January 25, 1989

Docket No.: 50-461

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PDIII-2 r/f

Mr. Dale Holtzscher
Acting Manager-Licensing and Safety
Clinton Power Station
Post Office Box 678
Mail Code V920
Clinton, Illinois

Dear Mr. Holtzscher:

SUBJECT: ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT - TECHNICAL SPECIFICATION CHANGES CONCERNING THE FIRST REFUELING OF THE CPS REACTOR WITH NEW FUEL TYPES AND TO SUPPORT SUBSEQUENT REACTOR OPERATION (CYCLE 2) IN THE MAXIMUM EXTENDED OPERATING DOMAIN (MEOD) AND WITH REDUCED FEEDWATER TEMPERATURES (TAC 69308)

RE: CLINTON POWER STATION, UNIT 1

Pursuant to 10 CFR 51.119, the Commission has requested the Office of the Federal Register to publish the enclosed "Environmental Assessment and Finding of No Significant Impact." This notice is in regard to your request dated September 6, 1988 as supplemented December 22, 1988, for changes to the Technical Specifications (TSs) concerning the first refueling of the CPS reactor with new fuel types and to support subsequent reactor operation (Cycle 2) in the Maximum Extended Operating Domain (MEOD) and with reduced feedwater temperatures.

15/

John B. Hickman, Project Manager
Project Directorate III-2
Division of Reactor Projects - III, IV, V and Special Projects

Enclosure:
As stated

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PDIII-2	PDIII-2	OGC	PDIII-2		DF01
JHickman:km	LLuther	RBachman	DMuller		1/1
1/10/89	1/10/89	1/13/89	1/11/89	1/25	

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

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Acting Manager-Licensing and Safety
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Post Office Box 678
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Clinton, Illinois 61727

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As stated

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UNITED STATES NUCLEAR REGULATORY COMMISSION

ILLINOIS POWER COMPANY, ET AL.

DOCKET NO. 50-461

ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

The U. S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to the Illinois Power Company* (IP), Soyland Power Cooperative, Inc. and Western Illinois Power Cooperative, Inc., (the licensees) for Clinton Power Station, Unit 1, located in DeWitt County, Illinois.

ENVIRONMENTAL ASSESSMENT

Identification of Proposed Action:

The licensees have requested a license amendment that would revise the Technical Specifications (TS) related to four issues. First, the proposed license amendment would allow the Clinton Power Station (CPS) to perform its first reactor refueling, in which new types of reactor fuel will be utilized, and to proceed with subsequent reactor operation with the reloaded core. Second, the licensees propose to expand the current power flow operating domain to permit flows up to 107% of rated core flow and with core flows less than 100%. Additionally, operation is requested for feedwater temperatures down to 370°F at rated conditions. Third, the proposed license amendment

*Illinois Power Company is authorized to act as agent for Soyland Power Cooperative, Inc. and Western Illinois Power Cooperative, Inc. and has exclusive responsibility and control over the physical construction, operation and maintenance of the facility.

would revise the Remote Shutdown System Controls to include additional control switches for valves 1E12-F068B and 1E12-F014B and circuit breaker 252-AT1AA1. Fourth, a change is requested that will modify the jet pump surveillance requirement.

This revision to the Clinton Power Station license would be made in response to the licensees' application for amendment dated September 6, 1988 as supplemented December 22, 1988.

The Need for the Proposed Action:

Pursuant to 10 CFR 50.50, IP, et al. have proposed an amendment to Facility Operating License No. NPF-62 which consists of changes to the TS concerning four issues.

