

TENNESSEE VALLEY AUTHORITY

CHATTANOOGA, TENNESSEE 37401

400 Chestnut Street Tower II

November 28, 1984

BLRD-50-438/84-38

BLRD-50-439/84-35

U.S. Nuclear Regulatory Commission  
Region II  
Attn: Mr. James P. O'Reilly, Regional Administrator  
101 Marietta Street, NW, Suite 2900  
Atlanta, Georgia 30323

Dear Mr. O'Reilly:

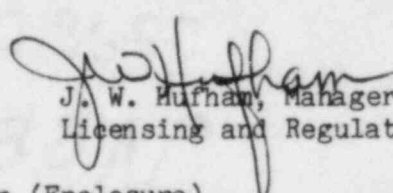
BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2 -DEFICIENT CATALYST BED IN COMSIP,  
INCORPORATED, HYDROGEN ANALYZERS - BLRD-50-438/84-38, BLRD-50-439/84-35 -  
FINAL REPORT

The subject deficiency was initially reported to NRC-OIE Inspector  
P. E. Fredrickson on May 18, 1984 in accordance with 10 CFR 50.55(e) as  
NCR BLN NEB 8412. This was followed by our interim report  
dated June 19, 1984. Enclosed is our final report. We consider 10 CFR Part 21  
applicable to this deficiency.

If you have any questions, please get in touch with R. H. Shell at  
FTS 858-2688.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

  
J. W. Hufham, Manager  
Licensing and Regulations

Enclosure

cc: Mr. Richard C. DeYoung, Director (Enclosure)  
Office of Inspection and Enforcement  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Records Center (Enclosure)  
Institute of Nuclear Power Operations  
1100 Circle 75 Parkway, Suite 1500  
Atlanta, Georgia 30339

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## ENCLOSURE

BELLEFONTE NUCLEAR PLANT UNITS 1 AND 2  
DEFICIENT CATALYST BED IN COMSIP, INCORPORATED, HYDROGEN ANALYZERS  
BLN NEB 8412  
BLRD-50-438/84-38, BLRD-50-439/84-35  
10 CFR 50.55(e)  
FINAL REPORT

### Description of Deficiency

It has been identified that the containment hydrogen analyzers catalyst beds on Bellefonte Nuclear Plant (BLN) units 1 and 2 may have a limited or diminished useful life. This is due to poisoning by fission-fragment iodine in a post-LOCA containment atmosphere. This deficiency was discovered from thermodynamic calculations performed by Comsip, Incorporated, and others. These calculations utilized a larger post-LOCA containment fission-fragment iodine concentration (as high as 0.02 mm mercury) than was earlier assumed. Comsip, Incorporated, estimated that the effective catalyst bed life may be as short as ten days. TVA was notified of this condition by NRC IE Information Notice 84-22 and by Comsip, Incorporated, 10 CFR 21 notification. This deficiency was caused by an assumed value for fission-fragment iodine concentration which may have been too low in some cases.

### Safety Implications

The containment hydrogen analyzers are used to detect the presence and concentration of post-LOCA containment atmosphere hydrogen concentration. This information is used by the control room operators to manually operate the hydrogen recombiners and/or the hydrogen purge system as described in the BLN FSAR section 6.2.5. The deficiency, if not corrected, could result in an inaccurate hydrogen gas analyzer reading following a LOCA. This could allow the hydrogen gas concentration in containment to exceed allowable limits (which could result in combustion or detonation of hydrogen gas) due to operator inaction. Combustion of hydrogen inside containment possibly could adversely affect the operation of essential safety-related equipment, result in doses to plant personnel greater than 10 CFR 20 limits, or result in offsite doses greater than 10 CFR 100 limits.

### Corrective Action

The existing containment hydrogen analyzers catalyst beds will be removed and replaced with catalyst beds of new configuration. This work will be performed in accordance with engineering change notice (ECN) 3140. The new catalyst beds are designed to function in a post-LOCA containment atmosphere and have shown no degradation after five months of continuous testing. The new catalyst beds are manufactured by Comsip, Incorporated. The use of these new catalyst beds will assure that the hydrogen gas analyzers can provide accurate post-LOCA containment hydrogen concentration information for a period exceeding 100 days. One-hundred days of postaccident operation is required by TVA's Office of Engineering calculations.

To prevent recurrence of this deficiency, Comsip, Incorporated, initiated testing to gather empirical data regarding fission-fragment iodine production in a post-LOCA containment atmosphere. Comsip, Incorporated, has subsequently produced the aforementioned new catalyst bed configuration. No further action to prevent recurrence is required.

All corrective action for this item will be completed by October 1, 1985.