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Dismantling of V1 NPP primary circuit contaminated components - current status

Matej Zachar

VUJE, a.s., Trnava, Slovakia

General information about Project D4.2

- **Title:** D4.2 Dismantling of Reactor Coolant System Large Components
- **Employer:** JAVYS, a.s.
- **Co-funded:** European Union through the European Bank for Reconstruction and Development
- **Contractor:** Consortium Westinghouse Electric Spain; Westinghouse Electric Sweden; VUJE
- **Start date:** 10/2017
- **Duration:** 62 months
- **Main target:** Dismantling and fragmentation of main large components of V1 NPP (2x VVER – 440 reactors)



Co-funded by
the European Union



Westinghouse

vuje

Scope of D4.2 Project – Contaminated components

- **Large contaminated components**
 - Steam Generators - 12 pieces
 - Main Isolation Valves - 24 pieces
 - Main Circulation Pumps - 12 pieces
 - Primary piping
 - Pressurizers - 2 pieces
 - Pressurizer Relief Tanks (“Bubble Tanks”) - 2 pieces
- **Remote handled (RH) waste storage**
 - RH waste retrieval and fragmentation (scope of Westinghouse)
 - Civil part dismantling and demolition (scope of VUJE)
- **Lock-out and Tag-out of systems and components**
- **Dismantling of auxiliary systems and components**

Dismantling of Steam Generators - Concept

- **Concept of Steam Generators (SGs) dismantling and fragmentation:**
 - Manipulation of SGs from Reactor Hall to former Turbine Hall
 - Establishment of temporary storage areas for SG in Turbine Hall
 - Establishment of Dry cutting workshop in Turbine Hall
 - **Dry cutting (fragmentation) of the Steam Generators:**
 - Primary cutting of shell (horizontal and vertical cuts)
 - Secondary cutting of shell (thermal cutting) - pieces with weight less than 1 ton
 - Primary cutting of tubes (70 cm)
 - Secondary cutting of tubes (35 cm – hydraulic shears)
 - Fragmentation of collectors (band saw)



Basic parameters	Weight	156 680 kg	Number of tubes	5 536
	Length of shell	11 800 mm	Tubes diameter	16 mm
	Inside diameter of shell	3 210 mm	Tubes thickness	1,4 mm
	Thickness of shell	72-132 mm		

