



**Commonwealth Edison**

Zion Generating Station  
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Zion, Illinois 60099  
Telephone 708 / 746-2084

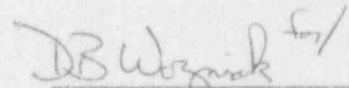
December 29, 1993

U. S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

Dear Sir:

The enclosed Licensee Event Report number 93-003-00, Docket No. 50-304/DPR-48 from Zion Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(i)(B), which requires a 30 day written report when any operation or condition occurs that is prohibited by the plant's Technical Specification.

Very truly yours,

  
\_\_\_\_\_  
E. A. Broccoli  
Station Manager  
Zion Generating Station

EAB/bh

Enclosure: Licensee Event Report

cc: NRC Region III Administrator  
NRC Resident Inspector  
INPO Record Center  
CECo distribution List

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

Form Rev 3.0

| FACILITY NAME (1) | DOCKET NUMBER (2)             | LER NUMBER (6) |                   |                      |                   |                    |       | Page (3) |       |  |
|-------------------|-------------------------------|----------------|-------------------|----------------------|-------------------|--------------------|-------|----------|-------|--|
|                   |                               | Year           | ///<br>///<br>/// | Sequential<br>Number | ///<br>///<br>/// | Revision<br>Number |       |          |       |  |
| Zion Unit 2       | 0   5   0   0   0   3   0   4 | 9   3          | -                 | 0   0   3            | -                 | 0   0              | 0   2 | OF       | 0   3 |  |

TEXT Energy Industry Identification System (EIS) codes are identified in the text as [XX]

A. CONDITION PRIOR TO EVENT

Mode De-fueled RX Power 0% RCS [AB] Temperature/Pressure Ambient °F/ Ambient psig

B. DESCRIPTION OF EVENT

On 11-29-93, during testing of the Unit 2 pressurizer safety valves (2RC8010A, 2RC8010B and 2RC8010C) [AB] at Westinghouse all three valves failed the acceptance criteria for the as-found Nitrogen testing. The testing was required per Technical Specifications (T.S.) section 4.0.5. The setpoint acceptance criteria was 2485 psig ± 1% (2460 to 2510 psig) per T.S. section 4.3.1.C.1.

2RC8010A initially lifted at 2412 psig and then lifted at 2438 psig. During the disassembly, it was determined that the valve was assembled properly. However, there was a small amount of boron found on the disk seating area. This boron would have prevented the valve from fully seating, allowing the valve to leak. During the previous operating period, no evidence of leakage was noted. Industry experience suggests components may more readily yield leakage for nitrogen than for steam.

2RC8010B initially lifted at 2514 psig and subsequent lifts were at 2503 psig. Only the first lift was out of tolerance. During disassembly, nothing was found to be wrong with the valve. Information provided by other utilities indicates that it is not uncommon for the first lift on relief valves to be high and subsequent lifts to come back into tolerance.

2RC8010C was leaking past the seat to the degree that test pressure could not be achieved and as-found lift was not able to be obtained. During disassembly, boron was found on the seats. Also, there was a piece of debris on the seats that would have prevented the disk from properly seating. No evidence of leakage was noted during the previous operating cycle.

On 12/17/93, during testing of the Unit 1 pressurizer safety valves (1RC8010B and 1RC8010C) at Westinghouse both valves failed the as-found nitrogen test.

1RC8010B lifted at 2419 psig the first time and then failed to lift on the next two attempts due to leakage. 1RC8010C lifted at 2423 psig the first time and then also failed to lift on the next two attempts due to leakage. During disassembly of these two valves, Westinghouse found large amounts of boron on each of the seating surfaces. This boron would cause the valve to leak-by to the extent that the valve would not lift. No evidence of leakage was noted during the previous operating cycle.

C. APPARENT CAUSE OF EVENT

The cause of 2RC8010A, 2RC8010C, 1RC8010B, and 1RC8010C to fail low was component failure. 2RC8010A, 2RC8010C, 1RC8010B and 1RC8010C lifted at a lower pressure than their actual setpoints. Boric Acid accumulation and other debris on the valve seat allowed leakage by these valves. Discussions with the Crosby Valve Representative, Westinghouse, and other utilities determined that performing a setpoint test on a leaking valve causes the valve to open at a lower pressure than the actual setpoint. This is due to the fact that the effective seat area is greater when the valve is leaking and the force required to open the valve is a function of the disc and seat areas and the pressure exerted.

The cause of 2RC8010B to fail high could not be determined.

D. SAFETY ANALYSIS OF EVENT

T.S. section 3.3.1.C.2 requires all safety valves to be operable when reactor coolant temperature is greater than 200 degrees F. The T.S. setpoint for these valves is 2485 ± 1% (2460 to 2510 psig). Of the five failures documented in this investigation, four failed low and one failed high.

Previous evaluation in April 1992 by Westinghouse, Nuclear Fuel Services and Site Nuclear Engineering addressed the concern of failures low. It was determined that the most limiting case in this situation was the loss of load transient. Analysis showed that if the high pressurizer pressure trip setpoint is not reached due to premature safety relief valve operation, a reactor trip would occur on OT&T. It was determined that this case was not safety significant. This analysis was based on the assumption that the valves would open at the Power Operated Relief Valve (PORV) setpoint of 2335 psig.

The one valve that failed high, lifted at 2514 psig or 1.01% higher than the design setpoint. The design of the pressurizer safety valves is to prevent the Reactor Coolant System (RCS) from exceeding design pressure by more than 10% (2735 psig). Additionally all components in the RCS were hydrotested to 3107 psig prior to initial operation. Based on these facts, even though the valve lifted at a pressure slightly above its maximum design setpoint (0.01%), the valve operated at a pressure well below the system design limitation. Therefore, this case posed no additional threat to the health and safety of the public.

