
Amergen Energy Company, LLC

Attachment 1: Evaluation of Proposed Changes
Attachment 2: Mark-up of Proposed Technical Specifications Page Changes
Attachment 3: Mark-up of Technical Specifications Bases Page Changes (For Information Only)

ATTACHMENT 1
Evaluation of Proposed Changes

Subject: Request for a License Amendment to Revise Local Power Range Monitor Calibration Frequency

1.0 DESCRIPTION

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," AmerGen Energy Company, LLC (AmerGen) requests the following amendment to Appendix A, Technical Specifications (TS), of Facility Operating License No. NPF-62 for Clinton Power Station (CPS), Unit 1. Specifically, the proposed changes will revise Surveillance Requirement (SR) 3.3.1.1.8 and SR 3.3.1.3.2 to increase the interval between Local Power Range Monitor (LPRM) calibrations from 1000 megawatt-days per ton (MWD/T) average core exposure to 2000 MWD/T average core exposure. Increasing the interval between required LPRM calibrations is acceptable due to improvements in fuel analytical bases, core monitoring processes, and nuclear instrumentation.

The NRC has previously approved similar amendments for the James A. Fitzpatrick Nuclear Power Plant (Reference 1), the Vermont Yankee Nuclear Power Station (Reference 2) and the River Bend Station (Reference 3). The subject license amendment request proposes to adopt surveillance testing requirements similar to those addressed in the previously approved amendments.

2.0 PROPOSED CHANGES

The purpose of this proposed change is to revise the TS SRs for periodic calibration of the LPRMs. The current requirement is stipulated by SR 3.3.1.1.8 and SR 3.3.1.3.2 and is contained in TS 3.3.1.1, "Reactor Protection System (RPS) Instrumentation" and TS 3.3.1.3, "Oscillation Power Range Monitor (OPRM) Instrumentation," respectively. SRs 3.3.1.1.8 and 3.3.1.3.2 currently specify that LPRMs be calibrated at a frequency of every 1000 MWD/T. The proposed change revises these surveillance requirements to read as follows.

SURVEILLANCE	FREQUENCY
SR 3.3.1.1.8 Calibrate the local power range monitors.	2000 MWD/T average core exposure

SURVEILLANCE	FREQUENCY
SR 3.3.1.3.2 Calibrate the local power range monitors.	2000 MWD/T average core exposure

Additionally, in support of these proposed changes, the associated TS Bases Sections will be revised to reflect the change in the LPRM calibration frequency from 1000 MWD/T average core exposure to 2000 MWD/T average core exposure. The proposed Bases changes are provided in Attachment 3 for information only and do not require NRC approval.

3.0 BACKGROUND

The LPRM subsystem consists of fission chamber detectors, signal conditioning equipment, display and alarm equipment, associated power supplies, cabling, and trip functions. The LPRM subsystem provides outputs to the Average Power Range Monitor (APRM) system, the Oscillation Power Range Monitor (OPRM) system, the Rod Control and Information System (RC&IS), and to the 3D MONICORE core monitoring system through the computer interface module. The APRM system provides indication of core average thermal power and input to RPS. The OPRM system is capable of detecting thermal hydraulic instability by monitoring local neutron flux within the reactor core. It also provides input to RPS. LPRM inputs to the 3D MONICORE system are used to calculate core power distribution and ensure operation within established fuel thermal operating limits.

The LPRM subsystem consists of 33 LPRM detector strings distributed radially throughout the core. Each detector string contains four fission detectors located at four different fixed axial heights. Each fission chamber produces a current that is coupled with the LPRM signal conditioning equipment to provide the desired scale indications. The chambers are vertically spaced in the LPRM detector dry tube assemblies to monitor four horizontal planes of the core, complementing the radial coverage given by the arrangement of the LPRM detector dry tube assemblies across the core.

