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J. Stephen Perry
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10CFR50.90

Docket No. 50-461

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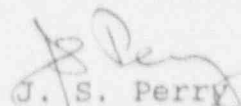
Subject: Clinton Power Station
Proposed Amendment of Facility
Operating License No. NPF-62

Dear Sir:

Pursuant to 10CFR50.90, Illinois Power Company (IP) hereby applies for amendment of Facility Operating License No. NPF-62, Appendix A - Technical Specifications, for Clinton Power Station (CPS). This request consists of proposed changes to Technical Specification 3/4.3.6, "Control Rod Block Instrumentation." For each of these proposed Technical Specification changes, a description, the associated justification (including a Basis For No Significant Hazards Consideration), and marked-up copies of pages from the current Technical Specifications are provided in Attachment 2. In addition, an affidavit supporting the facts set forth in this letter and its attachments is provided in Attachment 1.

IP has reviewed the proposed changes against the criteria of 10CFR51.22 for categorical exclusion from environmental impact considerations. The proposed changes do not involve a significant hazards consideration, or significantly increase the amounts or change the types of effluents that may be released offsite, nor do they significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, IP concludes the proposed changes meet the criteria given in 10CFR51.22(c)(9) for a categorical exclusion from the requirement for an Environmental Impact Statement.

Sincerely yours,


J. S. Perry
Vice President

DAS/alh

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Attachments

cc: NRC Clinton Licensing Project Manager
NRC Resident Inspector, V-690
NRC Region III, Regional Administrator
Illinois Department of Nuclear Safety

STATE OF ILLINOIS

COUNTY OF DEWITT

J. Stephen Perry, being first duly sworn, deposes and says:
That he is Vice President of Illinois Power Company; that
the application for amendment of Facility Operating License
NPF-62 has been prepared under his supervision and
direction; that he knows the contents thereof; and that to
the best of his knowledge and belief said application and
the facts contained therein are true and correct.

DATE: This 16 day of August 1991.

Signed: _____

J. Stephen Perry
J. Stephen Perry

Subscribed and sworn to before me this 16th day of
August 1991.



Linda S. French

Notary Public

Background

Clinton Power Station (CPS) Technical Specification Table 3.3.6-2, "Control Rod Block Instrumentation Setpoints," currently identifies that the Trip Setpoints and Allowable Values (in terms of % of RATED THERMAL POWER) associated with the Rod Pattern Control System (RPCS) Low Power Setpoint (Item 1.a) and Rod Withdrawal Limiter (RWL) High Power Setpoint (Item 1.b) are to be determined during the startup test program. Accordingly, the data necessary to establish these setpoints was obtained during the startup test program, and the values determined for the Trip Setpoints and Allowable Values were submitted to the NRC for their review on February 5, 1988 (reference Illinois Power Company (IP) letter U-601118). However, prior to NRC approval of IP's February 5, 1988 amendment request, IP identified that a modification to the main turbine control system would be performed during the second refueling outage. This modification would convert the high pressure turbine control valve control logic from the full-arc steam admission mode to the partial-arc steam admission mode. It was recognized that this modification could result in a change to the RPCS Low Power Setpoint (LPSP) and High Power Setpoint (HPSP). As a result, IP requested withdrawal of that portion of the February 5, 1988 amendment request until completion of the turbine control modification and the determination of new setpoints for the LPSP and HPSP.

Modification of the main turbine control system was completed during the second refueling outage at CPS. Results of testing conducted during the subsequent reactor startup were utilized to either confirm that the setpoints for the RPCS LPSP and HPSP which were determined during the initial startup test program continue to be appropriate or to determine new setpoints. This request therefore involves proposed changes to CPS Technical Specification Table 3.3.6-2 to incorporate the revised RPCS LPSP and HPSP.

