

JUN 14 1977

Docket Nos. 50-438
and 50-439 ✓

Tennessee Valley Authority
ATTN: Mr. Godwin Williams, Jr.
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Distribution: w/encl.

Docket File
LWR #3 File
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bcc: J. Buchanan
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Gentlemen:

SUBJECT: BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 - REQUEST FOR RELIEF
FROM INSPECTION OF WELDS IN HIGH-ENERGY FLUID SYSTEM PIPING
ENCLOSED IN GUARD PIPES

We have reviewed your request for exemption from inservice inspection of welds located in high-energy fluid system piping enclosed in guard pipes. Our review included the following submittals:

- (1) "Break Exclusion Position for Complying with APCSB 3-1 and MEB 3-1" report #CEB-76-13 dated 6/8/76
- (2) "Pipe Rupture Analysis for Guard Pipe - Bellefonte Nuclear Plant" report #CEB-76-25 dated 10/6/76

In addition, we have considered statements by TVA on this matter at an August 20, 1976 meeting, a June 2, 1977 meeting, and numerous conference call discussions.

We have concluded that TVA has not provided sufficient technical justification for waiving the required inservice inspection of high-energy fluid system piping welds enclosed in guard pipes. The specific details of our evaluation are contained in the attached enclosure. Our position remains as stated in the August 20, 1976 meeting. This position is that we must find TVA's analyses acceptable, and they must show that the Bellefonte containments will not fail before we would consider granting an exemption from inspection of these welds.

Sincerely,

Original signed by:

Anthony Bournia

Olan D. Parr, Chief

Light Water Reactors Branch No. 3

Division of Project Management

Enclosure:

NRC Staff Comments on TVA (SEE PREVIOUS YELLOW FOR CONCURRENCES)

OFFICE	Submittals CEB-76-25 and CEB-76-13	DSS	DSS	DSS	LWR BC
SURNAME	See next page WPike/ms	RBosnak	JKnight	FCherny	ODParr
DATE	6/ /77	6/ /77	6/ /77	6/ /77	6/ /77

Tennessee Valley Authority

- 2 -

JUN 14 1977

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ENCLOSURE

NRC STAFF COMMENTS ON TVA

SUBMITTALS CEB-76-13 AND CEB-76-25

1. "Break Exclusion Position for Complying With APCSB 3-1 and MEB 3-1" report #CEB-76-13 dated 6/8/76.

This submittal describes the proposed design of main steam and feedwater piping beginning at the flued head anchors in the primary containment and extending through the annulus to the main steam valve rooms and extending through the valve rooms and isolation valves to the flued head anchors in the outer valve room walls.

This piping generally falls in the category of piping defined in category B.1.b "Fluid System Piping in Containment Penetration Areas" as defined in Branch Technical Position MEB 3-1. This criteria exempts piping in the containment penetration area out to the first restraint or anchor outside containment beyond the outermost isolation valve from postulated pipe breaks provided that the piping complies with the conservative design and inspection criteria as defined in B.1.b (1) through (5) of BTP MEB 3-1 and B.2.c and B.2.d of APCSB 3-1.

It is not possible from the information submitted to verify whether all of these criteria are being complied with. TVA should submit an addendum to this submittal that specifically addresses each of these criteria. The information supplied relative to the low level of stresses calculated for this section of piping is adequate for demonstration of compliance with the low stress criterion specified in B.1.b(1)(e) of MEB 3-1. However, stress criterion B.1.b(1)(f) should be additionally addressed.

The most significant criteria not addressed in the submittal involves the inservice inspection of the piping welds. As specified in B.2.d of APCSB 3-1 all longitudinal and circumferential welds in this piping must be 100% volumetrically examined during each inspection interval. An inspection interval is as defined in IWA-2400 of ASME Section XI. These augmented inservice inspection requirements take precedence over any inspections specified for this piping in ASME Section XI. These inspections are an additional NRC requirement and are not related to the inspections required by the edition and addenda of ASME Section XI which will be used for the normal inservice inspection of this plant per 10 CFR 50.55a(g) requirements.

TVA should submit an addendum to CEB-76-13 demonstrating compliance with all of the referenced criteria. If demonstration of compliance is provided, we will accept this valve room piping to be in conformance with break postulation criteria applicable for this plant.

2. "Pipe Rupture Analysis for Guard Pipe - Bellefonte Nuclear Plant" report #CEB-76-25 dated 10/6/76.

This submittal is intended to address the main steam and feedwater line guard pipes which begin inside containment at the secondary shield wall and penetrate through the primary containment to a flued head anchor located in the annulus between the primary and secondary containments and through the secondary containment to the main steam valve room wall.

The primary purpose of making this submittal was to demonstrate that containment integrity would be maintained if a break occurred in the process pipe enclosed within the guard pipe on the inside containment side of the flued head anchor. As indicated in the submittal, the flued head is an integrally forged part of the process pipe. Although it was not indicated in the submittal, we have been advised by TVA that the process pipe circumferential welds closest to the flued head are approximately 120 inches away from the flued head on both the inside and outside containments sides for the main steam piping and about 84 inches for the feedwater piping. TVA proposes to enclose all of these welds within guard pipes.

Typically, piping in this region of a plant has been treated as "break exclusion" piping subject to the conservative stress criteria and an augmented inservice inspection program as discussed above for submittal. If any process pipe welds were enclosed within a guard pipe, some form of access to them would normally have to be provided in the guard pipe, such as a removable cover, to provide accessibility to the weld(s) so that the augmented inservice inspection could be performed.

For Bellefonte it appears that TVA has elected to treat the process pipe within the region bounded by the guard pipe as standard ASME Class 2 pipe and has taken the position that the process pipe welds within the guard pipe are not inspectable due to inaccessibility.

TVA has resisted the idea of providing access provisions in the Bellefonte guard pipes for the following reasons: (1) access provisions would weaken the guard pipe, and (2) even with very large access ports adequate inspection is impossible.

In arriving at the design discussed in CEB-76-25, TVA has rejected several other penetration designs which involved other process pipe weld locations. In discussions with TVA regarding one of the former concepts, which also involved placing of process pipe welds within guard pipes, we had expressed concern as to whether TVA could demonstrate by analysis that, if a break occurred in a process pipe weld that is exempt from inservice inspection, the surrounding guard pipe would remain intact thus assuring containment integrity.

The analysis approach used in the submittal for demonstrating maintenance of containment integrity under postulated full break conditions does not constitute sufficient technical basis for waiving the required inservice inspection primarily because there is no justification provided for the jet impingement force component of the load input. Without substantiation of the conservativeness of this load, we can not accept this analytical approach for the intended justification.

If TVA can demonstrate containment integrity considering postulated rupture of the process pipes the requested exemption from inservice inspection can probably be accepted. If after evaluation this approach does not appear feasible then we will require as an alternative that the following be implemented:

Revise the design of the Bellefonte penetrations to provide access for volumetric inservice inspection of the referenced welds. If this access is provided, together with commitments to comply with the criteria specified in B.1.b(1) through (5) of BTP MEB 3-1 and B.2c and B.2.d of APCSB 3-1, then this piping can be considered "break exclusion" piping, and thus, breaks will not have to be postulated in the welds.