Dismantling of Steam Generators – Manipulation of SGs

- Disconnection and dismantling of SGs auxiliary systems



Dismantling of Steam Generators – Manipulation of SGs

- Disconnection and dismantling of SGs auxiliary systems



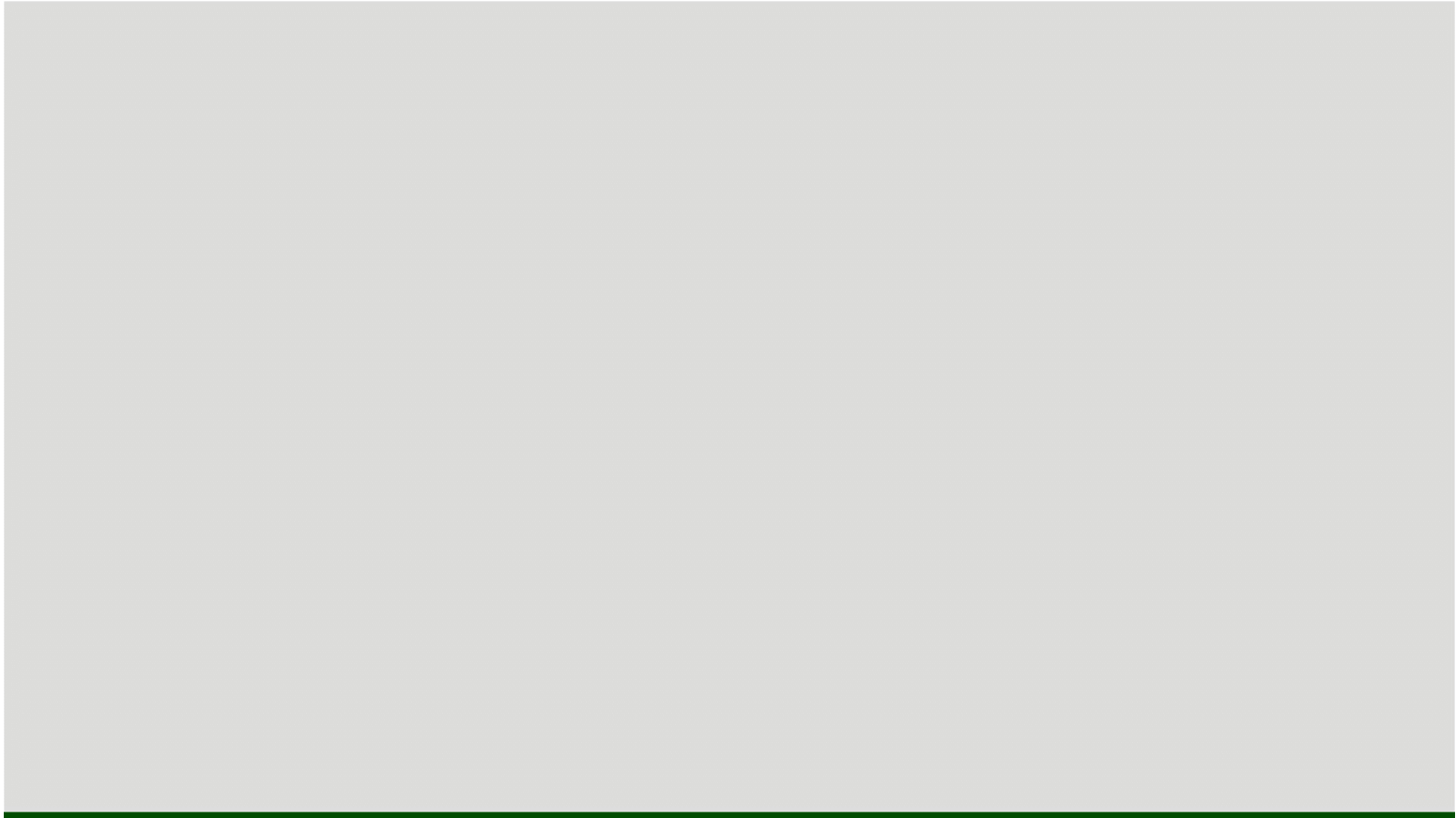
Dismantling of support constructions



Blinding of SG openings

Dismantling of Steam Generators – Manipulation of SGs

- Lowering of SG on the floor

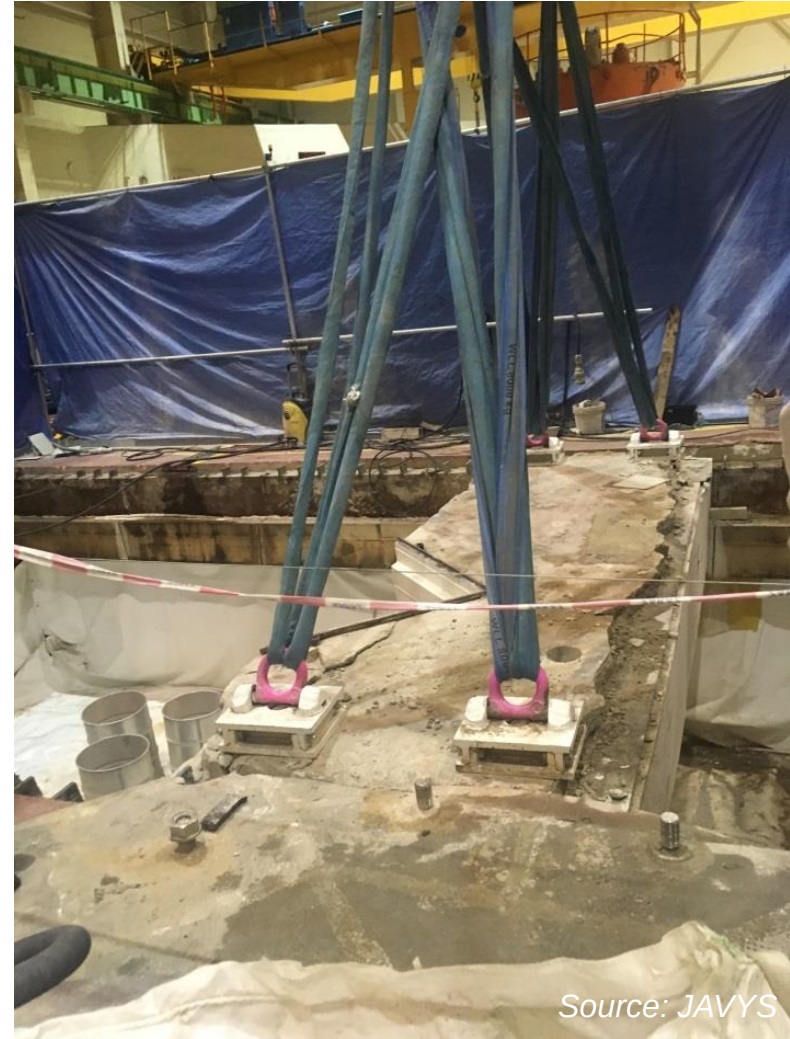


