UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 30, 1999

Mr. J. E. Cross
President-Generation Group
Duquesne Light Company
Post Office Box 4
Shippingport, PA 15077

SUBJECT: BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2 - ISSUANCE OF AMENDMENT RE: AXIAL FLUX DIFFERENCE MONITOR, QUADRANT POWER TILT RATIO MONITOR, ROD POSITION DEVIATION MONITOR, AND ROD INSERTION LIMIT MONITOR (TAC NOS. MA4440 AND MA4441)

Dear Mr. Cross:

The Commission has issued the enclosed Amendment No. 225to Facility Operating License No. DPR-66 and Amendment No. 102 to Facility Operating License No. NPF-73 for the Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and BVPS-2). These amendments consist of changes to the Technical Specifications (TSs) in response to your application dated December 24, 1998, as supplemented June 15, June 17, and July 7, 1999, which submitted License Amendment Request Nos. 262 and 135.

These amendments revise the TS requirements for the axial flux difference (AFD) monitor, quadrant power tilt ratio (QPTR) monitor, rod position deviation monitor, and rod insertion limit (RIL) monitor. Specifically, the changes (1) relocate requirements for the AFD monitor and the QPTR monitor to the Licensing Requirements Manual; (2) delete requirements for the rod position deviation monitor and RIL monitor from the TSs; (3) modify Unit 1 surveillance requirements (SR) 4.1.3.5 and 4.1.3.6 by incorporating the Unit 2 wording to provide surveillances more consistent with the Limiting Condition for Operation; (4) change Unit 1 SR 4.1.3.2.2, SR 4.1.3.5, SR 4.1.3.6 and Unit 2 SR 4.1.3.5 from 24-hour surveillance frequencies to 12-hour frequencies; and (5) delete Unit 1 SR 4.1.3.2.3.

Your application stated that the basis for these changes is provided in the Nuclear Regulatory Commission (NRC)-approved Nuclear Electric Institute Technical Specification Task Force 110, Revision 2 (TSTF 110, Rev 2), changes to NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," Revision 1, dated April 1995. However, your application did not address differences between the hardware on which NUREG-1431 is based, and the hardware which is actually installed at BVPS-1. During its review of the proposed changes, the NRC staff reviewed historical documentation associated with BVPS-1 License Amendments Nos. 51, 52, 57,68, and 141 which discussed performance problems that Duquesne Light Company (DLC) had experienced with the BVPS-1 Analog Rod Position Indication System. In order to completely evaluate the applicability of the TSTF-110, Rev. 2, changes to BVPS-1, the NRC staff requested that DLC provide additional information which demonstrates that the performance characteristics of the BVPS-1 Individual Rod Position Indication System are consistent with those of the system upon which NUREG-1431 is based. The requested information was provided in your letter dated June 15, 1999.

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A copy of our safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Victor Nerses for

Daniel S. Collins, Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

Enclosures:
1. Amendment No. 225 to DPR-66
2. Amendment No. 102 to NPF-73
3. Safety Evaluation

cc w/encls: See next page

August 30, 1999

A copy of our safety evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by: V. Nerses for

Daniel S. Collins, Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-334 and 50-412

Enclosures: 1. Amendment No. 225 to DPR-66
2. Amendment No. 102 to NPF-73
3. Safety Evaluation

cc w/encls: See next page

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Beaver Valley Power Station, Units 1 and 2

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2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-66 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 225, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

   In addition, the license is amended by changes to paragraph 2.C.(10) to the Facility Operating License No. DPR-66 as follows:

   (10) Additional Conditions

   The Additional Conditions contained in Appendix C, as revised through Amendment No. 225, are hereby incorporated into this license. Duquesne Light Company shall operate the facility in accordance with the Additional Conditions.

3. This license amendment is effective as of the date of its issuance, to be implemented within 60 days. Implementation of this amendment shall include the relocation of these technical specification requirements to the appropriate documents, as described in the licensee's application dated December 24, 1998, and evaluated in the staff's safety evaluation attached to this amendment.

FOR THE NUCLEAR REGULATORY COMMISSION

S. Singh Bajwa, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachments: 1. Page 2 of Appendix C of Operating License No. DPR-66
2. Changes to the Technical Specifications

Date of Issuance: August 30, 1999

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

PENNSYLVANIA POWER COMPANY

DOCKET NO. 50-334

BEAVER VALLEY POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 225
License No. DPR-66

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Duquesne Light Company, et al. (the licensee) dated December 24, 1998, as supplemented June 15, June 17, and July 7, 1999, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

ATTACHMENT TO LICENSE AMENDMENT NO. 225

FACILITY OPERATING LICENSE NO. DPR-66

DOCKET NO. 50-334

Replace the following pages of Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
3/4 1-19	3/4 1-19
3/4 1-20	3/4 1-20
3/4 1-20b	3/4 1-20b
3/4 1-20c	3/4 1-20c
3/4 1-23	3/4 1-23
3/4 1-23a	3/4 1-23a
3/4 2-2	3/4 2-2
3/4 2-11	3/4 2-11
B 3/4 1-4	B 3/4 1-4
B 3/4 2-7	B 3/4 2-7
B 3/4 2-10	B 3/4 2-10

Revise Appendix C of the License as follows:

Remove Page	Insert Page
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LIMITING CONDITION FOR OPERATION (Continued)

b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.

c) A power distribution map is obtained from the movable incore detectors and FQ(Z) and $F^N_{\Delta H}$ are verified to be within their limits within 72 hours.

d) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions.

d. With more than one rod tripable but inoperable due to causes other than addressed by Action a above, POWER OPERATION may continue provided that:

1. Within one hour, the remainder of the rods in the bank(s) with the inoperable rods are aligned to within ± 12 steps of the inoperable rods while maintaining the rod sequence and insertion limits provided in the CORE OPERATING LIMITS REPORT. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, and

2. The inoperable rods are restored to OPERABLE status within 72 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 Each shutdown and control rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 10 steps in any one direction at least once per 31 days.

4.1.3.1.2 The position of each full length rod shall be determined to be within ± 12 steps of the associated group demand counter by verifying the individual rod position at least once per 12 hours.

*See Special Test Exception 3.10.2 and 3.10.4

POSITION INDICATION SYSTEMS-OPERATING

LIMITING CONDITION FOR OPERATION

3.1.3.2 The shutdown and control rod position indication system shall be OPERABLE as follows:

Group Demand Counter(1), 1 per group

Individual analog rod position instrument channel, 1 per rod ±12 steps(1) accuracy(3)

(1) During the first hour following rod motion, the group demand counter is the primary indicator of precise rod position information, with the analog channels displaying general rod movement information. For power levels below 50%, a 1-hour thermal soak time is allowed before the analog channels are required to perform within the specified accuracy.

(2) For power levels below 50% a one hour thermal soak time is allowed.