Each LPRM dry tube assembly also contains a calibration tube for a Traversing In-core Probe (TIP). The TIP movable fission detectors are periodically traversed to provide a continuous axial flux profile at each LPRM string location. The data is used in the calibration of the 132 fixed LPRM fission detectors. Appropriate Gain Adjustment Factors (GAFs) are determined for each LPRM detector based on this information. These GAF values are applied to LPRM signals during the LPRM calibration process. These calibrations compensate for changes in detector sensitivity resulting from the depletion of fissile material lining the individual LPRM fission chambers. Calibrations also compensate for changes in core thermal flux distribution. LPRM calibrations are performed while the reactor is operating at power due to the limited sensitivity of the LPRM detectors.

Numerous tests have been performed on the chamber assemblies including tests of linearity, lifetime, gamma sensitivity, and cable effects. These tests and experience in operating reactors provide confidence in the ability of the LPRM subsystem to monitor neutron flux to the design accuracy throughout the design lifetime of the LPRM detectors.

The current signals from the LPRM detectors are transmitted to LPRM amplifiers in the control room. The LPRM amplifier signals are indicated on the operator's control console through RC&IS. When a control rod is selected for movement, the output signals from the amplifiers associated with the adjacent four LPRM detectors are displayed on the operator's control console. The four LPRM detector signals are displayed on four digital displays. The operator can readily obtain readings of all the LPRM amplifiers from the process computer. For the RC&IS system, the LPRM reading is only used as a display to the operator.

At rated thermal power, 1000 MWD/T is approximately 35.4 days (i.e., 1000 MWD/T x 122.947 tons uranium in Cycle 11 / 3473 MWt). The proposed change to the SR frequency will double the effective time interval between successive LPRM calibrations.

The CPS Updated Safety Analysis Report (USAR) Section 7.6.1.5, "Neutron Monitoring System – Instrumentation and Controls," provides additional discussion on the LPRM, APRM, and TIP Systems. The accuracy of the LPRM subsystem and its impact on overall power distribution uncertainty are documented in General Electric Company (GE) Licensing Topical Report NEDO-10958-P-A, "General Electric BWR Thermal Analysis Basis (GETAB) Data, Correlation and Design Application," (Reference 4).

4.0 TECHNICAL ANALYSIS

LPRM gain settings are determined from the local flux profiles measured by the TIP system. Properly gain adjusted LPRM readings establish the relative local neutron flux profile for appropriate representative input to the APRM and OPRM systems. The current SR interval between required LPRM calibrations is based on initial GE recommendations.

The APRM and OPRM systems are the only nuclear instrumentation systems that use LPRM readings. In accordance with TS SR 3.3.1.1.2, APRM readings are maintained within ≤ 2% of the rated core thermal power by weekly verification against the heat balance calculations. LPRM chamber responses are very linear and therefore, do not vary significantly with exposure over the period of a week. The LPRM calibration interval extension will have no significant effect on APRM accuracy during power maneuvers or transients. The OPRM system is used to monitor for thermal-hydraulic instabilities. The system monitors for relative changes in frequency and amplitude of LPRM readings and is insensitive to the absolute value of individual LPRM readings when the reactor is at equilibrium. The proposed LPRM calibration interval extension will have no significant effect on OPRM instrumentation accuracy during plant transients. Therefore, it is concluded that the performance of the APRM and OPRM systems will not be significantly affected by the proposed LPRM surveillance interval increase.

With regard to the 3D MONICORE core monitoring system, the justification to increase the surveillance interval is based on maintaining the overall uncertainty in the power distribution calculation within the limits contained in Reference 4. The calibration frequency has a small effect on the overall nodal power distribution uncertainty associated with the LPRMs based on operation between successive LPRM calibrations.

This small additional uncertainty will not increase the total power distribution uncertainty to a value in excess of the 8.7% value allowed by the Reference 4 GETAB safety limit analysis.

The LPRM calibration is performed by executing the on-demand computer program number 1 (i.e., OD-1, "Whole Core LPRM Calibration") to collect TIP axial profile data. This data is used as a basis for adjusting the LPRM amplifier gains and output signal, as required, to reflect the true thermal flux at each LPRM.

