

CHALLENGES TODAY.  
RESPONSIBILITY FOR AGES

Virtual Workshop  
2 March 2022

Steam Drum Separator Dismantling



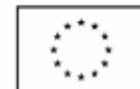
IGNALINA  
NUCLEAR  
POWER PLANT



ACCREDITED  
MSCB-113



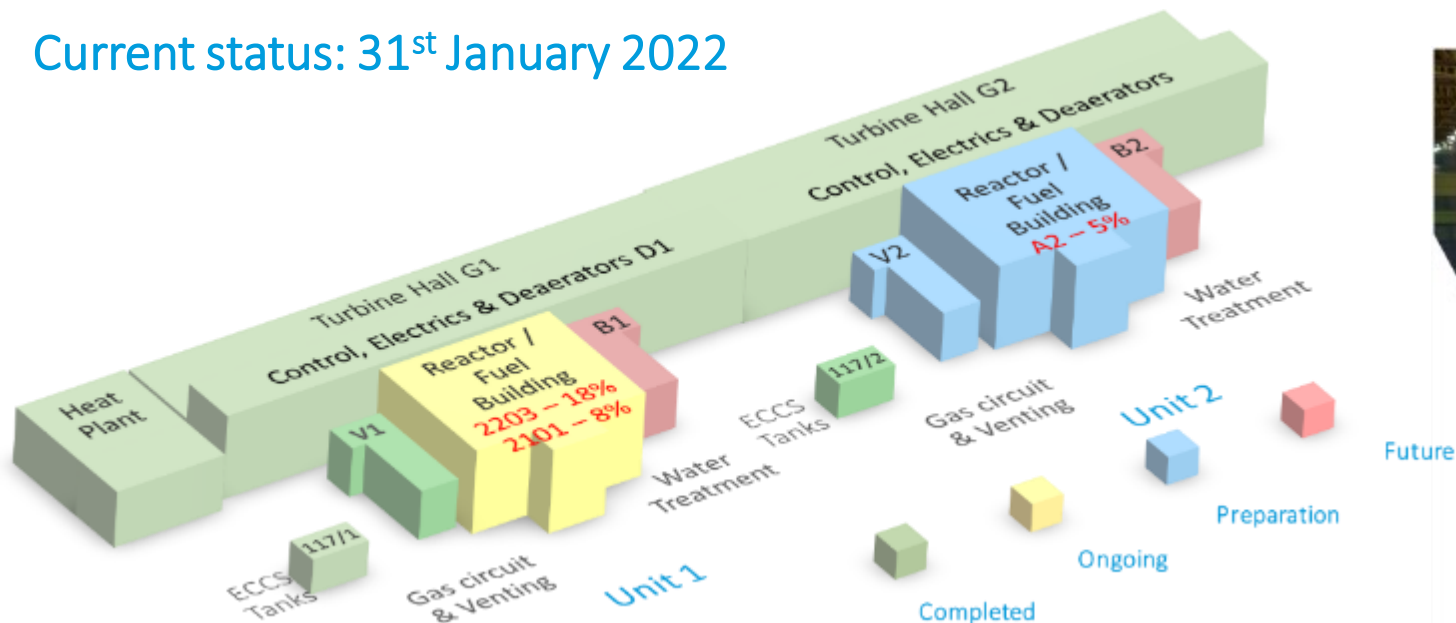
ISO 9001:2015  
GKLT-0199-QC



Ignalina NPP decommissioning  
activities are co-financed by  
the European Union