(3) Malfunctions of the group demand counters or analog RPI, providing no actual rod misalignment existed during the malfunction, shall be reported in the monthly operating report.

LIMITING CONDITION FOR OPERATION (Continued)

e. If the position of a maximum of one rod cannot be determined by either the direct reading of the rod position indicators or by reading primary detector voltage measurements,

1. Determine the position of the non-indicating rod indirectly by the movable incore detectors immediately and at least once per 8 hours and immediately after any motion of the non-indicating rod which exceeds 24 steps in one direction since the last determination of the rod's position.

f. If the position of more than one rod cannot be determined by either the direct reading of the rod position indicators or by reading primary detector voltage measurements, then Specification 3.0.3 is applicable.

2. Reduce THERMAL POWER to less than 50% of RATED THERMAL power within 8 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2.1 Each of the group demand counters shall be determined to be OPERABLE by:

a. Performing a CHANNEL CHECK by the group demand counters within a bank, and observing proper overlap* of the indicated positions, and

b. Performing a CHANNEL CHECK by an intercomparison between the control bank benchboard indicators and the logic solid state indicators in the logic cabinet, and determining their agreement within ± 2 steps, at least once per 92 days.

* During startup and shutdown, overlap must be checked for all control banks at the respective bank overlap height transition points.

SURVEILLANCE REQUIREMENTS (Continued)

4.1.3.2.2 Each of the analog rod position indicators shall be determined to be OPERABLE by:

a. Performing a CHANNEL CHECK by intercomparison** between each analog rod position indicator and its corresponding group demand counter at least once per 12 hours.

b. Performing a CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION at least once per 18 months.

For Core PHYSICS TESTING in Mode 2, primary detector voltage measurements may be used to determine the position of rods in shutdown banks A and B and control banks A and B for the purpose of satisfying Specification 3.1.3.2. During Mode 2 operation, rod position indicators for shutdown banks A and B and control banks A and B may deviate from the group demand indicators by greater than ± 12 steps during reactor startup and shutdown operations, while rods are being withdrawn or inserted. If the rod position indicators for shutdown banks A and B and control banks A and B deviate by greater than ± 12 steps from the group demand indicator, rod withdrawal or insertion may continue until the desired group height is achieved. When the desired group height is achieved, a one hour soak time is allowed below 50% reactor power to permit stabilization of the rod position analog indicators. To attain thermal equilibrium during the one hour soak time, the absolute value of rod motion shall not exceed 6 steps.

** For power levels below 50% one hour thermal "soak time" is permitted. During this soak time, the absolute value of rod motion is limited to six steps.

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown rods shall be within the insertion limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2*#

ACTION:

With a maximum of one shutdown rod inserted beyond the insertion limit, except for surveillance testing pursuant to Specification 4.1.3.1.1, within one hour either:

a. Restore the rod to within the limit, or

b. Declare the rod to be inoperable and apply Specification 3.1.3.1.

SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown rod shall be determined to be within the insertion limit**:

a. Within 15 minutes prior to withdrawal of any rods in control banks A, B, C or D during an approach to reactor criticality, and

b. At least once per 12 hours thereafter.

---

* See Special Test Exception 3.10.2 and 3.10.4.

** For power levels below 50% one hour thermal "soak time" is permitted.
During this soak time, the absolute value of rod motion is limited to six steps.

\# With $K_{eff} \geq 1.0$.

CONTROL ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The control banks shall be within the insertion limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: Modes 1* and 2*#

ACTION:

With the control banks inserted beyond the insertion limits, except for surveillance testing pursuant to Specification 4.1.3.1.1, either:

a. Restore the control banks to within the limits within 2 hours, or

b. Reduce THERMAL POWER within 2 hours to less than or equal to that fraction or RATED THERMAL POWER which is allowed by the bank position insertion limits specified in the CORE OPERATING LIMITS REPORT, or

c. Be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.6 The position of each control bank shall be determined to be within the insertion limits** at least once per 12 hours.

---

* See Special Test Exception 3.10.2 and 3.10.4
\# With $K_{eff} \geq 1.0$
** For power levels below 50%, one hour thermal "soak time" is permitted. During this soak time, the absolute value of rod motion is limited to six steps.

LIMITING CONDITION FOR OPERATION (Continued)

b. THERMAL POWER shall not be increased above 90% of RATED THERMAL POWER unless the indicated AFD is within the target band and ACTION a.2.a) 1), above has been satisfied.

c. THERMAL POWER shall not be increased above 50% of RATED THERMAL POWER unless the indicated AFD has not been outside of the target band for more than 1 hour penalty deviation cumulative during the previous 24 hours.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The indicated AXIAL FLUX DIFFERENCE shall be determined to be within its limits during POWER OPERATION above 15% of RATED THERMAL POWER for each OPERABLE excore channel at least once per 7 days.

4.2.1.2 The indicated AFD shall be considered outside of its target band when at least 2 of 4 or 2 of 3 OPERABLE excore channels are indicating the AFD to be outside the target band. POWER OPERATION outside of the target band shall be accumulated on a time basis of:

a. One minute penalty deviation for each one minute of POWER OPERATION outside of the target band at THERMAL POWER levels equal to or above 50% of RATED THERMAL POWER, and

b. One-half minute penalty deviation for each one minute of POWER OPERATION outside of the target band at THERMAL POWER levels between 15% and 50% of RATED THERMAL POWER.

ATTACHMENT TO LICENSE AMENDMENT NO. 102

FACILITY OPERATING LICENSE NO. NPF-73

DOCKET NO. 50-412

Replace the following pages of Appendix A, Technical Specifications, with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

Remove	Insert
3/4 1-19	3/4 1-19
3/4 1-21	3/4 1-21
3/4 1-24	3/4 1-24
3/4 1-25	3/4 1-25
3/4 2-2	3/4 2-2
3/4 2-10	3/4 2-10
B 3/4 1-5	B 3/4 1-5
B 3/4 2-7	B 3/4 2-7
B 3/4 2-9	B 3/4 2-9
B 3/4 2-10	B 3/4 2-10

Revise Appendix D of the License as follows:

Remove Page	Insert Page
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LIMITING CONDITION FOR OPERATION (Continued)

b) The SHUTDOWN MARGIN requirement of Specification 3.1.1.1 is determined at least once per 12 hours.

c) A power distribution map is obtained from the movable incore detectors and $F_Q(Z)$ and $F^N_{\Delta H}$ are verified to be within their limits within 72 hours.

d) A reevaluation of each accident analysis of Table 3.1-1 is performed within 5 days; this reevaluation shall confirm that the previously analyzed results of these accidents remain valid for the duration of operation under these conditions.

d. With more than one rod trippable but inoperable due to causes other than addressed by Action a above, POWER OPERATION may continue provided that:

1. Within one hour, the remainder of the rods in the bank(s) with the inoperable rods are aligned to within ± 12 steps of the inoperable rods while maintaining the rod sequence and insertion limits provided in the CORE OPERATING LIMITS REPORT. The THERMAL POWER level shall be restricted pursuant to Specification 3.1.3.6 during subsequent operation, and

2. The inoperable rods are restored to OPERABLE status within 72 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.1.1 Each shutdown and control rod not fully inserted in the core shall be determined to be OPERABLE by movement of at least 10 steps in any one direction at least once per 31 days.