The first change consists of various revisions to allow CPS to perform its first reactor refueling (in which new types of nuclear fuel will be utilized) and to proceed with subsequent reactor operation with the reloaded core. Two new G.E. BWR fuel types will be utilized for the CPS reload. These fuel types have specified MAPLHGR-vs-Core Exposure requirements. Additionally, General Electric Standard Application for Reactor Fuel (GESTAR), NEDE-24011-P-A-8, which established the MCPR Safety Limit of 1.06 (1.07 for single recirculation loop operation) for the initial fuel cycle for CPS, requires this safety limit to be increased by 0.01 for reload cores. As the reload analysis includes an evaluation of plant operation (including postulated responses to design basis accidents or transients), the Technical Specifications must be changed to reflect the revised safety or power distribution limits. Some of the changes identified as reload-related are not unique to the first reload (for Cycle 2) as they apply to reloads in general. They should, however, minimize the number

of Technical Specification changes that would otherwise be required for future reloads.

The second change consists of revisions to various TS to expand the power flow operating domain. The current power flow operating domain is depicted in Technical Specification Bases Section 3/4.2.3 (Bases Figure B3/4.2.3-1, "Reactor Operating Map"). This operating map was developed based on restrictions such as recirculation pump NPSH, plant control characteristics and core thermal power and flow limits. Safe operation in this region is justified by the accident and transient analyses described in Final Safety Analysis Report (FSAR) Chapters 6 and 15. In order to improve the operating flexibility and the capacity factors for CPS, IP contracted General Electric to evaluate the accident and transient scenarios for the modified operating map in the regions of the Maximum Extended Operating Domain (MEOD). Expanding the operating domain allowed on the power flow map can result in greater operational flexibility and improved unit capacity factors. From a core operations and fuel management standpoint, the chief benefits are: 1) better power shaping and fuel preconditioning, 2) xenon compensation, and 3) compensation for reactivity reduction due to exposure. An additional change was requested to support operating the reactor with a feedwater temperature from 420°F down to 370°F at rated conditions. This is desired to allow continued operation with the loss of certain portions of feedwater heating.

The third change consists of a revision to Technical Specification Table 3.3.7.4-2, REMOTE SHUTDOWN SYSTEM CONTROLS, to add controls for motor-operated valves 1E12-F068B and 1E12-F014B and circuit breaker 252-AT1AA1. Current

operation of these components, when the normal control switch is inaccessible, requires them to be operated manually. The circuitry is therefore being modified to add control switches for these components. The addition of these control switches will enhance the operation of the Remote Shutdown System according to the acceptable methods recognized by the NRC for satisfying GDC-19.

The fourth change consists of various revisions to the TS 3.4.1.2 surveillance requirements for the jet pumps. The licensees propose to delete the current prerequisite for performing the surveillance "when both recirculation loop flows are operating at the same flow control valve position." This is a restriction which does not provide any allowance for differences between flow control valve (FCV) positions (or recirculation loop flows) even though Specification 3.4.1.3 allows for some mismatch (within specified limits) between recirculation loop flows. In addition, the wording of the current Specification requires performance of the jet pump surveillances prior to exceeding 25% RATED THERMAL POWER (RTP). However, attempts to perform these surveillances at less than 25% RTP do not provide reliable or consistent data. Therefore, the licensees propose to change the words "prior to THERMAL POWER exceeding 25% of RATED THERMAL POWER and at least once per 24 hours" to "at least once per 24 hours when THERMAL POWER is greater than or equal to 25% of RATED THERMAL POWER."

The fourth change also includes a proposal to condense the wording of the Specification by combining the two existing sections, which separately address single and double reactor recirculation loop operation, into a single section,

and a revision of the Surveillance to allow monitoring either jet pump (diffuser-to-lower plenum) differential pressure or jet pump flow with a different (but consistent) acceptance criteria to be specified for each.