Dismantling of Steam Generators – Manipulation of SGs

- Removal of the slab

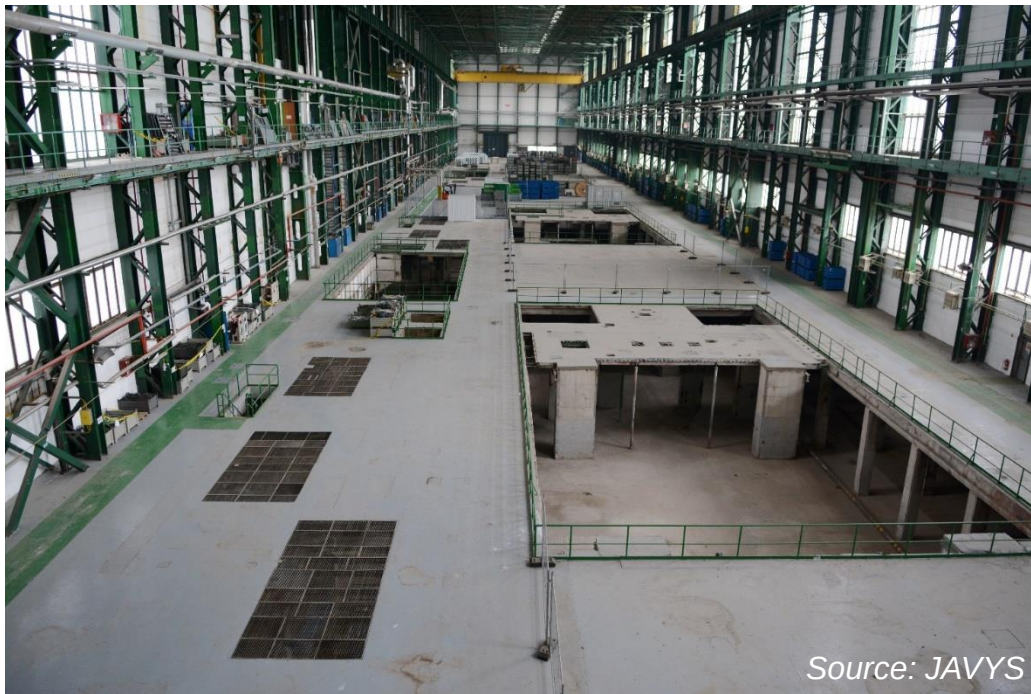


**5 blocks per each opening;
each = approximately 25 tons**



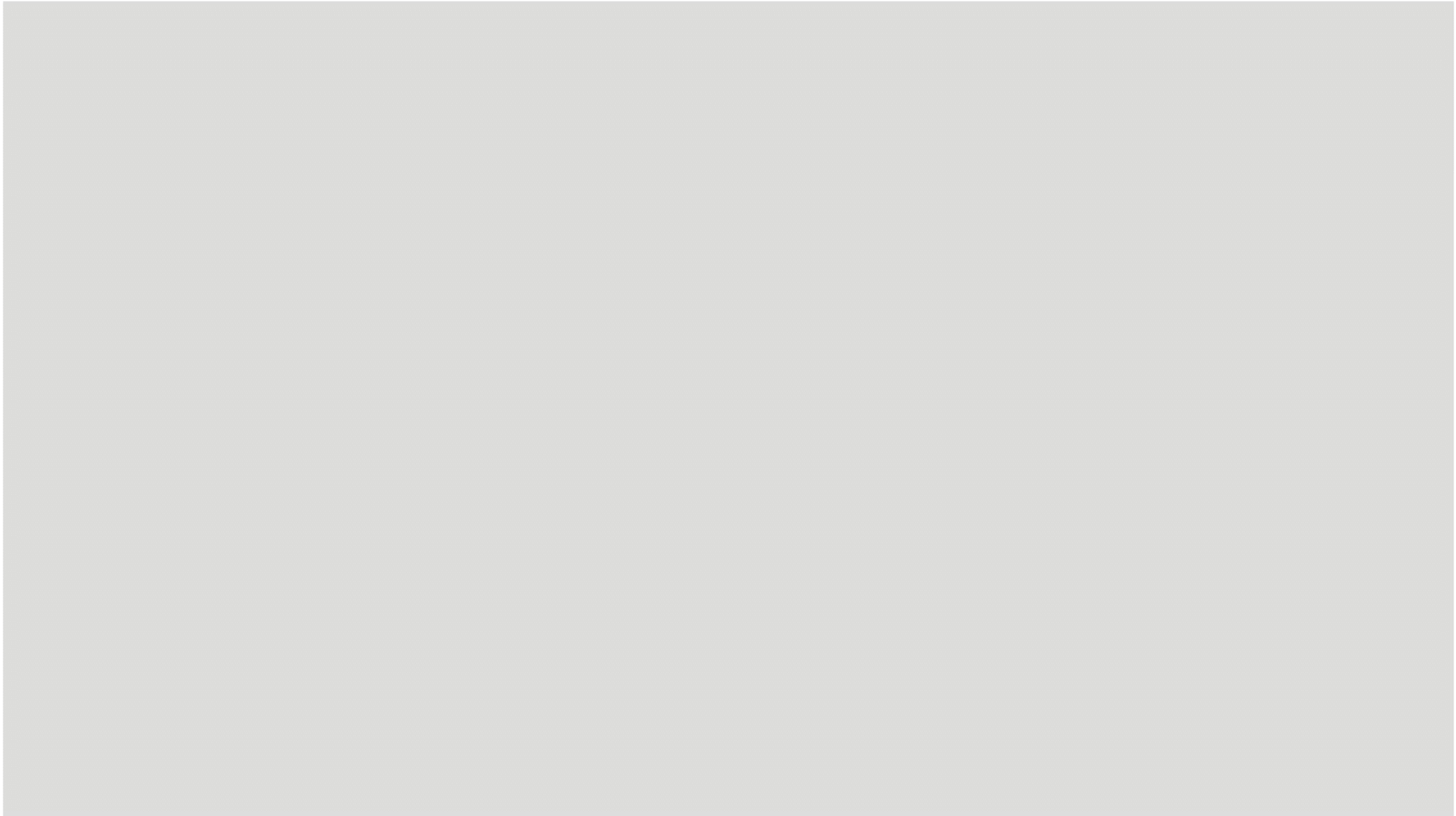
Dismantling of Steam Generators – Storage areas establishment

- Establishment of temporary storage areas for SGs in Turbine Hall
- Final state – established controlled area



Dismantling of Steam Generators – Manipulation of SGs

- Extraction and movement of SGs



Dismantling of Steam Generators – Manipulation of SGs



**Current state –
9 out of 12 SGs
are manipulated
and stored in
Turbine Hall**

Source: JAVYS

Dismantling of Steam Generators – Workshop establishment

- Construction of Dry cutting workshop in Turbine Hall



Dismantling of Steam Generators – Workshop establishment

- Installation of auxiliary systems (ventilation, cranes, band saw) in Dry cutting workshop