4.1.3.1.2 The position of each full length rod shall be determined to be within ± 12 steps of the associated group demand counter by verifying the individual rod position at least once per 12 hours.

POSITION INDICATION SYSTEMS - OPERATING

LIMITING CONDITION FOR OPERATION

3.1.3.2 The Digital Rod Position Indication System and the Demand Position Indication System shall be OPERABLE and capable of determining the control rod positions within ± 12 steps.

APPLICABILITY: MODES 1 and 2.

ACTION:

a. With a maximum of one digital rod position indicator per bank inoperable either:

   1. Determine the position of the nonindicating rod(s) indirectly by the movable incore detectors at least once per 8 hours and immediately after any motion of the nonindicating rod which exceeds 24 steps in one direction since the last determination of the rod's position, or

   2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

b. With a maximum of one demand position indicator per bank inoperable either:

   1. Verify that all digital rod position indicators for the affected bank are OPERABLE and that the most withdrawn rod and the least withdrawn rod of the bank are within a maximum 12 steps of each other at least once per 8 hours, or

   2. Reduce THERMAL POWER to less than 50% of RATED THERMAL POWER within 8 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.2 Each digital rod position indicator shall be determined to be OPERABLE by verifying that the Demand Position Indication System and the Digital Rod Position Indication System agree within 12 steps at least once per 12 hours.

SHUTDOWN ROD INSERTION LIMIT

LIMITING CONDITION FOR OPERATION

3.1.3.5 All shutdown rods shall be within the insertion limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2*#

ACTION:

With a maximum of one shutdown rod inserted beyond the insertion limit, except for surveillance testing pursuant to Specification 4.1.3.1.1, within one hour either:

a. Restore the rod to within the limit, or

b. Declare the rod to be inoperable and apply Specification 3.1.3.1.

SURVEILLANCE REQUIREMENTS

4.1.3.5 Each shutdown rod shall be determined to be within the insertion limit:

a. Within 15 minutes prior to withdrawal of any rods in control banks A, B, C, or D during an approach to reactor criticality, and

b. At least once per 12 hours thereafter.

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*See Special Test Exception 3.10.2 and 3.10.3

#With $K_{eff} \geq 1.0$

CONTROL ROD INSERTION LIMITS

LIMITING CONDITION FOR OPERATION

3.1.3.6 The control banks shall be within the limits specified in the CORE OPERATING LIMITS REPORT.

APPLICABILITY: MODES 1* and 2*#

ACTION:

With the control banks inserted beyond the insertion limits, except for surveillance testing pursuant to Specification 4.1.3.1.1, either:

a. Restore the control banks to within the limits within 2 hours, or

b. Reduce THERMAL POWER within 2 hours to less than or equal to that fraction of RATED THERMAL POWER which is allowed by the bank position insertion limits specified in the CORE OPERATING LIMITS REPORT or

c. Be in at least HOT STANDBY within 6 hours.

SURVEILLANCE REQUIREMENTS

4.1.3.6 The position of each control bank shall be determined to be within the insertion limits at least once per 12 hours.

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*See Special Test Exception 3.10.2 and 3.10.3

#With $K_{eff} \geq 1.0$

LIMITING CONDITION FOR OPERATION (Continued)

ACTION: (Continued)

b. THERMAL POWER shall not be increased above 90 percent of RATED THERMAL POWER unless the indicated AFD is within the target band and ACTION a.2.a)1), above has been satisfied.

c. THERMAL POWER shall not be increased above 50 percent of RATED THERMAL POWER unless the indicated AFD has not been outside of the target band for more than 1 hour penalty deviation cumulative during the previous 24 hours.

SURVEILLANCE REQUIREMENTS

4.2.1.1 The indicated AXIAL FLUX DIFFERENCE shall be determined to be within its limits during POWER OPERATION above 15 percent of RATED THERMAL POWER for each OPERABLE excore channel at least once per 7 days.

4.2.1.2 The indicated AFD shall be considered outside of its target band when at least 2 of 4 or 2 of 3 OPERABLE excore channels are indicating the AFD to be outside the target band. POWER OPERATION outside of the target band shall be accumulated on a time basis of:

a. One-minute penalty deviation for each 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels equal to or above 50 percent of RATED THERMAL POWER, and

b. One-half-minute penalty deviation for each 1 minute of POWER OPERATION outside of the target band at THERMAL POWER levels between 15% and 50% of RATED THERMAL POWER.

SURVEILLANCE REQUIREMENTS

4.2.4 Verify the QPTR is within the limit:

a. By calculation[2] at least once per 7 days.

b. Using the movable incore detectors once within 12 hours and every 12 hours thereafter.[3]

(2) With one power range high neutron flux channel input to QPTR inoperable and THERMAL POWER less than 75 percent RTP, the remaining three power range high neutron flux channels can be used for calculating the QPTR.

(3) Only required to be performed with less than four power range high neutron flux channels input to QPTR operable with THERMAL POWER greater than or equal to 75 percent RTP.

3/4.1.2 BORATION SYSTEMS (Continued)

satisfied before the verification is completed to ensure that no unacceptable reduction of SHUTDOWN MARGIN occurred when the LCO requirements were not satisfied.

The primary function of the surveillance is to ensure that the valve(s) used to isolate the Primary Grade Water System are locked, sealed or otherwise secured. The frequency of 31 days to ensure that the Primary Grade Water System is properly isolated is based on engineering judgment, and has proven to be acceptable. Operating experience has shown that the failure rate is so low that the 31 day frequency is justified. A time frame of 15 minutes provides a minimum reasonable time for an operator to isolate the Primary Grade Water System following a planned activity requiring its use.

3/4.1.3 MOVABLE CONTROL ASSEMBLIES

The specifications of this section ensure that 1) acceptable power distribution limits are maintained, 2) the minimum SHUTDOWN MARGIN is maintained, and 3) the potential effects of rod misalignment on associated accident analyses are limited. OPERABILITY of the movable control assemblies is established by observing rod motion and determining that rods are positioned within ± 12 steps (indicated position), of the respective group demand counter position. The OPERABILITY of the control rod position indication system is required to determine control rod positions and thereby ensure compliance with the control rod alignment and insertion limits.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those safety analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation.

