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Session96: Korean WM Update & Vendor Problem Solving Matchmaking

# Decommissioning Plan for Kori Unit 1 - RV and RVI Segmentation -



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R&D for RV/RVI Segmentation



Current Issues



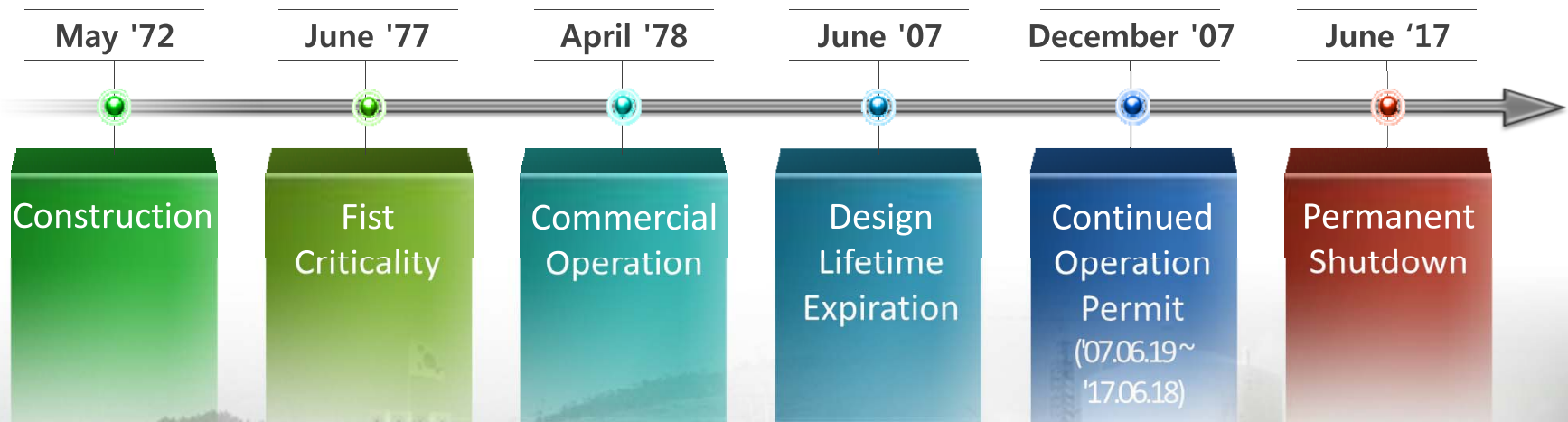


# Introduction



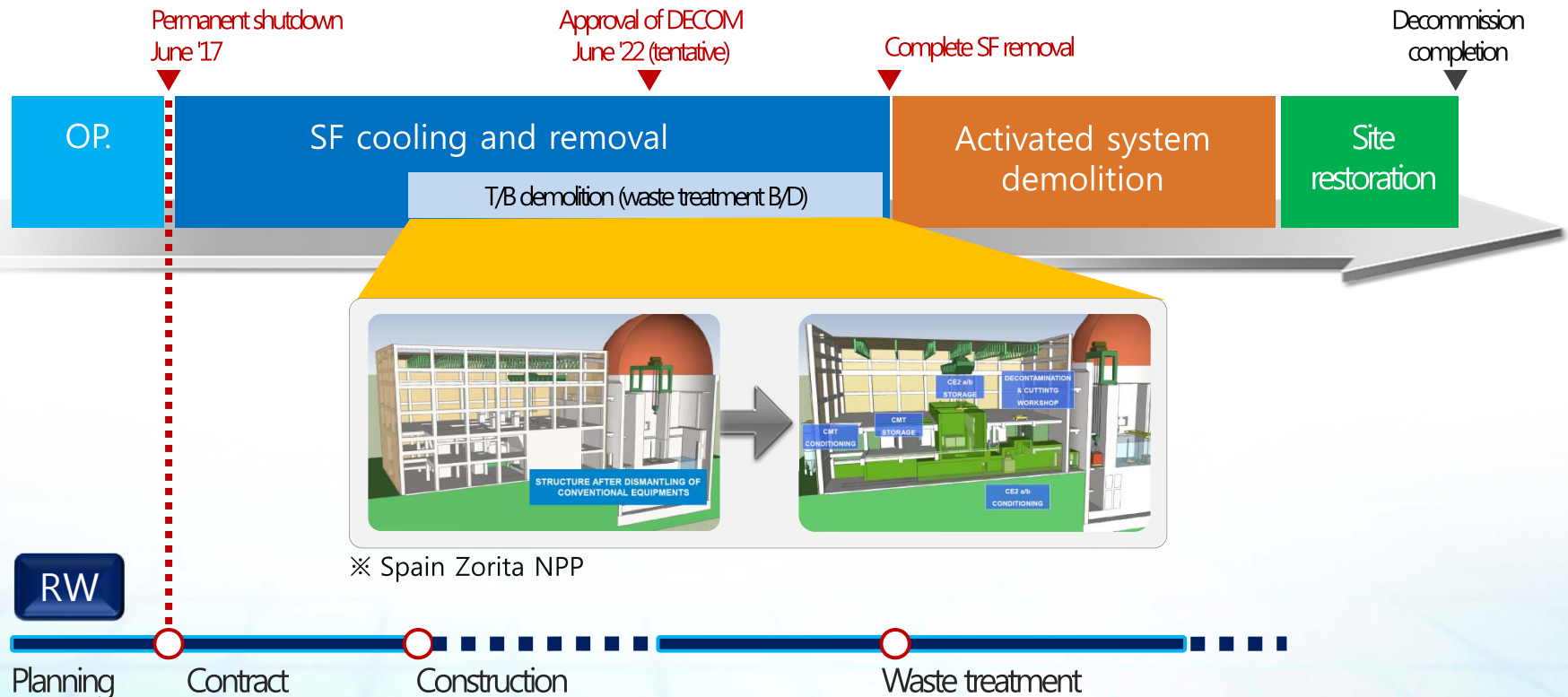
# 01. History of Kori-1

- Westinghouse type (2-Loop) 587 MWe PWR