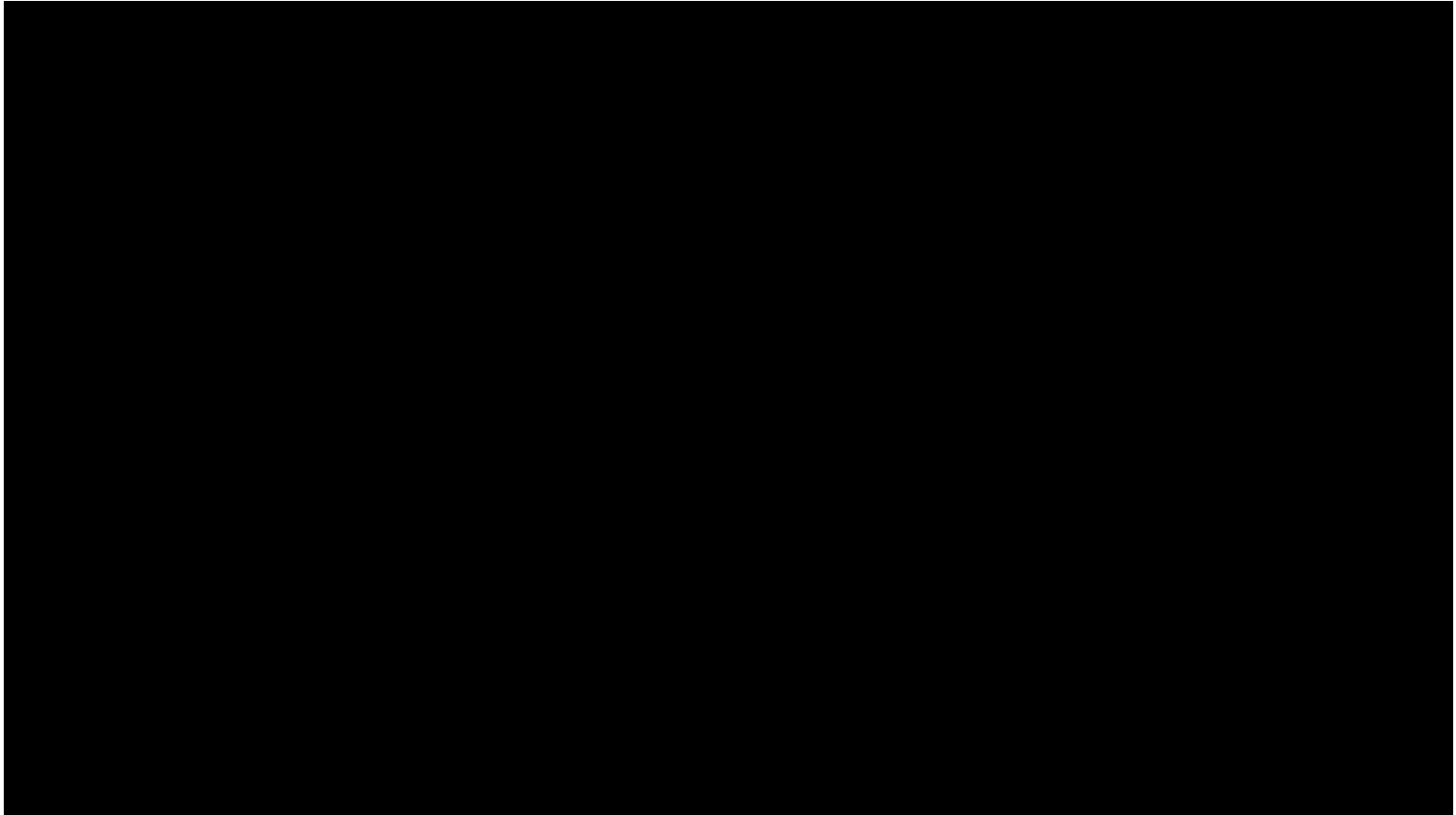


Source: JAVYS

**Installation,
commissioning and
testing of cutting
equipment -
planned to be done
this summer**

Dismantling of Steam Generators – Fragmentation

- FAT tests of the cutting equipment – successfully performed
- Cutting of SG tubes



Dismantling of Pressurizer and Bubble Tank - Concept

- **Concept of Pressurizer (PRZ) dismantling and fragmentation:**
 - In-situ dismantling and fragmentation
 - Removal of PRZ heaters – reduce the dose rate
 - Primary fragmentation by wire saw
 - Secondary fragmentation (thermal methods) - pieces with weight less than 1 ton
- **Concept of Bubble Tank (BT) dismantling and fragmentation:**
 - In-situ dismantling and fragmentation
 - Primary and secondary fragmentation by plasma cutting tool