The maximum rod drop time restriction is consistent with the assumed rod drop time used in the safety analyses. Measurement with T_{avg} greater than or equal to 541°F and with all reactor coolant

3/4.2.4 QUADRANT POWER TILT RATIO (QPTR) (Continued)

APPLICABILITY (Continued)

the reactor coolant to require the implementation of a QPTR limit on the distribution of core power. The QPTR limit in these conditions is, therefore, not important. Note that the $F^N_{\Delta H}$ and $F_Q(Z)$ LCOs still apply, but allow progressively higher peaking factors at 50 percent RTP or lower.

ACTION

a. With the QPTR exceeding its limit, a power level reduction of 3 percent RTP for each 1 percent by which the QPTR exceeds 1.00 is a conservative tradeoff of total core power with peak linear power. The completion time of 2 hours allows sufficient time to identify the cause and correct the tilt. Note that the power reduction itself may cause a change in the tilted condition.

b. After completion of ACTION a, any additional changes in the QPTR are detected by requiring a check of the QPTR once per 12 hours thereafter. If the QPTR continues to increase, THERMAL POWER has to be reduced accordingly. A 12 hour completion time is sufficient because any additional change in QPTR would be relatively slow.

c. The peaking factors $F^N_{\Delta H}$ and $F_Q(Z)$ are of primary importance in ensuring that the power distribution remains consistent with the initial conditions used in the safety analyses. Performing surveillances on $F^N_{\Delta H}$ and $F_Q(Z)$ within the completion time of 24 hours ensures that these primary indicators of power distribution are within their respective limits. A completion time of 24 hours takes into consideration the rate at which peaking factors are likely to change, and the time required to stabilize the plant and perform a flux map. If these peaking factors are not within their limits, the actions provide an appropriate response for the abnormal condition. If the QPTR remains above its specified limit, the peaking factor surveillances are required each 7 days thereafter to evaluate $F^N_{\Delta H}$ and $F_Q(Z)$ with changes in power distribution. Relatively small changes are expected due to either burnup and xenon redistribution or correction of the cause for exceeding the QPTR limit.

3/4.2.4 QUADRANT POWER TILT RATIO (QPTR) (Continued)

ACTION (Continued)

power does not reach RTP within 24 hours, but is increased slowly, then the peaking factor surveillances must be performed within 48 hours of the time when the ascent to power was begun. These completion times are intended to allow adequate time to increase THERMAL POWER to above the limit of ACTION a or b, while not permitting the core to remain with unconfirmed power distributions for extended periods of time.

This action assures that the peaking factor surveillances may only be done after the excore detectors have been normalized to show a tilt less than or equal to 1.02 (i.e., ACTION e). The intent of this is to have the peaking factor surveillances performed at operating power levels, which can only be accomplished after the excore detectors are normalized to show a tilt less than or equal to 1.02 and the core returned to power.

g. If ACTIONS a through f are not completed within their associated completion times, the unit must be brought to a MODE or condition in which the requirements do not apply. To achieve this status, THERMAL POWER must be reduced to less than 50 percent RTP within 4 hours. The allowed completion time of 4 hours is reasonable, based on operating experience regarding the amount of time required to reach the reduced power level without challenging plant systems.

SURVEILLANCE REQUIREMENTS (SR)

SR 4.2.4.a

SR 4.2.4.a is modified by a Note that allows QPTR to be calculated with three power range high neutron flux channels that input to QPTR if THERMAL POWER is less than 75 percent RTP and one power range high neutron flux channel is inoperable.

This surveillance verifies that the QPTR, as indicated by the Nuclear Instrumentation System (NIS) channels, excore channels, is within its limits. The frequency of 7 days takes into account other information and alarms available to the operator in the control room.

APPENDIX D

ADDITIONAL CONDITIONS
OPERATING LICENSE NO. NPF-73

Duquesne Light Company, Ohio Edison Company, The Cleveland Electric Illuminating Company, and The Toledo Edison Company shall comply with the following conditions on the schedules noted below:

Amendment Number	Additional Condition	Implementation Date
102	The licensee is authorized to relocate certain Technical Specification requirements to licensee-controlled documents. Implementation of this amendment shall include the relocation of these Technical Specification requirements to the appropriate documents as described in the licensee's application dated December 24, 1998, as supplemented June 15, June 17, and July 7, 1999, and evaluated in the staff's evaluation attached to this amendment.	The amendment shall be implemented within 60 days from August 30, 1999

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

DOCKET NO. 50-412

BEAVER VALLEY POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 102
License No. NPF-73

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Duquesne Light Company, et al. (the licensee) dated December 24, 1998, as supplemented June 15, June 17, and July 7, 1999, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-73 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 102 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto are hereby incorporated in the license DLCO shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

   In addition, the license is amended by changes to paragraph 2.C.(11) to the Facility Operating License No. NPF-73 as follows:

   (11) Additional Conditions

   The Additional Conditions contained in Appendix D, as revised through Amendment No. 102 , are hereby incorporated into this license. Duquesne Light Company shall operate the facility in accordance with the Additional Conditions.

3. This license amendment is effective as of the date of its issuance, to be implemented within 60 days. Implementation of this amendment shall include the relocation of these technical specification requirements to the appropriate documents, as described in the licensee's application dated December 24, 1998, and evaluated in the staff's safety evaluation attached to this amendment.

FOR THE NUCLEAR REGULATORY COMMISSION

S. Singh Bajwa, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachments: 1. Page 2 of Appendix D of Operating License No. NPF-73
2. Changes to the Technical Specifications

Date of Issuance: August 30, 1999

SURVEILLANCE REQUIREMENTS

4.2.4 Verify the QPTR is within the limit:

a. By calculation[2] at least once per 7 days.

b. Using the movable incore detectors once within 12 hours and every 12 hours thereafter.[3]

(2) With one power range high neutron flux channel input to QPTR inoperable and THERMAL POWER less than 75 percent RTP, the remaining three power range high neutron flux channels can be used for calculating the QPTR.

(3) Only required to be performed with less than four power range high neutron flux channels input to QPTR operable with THERMAL POWER greater than or equal to 75 percent RTP.

position indicators (after thermal soak after rod motion) is sufficient verification that the control rods are above the insertion limits below 50 percent power. Above 50 percent power, reliance is placed on the analog rod position indicator channels to assure that control rods are above the insertion limits.

The ACTION statements which permit limited variations from the basic requirements are accompanied by additional restrictions which ensure that the original design criteria are met. Misalignment of a rod requires measurement of peaking factors and a restriction in THERMAL POWER. These restrictions provide assurance of fuel rod integrity during continued operation. In addition, those safety analyses affected by a misaligned rod are reevaluated to confirm that the results remain valid during future operation.