- First NPP in Korea  
: construction – operation – continued op. – permanent shutdown



## 02. Milestone for Kori-1 NPP D&D

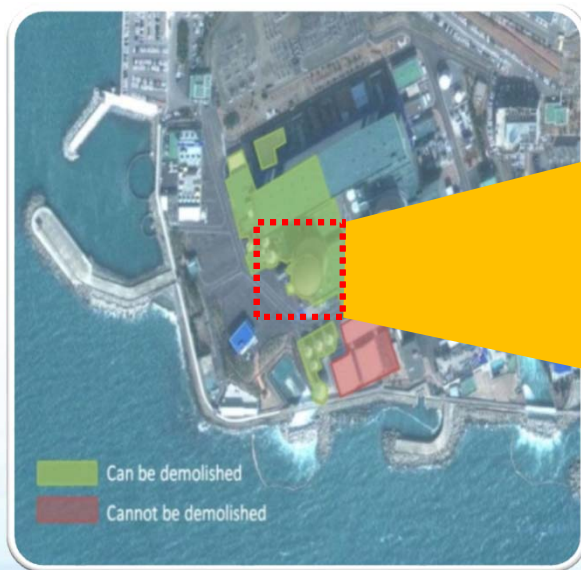
- ❑ Decommission strategy: COLD(T/B, etc.) to HOT
- ❑ Demolition of activated structure after SF removal



## 03. RV/RVI of Kori-1 NPP

### RV/RVI specification

- RV(Carbon steel) – Dia. ~3.8m, Height ~9.7m, Weight ~187ton (w/o head)
- RVI(STS 304) – **Max. Thickness ~340mm, Weight ~120ton**