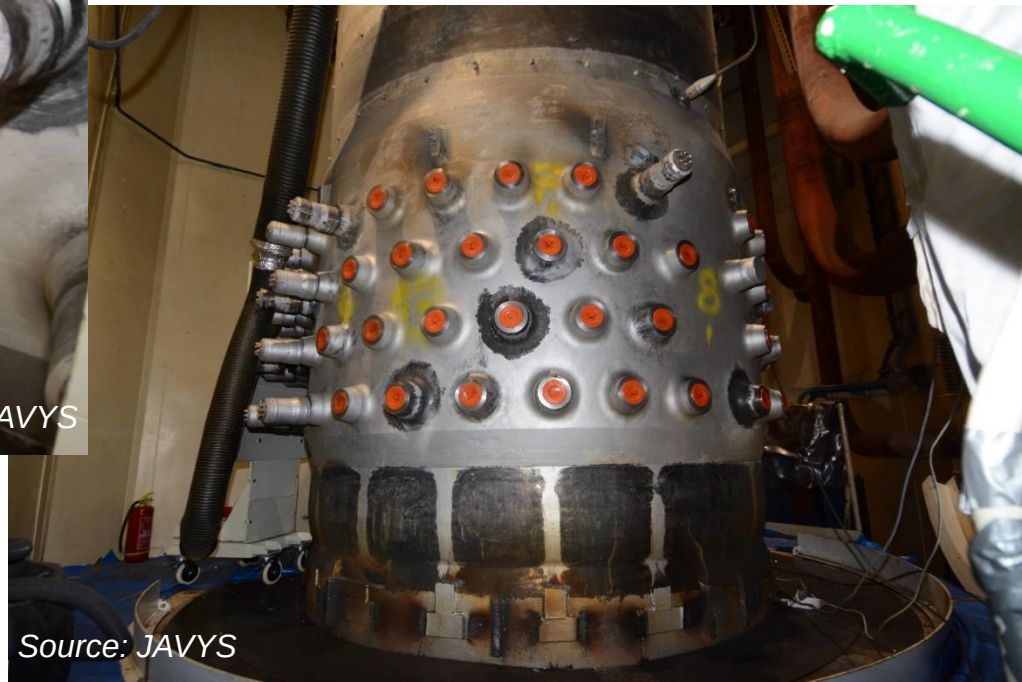
Basic parameters	PRZ weight	118 800 kg	BT weight	6 350 kg
	Height	10 835 mm	Length	5 400 mm
	External diameter	2 675-2 770 mm	External diameter	2 026 mm

Dismantling of Pressurizer and Bubble Tank- Performed activities

- Bubble Tank – dismantling was completed (Unit 1)
- Pressurizer Heaters (108 pieces) – removal was completed (Unit 1)



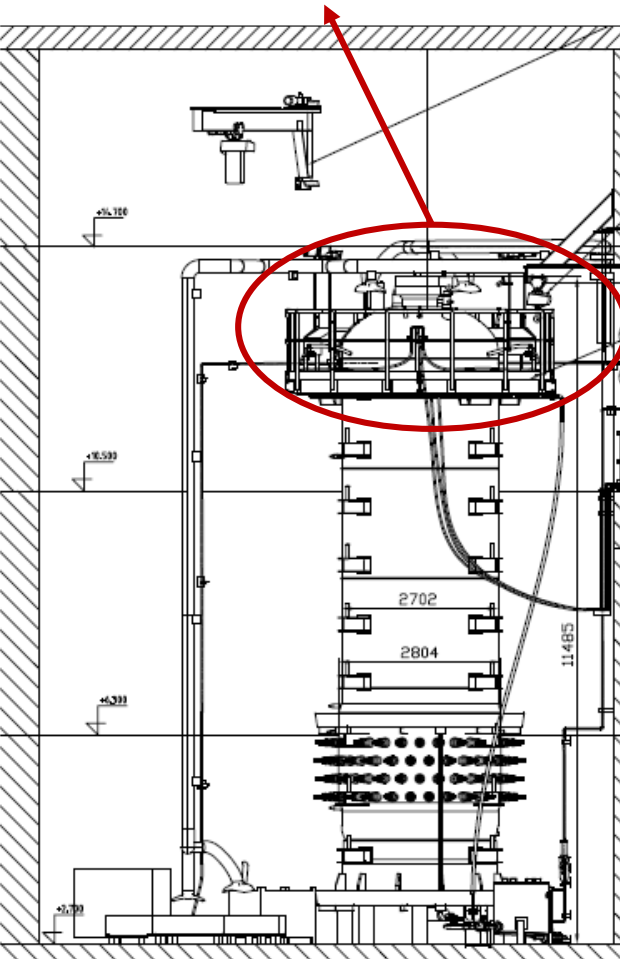
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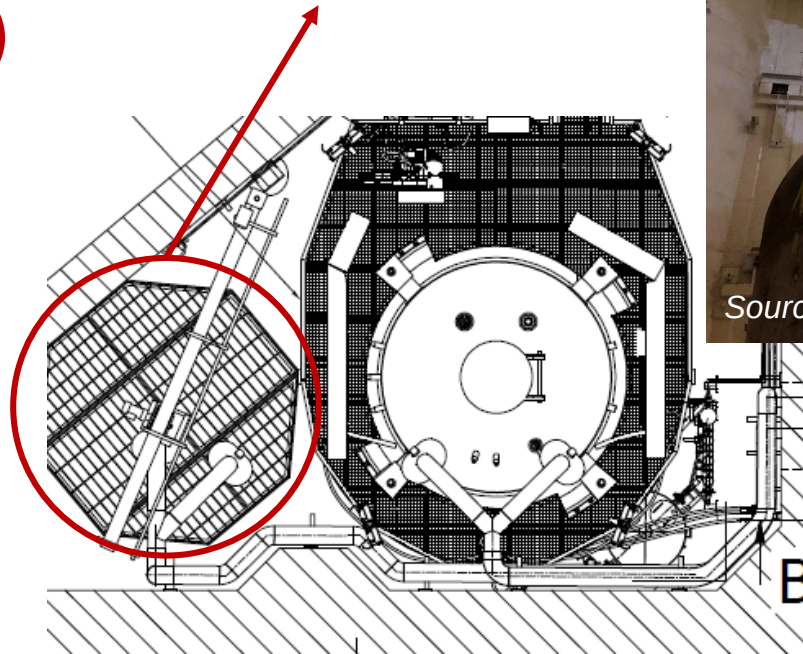
Source: JAVYS

