

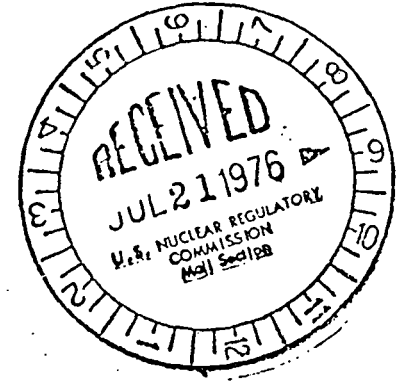


Dresden Nuclear Power Station  
 R.R. #1  
 Morris, Illinois 61  
 Telephone 815/942-2920

*This report describes the cracking of isolator condenser safe end.*

BBS Ltr. #76-531

July 14, 1976



Mr. James G. Keppler, Regional Director  
 Directorate of Regulatory Operations - Region III  
 U. S. Nuclear Regulatory Commission  
 799 Roosevelt Road  
 Glen Ellyn, Illinois 60137

Enclosed please find an update report to Reportable Occurrence report number 50-237/1976-21. This report is being submitted to your office in accordance with the Dresden Nuclear Power Station Technical Specifications, Section 6.6.B.

*B. B. Stephenson*  
 B. B. Stephenson  
 Station Superintendent  
 Dresden Nuclear Power Station

BBS:jo

Enclosure

cc: Director of Inspection & Enforcement  
 Director of Management Information & Program Control  
 File/NRC

COPY SENT REGION III

LICENSE NAME: 01 I L D R S Z  
 LICENSE NUMBER: 00-000000-00  
 LICENSE TYPE: 411111  
 EVENT TYPE: 01

CATEGORY: 01 CONT  
 REPORT TYPE: T  
 REPORT SOURCE: L  
 DOCKET NUMBER: 050-0237  
 EVENT DATE: 040676  
 REPORT DATE: 071377

EVENT DESCRIPTION

02 AN INSERVICE INSPECTION OF THE UNIT-2 ISOLATION CONDENSER SAFE-END  
 03 REVEALED AN UNACCEPTABLE ULTRASONIC INDICATION. THE 14-INCH DIAMETER SAFE-END  
 04 WAS SUBSEQUENTLY REMOVED AND A DYE-PENETRANT EXAM OF THE INNER-DIAMETER  
 05 SURFACE CONFIRMED THE EXISTENCE OF CRACKS. THE CRACKS WERE NOT  
 06 THROUGH-WALL AND IN NO WAY AFFECTED SYSTEM OPERATION. SIMILAR INSTANCES

SYSTEM CODE: CE  
 CAUSE CODE: E  
 COMPONENT CODE: PIPE EXX  
 PRIME COMPONENT SUPPLIER: N  
 COMPONENT MANUFACTURER: B O I S  
 VIOLATION: N

CONT. ON ATTACHED SHEET

CAUSE DESCRIPTION

08 THE CRACKED SAFE-END WAS REMOVED AND SENT TO BATTILLE COLUMBUS  
 09 LABORATORIES FOR METALLOGRAPHIC ANALYSIS. THE RESULTS REVEALED THE  
 10 EXISTENCE OF ONE CIRCUMFERENTIALLY-ORIENTED CRACK AT THE 7:00 POSITION

FACILITY STATUS: H  
 % POWER: 000  
 OTHER STATUS: NA  
 METHOD OF DISCOVERY: B  
 DISCOVERY DESCRIPTION: NA

CONT. ON ATTACHED SHEET

FORM OF ACTIVITY RELEASED: Z  
 CONTENT OF RELEASE: Z  
 AMOUNT OF ACTIVITY: NA  
 LOCATION OF RELEASE: NA

PERSONNEL EXPOSURES

NUMBER: 000  
 TYPE: Z  
 DESCRIPTION: NA

PERSONNEL INJURIES

NUMBER: 000  
 DESCRIPTION: NA

OFFSITE CONSEQUENCES

NA

LOSS OR DAMAGE TO FACILITY

TYPE: Z  
 DESCRIPTION: NA

PUBLICITY

NA

ADDITIONAL FACTORS

NA

8 9

EVENT DESCRIPTION (Continued)

of cracking in furnace-sensitized stainless steel forgings have occurred on both Unit-2 core spray loops as well as on the HPCI steam line.

The safe-end (which was SA-182 F316 stainless steel) was replaced with one forged from SA-182 F316L stainless steel. (50-237/1976-21)

CAUSE DESCRIPTION (Continued)

and four axially-oriented cracks at the 1:00, 4:00, 4:45, and 5:00 positions. The depth of the circumferential crack was found to be 0.261 inches, while the axial cracks ranged in depth from 0.255 to 0.500 inches. The circumferential crack was located approximately 3/8 inch from the safe-end-to-pipe weld and was 0.60 inches long at the I.D. surface. The axial cracks ranged from 0.23 to 0.43 inches in length and extended to within 1/16 inch of the safe-end-to-pipe weld.

The metallographic examination revealed similar features in both the axial and circumferential cracks: initiation at the I. D. surface, and intergranular propagation in a heavily-sensitized microstructure. Microprobe analyses of fracture surfaces and cross sections of the cracks indicated no chlorides, fluorides, sulfides, or other possible corrosives. Moderate residual stresses from welding and possibly from inner surface grinding (up to 5 mils of cold working were observed) may also have been contributing factors. The mechanism of cracking is the same as that experienced in the HPCI safe-end, the 10-inch core spray piping, and the 4-inch recirculation bypass piping.

The cracked safe-end was manufactured from SA-182 F316 stainless steel and was unclad. It was approximately 5 inches long, with a 14-inch O.D. at the piping end (0.56-inch wall thickness) and a 16-inch O.D. at the nozzle end (1.08-inch wall thickness). The safe-end was furnace-sensitized during the post-weld stress relief treatment of the pressure vessel.