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## REVISED 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.: 463-8570  
SRP Section: 10.3 – Main Steam Supply System  
Application Section: 10.3  
Date of RAI Issue: 04/19/2016

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### **Question No. 10.03-5**

GDC 4 requires that SSCs important to safety are designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. GDC 34 requires the portions of the main steam system (MSS) associated with residual heat removal function to transfer heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded. SRP 10.3 provides guidance and acceptance criteria to meet relevant requirements associated with the MSS.

The staff reviewed DCD Tier 2, Section 10.3, for a description of all flowpaths that branch off the main steamlines between the main steam isolation valves (MSIVs) and turbine stop valves as specified in SRP 10.3, Section III.5.E. The staff determined that this information is either incomplete or missing from the application.

The applicant is requested to include in the DCD a complete tabulation and description of all flowpaths between the MSIVs and turbine stop valves, including shutoff valves in connected piping, and bypass valves. The type of information and level of detail needed for the staff to complete its review is listed in item i through ix of SRP 10.3, Section III.5.E.

### **Response – (Rev. 1)**

A new table including information required in SRP 10.3, Section III.5.E **had been** added in the DCD Tier 2, Subsection 10.3.2.2.1.

**That** table format was based on the similar table provided in other DCDs. **The changes that were proposed in the original response to this RAI have been incorporated into Revision 1 of the DCD; however, changes to Tier 2 DCD, Table 10.3.2-6 were identified resulting from a self-assessment necessitating a revised response to this RAI are included in the Attachment.**

**Impact on DCD**

DCD Tier 2, Table 10.3.2-6 will be revised as indicated in the attachment markup.

**Impact on PRA**

There is no impact on the PRA.

**Impact on Technical Specifications**

There is no impact on Technical Specifications.

**Impact on Technical/Topical/Environmental Reports**

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

APR1400 DCD TIER 2

RAI 463-8570 - Question 10.03-5\_Rev.1

Table 10.3.2-6

Main Steam Branch Piping (2.5 Inches and Larger), Between the MSIVs and the Turbine Stop Valves

Description	Max. Steam Flow	Shutoff Valve	Valve Closure Time	Actuator	Comments
Turbine bypass lines to condenser ; 8 lines total	1,292,000 lb/hr (162.79 kg/s), each lines	16 in (406.4 mm) globe (turbine bypass valve)	within 5 sec when the permissive signal from the SBCS	Air operated ; Fail close	Valves are normally closed during power operation
Reheating steam 2 <sup>nd</sup> stage to MSRs ; 2 lines total	413,500 lb/hr (52.1 kg/s), each lines	12 in (304.8mm) Gate (isolation valve)	[[ Max. 49 sec ]] <sup>1)</sup>	Motor operated ; Jogging/Fail-As-Is	Flow to reheater ceases following turbine trip flow ceases following valve closure on a main steam isolation signal
Main steam supply to auxiliary steam system. ; 1 line	476,000 lb/hr (59.975 kg/s)	10 in (254 mm) globe (isolation valve)	[[ Max. 60 sec ]] <sup>1)</sup>	Motor operated ; Fail-As-Is	This line is normally open during power operation.
High pressure turbine steam supply lines ; 4 lines total	4,504,000 lb/hr (567.49 kg/s), each lines	32 in (812.8 mm) gate (HP turbine stop valve)	0.3 sec	Electro-Hydraulic operated, Fail close	Main steam flow to high pressure turbine ceases following stop valve closure on a turbine trip
Main steam supply for turbine steam seal ; 1 line	38,987 lb/hr (4.91 kg/s)	4 in (101.6 mm) gate (isolation valve)	[[ - ]] <sup>1)</sup>	Motor operated ; Fail-As-Is	This line is normally open during power operation.
Main steam supply to feedwater pump turbine , 3 lines	146,287 lb/hr (18.43 kg/s), each lines	6 in gate (H.P. steam inlet stop valve)	[[ - ]] <sup>1)</sup>	Electro-Hydraulic operated, Fail close	Flow ceases after receipt of main steam isolation signal

1) Value determined by valve supplier

Replace with "A"

Table 10.3.2-6

Main Steam Branch Piping (2.5 Inches and Larger), Between the MSIVs and the Turbine Stop Valves

Description	Max. Steam Flow	Shutoff Valve	Valve Closure Time	Actuator	Comments
Turbine bypass lines to condenser ; 8 lines total	1,292,000 lb/hr (162.79 kg/s), each lines	16 in (406.4 mm) globe (turbine bypass valve)	within 5 sec when the permissive signal from the SBCS	Air operated ; Fail close	Valves are normally closed during power operation.
Reheating steam 2 <sup>nd</sup> stage to MSRs ; 2 lines total	413,500 lb/hr (52.1 kg/s), each lines	12 in (304.8mm) Gate (isolation valve)	[[ Max. 49 sec ]] <sup>1)</sup>	Motor operated ; Jogging/Fail-As-Is	Flow to reheater ceases following valve closure due to turbine trip or main steam isolation signal.
Main steam supply to auxiliary steam system. ; 1 line	476,000 lb/hr (59.975 kg/s)	10 in (254 mm) globe (isolation valve)	[[ Max. 60 sec ]] <sup>1)</sup>	Motor operated ; Fail-As-Is	There is no flow to this line during power operation. Valve is automatically closed by MSIV close fail signal.
High pressure turbine steam supply lines ; 4 lines total	4,504,000 lb/hr (567.49 kg/s), each lines	32 in (812.8 mm) gate (HP turbine stop valve)	0.3 sec	Electro-Hydraulic operated, Fail close	Main steam flow to high pressure turbine ceases following stop valve closure on a turbine trip.
Main steam supply for turbine steam seal ; 1 line	38,987 lb/hr (4.91 kg/s)	4 in (101.6 mm) gate (isolation valve)	[[ - ]] <sup>1)</sup>	Motor operated ; Fail-As-Is	Valve is normally closed during power operation.
Main steam supply to feedwater pump turbine , 3 lines	146,287 lb/hr (18.43 kg/s), each lines	6 in gate (H.P. steam inlet stop valve)	[[ - ]] <sup>1)</sup>	Electro-Hydraulic operated, Fail close	There is no flow to this line during power operation. Valves are closed after receipt of main steam isolation signal.

<sup>1)</sup> Value determined by valve supplier

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