Dismantling of Pressurizer – Workplace

Platform with wire saw



Area of secondary fragmentation – thermal cutting



Opening
above PRZ

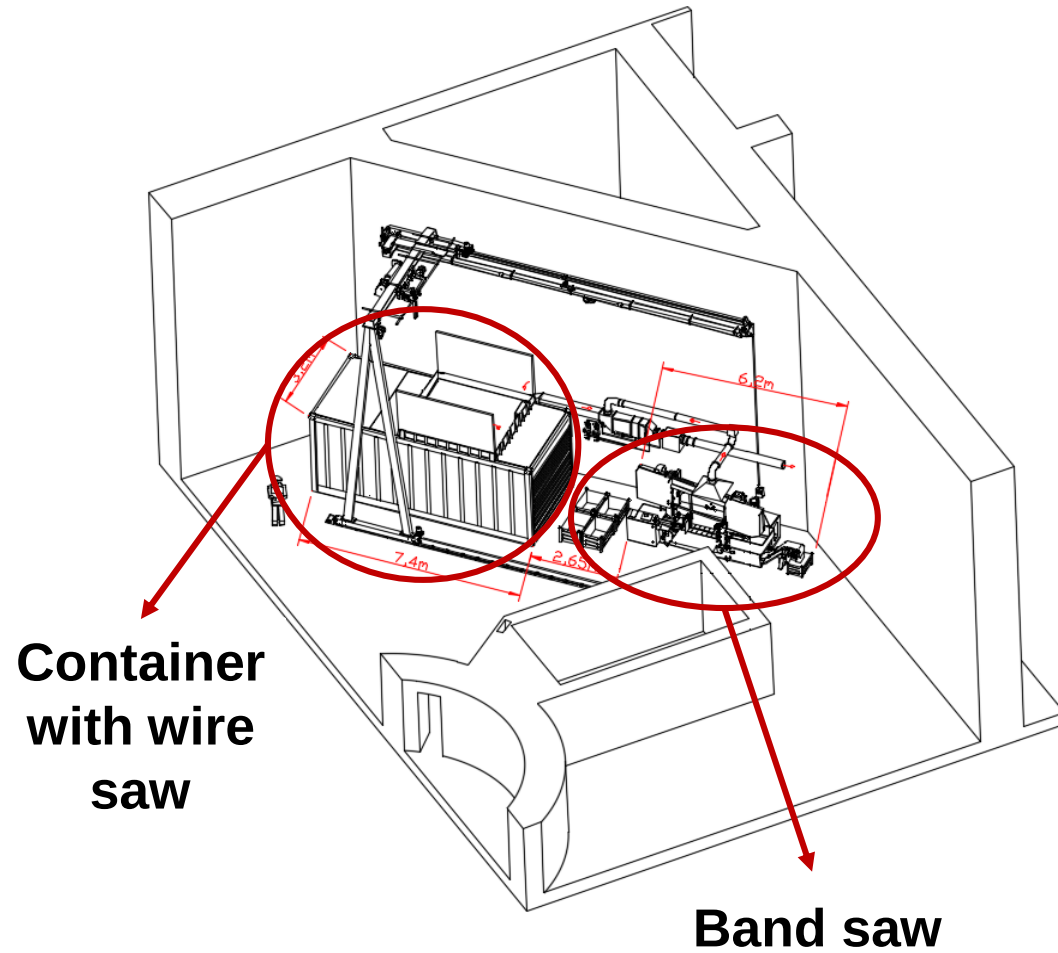
Dismantling of Main Circulating Pumps, Main Isolation Valves and Primary Piping - Concept