Description of Proposed Changes

In accordance with 10CFR50.90, the following proposed changes to Technical Specification 3/4.3.6, "Control Rod Block Instrumentation," are being proposed:

- 1) The nominal trip setpoint under the Trip Setpoint column for the RPCS Low Power Setpoint (Table 3.3.6-2, Item 1.a) is being revised from "(*)% of RATED THERMAL POWER" to " 138.0 ± 2.3 psig*" and the associated Allowable Value is being revised from "(*)% of RATED THERMAL POWER" to " ≥ 115.0 psig, ≤ 175.0 psig*."
- 2) The nominal trip setpoint under the Trip Setpoint column for the RWL High Power Setpoint (Table 3.3.6-2, Item 1.b) is being revised from "(*)% of RATED THERMAL POWER" to " ≤ 361.6 psig*" and the associated Allowable Value is being revised from "(*)% of RATED THERMAL POWER" to " ≤ 400 psig*."
- 3) Footnote "*" is being revised to delete the statement that the setpoints are to be determined during the startup test program and to add a statement that these setpoints are turbine first stage pressure values.

Justification for Proposed Changes

As stated in the Bases for Technical Specification 3/4.3.6, the control rod block functions are provided consistent with the requirements of the Technical Specifications in Section 3/4.1.4, "Control Rod Program Controls," and Section 3/4.2, "Power Distribution Limits," to provide a backup to CPS administrative controls on control rod manipulations. The administrative controls and control rod block functions ensure that fuel thermal limits and initial conditions of design basis accidents are preserved during control rod movements. The primary control rod block functions are the Rod Pattern Control System and the Rod Withdrawal Limiter. Each of these two functions are more fully described below.

Rod Pattern Control System (RPCS)

As described in Updated Safety Analysis Report (USAR) Section 7.6.1.7, the purpose of the RPCS is to reduce the consequences of a postulated Control Rod Drop Accident (CRDA) by restricting the patterns of control rods that can be established to predetermined sets when operating below the LPSP. As discussed in USAR Section 15.4.9, the RPCS ensures that the fuel design peak enthalpy of 280 calories/gram is not exceeded during a postulated CRDA initiated from any plant operating condition.

The CRDA analyzed in USAR Section 15.4.9 is the result of a postulated event in which the highest reactivity-worth control rod within the constraints of the RPCS drops from the fully inserted or an intermediate position in the reactor core. In accordance with this CRDA analysis, the highest worth control rod, initially in a fully inserted or intermediate position, is assumed to become decoupled from its drive mechanism. The drive mechanism is then withdrawn; however, the decoupled control rod is assumed to be stuck in place. At a later moment, the control rod is assumed to suddenly fall free and drop to the position of the control rod drive mechanism. This results in the removal of large negative reactivity from the core and results in a localized power excursion. The velocity of the dropped control rod (and hence, the rate of negative reactivity removal) is limited by the velocity limiter on the bottom of the control rod blade. The reactor is assumed to scram as a result of high neutron flux sensed by the Average Power Range Monitors (APRMs) (120% of RATED THERMAL POWER neutron flux).

The LPSP has been chosen to correspond to the reactor power level at which a limiting CRDA can no longer occur. In accordance with the CRDA analysis, this power level has been determined to be 20% of RATED THERMAL POWER. Therefore, no restrictions on the control rod pattern are required above 20% of RATED THERMAL POWER.

Rod Withdrawal Limiter (RWL)

As described in USAR Section 7.6.1.7, the RWL limits continuous control rod withdrawal to prevent excessive change in the heat flux rate in the event of a control rod withdrawal error (RWE). This event is assumed to occur as the result of an operator error in which a single control rod or gang of control rods is withdrawn continuously until the RWL blocks further withdrawal. The analysis for this event demonstrates that this event is of minimal concern below 35% of RATED THERMAL POWER, even without continuous control rod withdrawal restraints. At power levels

above the LPSP, the RWL restricts continuous control rod withdrawal to four notches (2 feet) until the HPSP is reached (70% of RATED THERMAL POWER). Above the HPSP, continuous control rod withdrawal is limited to two notches (1 foot). In accordance with the RWE analysis, the HPSP was chosen to provide more restrictive restraints on continuous control rod withdrawal at reactor power levels above 70% of RATED THERMAL POWER.

