U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

U.S EPR Bi-Directional Service Unit Connection to Safety Systems

Deanna Zhang

August 30-31, 2010

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Objective

The purpose of this presentation is to inform AREVA NP regarding the staff's position on the permanent bi-directional Service Unit (SU) connection to Instrumentation and Control (I&C) safety systems.

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Background

- During the June 25, 2010 public meeting, the staff identified the permanent, bi-directional communication link between the SU and the safety I&C systems as not adequately addressing how the design meets NRC requirements for independence.
- On July 21, AREVA NP presented their proposal to address the permanent SU connection:
  - Provide additional information in a technical report and Tier 1 and 2 of the DCD.
  - No design changes to the permanent SU connection.

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Staff Position

- The staff considered AREVA NP's proposal regarding the permanent, bi-directional data communication link between the SU and safety systems, and as communicated at the July 21 public meeting, the staff noted the following concerns:
  - The design information to justify this one aspect of the I&C design would result in a large and complex licensing basis that could prove difficult to manage for licensees and the vendor and could impact the regulatory oversight process.
  - While AREVA NP proposes the justification could be performed in a timely manner, based on the amount of information required for submittal, it is unlikely that AREVA NP will be able to provide this information to support AREVA NP's desired schedule.

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Staff Position (cont.)

- The staff did not identify issues with the functions performed by the SU, but did not see them as necessary to perform safety functions.
- The implementation of the SU functions appears overly complex as compared to other design alternatives which would achieve a higher level of safety and a faster, more certain licensing review (e.g., uni-directional connection or making the SU safety related).

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Staff Position (cont.)

- If AREVA NP decides to continue with the permanent, bi-directional communication link between the SU and safety systems, then:
  - Design information would need to be submitted as identified by the staff to become part of the licensing basis information,
  - Support necessary audits, and
- All design information would need to be provided in a timely manner, and the schedule would be re-evaluated at that time.

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Staff Position (cont.)

- The staff will need to consider whether the resulting licensing basis is too large and complex for adequate design control by future licensees and regulatory oversight by the NRC.

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Conclusion

- If AREVA NP decides to pursue the permanent, bi-directional connection of the SU to safety systems, a substantial amount of information and resources will be necessary to license the design.
- Other alternatives may provide a higher level of safety, and a more certain licensing outcome with less risk to success.

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Back-up

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Required Information for Detailed Design Review

- Based on the information provided for the Oconee LAR regarding the service unit, the staff would at a minimum require the following information be provided in the licensing basis:
  - SPACE diagrams (e.g., network, function) for service unit connection with safety systems
  - FMEA for the service unit demonstrating adequacy of the design
  - Software on Service Unit Computer (e.g., GSM)
  - Service unit functions and justification for these functions
  - Types of messages and data communicated between service unit and safety systems
  - Description of software protection to a software algorithm level to prevent the service unit from adversely impacting safety function processors

U.S.NRC
UNITED STATES NUCLEAR REGULATORY COMMISSION
Protecting People and the Environment

Information Required for Audit

- "TELEPERM XS Service Monitor and Service Monitor Server (TXS Software Release 3.0.x) User Manual TXS-1045-76-V2.2.