# INPP dismantling projects

Current status: 31<sup>st</sup> January 2022

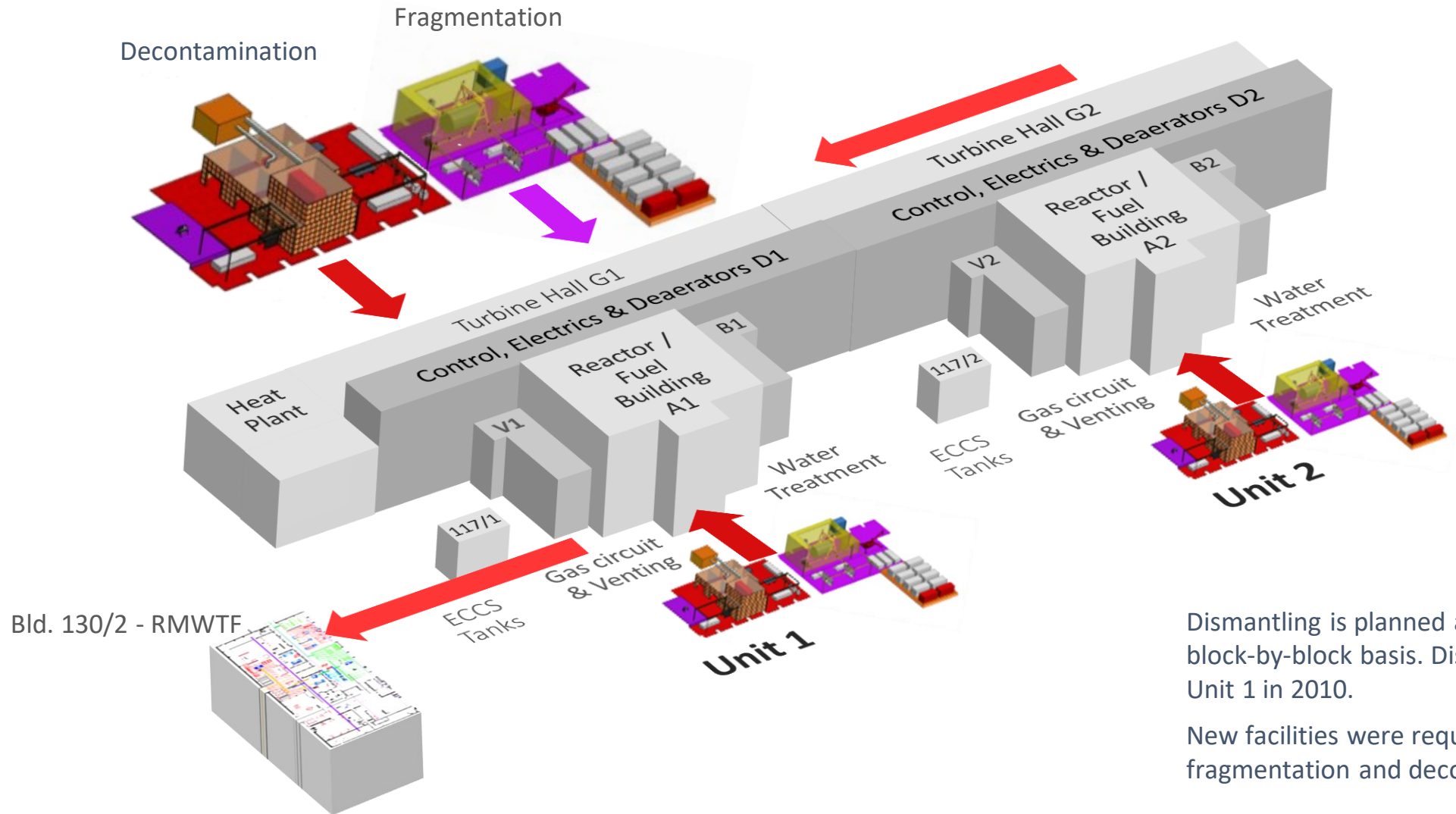


	x 1000 tons	2010-2021	2022	2022	2010-2038
		(in all)	(plan)	(fact)	(in all)
<b>Dismantled:</b>	Equipment	62,4	3,8	0,2	166,9
	Concrete	9,2	4,8	0,4	1 919,4
<b>Waste free-released:</b>	Equipment	50,6	4,4	0,1	124,4
	Concrete	8,3	3,6	0,4	1 754,5





