



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

TENNESSEE VALLEY AUTHORITY

POSITION ON USE OF THE B&W INTEGRATED CONTROL SYSTEM

BELLEFONTE NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-438 AND 50-439

1.0 INTRODUCTION

In a letter to the NRC dated April 29, 1991, the Tennessee Valley Authority (TVA) requested that the NRC staff review the TVA position regarding the Integrated Control System (ICS) design to be used in the Bellefonte Nuclear Plant (BLN), Units 1 and 2. The NRC staff visited the BLN site on May 22 and 23, 1991, and provided comments regarding ICS licensing issues that would be addressed by the NRC staff should TVA decide to resume licensing of the Bellefonte nuclear plants.

The purpose of this safety evaluation is to present the NRC staff's evaluation and conclusions regarding the TVA implementation of the Bellefonte Nuclear Plant, (BLN), Units 1 and 2 ICS design.

2.0 EVALUATION

The TVA position is that the BLN units using the existing Bailey 820 ICS with the modifications recommended by the Babcock & Wilcox Owners Group (B&WOG) Safety and Performance Improvement Program (SPIP) can adequately meet the NRC regulatory requirements. The SPIP recommendations were developed to reduce the number of challenges to the plant safety systems, and thereby improve plant performance. The justification for the TVA position is that industry experience with the Bailey 820 ICS with SPIP modifications has shown the 820 ICS to be a reliable system.

The Bailey 820 ICS is installed in other B&W designed plants (e.g., Davis-Besse). Several modifications to the original Bailey 820 system design have been incorporated into the BLN ICS design. The BLN ICS design differs from the Bailey 820 ICS used in other B&W plants in that essential controls and instrumentation for controlling the systems that are essential for controlling transient conditions have been removed from the ICS and incorporated into the Essential Controls and Instrumentation (ECI) system. This system consists of two independent trains of instrumentation and controls that have Class 1E power supplies. The two trains are totally redundant, i.e., either train can be used to control essential plant equipment. This design is superior to the nonnuclear instrumentation (NNI) designs used in the other B&W plants. The present NNI designs are not completely redundant and do not have Class 1E power supplies. Consequently, the staff finds the BLN design to be an acceptable configuration.

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The ICS at BLN was installed prior to the BLN construction deferral in mid-1988, and has been maintained in an energized state since the deferral. The maintenance program consisted of testing the individual modules and keeping the system clean. Calibrations were not performed because the actual calibration points were not required during the construction deferral phase. TVA has tested approximately 40 of the 300 ICS modules and has not detected any module failures. B&W states that there have been three module failures in the nuclear industry to date, and do not expect to find any failures in the BLN system. TVA will keep the modules continuously energized. TVA has maintained the Field Change Notices (FCNs) and can resume installation with minimal effort. The staff finds this to be acceptable.

All ICS/NNI power supplies will be replaced as part of the construction process. The existing power supplies have electrolytic capacitors, which have a history of failure during resumption of power. While the power supplies are several years from the end of their service life, TVA has decided to replace the power supplies during the construction phase as part of their preventive maintenance program, instead of during a subsequent refueling outage. The staff finds this to be acceptable.

TVA committed to implement an SPIP at BLN. The BLN staff will review the NRC staff's assessment of the B&WOG SPIP as part of their program. Additionally, TVA committed to have their SPIP audited in the same manner as the other B&W licensees.

3.0 CONCLUSION

Based upon its review of the TVA position paper, and the results of the BLN site visit, the NRC staff concurs with the approach taken by TVA with regard to using the Bailey 820 ICS design now installed at BLN. Following reactivation, the staff will conduct SPIP implementation audits of the BLN units as a part of the licensing process.

Reference:

Letter from E. G. Wallace, TVA, to U.S. Nuclear Regulatory Commission, "Bellefonte Nuclear Plant (BLN) - Transmittal Position Regarding the Integrated Control System (ICS) (TAC No. 80219), dated April 29, 1991.

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AUG 22 1991

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