
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.: 118-8072
SRP Section: 10.04.04 - Turbine Bypass System
Application Section: 10.4.4
Date of RAI Issue: 07/27/2015

Question No. 10.04.04-1

10 CFR 52.47(a)(2) requires that a standard design certification applicant provide a description and analysis of the structures, systems, and components (SSCs) of the facility, with emphasis upon performance requirements, the bases, with technical justification therefor, upon which these requirements have been established, and the evaluations required to show that safety functions will be accomplished.

Section 10.4.4.5, "Instrumentation Requirements," of the DCD Tier 2 indicates that the turbine bypass system (TBS) controls are provided in the main control room (MCR) and the remote shutdown room (RSR). The DCD also indicates where the valve position indicators and the pressure indicators are located in the MCR along with information related to the leak monitoring system.

The staff finds the DCD Tier 2, Section 10.4.4 lacking information related to the details of the TBS instrumentation.

The applicant is requested to describe in detail the TBS instrumentation. The DCD is to be modified accordingly.

Response

TBS consists of eight (8) turbine bypass valves (TBVs) as shown in Figure 10.3.2-1 of DCD, Tier 2. The TBVs are normally controlled by the steam bypass control system (SBCS) but are capable of MCR/RSR or local manual operation. TBV instrumentation and SBCS instrumentation constitutes the TBS instrumentation. The valve position indication, valve inoperable alarm, and valve leakage alarm for the TBVs are monitored both in the MCR and the

RSR. The SBCS instrumentation is described in Subsection 7.7.1.1.d.

Impact on DCD

DCD Tier 2, Section 10.4.4.5 will be revised as indicated on the attached markup.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical, or Environmental Report.

APR1400 DCD TIER 210.4.4.3 Safety Evaluation

The TBS has no safety-related function and is not required to operate during or after an accident.

This relieving capacity, in conjunction with the SBCS and RPCS, allows a turbine full load rejection without causing a reactor trip or lifting the POSRVs and/or MSSVs.

The TBVs fail closed upon loss of motive air or electric signal. In the unlikely event that one of the TBVs opens inadvertently, the maximum steam flow through one valve at full-load main steam pressure is less than the maximum permissible flow to limit a reactor transient.

The equipment and high-energy lines of the TBS are located in the turbine building. TBS piping failures would not affect any safety-related equipment because turbine building has no safety-related equipment in the vicinity of the TBS. Therefore, NUREG-0800 BTP 3-3 and BTP 3-4 (References 12 and 13, respectively) are not applicable to the TBS. Pipe failures are addressed in Subsections 3.6.1 and 3.6.2.

10.4.4.4 Inspection and Testing Requirements

Preoperational and startup tests conform with the recommendations of NRC RG 1.68 (Reference 14). A test is conducted to verify opening of the TBVs in response to a signal simulating turbine bypass from the SBCS. Additional descriptions of inspection and tests are provided in Subsection 14.2.12.1.29.

10.4.4.5 Instrumentation Requirements

The valve position indication, valve inoperable alarm, and valve leakage alarm for the TBVs are monitored both in the MCR and the RSR. The SBCS instrumentation is described in Subsection 7.7.1.1.d.

~~Controls are provided in the MCR and RSR. Pressure, flow, valve position indication, valve leak monitoring system, and alarms are provided in the MCR and RSR.~~

10.4.5 Circulating Water System

The CWS supplies cooling water to the condenser and the T/G building open cooling water system (TGBOCWS). The CW discharged from the condenser and the TGBCCW heat