
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.: 175-8034
SRP Section: 05.04.12 – Reactor Coolant System High Point Vents
Application Section: 5.4.12
Date of RAI Issue: 08/20/2015

Question No. 05.04.12-6

Standard Review Plan (SRP) Section 5.4.12, SRP Acceptance Criterion 13 states: "Procedures to effectively operate the vent system must consider when venting is needed and when it is not needed. A variety of initial conditions for which venting may be required should be considered. Operator actions and necessary instrumentation should be identified." Additional guidance is provided in Regulatory Guide (RG) 1.206, Subsection C.I.5.4.12.3, "Performance Evaluation": "The evaluation should cover vent system operation, including procedures that address, (1) when venting is/is not needed, (2) the method to determine the size of a noncondensable bubble, (3) initial conditions for venting, (4) requisite instrumentation, and (5) operator actions."

While DCD Tier 2, Subsection 5.4.12.3 provides some of the information requested by the SRP, it does not fully explain operation of the vent system. The procedures provided for the RVCH portion of the RCGVS are not entirely clear. Specifically, on page 5.4-84 of the DCD:

1. Regarding point a., what transients or other initial conditions would necessitate system operation, i.e., what conditions would make venting the noncondensable gases in the upper reactor vessel necessary?
2. Regarding point c., insufficient information has been provided as to how the operator would know when to initiate and terminate system operation. What conditions would an operator identify to know when to start and stop gas venting?
3. Regarding point e., it seems an operator would also need to close the RCGVS valve to terminate system operation. Is this accurate?

In addition, information has only been provided for the RVCH portion of the vent system; no procedures for the pressurizer vents are provided. Therefore, please address the aforementioned questions, provide procedures for the pressurizer portion of the RCGVS, and make updates in the DCD as appropriate. This is needed to fulfill SRP Acceptance Criterion 13, which is a way to satisfy, in part, the requirements of 10 CFR 50.46a and 10 CFR 50.34(f)(2)(vi).

Response

1. The conditions that would make venting of the noncondensable gases in the RCS and when to start and stop gas venting are described in Subsection 5.4.7.3.1, 5.4.12.2.1, and 5.4.12.2.2. A reference pointer is added to DCD Subsection 5.4.12.3 as indicated in the attachment.
2. Please refer to response to item 1 above.
3. Clarification is added to DCD Subsection 5.4.12.3 as indicated in the Attachment.

The pressurizer vent operation is added to DCD Subsection 5.4.12.3 as indicated in the attachment.

In addition, the system operating procedures are described in Section 13.5 and have not been developed at this DC stage. Therefore, the system operating procedure for the RCGVS will be developed by the COL item 13.5(4) and 13.5(5). DCD Subsection 5.4.12.3 will be revised as indicated in the attachment.

Impact on DCD

In DCD Tier 2, Subsection 5.4.12.3 will be revised as indicated in the Attachment.

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 2

A break in the vent line on the reactor vessel closure head (RVCH) is categorized as a small break LOCA of not greater than NPS of 2.54 cm (1 in) in diameter. A break phenomenon (or behavior) of the RVCH vent line is similar to the breaks that are analyzed in Subsection 15.6.5. Hence, the results presented in Subsection 15.6.5 conservatively envelop the RVCH vent line break case.

The evaluation of the reactor coolant gas vent system operation is as follows:

- a. The ~~operation is~~ **operations are** needed when venting the noncondensable in the upper reactor vessel ~~is~~ necessary.
- b. The size of a noncondensable bubble is estimated from reading the reactor vessel water level indication.
- c. Initiating and terminating system operation are manually performed in accordance with the ~~above described conditions.~~ **conditions as described in Subsection 5.4.7.3.1, 5.4.12.2.1, and 5.4.12.2.2.**
- d. The temperature and pressure instrumentation is provided to detect RCS leakage and pressure buildup, respectively.
- e. **actions** The operator ~~action~~ **and close** to open the RCGV ~~valve may be~~ **valves are** needed to vent steam in the reactor vessel closure head **and the pressurizer** or to release steam to the IRWST.

The venting operation is performed in accordance with system operating procedure for the RCGVS to discharge noncondensable gases and steam from the high point of the RCS during post-accident conditions. The system operating procedure for the RCGVS ~~is described in Section 13.4.~~

will be developed as part of COL information item 13.5(4) and 13.5(5).

5.4.12.4 Inspection and Testing Requirements

Subsection 3.9.6 describes inservice testing and inspection of valves. Subsection 5.2.4 describes inservice inspection and testing of ASME Code, Class 1 components that are part of the reactor coolant pressure boundary.