

SUPPLEMENTAL REPORT
Inspection Summary Units 1-3

BFRO-50-259/7806

During nondestructive examinations of MSRVS (Target Rock model 67F) on unit 1 refueling outage, linear indications of minor casting defects were found on valves S/N's 59 and 72. These indications were found during modification of the MSRVS by an offsite facility.

The casting defects did not compromise minimum design wall thickness. Subsequently, the defects in the valves were ground out and weld repaired. During weld repairs on S/N 72, cracks occurred in the weld-affected area and it was decided not to attempt further repair or to use this valve.

In accordance with followup actions to this occurrence, MSRVS being modified during unit 2 refueling outage were similarly inspected. Two more MSRVS were found with linear surface indications, S/N's 61 and 246.

The casting defects for the two unit 2 valves were removed and the base material liquid penetrant examined. The cavities created by the grinding operation to remove the defects did not violate minimum wall required to meet the safety limits of the valve design criteria. The lost wall and valve contour was weld repaired and therein eliminated the created stress riser. All weld repair was performed in accordance with ASME boiler and pressure code.

The remaining eleven Target Rock valves were inspected during the unit 3 refueling outage. A penetrant examination revealed that linear indications existed in the valve wall above the seat weld area in two valves, S/N's 27 and 185. These indications were removed by grinding to a depth of not more than 0.062 mils. No weld repair was required. This completed the penetrant inspection of units 1-3 Target Rock MSRVS bodies.

As a result of finding these minor casting defects in the form of linear indications, TVA requested the Target Rock Corporation to provide us with their analysis of the problem. In a letter from R. M. Platz, Target Rock Corporation, to T. F. Ziegler, TVA, dated April 28, 1978, the following analysis was given:

The main body casting is a low-stressed part on which the actual wall thickness is approximately twice the minimum design wall requirements. The castings are poured from ASTM-A-216, Grade WCB, and are inspected with both magnetic particle and radiographic examinations for acceptance. The radiographic inspection for a Class II casting has acceptance standards which allow the presence of considerable shrinkage, porosity, nonmetallics, etc. These casting defects do not appear as liquid penetrant indications unless they actually intercept the casting surface.

Target Rock has found on infrequent occasions that internal defects close to a casting wall may locally break the surface after extended periods of operation at temperature. This has not been considered to be a progression of the casting defect but rather is the result of stabilization of the body in the assembly and system. Defects occurring in the casting close to welded areas are most likely to open to the surface, probably due to relief of welding stresses.

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It should be noted that a shrinkage condition which is acceptable by the radiographic acceptance standards represents a defect that could be concentrated near the surface or diffused throughout the thickness of the casting wall. If concentrated near the surface, grinding to remove a slight surface indication could produce gross liquid penetrant indications because the metal removal has penetrated the concentrated shrinkage condition. It is Target Rock's experience that most shrinkage adjacent to the surface in the main body castings can be removed by local grinding, usually with grinding depths of less than 1/4-inch. Since this depth would not abrogate minimum wall requirements, a blending of the grind-out to the casting wall should be a satisfactory and acceptable method of repair. Welding to a qualified procedure to restore full wall thickness is likewise considered satisfactory.

At this time, no further nondestructive examinations are scheduled and this will be our final report.

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

716 Edney Building

March 2, 1979

Mr. James P. O'Reilly, Director
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Dear Mr. O'Reilly:

TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT UNIT 1 - DOCKET
NO. 50-259 - FACILITY OPERATING LICENSE DPR-33 - SUPPLEMENTAL INFORMATION
TO REPORTABLE OCCURRENCE REPORT BFRO-50-259/7806

This letter is to provide you with supplemental followup information to
my letter dated June 6, 1978. The referenced licensee event report
dealt with defects in the form of linear indications around the seat
area of main steam relief valve castings. At the time BFRO-50-259/7806
was written, specific failure data was not available, and we committed
ourselves to supply the failure data when available.

Enclosed is a supplemental report for BFRO-50-259/7806 which supplies
the followup information.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

H. S. Fox
Director of Power Production

Enclosure (3)

cc (Enclosure):

Director (3)
Office of Management Information and Program Control
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Director (40)
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R. F. Sullivan, NRC Inspector, Browns Ferry

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