# INPP New Waste Treatment Facilities and radioactive waste streams

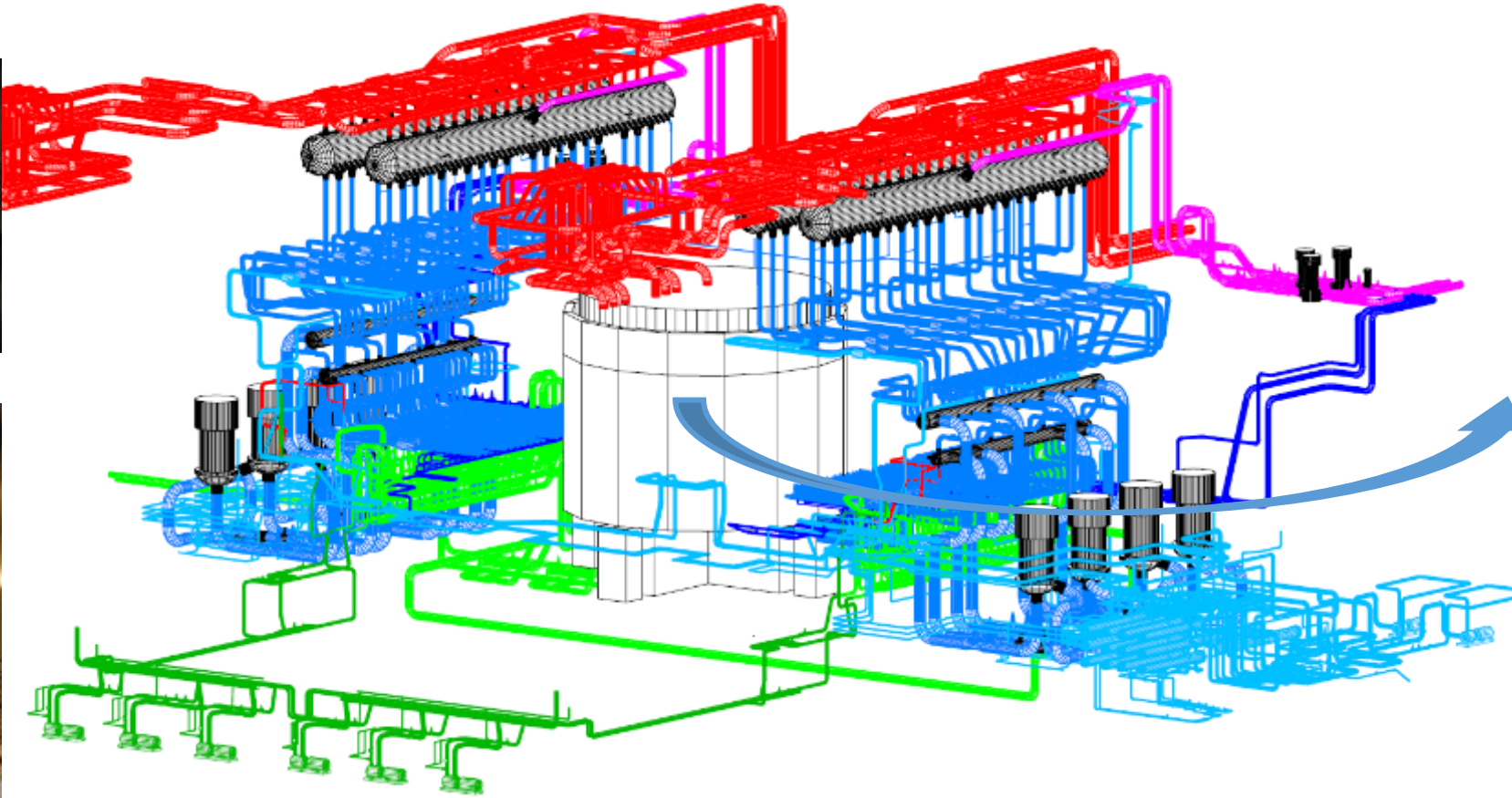


Dismantling is planned and executed on a block-by-block basis. Dismantling started in Unit 1 in 2010.

