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U-602756
8E.100a
June 9, 1997

Docket No. 50-461

10CFR50.10

Document Control Desk
Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Clinton Power Station Withdrawal of Proposed Amendment
of Facility Operating License No. NPF-62 (LS-97-001)

Dear Madam or Sir:

By letter U-602714 dated April 1, 1997, Illinois Power (IP) requested amendment of Operating License NPF-62 for Clinton Power Station (CPS). This amendment was to incorporate a requirement to maintain in effect interim administrative controls and contingent operator actions until IP completes the modifications to upgrade the degraded voltage protection instrumentation and distribution system for all three divisions of safety-related AC power. That letter also recognized that use of the interim administrative controls constituted an unreviewed safety question (USQ).

IP's April 1, 1997 amendment request identified that IP would be performing adjustments to the CPS distribution system prior to restart from the current refueling outage (RF-6) to ensure that with offsite power at the minimum expected voltage, adequate voltage will be provided to all Class 1E equipment. That letter also identified that IP was performing calculations to reconfirm the adequacy of the minimum required voltages at the limiting 120-VAC level and that the results of these calculations would be provided when they become available. The Attachment to this letter describes the required distribution system adjustments and the results of the supporting calculations.

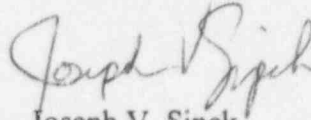
The results of the calculations have shown that with the distribution system adjustments described in the Attachment to this letter, coupled with the new degraded voltage relays set at the setpoints approved in Amendment No. 110 to the CPS Operating License, manual operator actions are no longer necessary to provide protection for Class 1E loads from an undervoltage condition. Since IP has now concluded that automatic degraded voltage protection will be provided for all Class 1E equipment down to the 120-VAC level, IP has determined that a USQ will no longer

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exist for plant restart from the current refueling outage, and processing of the Technical Specification changes proposed in IP's April 1, 1997 letter is no longer required. As a result, IP is requesting withdrawal of its April 1, 1997 amendment request.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "Joseph V. Sipek". The signature is fluid and cursive, with the first name "Joseph" and last name "Sipek" clearly distinguishable.

Joseph V. Sipek
Director-Licensing

DAS/krk

Attachment

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

Background

As identified in Clinton Power Station (CPS) Licensee Event Report (LER) 94-005 (Illinois Power letter U-602296 dated June 3, 1994), Illinois Power (IP) personnel identified that the second level undervoltage (degraded voltage) instrumentation at CPS was not adequate to automatically ensure that sufficient voltage would be provided to all Class 1E loads, particularly at several 120-VAC distribution panels. As interim corrective action, IP installed an alarm for the Division 1, 2, and 3 4.16-kV buses and established contingent operator actions in order to minimize the potential that the Class 1E loads would not receive adequate voltage.

Longer-term actions were initiated to develop design change options for restoring the plant to within its licensing basis for automatic degraded voltage protection. The design change option selected involved upgrading the degraded voltage relays and installing voltage-regulating transformers for various 120-VAC distribution panels. These changes were scheduled to be installed one division at a time in separate refueling outages beginning in the sixth refueling outage (RF-6). The proposed use of the upgraded degraded voltage relays and their setpoints in the new configuration was reviewed by the NRC staff. These changes were subsequently approved by the NRC in Amendment No. 110 to the CPS Operating License, dated December 4, 1996.

During installation of the modification for Division 2 (i.e., modification AP-028) during the current refueling outage (RF-6), problems were experienced with the new voltage regulating transformers. The new transformers were determined to be susceptible to radio frequency/electro-magnetic interference (RFI/EMI) and as a result, the internal protective circuitry for one of the transformers was causing spurious trips. After an extended and unsuccessful attempt to resolve the tripping problems, it was decided to reinstall the original non-regulating transformers for the 120-VAC distribution panels. However, it was recognized that utilization of the new, more accurate relays calibrated to the setpoints approved in Amendment No. 110 would be appropriate, from a safety point of view, for improving automatic protection for the Class 1E loads. In fact, it was determined that plant safety would be enhanced by installing the new, more accurate relays in all three divisions prior to startup from the current refueling outage rather than installing them one division per refueling outage. Because the adequacy of this configuration was dependent on continued use of the interim administrative controls and contingent operator actions, the NRC staff requested IP to submit a license amendment request to acknowledge the continued use of the interim administrative controls and contingent operator actions until RF-7.