For Specification 3.1.3.1 ACTION c. and d., it is incumbent upon the plant to verify the trippability of the inoperable control rod(s). Trippability is defined in Attachment C to a letter dated December 21, 1984, from E. P. Rahe (Westinghouse) to C. O. Thomas (NRC). This may be by verification of a control system failure, usually electrical in nature, or that the failure is associated with the control rod stepping mechanism. In the event the plant is unable to verify the rod(s) trippability, it must be assumed to be untrippable and thus falls under the requirements of ACTION a.

BASES

3/4.2.4 QUADRANT POWER TILT RATIO (QPTR) (Continued)

LCO

The QPTR limit of 1.02, at which corrective action is required, provides a margin of protection for both the DNB ratio and linear heat generation rate contributing to excessive power peaks resulting from X-Y plane power tilts. A limiting QPTR of 1.02 can be tolerated before the margin for uncertainty in $F_Q(Z)$ and $(F^N_{\Delta H})$ is possibly challenged.

APPLICABILITY

The QPTR limit must be maintained in MODE 1 with THERMAL POWER greater than 50 percent RATED THERMAL POWER (RTP) to prevent core power distributions from exceeding the design limits.

Applicability in MODE 1 less than or equal to 50 percent RTP and in other MODES is not required because there is either insufficient stored energy in the fuel or insufficient energy being transferred to the reactor coolant to require the implementation of a QPTR limit on the distribution of core power. The QPTR limit in these conditions is, therefore, not important. Note that the $F^N_{\Delta H}$ and $F_Q(Z)$ LCOs still apply, but allow progressively higher peaking factors at 50 percent RTP or lower.

ACTION

a. With the QPTR exceeding its limit, a power level reduction of 3 percent RTP for each 1 percent by which the QPTR exceeds 1.00 is a conservative tradeoff of total core power with peak linear power. The completion time of 2 hours allows sufficient time to identify the cause and correct the tilt. Note that the power reduction itself may cause a change in the tilted condition.

b. After completion of ACTION a, any additional changes in the QPTR are detected by requiring a check of the QPTR once per 12 hours thereafter. If the QPTR continues to increase, THERMAL POWER has to be reduced accordingly. A 12 hour completion time is sufficient because any additional change in QPTR would be relatively slow.

3/4.2.4 QUADRANT POWER TILT RATIO (QPTR) (Continued)

SURVEILLANCE REQUIREMENTS (SR)

SR 4.2.4.a

SR 4.2.4.a is modified by a Note that allows QPTR to be calculated with three power range high neutron flux channels that input to QPTR if THERMAL POWER is less than 75 percent RTP and one power range high neutron flux channel is inoperable.

This surveillance verifies that the QPTR, as indicated by the Nuclear Instrumentation System (NIS) channels, excore channels, is within its limits. The frequency of 7 days takes into account other information and alarms available to the operator in the control room.

For those causes of QPT that occur quickly (e.g., a dropped rod), there typically are other indications of abnormality that prompt a verification of core power tilt.

SR 4.2.4.b

This surveillance is modified by a Note, which states that it is required only when less than four power range high neutron flux channels input to QPTR are operable and the THERMAL POWER is greater than or equal to 75 percent RTP.

With an excore detector inoperable, tilt monitoring for a portion of the reactor core becomes degraded. Large tilts are likely detected with the remaining channels, but the capability for detection of small power tilts in some quadrants is decreased. Performing SR 4.2.4.b at a frequency of 12 hours provides an accurate alternative means for ensuring that any tilt remains within its limits.

For purposes of monitoring the QPTR when one excore detector is inoperable, the movable incore detectors are used to confirm that the normalized symmetric power distribution is consistent with the indicated QPTR and any previous data indicating a tilt. The incore detector monitoring is performed with a full incore flux map or a partial core flux map with quarter core symmetry detailed in accordance with controlled procedures.

APPENDIX C

ADDITIONAL CONDITIONS
OPERATING LICENSE NO. DPR-66

Duquesne Light Company, Ohio Edison Company, and Pennsylvania Power Company shall comply with the following conditions on the schedules noted below:

Amendment Number	Additional Condition	Implementation Date
225	The licensee is authorized to relocate certain Technical Specification requirements to licensee-controlled documents. Implementation of this amendment shall include the relocation of these Technical Specification requirements to the appropriate documents as described in the licensee's application dated December 24, 1998, as supplemented June 15, June 17, and July 7, 1999, and evaluated in the staff's evaluation attached to this amendment.	The amendment shall be implemented within 60 days from August 30, 1999

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 225 AND 102 TO FACILITY OPERATING

LICENSE NOS. DPR-66 AND NPF-73

DUQUESNE LIGHT COMPANY

OHIO EDISON COMPANY

PENNSYLVANIA POWER COMPANY

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

THE TOLEDO EDISON COMPANY

BEAVER VALLEY POWER STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-334 AND 50-412

1.0 INTRODUCTION

By letter dated December 24, 1998, as supplemented June 15, June 17, and July 7, 1999, the Duquesne Light Company (the licensee) submitted a request for changes to the Beaver Valley Power Station, Unit Nos. 1 and 2 (BVPS-1 and BVPS-2), Technical Specifications (TSs). The requested changes would revise the TS requirements for the axial flux difference (AFD) monitor, quadrant power tilt ratio (QPTR) monitor, rod position deviation monitor, and rod insertion limit (RIL) monitor. The changes would (1) relocate requirements for the AFD monitor and the QPTR monitor to the Licensing Requirements Manual (LRM); (2) delete requirements for the rod position deviation monitor and RIL monitor from the TSs; (3) modify Unit 1 surveillance requirements (SR) 4.1.3.5 and 4.1.3.6 by incorporating the Unit 2 wording to provide surveillances more consistent with the Limiting Condition for Operation (LCO); (4) change Unit 1 SR 4.1.3.2.2, SR 4.1.3.5, SR 4.1.3.6 and Unit 2 SR 4.1.3.5 from 24-hour surveillance frequencies to 12-hour frequencies; and (5) delete Unit 1 SR 4.1.3.2.3. The June 15, June 17, and July 7, 1999, letters provided clarifying information and final versions of the revised TS pages, and did not change the initial proposed no significant hazards consideration determination or expand the amendment beyond the scope of the initial notice.

2.0 EVALUATION

The licensee proposed the following changes in its December 24, 1998, license amendment request. The NRC staff's evaluations of the proposed changes are as follows:

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2.1 Relocatation of Requirements for the AFD monitor and the QPTR monitor to the LRM

2.1.1 AFD Monitor

The axial flux difference (AFD) is a measure of the axial power distribution skewing to either the top or bottom half of the core. The AFD is sensitive to many core parameters such as control bank positions, core power level, axial burnup, axial xenon distribution, and, to a lesser extent, reactor coolant temperature and boron concentration. The allowed range of AFD is used in the nuclear design process to confirm that operation within these limits produces core peaking factors and axial power distributions that meet safety analysis requirements.