The original 1000 MWD/T surveillance frequency was based on using the older GE P-1 Periodic Core Evaluation software in the evaluation of core power distribution. This original software did not contain the sophisticated neutron diffusion and adaptive learning models used by the current 3D MONICORE system. Furthermore, the original GETAB analysis was based on core monitoring with first generation GE LPRM detectors (i.e., NA-100 series). These older generation LPRM chambers for core monitoring experienced certain inaccuracies related to depletion and loss of fissile material and fill gas between calibrations. These detectors introduced larger uncertainties into the GETAB analysis than the LPRM designs (i.e., NA-250 series) in service in the CPS reactor. GE evaluation of data from several plants indicates that the nodal power uncertainty resulting from performing thermal limit calculations in the LPRM mode is not substantially dependent upon the exposure interval between LPRM calibrations. This evaluation shows that the total uncertainty based on LPRM calibrations with a 2000 MWD/T surveillance interval is still less than the total uncertainty of 8.7% assumed in Reference 4.

The technical bases for extending the interval between LPRM calibrations to 2000 MWD/T have been previously reviewed and approved by the NRC (Reference 5). The licensing topical reports considered in Reference 5, provide detailed statistical evaluations of the uncertainties associated with LPRM-adaptive 3D MONICORE core monitoring calculations. Based on the data examined, it has been shown that the nodal power distribution uncertainty does not significantly deviate with LPRM exposure. These evaluations provide a basis for confidence that the GETAB equivalent power distribution uncertainty of 8.7% will not be exceeded as a result of extending the LPRM calibration frequency to 2000 MWD/T. This conclusion is based on improved performance of the NA-250 generation of LPRM chambers that exhibit consistent, less exposure dependent, LPRM sensitivity throughout their useful nuclear life because of design and manufacturing improvements. In addition, as previously stated, CPS uses the 3D MONICORE process computer program which is substantially more accurate and less dependent on LPRM inputs than the original GE P-1 power distribution calculation due to incorporation of a more sophisticated methodology that utilizes nodal diffusion theory coupled with plant data and improved neutron flux instrumentation.

CPS can be operated with significant margin to all applicable GETAB and GE Standard Application for Reactor Fuel (GESTAR) uncertainty limits with a 2000 MWD/T interval between LPRM calibrations, even in the conservative situation where one-third of all OD-1 TIP strings are unavailable due to failure or rejection. Other potential sources of uncertainty have also been evaluated and have been determined not to significantly increase the overall uncertainty value. These other evaluated potential sources of

uncertainty included: (a) failure of up to 25% of all LPRM detectors, (b) significantly asymmetric control rod patterns and minor core loading pattern asymmetries, and (c) major control rod pattern adjustments in the middle of the LPRM calibration interval. It should be noted that typical CPS practice is to operate with most LPRM detectors and TIP machines in service, highly symmetric rod and core loading patterns, and relatively long intervals between control rod pattern changes.

Conclusion

The performance of the APRM and OPRM systems is not significantly affected by the proposed LPRM surveillance interval increase. Evaluations previously reviewed and approved by the NRC, as documented in Reference 5, show that the total power distribution uncertainty for the increased calibration interval of 2000 MWD/T will remain bounded by the requirement of 8.7% specified in the Reference 4 GETAB analysis. With the improvements that have been made in core monitoring systems, it is acceptable to change the LPRM calibration frequency from 1000 MWD/T average core exposure to 2000 MWD/T average core exposure for CPS.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," AmerGen Energy Company, LLC (AmerGen) requests the following amendment to Appendix A, Technical Specifications (TS), of Facility Operating License No. NPF-62 for Clinton Power Station (CPS), Unit 1. Specifically, the proposed changes will revise Surveillance Requirement (SR) 3.3.1.1.8 and SR 3.3.1.3.2 to increase the interval between Local Power Range Monitor (LPRM) calibrations from 1000 megawatt-days per ton (MWD/T) average core exposure to 2000 MWD/T average core exposure. Increasing the interval between required LPRM calibrations is acceptable due to improvements in fuel analytical bases, core monitoring processes, and nuclear instrumentation.

