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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 30 TO FACILITY OPERATING LICENSE NO. NPF-62

CLINTON POWER STATION, UNIT NO. 1

ILLINOIS POWER COMPANY, ET AL.

DOCKET NO. 50-461

1.0 INTRODUCTION

By letter dated February 5, 1988, the Illinois Power Company (IP), et al. (the licensees) requested an amendment to Facility Operating License No. NPF-62 for the Clinton Power Station, Unit 1. The proposed amendment would revise Technical Specification Table 4.3.1.1-1, "Reactor Protection System Instrumentation Surveillance Requirements," to delete the Daily Channel Check requirements of note (h) for the Average Power Range Monitor Flow-Biased Simulated Thermal Power - High. Note (h) requires a verification that measured core (total core flow) flow is greater than or equal to established core flow at the existing loop flow control (APRM % flow).

The licensee has conducted discussions with the NRC and General Electric to determine the specific intent of note (h) and has noted and investigated differences in the wording of this item with other comparable Boiling Water Reactors (BWR).

2.0 EVALUATION

A review of the various versions of BWR Technical Specifications shows that there are two general versions of the footnote. Neither of the two versions exactly matches the wording appearing in the draft BWR-6 Standard Technical Specifications. (The last official version of the BWR STS for the BWR-5 does not contain the footnote at all.) The version in the Clinton Technical Specifications generally requires verifying that measured total core flow (total jet pump flow) for a given indicated reactor recirculation loop flow (as sensed by the APRMs) is greater than or equal to a previously established total core flow for that particular reactor recirculation loop drive flow.

A number of concerns and/or events may have been considered when the note was incorporated in the Technical Specifications. These are:

1) Flow control valve crudding;

2) Jet pump beam cracking;

3) Jet pump blockage;

4) Core crudding; and

5) Jet pump instrumentation problems.

The flow control valve (FCV) crudding problem does not apply to Clinton since the version of the surveillance at Clinton is not applicable to the drive-flow/FCV-position relationship. The surveillance only considers changes in the core-flow/drive-flow relationship. A check of the drive-flow/FCV-position relationship is provided for in the first surveillance in Technical Specification 3/4.4.1.2 (Jet Pump Operability) which requires verification that the indicated recirculation loop flow does not differ by more than 10% from established FCV-position/loop-flow characteristics.

Jet pump beam cracking or jet pump blockage is already addressed by the requirements of Technical Specification 3/4.4.1.2 (Jet Pump Operability). The surveillance requirements for this Technical Specification (4.4.1.2) are as follows:

> "Each of the above required jet pumps in an operating loop shall be demonstrated OPERABLE at least once per 24 hours when THERMAL POWER is greater than or equal to 25% of RATED THERMAL POWER by determining recirculation loop flow, total core flow and diffuser-to-lower plenum differential pressure for each jet pump and verifying that no two of the following conditions occur:
>
> a. The indicated recirculation loop flow differs by more that 10% from the established flow control valve position-loop flow characteristics.
>
> b. The indicated total core flow differs by more than 10% from the established total core flow value derived from recirculation loop flow measurements.
>
> c. The indicated jet pump diffuser-to-lower plenum differential pressure (or jet pump flow) of any individual jet pump differs from established patterns by more than 20% (10% for flow)."

If jet pump beam cracking or jet pump blockage were to occur, the problem would be recognized by this surveillance. General Electric Service Information Letter No. 330 identified surveillance 4.4.1.2.c. as an acceptable method for identifying jet pump beam cracking. Failure to meet the acceptance criteria would then require a plant shutdown because the corresponging ACTION under 3.4.1.2 states, "With one or more jet pumps inoperable, be in at least HOT SHUTDOWN within 12 hours." Therefore, additonal ACTION under the Reactor Protection System (RPS) instrumentation Technical Specification should not be required.

With respect to core crudding, General Electric has indicated that the change in m-ratio (core flow/recirculation loop drive flow) that might occur from beginning-of-cycle to end-of-cycle due to core crudding is so slight that this

phenomenon is not considered to be a significant concern and that the resultant change in the m-ratio would have negligible impact on the Average Power Range Monitor Flow-Biased Simulated Thermal Power trip setpoint.

Finally, with respect to jet pump instrumentation problems, if any of the surveillances under 4.4.1.2 yield unacceptable results, a jet pump instrumentation problem would be suspected. Cross checks against other related instruments associated with the required jet pump surveillances would be performed to determine if it is indeed just an instrument problem. If an instrument problem is identified, then the necessary actions would be performed to restore the instrumentation to operable status. No concern with respect to the Average Power Range Monitor Flow-Biased Simulated Thermal Power trip exists (assuming the Average Power Range Monitor Flow-Biased Simulated Thermal Power instrumentation is operable as verified by the performance of its associated surveillances) because a jet pump instrument problem does not involve an actual change in the m-ratio.

The five concerns are adequately addressed by the RPS instrumentation surveillances, the recirculation flow unit surveillances, and the jet pump surveillance. Jet pump beam cracking or jet pump blockage, which could cause a gross change in m-ration are already covered by specific surveillance requirements. Changes to the m-ration due to core crudding would be expected to be minimal over the course of the cycle. The surveillance requirements for RPS and recirculation flow unit instrumentation provide assurance that the concerns associated with core crudding are adequately addressed. A requirement like Note (h), therefore, should not be included in the RPS instrumentation Technical Specification because the concerns described above do not require it.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in surveillance requirements for the facility. The staff has determined that the amendment involves 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets 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 nor environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The proposed change to delete the Daily Channel Check for the Average Power Range Monitor Flow-Biased Simulated Thermal Power-High scram function and the associated Note (h) from Table 4.3.1.1-1 is acceptable. Adequate steps are taken without Note (h) to detect and take appropriate action for degraduation in the amount of core flow resulting from a given recirculation loop flow.

The staff 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, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and the security nor to the health and safety of the public.

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Dated: January 31, 1990