AEOD TECHNICAL REVIEW REPORT

UNIT: Zion, Unit 1
DOCKET NO: 50-295
LICENSEE: Commonwealth Edison Company
NSSS/AE: Westinghouse, Sargent & Lundy Engineers

TR REPORT NO: AEOD/T514
DATE: November 25, 1985
EVALUATOR/CONTACT: D. Zukor

SUBJECT: POTENTIAL LOSS OF COMPONENT COOLING WATER DUE TO MALADJUSTMENT OF RELIEF VALVES

EVENT DATE: February 16, 1985

REFERENCES:
(1) Licensee Event Report 85-008, Commonwealth Edison Company, Zion Unit 1, Docket No. 50-295, dated March 18, 1985.

(2) Commonwealth Edison Company, "Updated Final Safety Analyses Report," Docket No. 50-295.

(3) United States Nuclear Regulatory Commission, Region III, Inspection Report 50-295/85-012, dated April 23, 1985.

SUMMARY

On February 16, 1985, a pressure transient in the component cooling water (CCW) system at the Zion site caused a relief valve to lift. The valve did not reseat until approximately 1700 gallons of CCW had spilled onto the containment floor and the CCW system was isolated. Subsequent investigation showed that the nozzle ring settings on the valve were incorrect causing the valve to lift prematurely and to fail to reseat. The event itself had no serious safety consequences and no generic significance except as another failure mode of the CCW system. AEOD has suggested that this type of event be included in the resolution of Generic Issue (GI) 23 which includes CCW system failures. No further action on this event is planned by AEOD.

INTRODUCTION

The purpose of this investigation was to determine if the maladjustment of the relief valves had safety significance. The event is described and the circumstances leading to the event are given. The actions of Region III regarding the event are described. The results of a data search for similar failures of relief valves in component cooling water (CCW) systems are discussed, and the suggestion is made to include this event as input to resolution of GI 23.

DISCUSSION

The CCW system at the Zion site is a completely shared system. Under normal conditions, the Unit 1 and Unit 2 systems are connected.

On February 16, 1985 with Unit 1 at cold shutdown and Unit 2 at 99% power, a valve on the Unit 1 component cooling water return line from the reactor coolant pump (RCP) bearing oil coolers was closed to perform maintenance.

Shortly after this line was closed off, the Unit 2 CCW surge tank level was found to be decreasing. The Unit 1 CCW surge tank was not valved in at the time. In addition, the Unit 1 containment sump pumps were running continuously.

All CCW to the RCP bearing coolers was stopped (RCP was not operating) and the leak stopped. By that time about 1700 gallons of CCW had leaked onto the containment floor. When CCW flow to the RCP bearing coolers was restarted, no leakage was observed.

The licensee believes that a pressure transient was initiated when the RCP bearing oil coolers CCW return line was isolated causing a relief valve in the CCW system to lift. The valve did not reseat until all CCW to the bearing oil was isolated. Makeup capability exceeded leakage so there was no adverse effect on the plant or the safety functions of CCW system.

Since a pressure transient had previously lifted another relief valve in the CCW system on February 3, 1984, the licensee began an investigation. These relief valves are sized to relieve expansion in the tube side of the excess letdown heat exchanger if the shell side is isolated. They found that both of the relief valves, which had lifted and failed to reseat, had been readjusted during the inservice inspection program. At that time the nozzle ring settings had been adjusted to those of standard relief valves when in fact they required special adjustment. The station procedure did not indicate that these valves required special settings. The incorrect nozzle ring settings had slightly lowered the relief capacity and had caused the relief valve to lift prematurely and to fail to reseat. Since Unit 2 had identical valves in the CCW system, and these valves had also been part of the inservice inspection program, the nozzle ring settings were reset with Unit 2 at power on February 22, 1985.

Region III issued two violations to the licensee in connection with these events. The first was issued for inappropriate procedures because the procedure for setting the nozzle rings did not distinguish between ring settings for standard and special relief valve designs. The second was issued because a quality control inspector signed off on a hold point despite a considerable discrepancy between the "As Found" and the "As Reset" ring settings, without initiating an investigation as to the cause of the discrepancy.

GENERIC SIGNIFICANCE

A data search was done using the NPRDS system to determine if problems with relief valves in the CCW system of nuclear power plants were widespread. Very few events were found. Most involved drift of the lift setpoints or foreign materials in the valve. Only Zion appeared to have the problem with incorrect nozzle ring settings.

FINDINGS AND CONCLUSIONS

It does not appear that this particular problem is widespread for relief valves in CCW systems, however, such an event does represent a failure of the CCW system to perform its safety function.

This event has been discussed with the project manager of GI 23 which includes CCW system failures; it will be considered during the resolution of this generic issue. No further action on this event is planned by AEOD.