According to 10 CFR 50.92, "Issuance of amendment," paragraph (c), a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) Involve a significant reduction in a margin of safety.

In support of this determination, AmerGen 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 as discussed below.

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

   Response: No

   The proposed amendment revises the surveillance interval for the LPRM calibration from 1000 MWD/T average core exposure to 2000 MWD/T average core exposure. Increasing the frequency interval between required LPRM calibrations is acceptable due to improvements in fuel analytical bases, core monitoring processes, and nuclear instrumentation. Therefore, the revised surveillance interval continues to ensure that the LPRM detector signal will continue to be adequately calibrated.

   This change will not alter the operation of process variables, structures, systems, or components as described in the CPS Updated Safety Analysis Report (USAR). The proposed change does not alter the initiation conditions or operational parameters for the LPRM subsystem and there is no new equipment introduced by the extension of the LPRM calibration interval. The performance of the Average Power Range Monitor (APRM) system, Oscillation Power Range Monitor (OPRM) system, Rod Control and Information System (RC&IS) and 3D MONICORE core monitoring system is not significantly affected by the proposed surveillance interval increase. The proposed LPRM calibration interval extension will have no significant effect on the Reactor Protection System (RPS) instrumentation accuracy during power maneuvers or transients and will therefore not significantly affect the performance of the RPS. As such, the probability of occurrence for a previously evaluated accident is not increased.

   The radiological consequences of an accident can be affected by the thermal limits existing at the time of the postulated accident; however, LPRM chamber exposure has no significant affect on the calculated thermal limits since LPRM accuracy does not significantly deviate with exposure. For the LPRM extended calibration interval, the total nodal power uncertainty remains less than the uncertainty assumed in the General Electric BWR Thermal Analysis Basis (GETAB) safety limit, maintaining the accuracy of the thermal limit calculation. Therefore, the thermal limit calculation is not significantly affected by LPRM calibration frequency, and thus the radiological consequences of any accident previously evaluated are not increased.

   Based on the above information, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

   Response: No

   The performance of the APRM, OPRM, RC&IS and 3D MONICORE systems is not significantly affected by the proposed LPRM surveillance interval increase. The proposed change does not affect the control parameters governing unit operation or the response of plant equipment to transient conditions. The proposed amendment does not change or introduce any new equipment, modes of system operation or failure mechanisms.

   Therefore, based on the above information, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

   Response: No

   The proposed change has no impact on equipment design or fundamental operation, and there are no changes being made to safety limits or safety system allowable values that would adversely affect plant safety as a result of the proposed LPRM surveillance interval increase. The performance of the APRM, OPRM, RC&IS and 3D MONICORE systems is not significantly affected by the proposed change. The proposed LPRM calibration interval extension will have no significant effect on RPS instrumentation accuracy during power maneuvers or transients and will therefore not significantly affect the performance of the RPS. The margin of safety can be affected by the thermal limits existing at the time of the postulated accident; however, uncertainties associated with LPRM chamber exposure have no significant effect on the calculated thermal limits. The thermal limit calculation is not significantly affected since LPRM sensitivity with exposure is well defined. LPRM accuracy remains within the total nodal power uncertainty assumed in the GETAB, therefore maintaining thermal limits and the safety margin. The proposed change does not affect safety analysis assumptions or initial conditions and therefore, the margin of safety in the original safety analyses is maintained.

   Based on the above information, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above evaluation, AmerGen concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c).

5.2 Applicable Regulatory Requirements/Criteria

10 CFR 50.36(c)(3), "Surveillance requirements," states that SRs are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met.