TS limits on AFD were established in order to ensure core peaking factors are consistent with the assumptions used in the safety analysis. These requirements are addressed in the TSs via LCOs and SRs which require that the indicated AFD be maintained within the target band specified in the Core Operating Limits Report (COLR), and that the AFD is verified to be within limits on a routine basis using the operable excore channels. Additionally, there is an AFD monitor/alarm, which does not perform any protective functions, to aid the operator in maintaining AFD within limits. This monitor/alarm is not relied upon for these surveillances. However, there are TS requirements to perform the AFD verifications more frequently during periods when this monitor is not operable.

The licensee has proposed revision of SR 4.2.1.1 to remove requirements based on operability of the AFD monitor alarm, and revision of the associated bases to remove discussion of the alarm operation. The requirements removed from the SR, and the associated bases discussion, will be placed in the Licensing Requirements Manual (LRM). Specifically, the requirements removed from the SR are:

a. Monitoring the indicated AFD at least once-per-hour for the first 24 hours after restoring the AFD monitor to operable status.

b. Monitoring and logging the indicated AFD for each operable excore channel at least once-per-hour for the first 24 hours and at least once per 30 minutes thereafter, when the AFD monitor alarm is inoperable, in lieu of the normal once-per-7-day frequency.

The normal surveillance, which verifies that the AFD is within limits during power operation above 15 % rated thermal power (RTP) for each operable excore channel, is retained within the TS with its current minimum frequency of once-per-7-days.

The AFD monitor alarm is provided as an operator aid for maintaining AFD within established limits. It performs no protective functions assumed in a safety analysis. This change relocates requirements associated with the AFD monitor alarm to the LRM, but leaves the TS AFD limits, and AFD surveillance requirements unchanged. The LRM was developed and issued by the licensee to control and maintain those items removed from the TSs. Changes to the LRM are controlled in accordance with the requirements of 10 CFR 50.59. The current requirements for the AFD monitor alarm in SR 4.2.1.1 and the associated bases are not being changed in their relocation to the LRM. This change is consistent with NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," Revision 1, dated April 1995, as modified by the

Nuclear Regulatory Commission (NRC) staff-approved Nuclear Energy Institute (NEI) Technical Specification Task Force, Change 110, Revision 2 (TSTF-110, Rev. 2). Therefore, the NRC staff has concluded that relocation of the AFD monitor alarm requirements in SR 4.2.1.1 and the associated bases discussions of the alarm operation to the LRM is acceptable.

2.1.2 QPTR Monitor

The Quadrant Power Tilt Ratio (QPTR) is a measure of the radial power distribution within the core. The QPTR limit ensures that the gross radial power distribution remains consistent with the design values used in the safety analysis. The power density at any point in the core must be limited so that the fuel design criteria are maintained. Together, LCO 3.2.3, "Axial Flux Difference", LCO 3.2.4, "Quadrant Power Tilt Ratio", and LCO 3.1.3.6, "Control Rod Insertion Limits", provide limits on process variables that characterize and control the three dimensional power distribution of the reactor core. Control of these variables ensures that the core operates within the fuel design criteria and that power distribution remains within the bounds used in the safety analysis.

Precise radial power distribution measurements are made during startup testing, after refueling, and periodically during power operation. The TS limit on QPTR is addressed via an LCO and SRs which require that the QPTR be maintained within its limit, and that this is verified on a routine basis using the moveable incore detectors. Additionally, there is a QPTR monitor/alarm, which does not perform any protective functions, to aid the operator in maintaining QPTR within the TS limit. Although this monitor/alarm is not relied upon for the TS required QPTR surveillances, there are TSs requirements to perform the QPTR verification more frequently during periods when this monitor is not operable.

The licensee has proposed revision of SR 4.2.4 to remove requirements associated with the QPTR monitor alarm, and revision of the associated bases to remove discussion of alarm operability. The requirements removed from the SR, and the associated bases discussion, will be placed in the LRM. Specifically, the SR is modified to remove the requirement to calculate QPTR and verify that it is within limits within 12 hours, and every 12 hours thereafter, when the QPTR alarm is inoperable. The TS requirements to maintain QPTR less than or equal to 1.02 when reactor power is greater than 50 % RTP, and the associated action statements are unchanged. Additionally, the normal surveillance, which verifies that the QPTR is within limits, is retained within the TSs with its current minimum frequency of once-per-7-days.

The QPTR monitor alarm is provided as an operator aid for maintaining QPTR within established limits. It performs no protective functions assumed in a safety analysis. This change relocates requirements associated with the QPTR monitor alarm to the LRM, but leaves the TS QPTR limit, and QPTR surveillance requirements unchanged. The LRM was developed and issued by the licensee to control and maintain those items removed from the TSs. Changes to the LRM are controlled in accordance with the requirements of 10 CFR 50.59. The current requirements for the QPTR monitor alarm in SR 4.2.4 and the associated bases are not being changed in their relocation to the LRM. The 7-day surveillance frequency for verifying that QPTR is within limits takes into account other information and alarms available to the operator in the control room. This change is consistent with NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," Revision 1, dated April 1995, as modified by the NRC staff approved NEI TSTF-110, Rev. 2. Therefore, the NRC staff has concluded that relocation

of the QPTR monitor alarm requirements in SR 4.2.4 and the associated bases discussions of alarm operability to the LRM is acceptable.

2.2 Deletion of rod position deviation monitor and rod inspection limit (RIL) monitor requirements

The operability, including position indication, of the shutdown and control rods is an initial assumption in all safety analyses that assume rod insertion upon reactor trip. Maximum rod misalignment is an initial assumption in the safety analysis that directly affects core power distributions and assumptions of available shutdown margin (SDM). Rod position indication is required to assess operability and misalignment.

Mechanical or electrical failures may cause a control rod to become inoperable or to become misaligned from its group which, in turn, may cause increased power peaking, due to the asymmetric reactivity distribution and a reduction in the total available rod worth for reactor shutdown. Therefore, control rod alignment and operability are related to core operation in design power peaking limits and the core design requirement of a minimum SDM. Limits on control rod alignment and operability are contained in the TSs, and all rod positions are monitored and controlled during power operation to ensure that the power distribution and reactivity limits defined by the design power peaking and SDM limits are preserved.