Proposed Setpoints

The reactor thermal power inputs to the RPCS and RWL are derived from main turbine first stage pressure instrumentation. Initial values for the LPSP and HPSP were established based upon a predicted relationship between reactor thermal power and turbine first stage pressure (with margin for calculation uncertainties). This predicted relationship was obtained from steam flow data determined at various reactor power levels from several reactor heat balances. The turbine manufacturer's measured steam flow vs. turbine first stage pressure relationship was also utilized. The combination of these two relationships yielded the predicted relationship between reactor thermal power and turbine first stage pressure. Data obtained during the initial startup test program confirmed the validity of the predicted relationship.

Following modification of the main turbine control system during the second refueling outage at CPS, turbine first stage pressure measurements were taken at numerous power levels during the subsequent reactor startup. The test results showed that the actual turbine first stage pressure is slightly higher than the originally predicted value for all reactor power levels. The proposed setpoints are based on the more conservative result obtained from either the measured turbine first stage pressure or the originally predicted turbine first stage pressure (with margin for calculation uncertainties). Determination of these limits in this manner ensured that the most conservative value was established for the LPSP and HPSP instrument setpoints. Since the RPCS LPSP supports safety functions for both the RPCS and the RWL, a range has been specified for both the Allowable Value and Trip Setpoint such that the LPSP will be reached between 20 and 35% of RATED THERMAL POWER. The RPCS LPSP lower Allowable Value limit is based on an extrapolation of the test results at 20% of RATED THERMAL POWER; the upper Allowable Value limit was based on the originally predicted turbine first stage pressure (with margin for calculation uncertainties) at 35% of RATED THERMAL POWER. The upper Allowable Value limit of the RWL HPSP was based on the originally predicted turbine first stage pressure (with margin for calculation uncertainties) at 70% of RATED THERMAL POWER.

Based on the above-described Allowable Values, the Trip Setpoints for the LPSP and HPSP were established in accordance with the methodology of Regulatory Guide 1.105, "Instrument Setpoints." Accordingly, each setpoint is supported by a calculation that includes instrument accuracy, calibration uncertainties, and drift allowance during the 18-month calibration interval. Thus, these proposed setpoints will ensure that plant operation remains within the assumptions of the CRDA and RWE analyses.

Basis for No Significant Hazards Consideration

In accordance with 10CFR50.92, a proposed change to the Operating License (Technical Specifications) involves no significant hazards considerations if operation of the facility in accordance with the proposed change would not: (1) involve a significant increase in the probability or consequences of any 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. The proposed changes are evaluated against each of these criteria below.

- 1) The proposed changes are consistent with the Control Rod Drop Accident (CRDA) analysis presented in Updated Safety Analysis Report (USAR) Section 15.4.9 and the Rod Withdrawal Error (RWE) analysis presented in USAR Section 15.4.2. Additionally, the proposed setpoints have been developed based upon a conservative relationship between turbine first stage pressure and reactor power level using a setpoint methodology which takes into account appropriate instrument uncertainties in accordance with Regulatory Guide 1.105. In addition, this relationship has been confirmed by measurements taken during plant startup from the second refueling outage. Further, the proposed changes do not result in any change to plant equipment or operation. Therefore, the proposed changes do not result in a significant increase in the probability or consequences of any accident previously evaluated.
- 2) The proposed changes do not result in any changes to plant equipment or operation. As a result, no new failure modes are introduced. The proposed changes are clearly within the limits of plant operation as described in USAR Section 7.6.1.7. Therefore, the proposed changes cannot create the possibility of a new or different kind of accident from any accident previously evaluated.
- 3) The proposed changes are consistent with the CRDA and RWE analyses presented in the USAR and limit plant operation to those conditions assumed in the CRDA and RWE analyses. Additionally, the proposed setpoints have been developed based upon a conservative relationship between turbine first stage pressure and reactor power level using a setpoint methodology which takes into account appropriate instrument uncertainties in accordance with Regulatory Guide 1.105. In addition, this relationship has been confirmed by measurements taken during plant startup from the second refueling outage. Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based upon the foregoing, IP has concluded that these proposed changes do not involve a significant hazards consideration.