New facilities were required for fragmentation and decontamination

# INPP dismantling projects

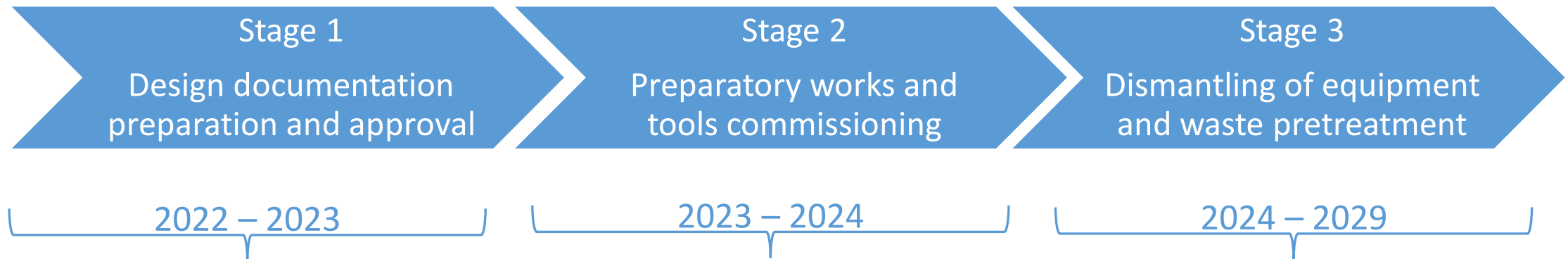
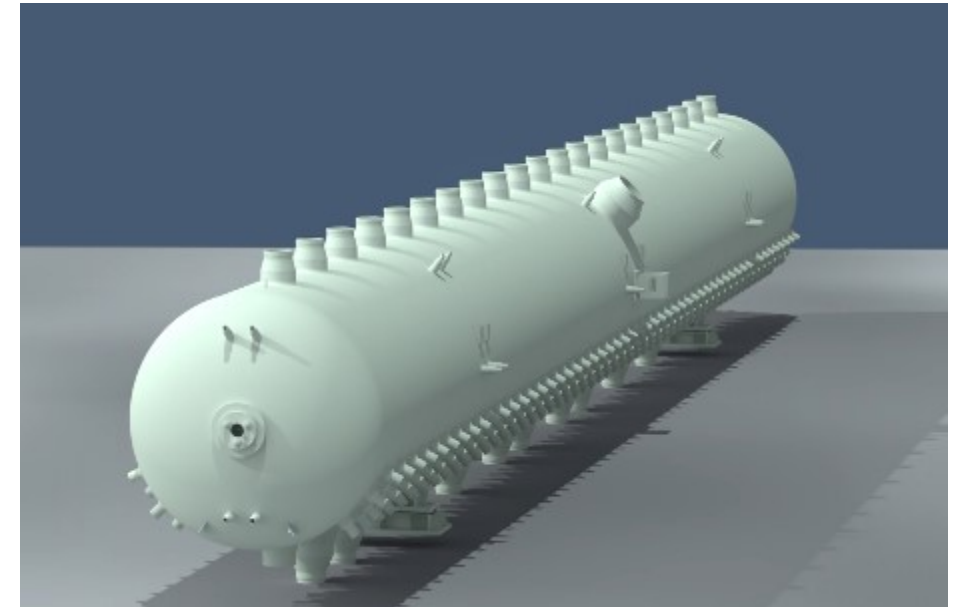
New projects: Units A1, A2/V2, R1/R2 and R3 zones D&D