- **Concept of Main Circulating Pumps (MCP), Main Isolation Valves (MIV) and Primary Piping (PP):**
 - Primary piping – partially dismantled (fragmented) in-situ (wire and orbital saw) followed by fragmentation in Dry cutting workshop
 - Disassembling (dismantling) of relevant removable parts of MCP and MIV - disconnection and unsealing of MCPs is now being performed
 - Establishment of Dry cutting workshop for MCP and MIV fragmentation (one per each unit)

Basic parameters	Length per loop (PP)	approx. 36 000 mm	Total weight of MCP (including stator, rotor, impeller...)	51 000 kg	Total weight of MIV	8 000 kg
	Diameter	560 mm	Maximum diameter (MCP)	3 675 mm	Diameter (MIV)	1 650 mm
	Wall thickness	32 mm				

Dismantling of Main Circulating Pumps, Main Isolation Valves and Primary Piping – Dry cutting workshop

- **Manufacturing of dry cutting workshop:**
 - Container with portal wire saw cooled by water
 - Band saw near the container

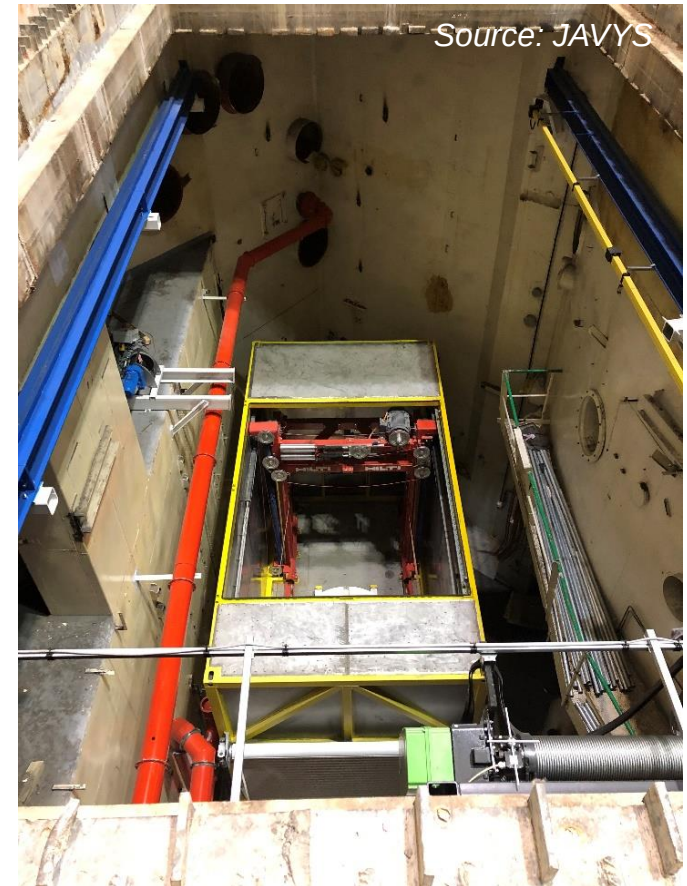


Dismantling of Main Circulating Pumps, Main Isolation Valves and Primary Piping – Dry cutting workshop



Dismantling of Main Circulating Pumps, Main Isolation Valves and Primary Piping – Dry cutting workshop

- **Preparation of the area for dry cutting workshop:**
 - Former area of two SGs (one per each unit)
 - **Commissioning tests – in July (Unit 1)**



Thank you very much for your attention

matej.zachar@vuje.sk