The axial position of shutdown rods and control rods are determined by two separate and independent systems: the Group Demand Position Indication System, and the Individual Analog Rod Position Indication (ARPI) System. The Group Demand Position Indication System counts the pulses from the Rod Control System that moves the rods. Individual rods in a group all receive the same signal to move and should, therefore, all be at the same position indicated by the group step counter for that group. This indication system is considered to be highly precise (± 1 step, or ± 5/8 inch). If a rod does not move one step for each demand pulse, the step counter will still count the pulse and incorrectly reflect the position of the rod. The ARPI system, on the other hand, uses a linear variable transformer (installed in BVPS-1) or a series of coils spaced along the hollow upper end of the control rod tube (installed in BVPS-2) to detect the position of the control rod extension shaft and display the position of the individual control rod. NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," is based on an ARPI system which uses the series of coils, such as installed in BVPS-2, and assumes that the normal indication accuracy of the ARPI system is ± 6 steps (± 3.75 inches), and the maximum uncertainty is ± 12 steps (± 7.5 inches). With an indicated deviation of 12 steps between the group step counter and ARPI system, the maximum deviation between actual rod position and the demand position could be 24 steps, or 15 inches. The licensing basis safety analysis assumes a ± 24 step rod misalignment.

Control and shutdown rod position accuracy is essential during power operations. Power peaking, ejected rod worth, or SDM limits may be violated in the event of a Design Basis Accident (DBA), with control or shutdown rods operating outside of their limits undetected. Therefore, the acceptance criteria for rod position indication is that rod positions must be known with sufficient accuracy in order to verify the core is operating within established core physics parameters, and that the alignment limits are preserved. These requirements are addressed in the TSs via LCOs and SRs which require that: the position indication systems are operable; the rods are properly aligned with their group; the rod positions are within the limits established in

the COLR; and that these are verified on a routine basis (Proposed changes to make these surveillance intervals 12 hours are discussed in Section 2.4 of this safety evaluation report). The surveillances associated with these TSs rely solely upon the Group Demand Position Indication System indications and the ARPI system indications; the Rod Position Deviation Monitor and the RIL monitor are not used in satisfying these surveillance requirements.

The licensee has proposed changes to the BVPS-1 and BVPS-2 TSs to remove requirements for the Rod Position Deviation Monitor and the RIL monitor which are consistent with the NRC staff approved NEI TSTF-110, Rev. 2 changes to NUREG-1431. The underlying assumptions for the NRC staff's approval of TSTF-110, Rev. 2, changes are that indications of the rod positions available to the operators are sufficiently accurate and that surveillance frequencies are appropriate to ensure adequate protection of core physics parameters and, hence, the monitors are not required. To apply the TSTF-110, Rev 2 changes to the existing BVPS-1 and BVPS-2 custom TSs, the installed rod position indication system hardware must then either be the same as, or have performance characteristics comparable to, the systems on which NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," is based. Additionally, the surveillance intervals must be consistent with NUREG-1431 as modified by TSTF-110, Rev. 2.

2.2.1 Rod Position Deviation Monitor

The licensee's proposed changes would:

a. Revise SR 4.1.3.1.2 to remove requirements for verification of group position once-per-4-hours during periods when the rod position deviation monitor is inoperable. The remaining surveillance verifies that the position of each full length rod is within 12 steps of the associated group demand counter at least once-per-12-hours.

b. Revise TS 3.1.3.2 (Unit 1 only) to remove the automatic rod position deviation monitor from shutdown and control rod position indication system operability requirements. Additionally, Action Statement requirements to check indicated positions every 4 hours when the automatic rod position deviation monitor is inoperable are deleted. The remaining TS LCO specifies operability requirements, and associated action statements, for the shutdown and control rod position indication system, which is comprised of the group demand position indicators and the individual analog rod position indicators.

c. Delete SR 4.1.3.2.3 (Unit 1 only).

d. Revise SR 4.1.3.2 (Unit 2 only) to remove requirements for comparison of Demand Position Indication System readings with Digital Rod Position Indication System readings once-per-4-hours during periods when the rod position deviation monitor is inoperable. The remaining surveillance determines that the Digital Rod Position Indication System is operable by verifying that the Demand Position Indication System and the Digital Rod Position Indication System agree within 12 steps at least once-per-12-hours.

e. Revise TS Bases 3/4.1.3 to remove discussion of the rod position deviation monitor.

Requirements that are in the existing TSs, but do not meet the guidance set forth in 10 CFR 50.36 for inclusion in the TSs, can be removed. The rod position deviation monitor/alarm is provided as an aid to alert the operator if any rod deviates from the bank position by more than ± 12 steps. It does not indicate conditions of the reactor coolant pressure boundary; it is not a process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis; it performs no protective functions assumed in a safety analysis to mitigate a design basis accident or transient; and, there is no operating experience or probabilistic risk assessment which shows it to be significant to public health and safety. Therefore, the rod position deviation monitor/alarm requirements specified in TS 3/4.1.3 do not meet any of the four criteria specified in 10 CFR 50.36(c)(2)(ii) regarding items for which a limiting condition for operation must be established. In its application for this amendment, the licensee noted that the operability requirement for the rod position deviation monitor was added to the Unit 1 TS 3.1.3.2 LCO by Amendment No. 51 to License No. DPR-66, and that inclusion of this operability requirement was inconsistent with the Westinghouse Standard Technical Specifications at the time (NUREG 0452, Rev. 4). As part of the review for the change proposed in the licensee's December 24, 1998, letter, the NRC staff reviewed documentation associated with Amendment No. 51 to the BVPS-1 license, as well as correspondence to and from the licensee associated with Amendment Nos. 52, 57, 68, and 141. All of these amendments were related to the BVPS-1 ARPI system.

The staff found in its review of the historical documentation that the inclusion of the operability requirements for the rod position deviation monitor in the TS LCO was done as part of an effort to address significant performance problems the licensee had experienced with the BVPS-1 ARPI system; specifically, inaccuracy and thermal drift which resulted in indicated rod positions which were outside of the TS required ± 12 step accuracy. In light of these problems, the addition of the operability requirement, in conjunction with the already existing requirement for surveillance at 4-hour intervals when the rod deviation monitor is inoperable, was intended to ensure timely protection of the core physics parameters in the event of rod misalignment outside of a ± 12 step band. Further review of the historical documents revealed that, around the time that Amendment 51 to the BVPS-1 license was issued, the licensee had installed custom meter faces, utilized plant computer algorithm compensation, and implemented a program for hot zero-power calibration in order to achieve the required ± 12 step accuracy. In order to further evaluate the applicability of the TSTF-110, Rev. 2, changes to BVPS-1, the NRC staff requested that the licensee provide additional information regarding any equipment modifications that have been installed on BVPS-1 since Amendment 51 was issued to address the accuracy and thermal drift problems previously encountered. The current BVPS-2 Updated Final Safety Analysis Report provides sufficient information for the NRC staff to determine that the BVPS-2 Individual Rod Position Indication System is the same system that NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," is based on and, hence, no additional information for BVPS-2 was required. The requested information was provided in the licensee's letter dated June 15, 1999.

