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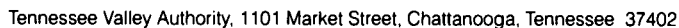
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BELLEFONTE POSITION PAPER REGARDING INTEGRATED CONTROL SYSTEM (ICS)

PURPOSE

This document describes TVA's plans for the upgrade and retention of the installed Integrated Control System (ICS) at the Bellefonte Nuclear Plant (BLN). TVA provides this position on the ICS for the staff's information. While TVA does not request specific staff approval, TVA welcomes any comments the NRC staff may have on the position described herein.

BACKGROUND

The ICS currently installed at both of the BLN units is a Bailey 820 system which is similar to the system currently installed at operating 177 fuel assembly (FA) plants. The BLN ICS incorporates improvements over the original 177 FA design such as a more reliable power supply and automatic bus transfer for AC power.

BLN is a B&W 205 FA plant, a newer design that is based on the 177 FA plant. It has some design features, such as an integral-economizer once-through steam generator and a larger pressurizer, which will cause its transient response to be somewhat different than the response of the 177 FA plants.

Over the past 15 years, transients have occurred at operating B&W 177 FA plants that were caused or aggravated by loss of ICS power, ICS hardware failure, or failure of ICS input signals. The B&W Owners Group (B&WOG) has instituted two programs aimed at improving the ICS and thus plant reliability.

In 1986, the B&WOG began the Safety and Performance Improvement Program (SPIP) to assess and improve plant performance and safety, focusing on trip reduction, availability, and operator burden. Many of the resulting SPIP recommendations are aimed at ICS reliability improvement and have been implemented at 177 FA plants. Subsequent operation has proven that when implemented, these recommendations result in fewer transients (see reference).

In 1987, the B&WOG began development of a microprocessor-based digital Plant Control System (PCS, referred to originally as the ACS, or "Advanced Control System") as a future upgrade to the ICS. The development of the PCS is currently in the prototype procurement and testing phase. Assuming that development proceeds without difficulty, installation of the PCS in the 177 FA plants could occur by the middle to latter part of this decade if no problems are found in the developmental process.

POSITION

BLN Units 1 and 2 are acceptable for licensing with the existing Bailey 820 system, modified as required to implement the applicable ICS SPIP recommendations.

TECHNICAL JUSTIFICATION

Since the beginning of the SPIP in 1986, statistics from the B&WOG Transient Assessment Committee on the operation of B&W 177 FA plants indicate a reduction in the number of ICS-related trips (see reference). Between the years of 1984-1987, the average number of ICS-related trips per plant, per reactor year, was 0.6. This average was reduced to 0.1 ICS-related trip per plant, per reactor year, during 1988-1990 following the implementation of SPIP recommendations.

The five ICS cabinets for each unit are installed and have been continuously energized throughout the plant's deferral, and therefore have experienced near normal operating conditions. The aging of the BLN ICS hardware is expected to be similar to that observed at operating B&W plants and should not be a factor in overall plant reliability. Operability tests on the BLN ICS modules performed this year have shown no failures to date. Therefore, TVA considers the ICS to be a safe, reliable control system for BLN.

Initial operation of BLN with the installed ICS allows plant startup and the accumulation of operating experience with a known and tested control system. The PCS program is developmental, and therefore best implemented first in a plant where operating characteristics are established and well known.

The projected schedule for PCS development may not allow time for adequate prototype testing and operation prior to when installation at BLN would be needed to support the planned BLN schedule. Acceleration of the PGS program is not practical since it runs the risk of unforeseen installation and operational difficulties and is not consistent with the B&W Owners Group 177 FA plant activities. The reported French N4 plant difficulty with its P-20 control system is an example of such implementation problems.

REFERENCES

B&W Owners Group Transient Assessment Program Operating Experience Summary Reports for the years 1982-1989