The proposed change involves increasing the surveillance interval of the LPRM calibration frequency from 1000 MWD/T average core exposure to 2000 MWD/T average core exposure. Increasing the frequency interval between required LPRM calibrations is acceptable due to improvements in fuel analytical bases, core monitoring processes and nuclear instrumentation. Therefore, the revised surveillance interval continues to ensure that the LPRM detector signal is adequately calibrated. This calibration provides assurance that the LPRM accuracy remains within the total nodal power uncertainty assumed in the thermal analysis basis and, as a result, the limiting conditions for operation will continue to be met.

10 CFR 50 Appendix A, General Design Criterion (GDC) 10, "Reactor Design," states that the reactor protection systems shall be designed with appropriate margin to assure that specified acceptable fuel design limits are not exceeded during any condition of normal operation, including the effects of anticipated operational occurrences. The proposed change has no impact on equipment design or fundamental operation and LPRM accuracy remains within the total nodal power uncertainty assumed in the thermal analysis basis, therefore maintaining thermal limits and the safety margin.

10 CFR 50 Appendix A, GDC 13, " Instrumentation and Control," states that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, anticipated operational occurrences, and accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems. Appropriate controls shall be provided to maintain these variables and systems within the prescribed operating ranges. The proposed change does not affect the control parameters governing unit operation and LPRM accuracy remains within the total nodal power uncertainty assumed in the thermal analysis basis. Therefore, the instrumentation and controls will continue to meet the requirements of GDC 13.

10 CFR 50 Appendix A, GDC 20, "Protection System Functions" states that the protection system shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences, and (2) to sense accident conditions and to initiate the operation of systems and components important to safety. LPRM accuracy remains within the total nodal power uncertainty assumed in the thermal analysis basis, allowing the APRM system to continue functioning properly. Therefore the proposed change will continue to meet the requirements of GDC 20.

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.

6.0 ENVIRONMENTAL EVALUATION

A review has determined that 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, "Standards for Protection Against Radiation," or would change an inspection or surveillance requirement. However, the proposed amendment does not involve: (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent 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, "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review," Paragraph (c)(9). Therefore, pursuant to 10 CFR 51.22, Paragraph (b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. Letter from U. S. NRC to Mr. M. Kansler, (Entergy Nuclear Operations, Inc), "James A. Fitzpatrick Nuclear Power Plant – Amendment Re: Regarding Local Power Range Monitor Calibration Frequency (TAC No. MB6945)," dated May 1, 2003

2. Letter from U. S. NRC to Mr. S. L. Newton, (Vermont Yankee Nuclear Power Corporation), "Vermont Yankee Nuclear Power Station – Issuance of Amendment Re: Local Power Range Monitor Calibration Frequency (TAC No. MA9053)," dated July 18, 2000

3. Letter from U. S. NRC to Mr. R. K. Edington (Entergy Operations, Inc.), "River Bend Station, Unit 1 – Issuance of Amendment Re: Changes to Local Power Range Monitor (LPRM) Calibration Frequency (TAC No. M98883)," dated June 11, 1999

4. General Electric Licensing Topical Report NEDO-10958-P-A, "General Electric BWR Thermal Analysis Basis (GETAB) Data, Correlation and Design Application," dated January 1977

5. Letter from U. S. NRC to G. A. Watford (GE), "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, 'Methodology and Uncertainties for Safety Limit MCPR Evaluations'; NEDC-32694P, 'Power Distribution

Uncertainties for Safety Limit MCPR Evaluation'; and 'Amendment 25 to NEDE-24011-P-A on Cycle-Specific Safety Limit MCPR' (TAC Nos. M97490, M99069 and M97491)," dated March 11, 1999

ATTACHMENT 2
Mark-up of Proposed Technical Specifications Page Changes

Revised Technical Specifications Pages

3.3-4
3.3-14b

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.5	Perform CHANNEL FUNCTIONAL TEST.	7 days
SR 3.3.1.1.6	Verify the source range monitor (SRM) and intermediate range monitor (IRM) channels overlap.	Prior to withdrawing SRMs from the fully inserted position
SR 3.3.1.1.7	----------NOTE---------- Only required to be met during entry into MODE 2 from MODE 1. ---------- Verify the IRM and APRM channels overlap.	7 days
SR 3.3.1.1.8	Calibrate the local power range monitors.	3000 ~~1000~~ MWD/T average core exposure
SR 3.3.1.1.9	Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.1.1.10	Calibrate the analog trip module.	92 days