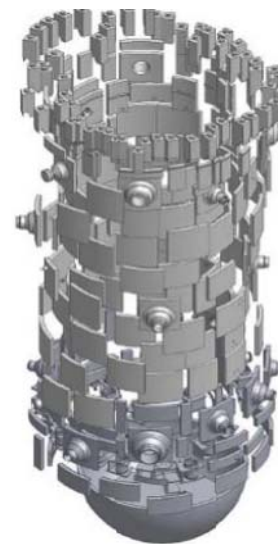


## R&D for RV/RVI Segmentation

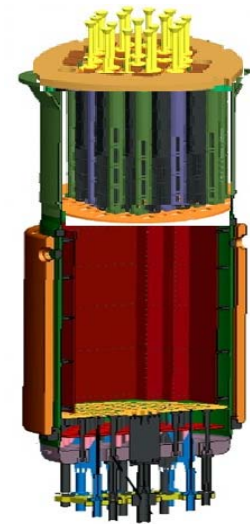


# 01. Overview of R&D Project

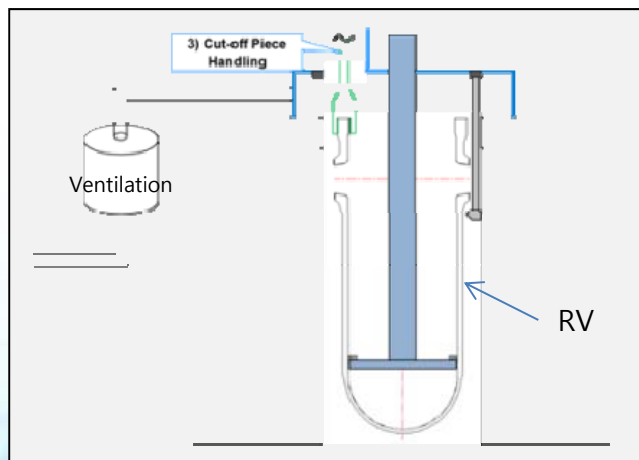
- RV/RVI Activation Analysis
- RV Segmentation
- RVI Segmentation
- Package for Segments
- Mockup Test



