UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 104 TO FACILITY OPERATING LICENSE NO. NPF-62

ILLINOIS POWER COMPANY, ET AL.

CLINTON POWER STATION, UNIT NO. 1

DOCKET NO. 50-461

1.0 INTRODUCTION

By letter dated December 14, 1995, Illinois Power Company, the licensee, requested a revision to the Clinton Power Station (CPS) Technical Specifications (TS). The proposed amendment would make several changes to the instrumentation sections of the CPS TS. The proposed changes are required due to engineering reanalyses or plant modifications. The affected instrumentation includes: (1) steam line flow high channels for the reactor core isolation cooling (RCIC) system, (2) ambient temperature channels in the residual heat removal (RHR) system heat exchanger rooms, (3) reactor vessel pressure channels that provide a permissive for operation of the shutdown cooling mode of the RHR system, and (4) RCIC storage tank water level instrument channels.

2.0 BACKGROUND

During the initial licensing of CPS, the licensee informed the NRC that it did not intend to use the steam condensing mode of the RHR system. Administrative controls were promptly established to preclude its use. Subsequently, a plant modification (RH-033) was implemented to permanently disable the steam condensing mode. This modification included changes to the piping originally intended to route reactor steam to the RHR heat exchanger from the RCIC steam supply piping. Specifically, the connecting piping (spool pieces) was eliminated and was flanged off within the Auxiliary Building steam tunnel to permanently preclude use of the steam condensing mode for RHR.

The RCIC system is designed such that automatic isolation is effected in the event of a break in the associated steam piping. This capability is provided via flow sensors (flow elbows) in two different locations of the RCIC steam supply piping. One set of sensors is located in the larger-diameter (eight-inch) portion of the RCIC steam supply piping upstream of the former connection to the piping from the RHR heat exchanger. Another set is located downstream of the former RHR/RCIC steam connection where the RCIC steam supply reduces to a smaller diameter (four inches). The steam line flow instrumentation was provided to detect a break of the RCIC steam line and initiate closure of the RCIC steam supply line isolation valves. Originally, the sensors located in the eight-inch portion of the RCIC steam supply piping were also designed to effect automatic isolation of the RCIC system in the

event of a line break in the piping that branched off the RCIC piping to the RHR heat exchanger. To stop steam from continuing to flow out of the break, the isolation is initiated on high flow to thus prevent or minimize damage to the reactor core. Specific credit for this function is not assumed in any USAR accident analyses since the bounding analysis is performed for large breaks such as the reactor recirculation line and main steam line breaks. However, these instruments prevent the RCIC steam line break from becoming bounding.

As part of plant modification RH-033, the licensee evaluated the upstream and downstream steam line flow sensors. This evaluation determined that despite the elimination of the steam flow path to the RHR heat exchanger, both sets of flow sensors will remain in place to continue to provide automatic isolation capability for the spectrum of line breaks that may be postulated to occur in the RCIC steam supply piping (in either the eight-inch or four-inch portion of the piping). It was also determined that the current setpoints are sufficient to perform this safety function.

3.0 EVALUATION

3.1 RCIC Steam Line Flow Instrumentation

Section 3 of TS Table 3.3.6.1-1, "Primary Containment and Drywell Isolation Instrumentation," lists the various instrumentation trip functions for automatic isolation of the RCIC system. Function 3.a, "RCIC Steam Line Flow-High," provides the trip that originates from instrument flow channel differential pressure sensing nozzles in the downstream (Auxiliary Building) four-inch RCIC line. Function 3.i, "RCIC/RHR Steam Line Flow-High," provides the trip that originates from instrument flow channel differential pressure sensing nozzles in the upstream (Drywell) eight-inch RCIC line.

As noted above, this instrumentation (Functions "a" and "i") is still in place and will continue to monitor RCIC steam flow and provide automatic isolation capability of the RCIC system. Thus, these instrument trip functions need to continue to be listed in Section 3 of Table 3.3.6.1-1. However, because there is no longer steam line piping common to the RCIC and RHR systems, it is inappropriate for the Function "i" to be identified as "RCIC/RHR Steam Line Flow-High" since this instrumentation now only monitors RCIC steam line flow. Merely deleting the "/RHR" portion of the Function description would render Function "i" indistinguishable from Function "a." The licensee therefore proposes to revise the descriptions for Functions "a" and "i" such that Function "a" would be identified as "Auxiliary Building RCIC Steam Line Flow High" and Function "i" would be identified as "Drywell RCIC Steam Line Flow-High."