Environmental Impacts of the Proposed Action:

The first of the proposed changes applies to the Clinton Power Station Cycle 2 (CPSC2) reload. The CPSC 2 will retain 456 GE fuel assemblies from Cycle 1, and add 168 new GE fuel assemblies. The new fuel for Cycle 2 has been approved in the Safety Evaluation Report for Amendment 16 to 'General Electric Standard Application for Reactor Fuel,' (GESTAR II). LOCA analyses have been performed for the retained and reload fuel using the SAFE/REFLOOD methods approved by the staff. Clinton still complies with 10 CFR 50.46, Appendix K. The nuclear design for CPSC2 has been performed by GE with the approved methodology described in GESTAR II. Since the CPSC2 nuclear design parameters have been obtained with previously approved methods and fall within expected ranges, the nuclear design is acceptable. The thermal-hydraulic design for CPSC2 has been performed by GE with the approved methodology described in GESTAR II. The transient and accident analysis methodologies used for CPSC2 are described in GESTAR II. The results are applicable to Clinton. The core-wide and the local transient analysis methodologies and results are acceptable because they fall within expected ranges. The limiting pressurization event, the main steam isolation valve closure with flux scram, analyzed with standard GESTAR II methods, gave results for peak vessel pressure of 1247 psig, which is below the ASME Section III limit of 1375 psig.

The General Electric Company analysis of "Maximum Extended Operating Domain and Feedwater Heater Out-of-Service Analysis for Clinton Power Station" describes the results of an evaluation of the safety impact of the second proposed change, operation in the MEOD with reduced feedwater temperatures. This evaluation included consideration of abnormal operating transients, LOCAs, containment pressures, load impact on vessel internals, flow induced vibration, and fuel mechanical performance. Many transients of Chapter 15 of the FSAR were considered for operation in the MEOD. It was concluded that the current power dependent Minimum Critical Power Ratio (MCPR) limit bounded these cases in the MEOD. The analysis of the loss of feedwater heating (LFWH) transient in the MEOD indicated that the LFHW transient is bounded by the reload analysis. For operation in the MEOD, a slow recirculation flow runout transient was reanalyzed on a generic basis (BWR/6) with approved methods to account for initial operation at low flows and a higher power rod line of the ELLR. The two new flow dependent MCPR developed were found acceptable by the staff. The generic analysis of a LOCA in the MEOD obtained with approved methods were considered acceptable by the staff. A conservative containment analysis for operation in the MEOD with feedwater hearters out-of-service (FWHOS) resulted in a peak drywell pressure below the design limit of 30 psig. Calculations of an MSIV closure event with flux scram for operation in the MEOD indicated a peak vessel pressure of 1245 psig, well below the same code limit of 1375 psig.

The General Electric Company analysis supplied with the submittal includes results from analyses made to determine the new initial conditions of fuel thermal limits that would be needed to satisfy the pertinent licensing criteria if APRM setdown were eliminated. The evaluation included operation in the MEOD

with reduced feedwater temperature. The new Minimum Critical Power Ratio and Maximum Average Planar Linear Heat Generation Rate factors were found to be acceptable by the staff.

The third proposed change supports the addition of control switches in the control circuits of certain components in the Remote Shutdown System. These modifications were previously reviewed and approved by the staff. The addition of control switches to the division 2 RHR heat exchanger valves and division 1 power supply circuit breaker controls provides a diverse and redundant means of controlling the remote shutdown systems and thus will facilitate remote operation of these components. The proposal stated that the control switches meet the same quality standards and will be installed in accordance with the same requirements as the existing components on the Motor Control Centers and the Remote Shutdown Panel. The proposal also indicated that the normal control and operation of the circuit breaker and the valves will not be affected by the addition of these switches, and the ability to manually operate these components will remain unchanged. The staff concludes the proposed changes to the technical specification represent the modification that was previously approved by the staff, do not involve an unreviewed safety question and, therefore, are acceptable.