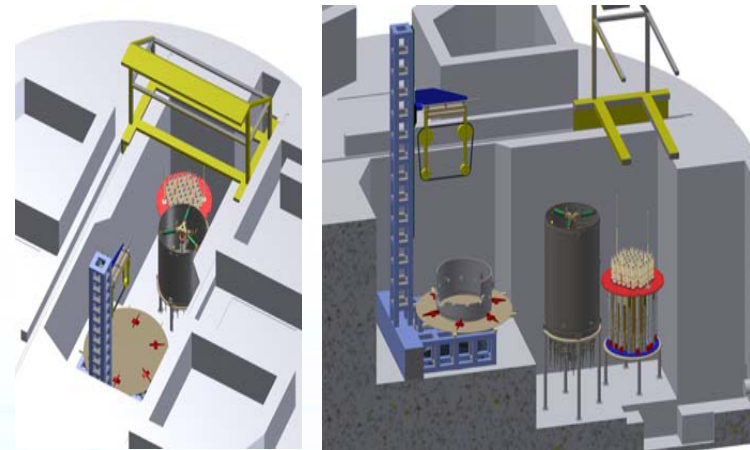
RV



RVI



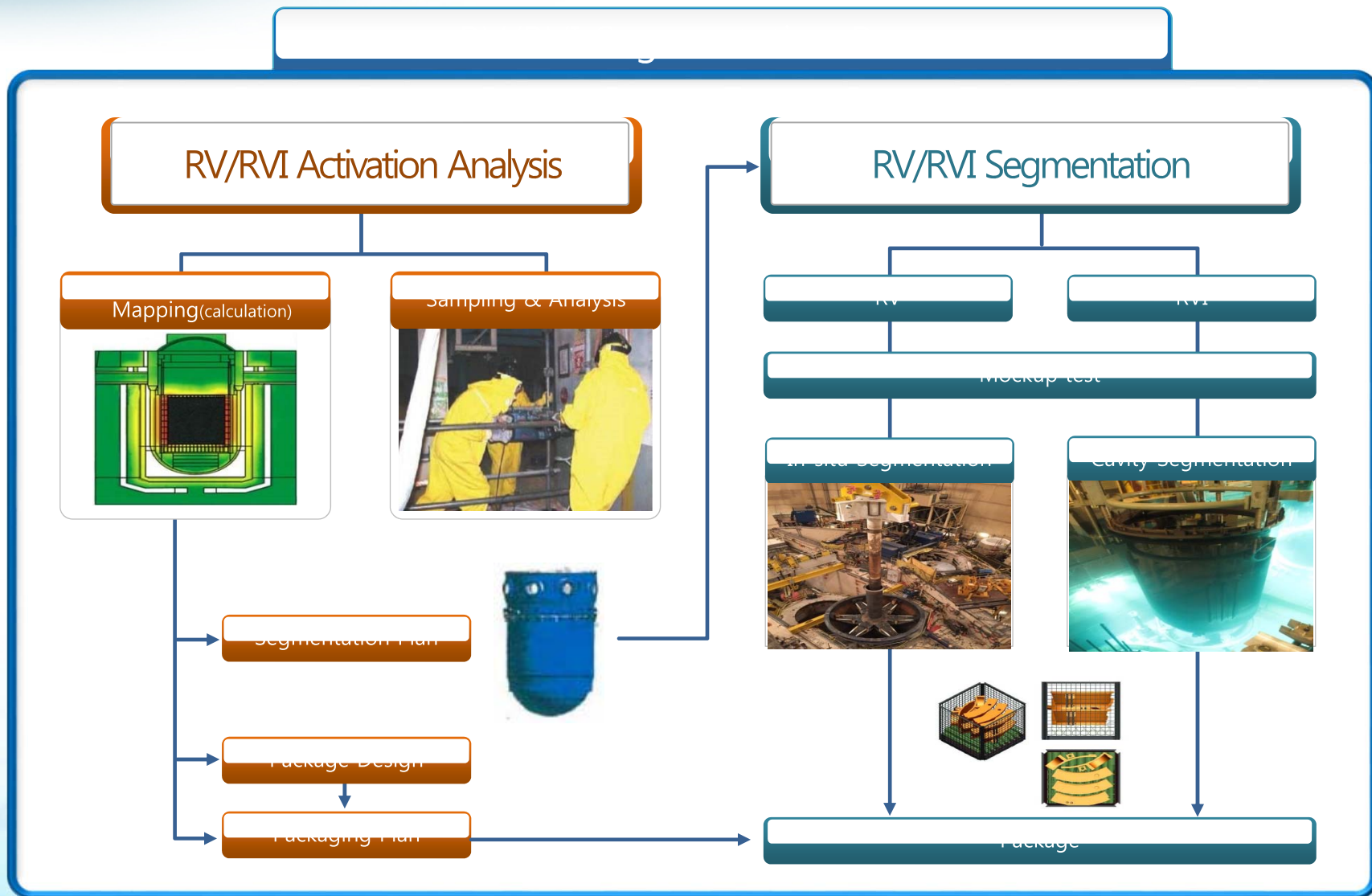
RV Segmentation



RVI Segmentation




## 02. Process Flow Diagram



# 01. RV/RVI Activation Analysis

### Sample analysis

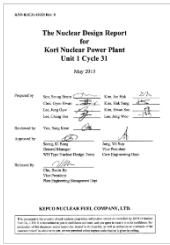
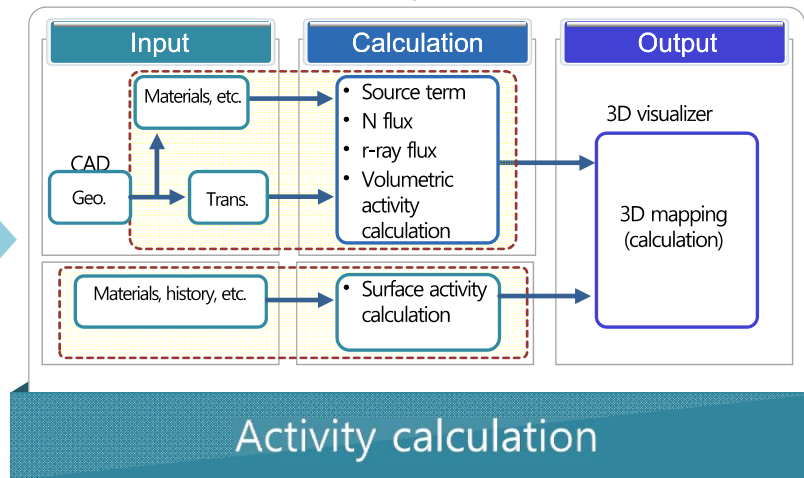
- In-/ex-vessel surveillance capsule, used In-core instrument etc.