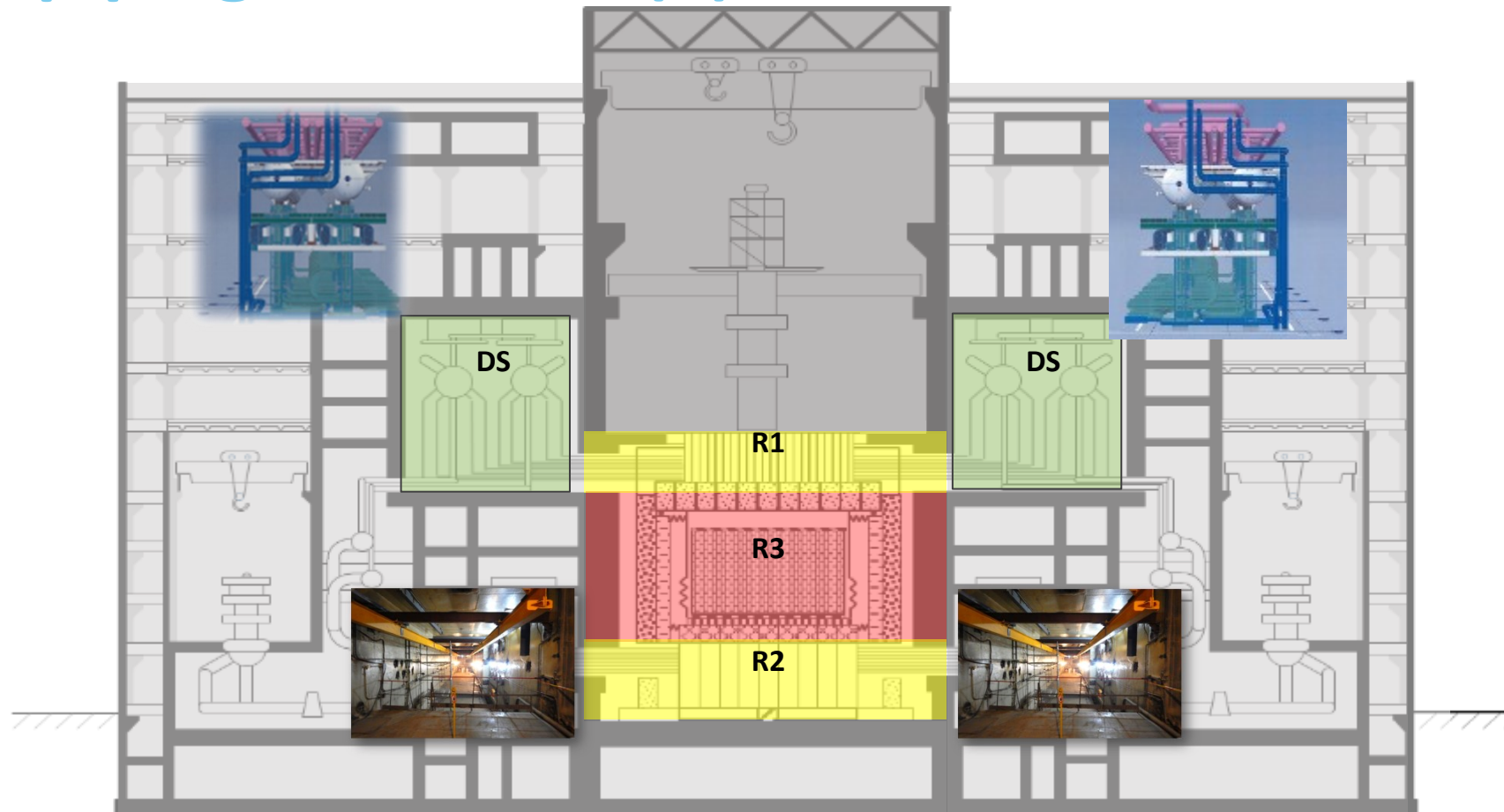
# D&D project for Steam Drum-Separator and primary piping at block A (1)

SE Ignalina NPP intends to procure services for D&D of Steam Drum-Separators and primary piping at block A.

The contract duration will be about 6-8 years (depends on dismantling and waste treatment technologies)



# D&D project for Steam Drum-Separator and primary piping at block A (2)



- Areas not linked with core dismantling (scope of projects 2203 and 2210)
- Areas linked with core dismantling (scope of projects 2203 and 2210)
- Above/below core zones (R1 + R2) (scope of projects 2101 and 2102)

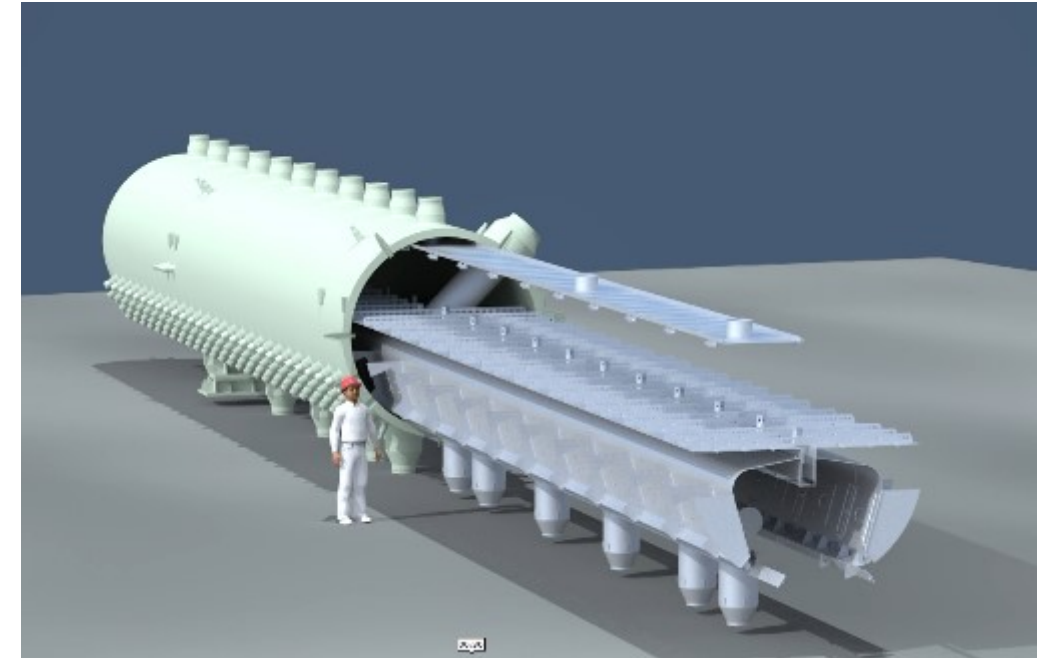
- Reactor core zona (R3) (scope of the project 2103)
- Drum Separators rooms 506/1,2 (Contractor's scope of supply)