The RCIC steam line flow trips will continue to operate as before for both trip functions. The Drywell RCIC Steam Line Flow-High isolation trip as described in Table 3.3.6.1-1, Function "i" will continue to isolate the RCIC system when steam flow through the eight-inch RCIC steam supply line exceeds the trip level. The Auxiliary Building RCIC Steam Line Flow-High isolation

trip as described in Table 3.3.6.1-1, Function "a" will continue to isolate the RCIC system when steam flow through the four-inch RCIC steam supply line exceeds the trip level.

The revised nomenclature is based on the physical location of the flow sensors and brings the TS into conformance with the CPS as-built design (as modified by plant modification RH-033). The changes are editorial in nature and, therefore, the staff finds them acceptable.

3.2 Ambient Temperature Monitoring Instrumentation

Ambient temperature monitoring instrumentation is provided in the RHR heat exchanger room(s) to detect and isolate a leak from the associated RHR piping. Under the original design (that supported use of the steam condensing mode of operation) this trip function would automatically isolate the RHR system as well as the RCIC system in the event of a leak in the RHR heat exchanger room; since, during the onset of such a leak, steam could be supplied by the RCIC steam supply piping during the steam condensing mode of operation of the RHR system.

Changes made to the plant during plant modification RH-033, as discussed above, have removed the connection from RCIC to RHR. Thus, the RHR ambient temperature isolation signal need only isolate the RHR system since there is no longer a possibility for RCIC piping to leak steam into the RHR room.

Accordingly, the licensee has proposed to delete the present Function 3.h, "RHR Heat Exchanger Ambient Temperature - High," from Table 3.3.6.1-1.

The RHR ambient temperature isolation trip will be changed to only isolate the RHR supply line when the RHR ambient temperature setpoint is exceeded. As there is no longer a possibility that the RCIC steam supply line can supply any steam to the RHR heat exchanger room, removing the RHR room ambient temperature input will also preclude the possibility of spurious isolation of the RCIC system due to high temperature in a RHR heat exchanger room.

This proposed change brings the TS into conformance with the CPS as-built design (as modified by plant modification RH-033). The staff, therefore, finds it acceptable.

3.3 Reactor Vessel Pressure Instrumentation

TS Table 3.3.6.1-1, Function 5.e (RHR Shutdown Cooling System; Reactor Vessel Pressure - High) is provided to isolate the shutdown cooling portion of the RHR system. Since the RHR shutdown cooling system piping is designed for pressures less than rated reactor vessel pressure, the interlock (RHR cut-in permissive) was originally provided for equipment protection to prevent an intersystem LOCA, though credit for the interlock is not assumed in the accident or transient analyses in the USAR. The Allowable Value for this interlock is currently specified as $\leq$ 150 psig.

However, based on assumptions made in response to NRC Generic Letter 89-10, the licensee proposes to use a lower Allowable Value for the Reactor Vessel

Pressure - High trip function. (The Allowable Value for the RHR cut-in pressure establishes the differential pressure at which the RHR suction valves must close in the event of a piping break downstream of the suction valves.) The licensee proposes to change the Reactor Vessel Pressure - High Allowable Value as given in Table 3.3.6.1-1, Function 5.e to $\leq$ 110 psig.

This new Allowable Value is more conservative with respect to considerations for shutting the shutdown cooling motor-operated valves and providing protection from overpressurizing the low pressure RHR shutdown cooling system piping. The staff, therefore, finds the proposed change acceptable.

3.4 RCIC Storage Tank Level Instrumentation

Currently, the Allowable Value for "RCIC Storage Tank Level - Low" (Function 3.d on TS Table 3.3.5.1-1 and Function 3 on TS Table 3.3.5.2-1) does not take into consideration the potential for a loss of pump head due to vortexing in the RCIC tank.

To address this concern and provide additional margin to account for it, the licensee has calculated a more conservative Allowable Value for the "RCIC Storage tank Level - Low" instrumentation. The licensee proposes changing the Allowable Value from $\geq$ 0 inches to $\geq$ 2.50 inches.

Although the Allowable Value would change, the actual trip setpoint would remain unchanged. The licensee's calculation based on design and actual instrument drift shows that the margin between the new allowable value and the trip setpoint is adequate. Therefore, the usable volume (125,000 gallons) of the RCIC tank is unchanged. In addition, no credit is taken for the volume in the RCIC storage tank for the HPCS or RCIC systems in performing their safety-related functions.

The proposed change is more conservative than the existing TS and provides additional margin to account for the potential for a loss of pump head due to vortexing in the RCIC tank. The staff, therefore, finds this change acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois state official was notified of the proposed issuance of the amendment. The state official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent 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 (61 FR 1631). 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 or environmental assessment need be prepared in connection with the issuance of this amendment.

6.0 CONCLUSION

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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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Date: April 10, 1996