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ILLINOIS POWER COMPANY

CLINTON POWER STATION, P.O. BOX 678, CLINTON, ILLINOIS 61727

May 24, 1985

Docket No. 50-461

Director of Nuclear Reactor Regulation
Attention: Mr. W. R. Butler, Chief
Licensing Branch No. 2
Division of Licensing
US Nuclear Regulatory Commission
Washington, DC 20555

Subject: Clinton Power Station Unit 1
Elimination of Arbitrary Intermediate
Pipe Breaks

Dear Mr. Butler:

In Letter U-0832 dated April 16, 1985, Illinois Power Company submitted a request for exemption from current Nuclear Regulatory Commission (NRC) piping design criteria with respect to arbitrary intermediate pipe breaks. Upon review of the submittal by the NRC, clarification was requested of the information in Appendix F which describes provisions to minimize steam and water hammer effects.

The attached information clarifies the exemption request regarding provisions to minimize steam and water hammer effects.

Please contact us if you have any questions regarding this information.

Sincerely yours,

F. A. Spangenberg
Director - Nuclear Licensing
and Configuration
Nuclear Station Engineering

JDT/lab

Attachment (1)

cc: B. L. Siegel, NRC Clinton Licensing Project Manager
NRC Resident Office
Illinois Department of Nuclear Safety
Regional Administrator, Region III, USNRC

B001
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PROVISIONS FOR MINIMIZING STEAM AND WATER HAMMER EFFECTS AT CLINTON POWER STATION UNIT 1

Provisions for minimizing steam and water hammer effects are as follows:

Residual Heat Removal System (RH), Low Pressure Core Spray System (LP), High Pressure Core Spray System (HP)

Water hammer in the RH, LP, and HP systems is prevented by keeping their discharge lines full. Water leg pumps keep the discharge lines full up to the injection isolation valves. Beyond the injection isolation valves, the lines are not drained when the systems are on standby, so they remain full.

Reactor Recirculation System (RR)

Water hammer loads in the RR system are not anticipated.

Main Steam System (MS), Feedwater System (FW)

The MS and FW systems are expected to experience steam and water hammer loads, respectively. The MS and FW stress reports include the stresses and usage factors calculated from the analyses performed for these loadings. The steam and water hammer analyses of these systems were performed with the HYTRAN computer code. HYTRAN is described in FSAR Section 3.9.1.2.6.3. MS piping is analyzed and designed for the effects of isolation valve closures, turbine stop valve closures, and safety relief valve openings. The FW piping is analyzed and designed for the effects of check valve closure caused by flow reversal from the reactor after an FW pump trip. Therefore, steam and water hammer are anticipated loads in the MS and FW systems.

Reactor Core Isolation Cooling System (RI)

The steam supply line of the RI system is sloped downward to allow any moisture in the line to drain off to a condensing pot. The isolation valves on the steam supply line are normally open and automatically close upon the receipt of an isolation signal. After the isolation signal clears, the isolation valves are reopened by the following controlled procedure:

1) The operator verifies that the inboard isolation valve is closed.
2) The operator then opens the outboard isolation valve. This allows condensate between the inboard and outboard isolation valves to drain.
3) Then, the operator opens the one-inch bypass valve around the inboard isolation valve. This allows the condensate ahead of the inboard isolation valve to drain and the downstream piping is warmed.
4) Finally, the inboard isolation valve is opened.

This procedure is the only way the isolation valves can be opened after they are closed by an isolation signal. Neither isolation valve is opened automatically by an initiation signal. No interlocks exist between the isolation valves because they are powered from different divisions. Therefore, this procedure minimizes steam and water hammer effects.

Pre-operational and Start-up Transient Vibration Tests

As described in FSAR Section 3.9.2, pre-operational and start-up testing for steam and water hammer will be performed on the above systems. During the tests, component displacements will be monitored with instrumentation and/or visual inspection.