During 1997/1998, DLC replaced a part of the BVPS-1 ARPI system with a Combustion Engineering Rod Position Indication (CERPI) system. This modification installed programmable logic controllers (PLCs) on BVPS-1 to replace the electronic processing equipment of the ARPI

system. The PLC algorithms correct for detector non-linearity, as well as compensate for detector temperature effects such as those due to power level or average coolant temperature changes. The PLCs have been demonstrated to accurately compensate for the inherent sensor non-linearity and thermal drift characteristics to provide consistent and accurate rod position indication.

Because the detector design has remained unchanged, short-term temperature effects immediately following rod movement are still present. However, since rods are moved as a bank, this thermal transient affects all rods in the bank in relatively the same manner; thus, the ability to detect a rod out of bank situation is not materially impaired. This short-term detector characteristic is addressed in the BVPS-1 TSs by the allowance for a 1-hour soak following rod movement.

The installation of the CERPI modification resulted in an average maximum deviation of 6 steps, and a steady-state absolute maximum individual rod position indication deviation of 10 steps from the demand position. NUREG-1431 is based on a system which provides normal indication accuracy of ± 6 steps, and a maximum uncertainty of ± 12 steps. Thus, the performance characteristics of the BVPS-1 CERPI system are consistent with those of the system upon which NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," is based.

Considering that rod motion is limited and infrequent during steady-state power operations, verification that individual rod positions are within alignment limits at a frequency of once-per-12-hours provides a history that allows the operator to detect a rod that is beginning to deviate from its expected position. This specified frequency takes into account other rod position information that is continuously available to the operator in the control room so that, during actual rod motion, deviations can be immediately detected. The specified 12-hour surveillance interval is consistent with NUREG-1431 as modified by TSTF-110, Rev. 2.

Therefore, since the rod position indication systems provide accurate steady state information on rod positions; the operators routinely verify rod positions are within limits; rod motion when the units are at power is limited and infrequent; short-term thermal effects on the BVPS-1 rod position indication system detectors do not impair the operators ability to detect a rod out of bank situation; and, the rod position deviation monitor serves no protective function, the NRC staff has concluded that removal of the rod position deviation monitor alarm from the TSs and revision of the associated Bases is acceptable. This change is consistent with NUREG-1431 as modified by the NRC staff approved NEI TSTF-110, Rev. 2.

2.2.2 RIL monitor

The insertion limits of the shutdown and control rods are initial assumptions in all safety analyses that assume rod insertion upon reactor trip. The insertion limits directly affect core power and fuel burnup distributions as well as assumptions of available SDM, and initial reactivity insertion rate. TS limits on control rod insertion have been established, and all rods are monitored and controlled during power operation to ensure that the power distribution and reactivity limits defined by the design power peaking and SDM limits are preserved. The surveillances associated with these TSs rely solely upon the Group Demand Position Indication

System indications; the Rod Insertion Limit Monitor is not used in satisfying these surveillance requirements.

The licensee's proposed changes would:

a. Revise SR 4.1.3.6 (Unit 1)and remove the requirement to verify that deviations between indicated positions are within limits once-per-4-hours during periods when the RIL monitor is inoperable. The wording is also changed so that the BVPS-1 SR and the BVPS-2 SR are consistent with each other, and consistent with the LCO. Additionally, the surveillance frequency is changed from once-per-24-hours to once-per-12-hours. The remaining surveillance verifies that the position of each control bank is within the insertion limits of the COLR at least once-per-12-hours.

b. Revise TS 4.1.3.6 (Unit 2) to remove the requirement to verify individual rod positions once-per-4-hours during periods when the RIL monitor is inoperable. The remaining surveillance verifies that the position of each control bank is within the insertion limits of the COLR at least once-per-12-hours.

c. Revise TS Bases 3/4.1.3 to remove discussion of the RIL monitor.

The RIL monitor/alarm is provided as an aid to alert the operator if the control banks are outside the limits of the COLR. It performs no protective functions assumed in a safety analysis. The Group Demand Position Indication systems installed in both BVPS-1 and BVPS-2 are the same type as that which NUREG-1431 is based on. Hence, there is no concern regarding the accuracy of the indications. Considering that rod motion is limited and infrequent during steady-state power operations, verification that banks are within their COLR limits once-per-12-hours allows the operator to detect a bank that is approaching the insertion limits. This specified frequency takes into account other rod position information that is continuously available to the operator in the control room so that, during actual rod motion, deviations can be immediately detected.

Therefore, since the rod position indication systems provide accurate information on rod positions; the operators routinely verify rod positions are within limits; and, the RIL monitor serves no protective function, the NRC staff has concluded that removal of the RIL monitor alarm from the TSs and revision of the associated Bases is acceptable. This change is consistent with NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," Revision 1, dated April 1995, as modified by the NRC staff approved NEI TSTF-110, Rev. 2.

2.3 Modification of Wording

The licensee has proposed modification of the BVPS-1 SR 4.1.3.5 and SR 4.1.3.6 wording to incorporate the Unit 2 wording and provide surveillances more consistent with the LCOs. References to the group demand counters and analog rod position indicators are removed such that the modified SRs require that the shutdown, and control bank rods be verified to be within the limits of the COLR. Since these SRs will still be satisfied by comparison of the indications of the group demand counters and analog rod position indicators, this is an editorial change only and does not materially alter any TS requirement. Therefore, the NRC staff concludes that this change is acceptable.

2.4 Revision of SR Frequencies

The licensee has proposed revision of the frequencies for BVPS-1 SR 4.1.3.2.2, SR 4.1.3.5, and SR 4.1.3.6 and BVPS-2 SR 4.1.3.5 from 24 hours to 12 hours. These changes result in verification that rod positions and power distributions are within their TS and COLR limits on a shiftly rather than daily basis. These frequency changes support the changes discussed in Sections 2.1 and 2.2 of this safety evaluation, and are consistent with NUREG-1431, "Standard Technical Specifications - Westinghouse Plants," Revision 1, dated April 1995, as modified by the NRC staff approved NEI TSTF-110, Rev. 2. Therefore, the NRC staff concludes that these changes are acceptable.

2.5 Deletion of BVPS-1 SR 4.1.3.2.3

The licensee has proposed deletion of BVPS-1 SR 4.1.3.2.3, which requires verification that the automatic rod deviation monitor is operable once-per-7-days, and that deviation between the group demand counters and analog rod position indicators is checked manually for each rod once-per-24-hours. Since the TS LCO and SR requirements for the rod position deviation monitor are being removed, revision of this SR to reflect that change, and a change to revise the frequency to 12 hours, results in a SR which is identical to that of SR 4.1.3.2.2.a. Therefore, since SR 4.1.3.2.2.a is being retained in the BVPS-1 TS with a 12-hour frequency, the NRC staff concludes that deletion of BVPS-1 SR 4.1.3.2.3 is acceptable.

3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendments. The State official had no comments.

4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (64 FR 4155). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: D. Collins

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