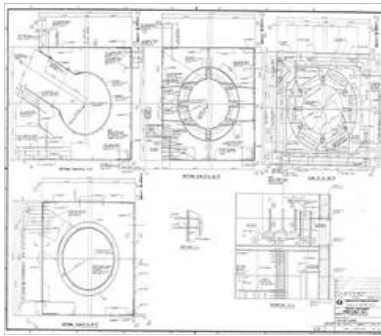
Time	Sample
'77.10	1 <sup>st</sup> Surveillance capsule
'84.08	2 <sup>nd</sup> Surveillance capsule
'88.01	3 <sup>rd</sup> Surveillance capsule
'99.09	4 <sup>th</sup> Surveillance capsule
'04.03	5 <sup>th</sup> Surveillance capsule
'15.05	6 <sup>th</sup> Surveillance capsule

### Operation history

- Nuclear design, fuel distribution, etc.

### Detailed design



### 3D/4D Mapping

- Database for cutting plan



## 02. RV Segmentation (1/2)

### ▣ Segmentation concept

- Segmentation in cavity
- Thermal method for safety and efficiency
- Sufficient ventilation system

### ▣ Segmentation scenario

#### 1. Preparation

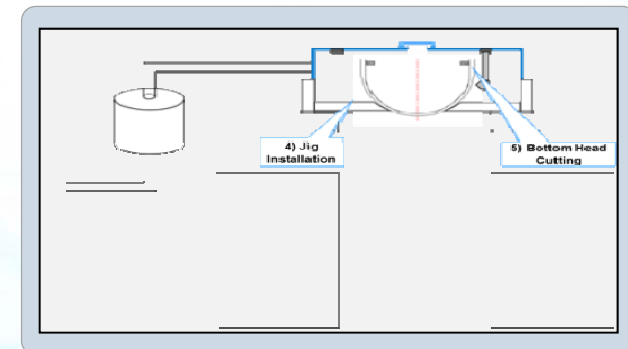
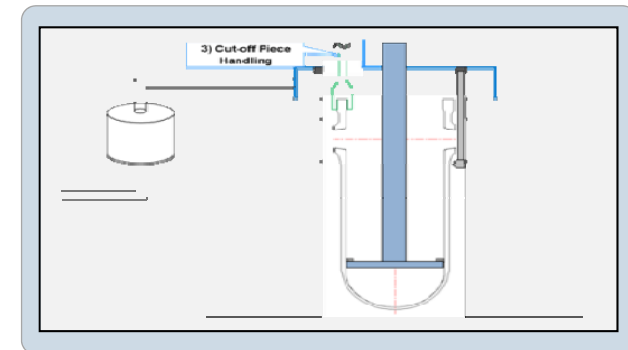
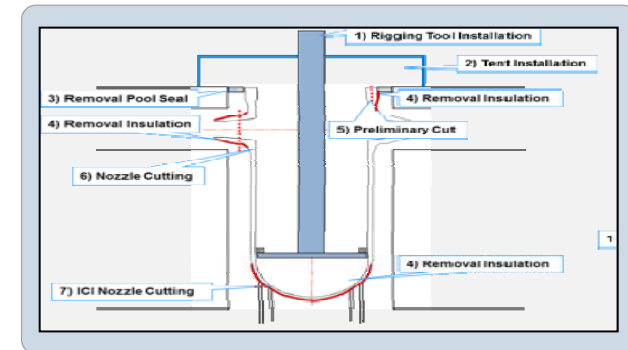
- Pool Seal, Hot/Cold Leg nozzle cutting
- ICI nozzle cutting and Insulation removal
- Pre-cut