(continued)

SURVEILLANCE REQUIREMENTS

----------NOTE----------
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 OPRM maintains trip capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.3.1	Perform CHANNEL FUNCTIONAL TEST.	184 days
SR 3.3.1.3.2	Calibrate the local power range monitors.	~~1000~~ 2000 MWD/T average core exposure
SR 3.3.1.3.3	----------NOTE---------- Neutron detectors are excluded. ---------- Perform CHANNEL CALIBRATION. The setpoints for the trip function shall be as specified in the COLR.	24 months
SR 3.3.1.3.4	Perform LOGIC SYSTEM FUNCTIONAL TEST.	24 months
SR 3.3.1.3.5	Verify OPRM is not bypassed when THERMAL POWER is ≥ 25% RTP and recirculation drive flow is ≤ the value corresponding to 60% of rated core flow.	24 months
SR 3.3.1.3.6	----------NOTE---------- Neutron detectors are excluded. ---------- Verify the RPS RESPONSE TIME is within limits.	24 months on a STAGGERED TEST BASIS

ATTACHMENT 3
Mark-up of Technical Specifications Bases Page Changes
(For Information Only)

Revised Technical Specifications Bases Pages

B 3.3-26
B 3.3-30a
B 3.3-39f
B 3.3-39h

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1.6 and SR 3.3.1.1.7 (continued)

block. Overlap between SRMs and IRMs similarly exists when, prior to withdrawing the SRMs from the fully inserted position, IRMs are above the downscale value of 5 and increasing as neutron flux increases, prior to the SRMs indication reaching their upscale limit.

As noted, SR 3.3.1.1.7 is only required to be met during entry into MODE 2 from MODE 1. That is, after the overlap requirement has been met and indication has transitioned to the IRMs, maintaining overlap is not required (APRMs may be reading downscale once in MODE 2).

If overlap for a group of channels is not demonstrated (e.g., IRM/APRM overlap), the reason for the failure of the Surveillance should be determined and the appropriate channel(s) declared inoperable. Only those appropriate channel(s) that are required in the current MODE or condition should be declared inoperable.

A Frequency of 7 days is reasonable based on engineering judgment and the reliability of the IRMs and APRMs.

SR 3.3.1.1.8

LPRM gain settings are determined from the local flux profiles measured by the Traversing Incore Probe (TIP) System. This establishes the relative local flux profile for appropriate representative input to the APRM System. The ~~1000~~ 2000 MWD/T Frequency is based on operating experience with LPRM sensitivity changes and the Licensing Topical Reports approved by the NRC in Reference 13.

SR 3.3.1.1.9 and SR 3.3.1.1.12

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions. Any setpoint adjustment shall be consistent with the assumptions of the current plant specific setpoint methodology. The 92 day Frequency of SR 3.3.1.1.9 is based on the reliability analysis of Reference 9.

(continued)

BASES

REFERENCES

1. USAR, Section 7.2.

2. USAR, Section 5.2.2.

3. USAR, Section 6.3.3.

4. USAR, Chapter 15.

5. USAR, Section 15.4.1.2.

6. NEDO-23842, "Continuous Control Rod Withdrawal in the Startup Range," April 18, 1978.

7. USAR, Section 15.4.9.

8. Letter, P. Check (NRC) to G. Lainas (NRC), "BWR Scram Discharge System Safety Evaluation," December 1, 1980, as attached to NRC Generic Letter dated December 9, 1980.