By letter U-602714 dated April 1, 1997, IP requested amendment of the CPS operating license to incorporate the requirement to maintain in effect the interim administrative controls and contingent operator actions until completion of the modifications to upgrade the degraded voltage protection instrumentation and distribution system for all three divisions of safety-related AC power. That letter also recognized that use of the interim administrative controls constituted an unreviewed safety question (USQ).

IP's April 1, 1997 amendment request identified that IP would be performing adjustments to the CPS distribution system prior to restart from the current refueling outage (RF-6) to ensure that with offsite power at its minimum expected voltage, adequate voltage will be provided to all Class 1E equipment, including the most limiting 120-VAC loads. That letter also identified that IP was performing calculations to reconfirm the adequacy of the minimum required voltages at the 120-VAC level and that the results of these calculations will be provided when they become available. This letter provides the results of the noted distribution system adjustments and supporting calculations.

Overview

IP has completed the calculations to determine the minimum required voltage for Class 1E 120-VAC loads (i.e., CPS calculation 19-AJ-72). The voltage requirements were used as input to/acceptance criteria for the Loss-of-Coolant Accident (LOCA) block-start voltage calculation (i.e., 19-AQ-02) previously reviewed by the NRC as part of Amendment No. 110. Completion of the calculations established the final adjustments required to the CPS distribution system. The established changes are based on an optimum resolution to ensure adequate voltage, provide fully automatic degraded voltage protection and yet minimize the potential for overvoltage. These adjustments involve increasing the Reserve Auxiliary Transformer (RAT) tap settings to provide a voltage boost of 2.5%, decreasing the Emergency Reserve Auxiliary Transformer (ERAT) tap settings to provide a voltage drop of 2.5%, increasing the tap settings on several 480/120-VAC distribution transformers by 5%, and moving some loads to existing voltage regulating transformers that have adequate load margin. Each of these changes will be reviewed under the requirements of 10 CFR 50.59 prior to installation.

The results of the calculations have also shown that with the above-described distribution system adjustments, coupled with the new degraded voltage relays set at the setpoints approved in Amendment No. 110, manual operator actions are no longer necessary to provide protection for Class 1E loads from an undervoltage condition. Since IP has now concluded that automatic degraded voltage protection will be provided for all Class 1E equipment down to the 120-VAC level, IP has determined that a USQ will no longer exist for plant restart from the current refueling outage, and processing of the Technical Specification changes proposed in IP's April 1, 1997 letter is no longer required. As a result, IP is requesting withdrawal of its April 1, 1997 amendment request. Summaries of the calculational methods and assumptions supporting these conclusions are provided below.

Summary of 120-VAC Calculations (19-AJ-70, 19-AJ-71 and 19-AJ-72)

There are approximately 200 120-VAC level circuits containing Class 1E equipment required to operate following a LOCA block-start, which are fed from nine 120-VAC Class 1E distribution panels. The end-use devices, associated minimum pick-up voltages, and cable lengths for these circuits were tabulated in calculation 19-AJ-72 to determine

the most limiting circuits with respect to required voltage. The limiting components were determined to be relays, solenoids, and solid-state devices (i.e., transmitters, recorders, and power supplies). The most limiting components were determined to be Westronic recorders which require a minimum voltage of 105.3 volts. Additionally, the circuits containing Class 1E equipment required to operate following a LOCA block-start were reviewed to determine the extent of any interlocking (which would contribute to additional voltage drop due to extensive cabling to jumper between panels and devices). Based on these reviews, two circuits from each of five distribution panels containing a large number of circuits, and one circuit from each of four distribution panels containing only a few circuits, were selected for further detailed evaluation. Thus, detailed evaluations were performed on 14 circuits associated with the nine Class 1E distribution panels. Based on the selection criteria, these evaluations are considered to be representative or bounding with respect to the remaining circuits.

Calculation 19-AJ-71 provides voltage drop analyses for the control circuits which are fed from the 480/120-VAC control transformers in the motor control center (MCC) buckets. A detailed analysis was performed on several circuits that have long cable lengths. The calculation determined that the highest minimum voltage required at the 480-VAC level for the control devices to function properly is 420 VAC. Although these calculations were based on actual cable lengths, the voltage drops were calculated in a very conservative manner since the calculations assumed a conservative cable impedance for all the circuits and assumed that the motor contactor coils were drawing in-rush current. In contrast, the minimum voltage used in previous calculations for determining the maximum allowable length of control circuit cables was 427 VAC. The assumed 427 VAC was the expected minimum voltage level available as determined during the original design phase of CPS. However as discussed above, the highest minimum voltage required for the control circuits has now been determined to be 420 VAC based on the actual installed control circuit cable lengths. This conclusion was also confirmed by analyzing, via calculation 19-AJ-70, all the control circuits for a few selected MCCs. The minimum voltages required for these circuits were determined to all be less than 420 VAC.