#### 2. Segmentation

- Segmentation of RV with rigging tool
- RV lower head segmentation
- Ventilation system for treatment of fume

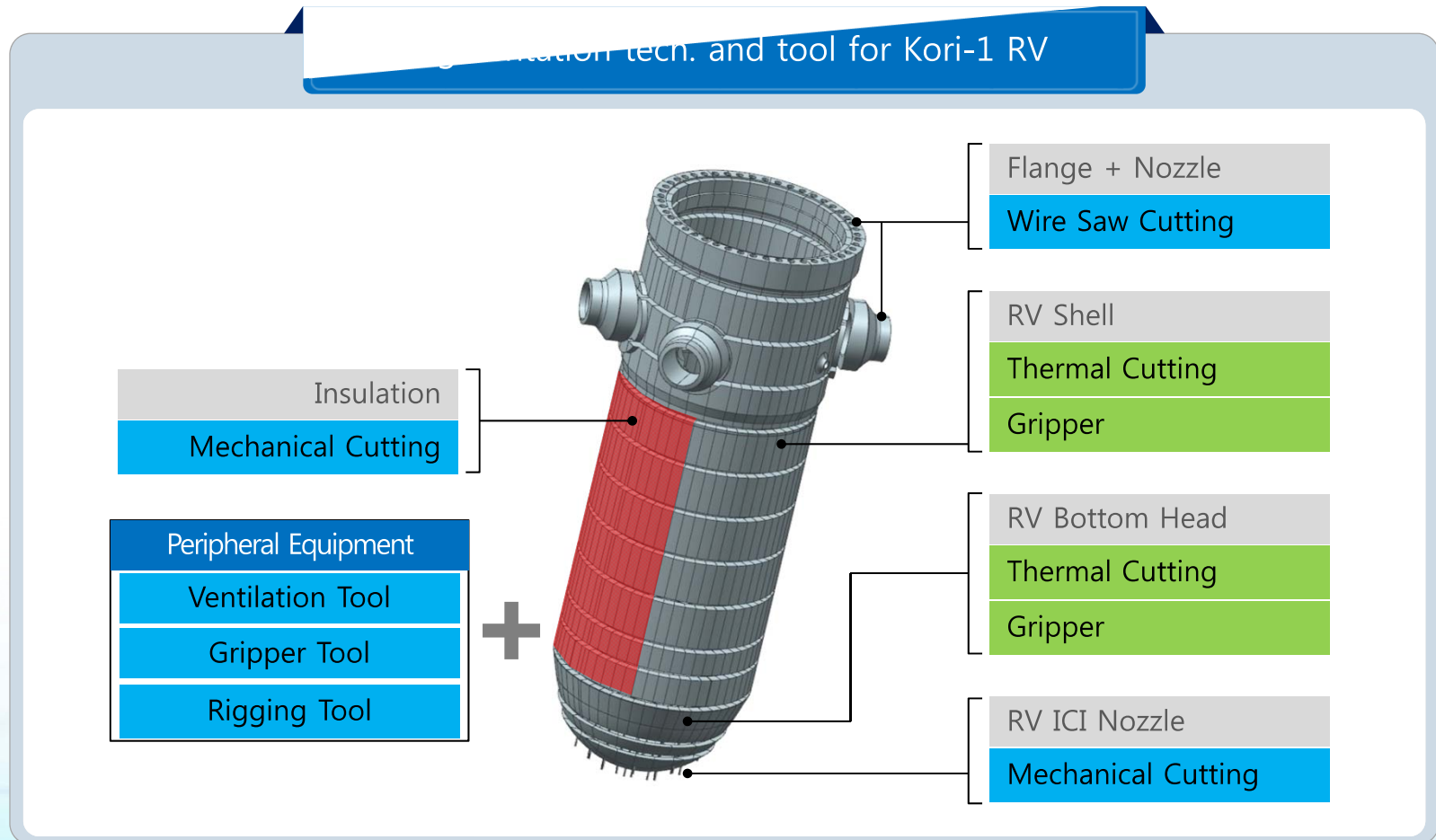