9. NEDO-30851-P-A, "Technical Specification Improvement Analyses for BWR Reactor Protection System," March 1988.

10. NEDO-32291-A, "System Analyses for Elimination of Selected Response Time Testing Requirements," January 1994.

Insert #1

11. Calculation IP-0-0002.

12. Calculation IP-0-0024.

BASES

SURVEILLANCE REQUIREMENTS (continued)

For the following OPRM instrumentation Surveillances, both OPRM modules are tested, although only one is required to satisfy the Surveillance Requirement.

SR 3.3.1.3.1

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the channel will perform the intended function. A Frequency of 184 days provides an acceptable level of system average unavailability over the Frequency interval and is based on the reliability of the channel (Reference 7).

SR 3.3.1.3.2

LPRM gain settings are determined from the local flux profiles measured by the Traversing Incore Probe (TIP) System. This establishes the relative local flux profile for appropriate representative input to the APRM System. The ~~1000~~ 2000 MWD/T Frequency is based on operating experience with LPRM sensitivity changes and the Licensing Topical Reports approved by the NRC in Reference 12.

SR 3.3.1.3.3

The CHANNEL CALIBRATION is a complete check of the instrument loop. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations, consistent with the plant specific setpoint methodology. Calibration of the channel provides a check of the internal reference voltage and the internal processor clock frequency. It also compares the desired trip setpoint with those in the processor memory. Since the OPRM is a digital system, the internal reference voltage and processor clock frequency are, in turn, used to automatically calibrate the internal analog to digital converters. The nominal setpoints for the period based detection algorithm are specified in the Core Operating Limits Report (COLR). As noted, neutron detectors are excluded from CHANNEL CALIBRATION because of the difficulty of simulating a meaningful signal. Changes in neutron detector sensitivity are compensated for by performing the 1000 MWD/T LPRM calibration against the TIPs (SR 3.3.1.1.8). SR 3.3.1.1.8 thus also ensures the operability of the OPRM instrumentation.

The nominal setpoints for the OPRM trip function for the period based detection algorithm (PBDA) are specified in the COLR. The PBDA trip setpoints are the number of confirmation counts required to permit a trip signal and the peak to average amplitude required to generate a trip signal.

The Frequency of 24 months is based upon the assumption of the magnitude of equipment drift provided by the equipment supplier (Reference 7).

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3.6 (continued)

virtually ensure an instantaneous response time. RPS RESPONSE TIME tests are conducted on an 24 month STAGGERED TEST BASIS. This Frequency is consistent with the refueling cycle and is based upon operating experience, which shows that random failures of instrumentation components causing serious time degradation, but not channel failure, are infrequent.

REFERENCES

1. NEDO-31960, "BWR Owners' Group Long-Term Stability Solutions Licensing Methodology," June 1991.

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10. NEDC-32989P, "Safety Analysis Report for Clinton Power Station Extended Power Uprate," dated June 2001.

11. Letter from K. P. Donovan (BWR Owners' Group) to U. S. NRC, "Guidelines for Stability Option III 'Enabled Region'," dated September 17, 1996.

Insert #2 →

INSERT #1

13. Letter from U. S. NRC to G. A. Watford (GE), "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, 'Methodology and Uncertainties for Safety Limit MCPR Evaluations'; NEDC-32694P, 'Power Distribution Uncertainties for Safety Limit MCPR Evaluation'; and 'Amendment 25 to NEDE-24011-P-A on Cycle-Specific Safety Limit MCPR' (TAC Nos. M97490, M99069 and M97491)," dated March 11, 1999

INSERT #2

12. Letter from U. S. NRC to G. A. Watford (GE), "Acceptance for Referencing of Licensing Topical Reports NEDC-32601P, 'Methodology and Uncertainties for Safety Limit MCPR Evaluations'; NEDC-32694P, 'Power Distribution Uncertainties for Safety Limit MCPR Evaluation'; and 'Amendment 25 to NEDE-24011-P-A on Cycle-Specific Safety Limit MCPR' (TAC Nos. M97490, M99069 and M97491)," dated March 11, 1999