Summary of LOCA Block-Start Calculation (19-AQ-02)

To verify that the voltage requirements determined in the detailed circuit evaluations described above are met under worst-case accident conditions, the LOCA block-start calculation (i.e., 19-AQ-02) was re-performed assuming post-LOCA offsite power voltage corresponding to the new relay minimum analytical limit value (i.e., 3870 VAC). During the preparation of calculations 19-AJ-72 and 19-AQ-02, IP determined that six distribution transformers, of the nine that feed Class 1E distribution panels, needed to have their taps raised to provide adequate voltage. The most limiting voltage at the 480-VAC level for the circuits associated with the six distribution transformers was determined to be 421 VAC. This is conservative since the most limiting sample circuit required 421 VAC while most of the remaining sample circuits required less than 415 VAC. For one of the three remaining Class 1E distribution panels, all of the loads were transferred to an existing voltage regulating transformer. The circuits associated with the two remaining

Class 1E distribution panels required more than 421 VAC in order to support the results of 19-AJ-72. All circuits in these panels (AB MCC 1A4 and AB MCC 1B4) were evaluated. The most limiting circuits were determined to require 425 VAC and 424 VAC, respectively. It should be noted that the required voltages for AB MCC 1A4 and AB MCC 1B4 distribution panels were not limiting for establishing the minimum required upstream voltages. The Auxiliary Power system analysis performed in calculation 19-AQ-02 supports the required minimum voltage to all the circuits fed from the Class 1E distribution panels under post-LOCA conditions.

With the completion of the noted distribution system adjustments, calculation 19-AQ-02 demonstrates that the new degraded voltage relays, set at the setpoints approved in Amendment No. 110, will provide adequate degraded voltage protection to all Class 1E loads, including loads at the 120-VAC level. More specifically, these calculations demonstrate that: (1) the upper analytical limit for the relay reset setpoint is below the minimum steady-state expected offsite power voltage following a postulated LOCA for operating cycle 7 (2) the lower analytical limit for the relay reset setpoint is above the minimum voltage required for proper starting and continued operation of all Class 1E loads required for mitigation of a LOCA, (3) the upper Allowable Value for the relay trip setpoint is below the lower Allowable Value for the relay reset setpoint, and (4) the lower analytical limit for the relay trip setpoint is above the value required to protect Class 1E equipment from degraded voltage conditions under non-LOCA and post-LOCA steady-state conditions. Thus, the bases for the relay setpoints established under Amendment No. 110 to the CPS Operating License continue to be met for operating cycle 7.

Additional information

The adjustments being made to increase selected distribution transformer tap settings by 5%, raising the RAT tap setting by 2.5%, and lowering the ERAT tap setting by 2.5% result in an overall increase in voltages applied to Class 1E components. As stated above, these changes are based on considerations given to ensuring adequate voltage, providing fully automatic degraded voltage protection and minimizing the potential for overvoltage until a permanent resolution is achieved in RF-7. The above-described calculations have demonstrated that Class 1E components will not be adversely affected for the duration of operating cycle 7, provided 4.16-kV voltage is maintained below 4300 VAC. Calculations demonstrate that this condition will be met for the expected offsite power voltage range with the plant on line, during postulated LOCA block-start conditions, with the plant off line when the Class 1E buses are powered from the ERAT, and with the plant off line when the Class 1E buses are powered from the RAT with approximately 11 MVA of load on the RAT. When the plant is off line, the Class 1E buses will normally be powered from the ERAT. In the event that the ERAT is unavailable, procedures will require frequent monitoring of bus voltage by plant operators to ensure adequate load is on the RAT to prevent an overvoltage condition. These controls will ensure that the 4300-VAC limit is not exceeded.

Prior to plant restart from RF-7, IP will install additional modifications to provide adequate voltage regulation for affected Class 1E loads.

Conclusion

Based on the above, IP has concluded that manual operator actions will no longer be necessary to provide protection for Class 1E loads from a degraded voltage condition following restart from the current refueling outage, and thus, no USQ will exist. As a result, IP is requesting withdrawal of its request to amend the CPS Operating License, dated April 1, 1997.