The fourth proposed change is a revision to the jet pump operability specifications to allow present Surveillance Requirement 4.4.1.2 to be performed with Thermal Power in excess of 25% of Rated Thermal Power instead of the present prior to exceeding 25% of Rated Thermal Power. The proposed Surveillance Requirement 4.4.1.2 will allow entry into Operational Conditions 1 and 2 without having to perform present Surveillance Requirement 4.4.1.2; however, jet pump Operability is required to be determined after entering

Operational Condition 2 (OC-2) and at least once every 24 hours thereafter by verifying that the diffuser to lower plenum differential pressure is within specified limits. Entry into OC-2 is necessary in order to perform the surveillance required to demonstrate jet pump operability. OC-2 operation is needed to achieve power levels sufficient for meaningful measurements of flow and differential pressure (dp). When power and flow conditions are too low, the effects of natural circulation, moderator subcooling changes and varying core differential pressure result in large data uncertainties. The changes proposed are acceptable because they are necessary for meaningful surveillance measurements. This proposed change also revises Surveillance Requirement 4.4.1.2 by deleting the requirement that the recirculation flow control valves be in the same position when performing the surveillance. The staff has reviewed the proposal and note that even at the same FCV position, relative loop flows are different because of differing flow path resistances and individual pump characteristics. The effect of the proposed change on measured parameters is, therefore, expected to be insignificant. We conclude that the proposed changes are acceptable. A proposed change to the specified acceptable deviation from patterns established for individual jet pump diffuser-to-lower plenum differential pressure from 10% to 20% is consistent with the recommendations of both NUREG/CR-3052 and General Electric Service Information Letter (SIL) No. 330 which established 20% as an acceptable indication of jet pump operability. Therefore, the changes are acceptable.

The Commission has concluded that these changes do not significantly increase the probability or consequences of any accident and that potential radiological releases during normal operations, transients would not be increased. With regard to non-radiological impacts, the proposed amendment

involves systems located entirely within the restricted area as defined in 10 CFR Part 20. They do not affect non-radiological plant effluents and have no other environmental impact. Therefore, the staff also concludes that there are no significant non-radiological environmental impacts associated with the proposed amendment.

Accordingly, the Commission findings in the "Final Environmental Statement related to the operation of Clinton Power Station, Unit No. 1" dated May 1982 regarding radiological environmental impacts from the plant during normal operation or after accident conditions, are not adversely altered by this action. IP is committed to operate Clinton, Unit 1 in accordance with standards and regulations to maintain occupational exposure levels "as low as reasonably achievable."

The Notice of Consideration of Issuance of Amendment and Opportunity for Hearing in connection with this action was published in the Federal Register on November 22, 1988 (53 FR 47285). No request for hearing or petition for leave to intervene was filed following this notice.

Alternative to the Proposed Actions:

The principal alternative would be to deny the requested amendment. This alternative, in effect, would be the same as a "no action" alternative. Since the Commission has concluded there are no significant environmental effects that would result from the proposed action, any alternative with equal or greater environmental impact need not be evaluated.

Alternative Use of Resources:

This action does not involve the use of resources not previously considered in connection with the Nuclear Regulatory Commission's Final Environmental Statement dated May 1982 related to this facility.

Agencies and Persons Consulted:

The NRC staff reviewed the licensees' request of September 6, 1988, as supplemented December 22, 1988, and did not consult other agencies or persons.

FINDING OF NO SIGNIFICANT IMPACT:

The Commission has determined not to prepare an environmental impact statement of the proposed license amendment.

Based upon this environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment.

For further details with respect to this action, see the request for amendment dated September 6, 1988 as supplemented December 22, 1988, and the Final Environmental Statement for the Clinton Power Station dated May 1982, which are available for public inspection at the Commission Public Document Room, 2120 L Street, N.W., Washington, D.C. 20055 and at the Vespasian Warner, 120 West Johnson Street, Clinton, Illinois 61727.

Dated at Rockville, Maryland this 25th day of January 1989.

FOR THE NUCLEAR REGULATORY COMMISSION

Daniel R. Muller, Director
Project Directorate III-2
Division of Reactor Projects - III,
IV, V and Special Projects