#### 3. Segmentation tool removal

- Remote thermal segmentation tool removal
- Ventilation system removal



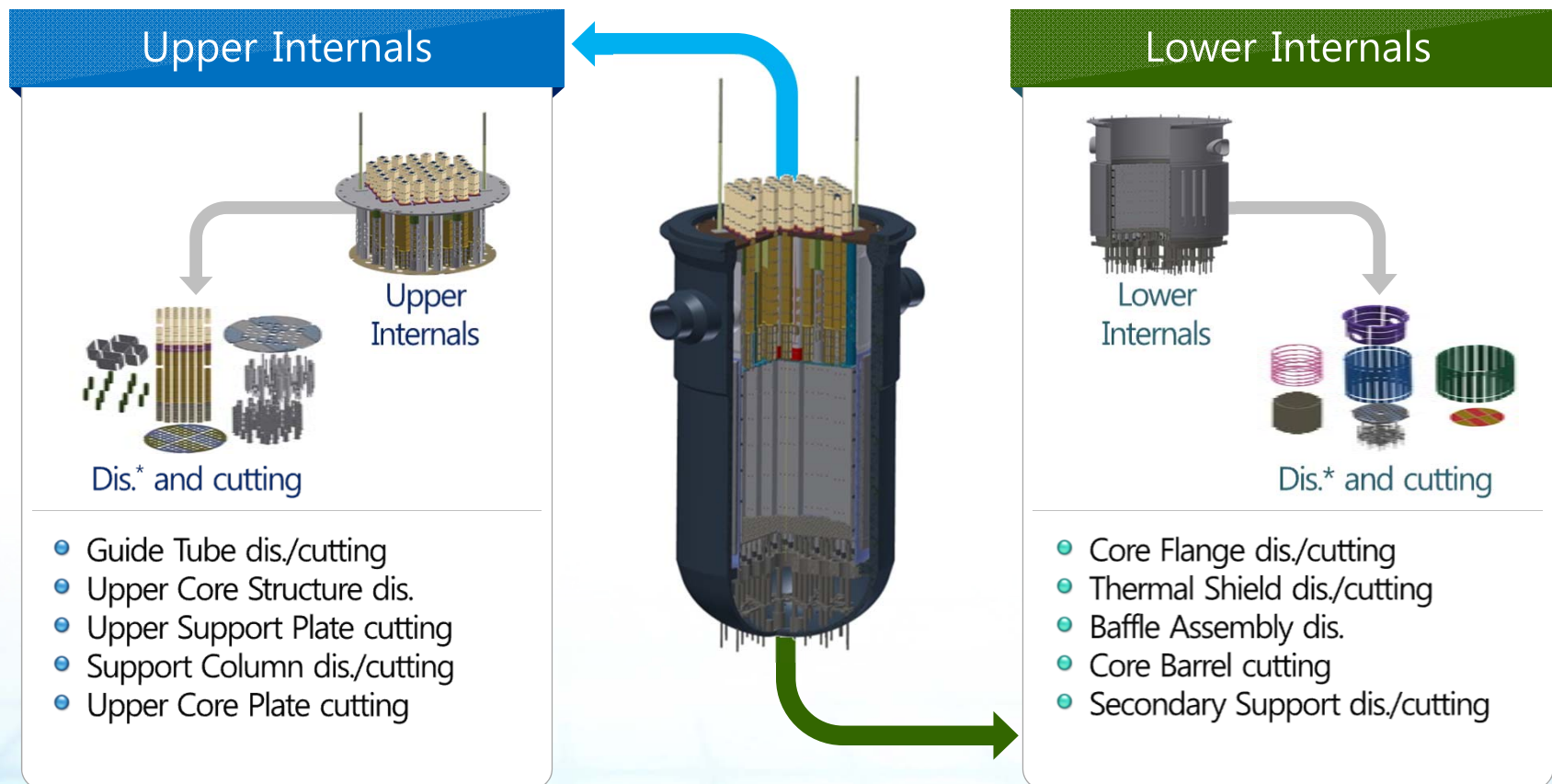
## 02. RV Segmentation (2/2)

