Development of RV Decommissioning Mockup

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1. Introduction

Since Kori unit 1 was permanently shut down, the importance of decommissioning technology has been emphasized. One of the most important technology in decommissioning activity is the segmentation and dismantling of activated large component. The reactor vessel (RV) is relatively highly activated among various systems [1]. The development of efficient RV segmentation is essential.

The development of RV decommissioning mockup for the Kori unit1 RV will be discussed in this paper. Mockup training is essential to verify segmentation process and minimize worker exposure in the radiation environment and segment the RV following the decommissioning schedule.

2. Design of RPV Mockup

2.1 Kori Unit 1 RV

The Kori unit 1 RV is a carbon steel structure with a outer diameter of about 3.8 m, a height of about 9.7 m and a weight of about 187 tons. The interior of carbon steel structure is cladded with stainless steel. As shown in Fig. 1, the RV is a cylindrical structure that contains and supports RVI. The main feature of RV is that the thickest part is the upper flange and there are four nozzles for connecting to the primary circuit.

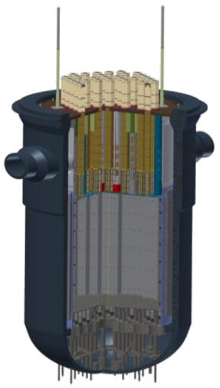

Fig. 1. Image of RV and RVI of Kori unit 1.

2.2 Conceptual Design of RV Mockup

The RV mockup should be the same size of actual RV in the form of a circular cylinder. However, since the structure is circular and symmetrical, it is not necessary to manufacture all of them. As shown in Fig. 2, the actual mockup is partially manufactured.

Fig. 2. Concept Image of the RV Mockup.

The main feature of Mockup is that the flange and nozzle, which are main parts of the RV, are designed as a module type so that they can be replaced after

segmentation process checking and segmentation scenarios validation.

3. Development of RV Mockup

3.1 Manufacture of Mockup

After completion of the design, KHNP-CRI manufactured RV mockup for segmentation process and segmentation scenarios. The nozzle specimens and flange specimens were manufactured as changeable module type after cutting. And auxiliary structure was manufactured for industrial safety.

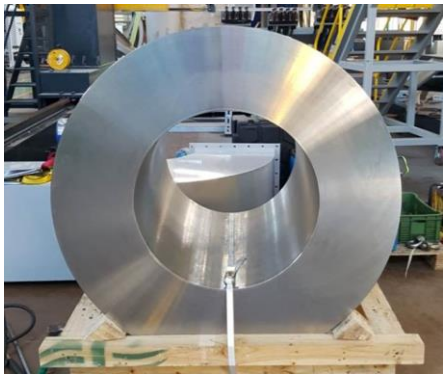

Fig. 3. Specimen of RV Nozzle.

Fig. 4. Specimen of RV Flange.

3.2 Installation of Mockup

For the RV segmentation process and segmentation scenarios, a mockup was made and installed in a field. And auxiliary structure was installed for industrial safety.

Fig. 5. RV Mockup Installation.

4. Conclusion

Development of a mockup is essential for the RV segmentation, which is high activated structure. The mockup developed in this study will be used to verify the segmentation process and to utilize it for worker training in the future decommissioning

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