### RV segmentation tech and related tools



## 03. RVI Segmentation (1/2)

### Segmentation scenario

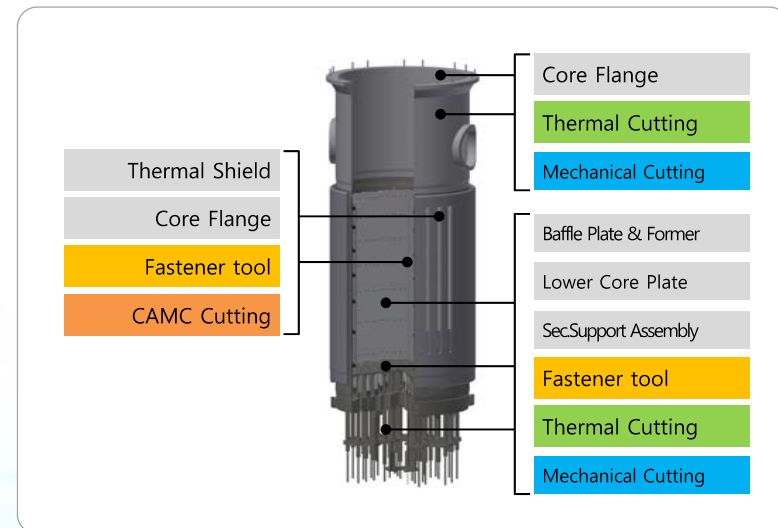
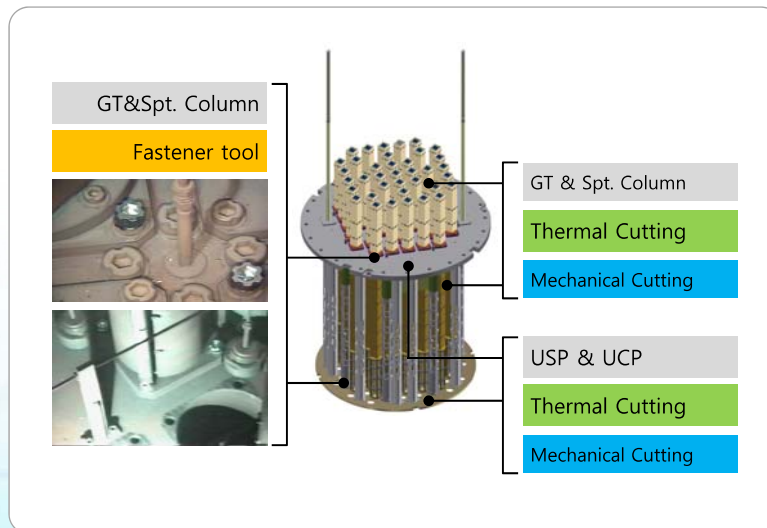


\* Disassemble

## 03. RVI Segmentation (2/2)

- ▣ Fastener tool for component disassemble
- ▣ Selection of suitable tech. (material, thickness, length, etc.)
  - Thermal tech. : Fine Plasma
  - Electrical tech. : Contact Arc Metal Cutting (CAMC)
  - Mechanical tech. : wheel/band Saw

### Segmentation tech. and tool for Kori-1 RVI



# Current Issues

- ▣ Characterization of RV/RVI and bio-shield
  - Sample analysis
  - Accurate calculation
  - Gamma ray imaging system
  
- ▣ D&D radioactive waste management
  - Metal waste treatment, recycle, and/or disposal
  - Selective removal of radioactive nuclide from concrete
  
- ▣ Segmentation process
  - Mockup test
  - Process development and MMI related issues
  - State of the art segmentation technology
  - Min. of secondary waste generated from segmentation, including ventilation, etc.

# Thank you

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