# D&D project for Steam Drum-Separator and primary piping at block A (3)

## Scope of Supply:

- Development of new/modification of existing D&D Technological Project and SAR
- Approval of new/modified D&D Technological Project and SAR by INPP
- Approval by regulatory agencies and stakeholders
- Engineering completion and drawing/document approvals
- Procurement, manufacturing, and testing of the equipment
- Site work – installation
- **D&D of DS and associated systems :**
  - ✓ dismantling of equipment
  - ✓ fragmentation up to required dimensions
  - ✓ waste transportation to Waste Pre-treatment Workshop in Blocks A1/A2
- Closing works (deinstallation of equipment used for D&D, rooms emptying)



# D&D project for Steam Drum-Separator and primary piping at block A (4)

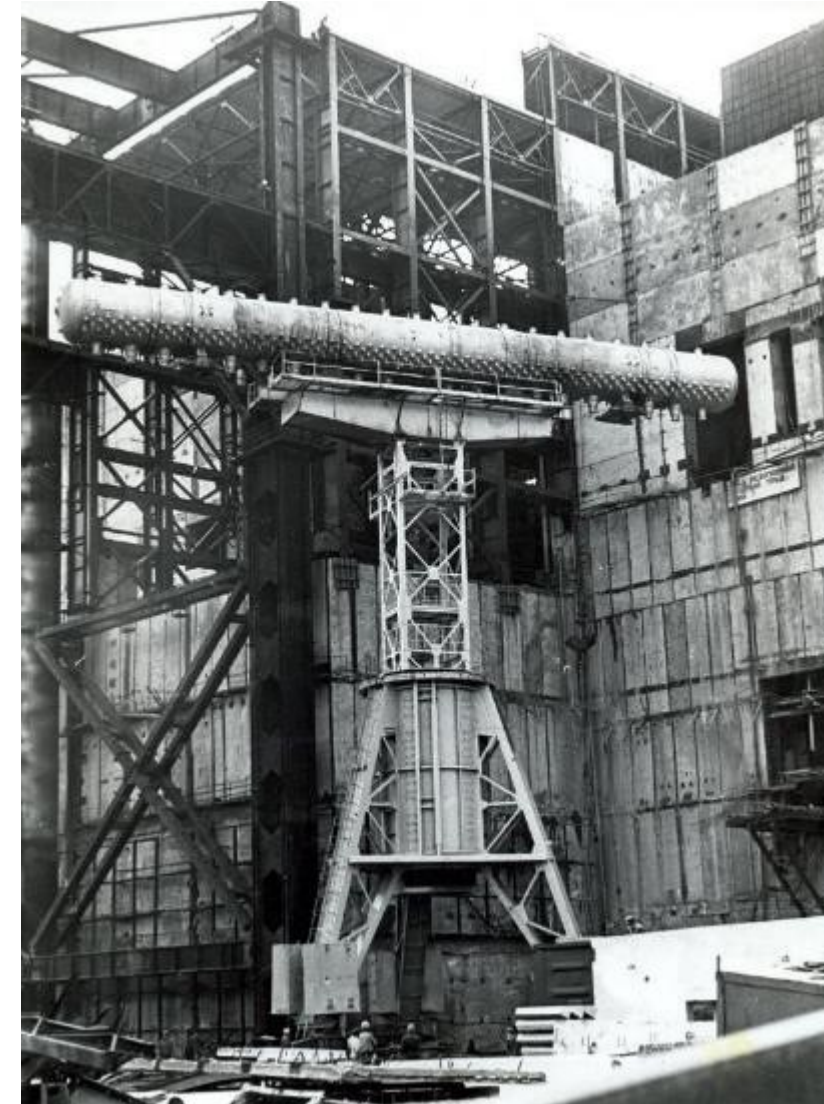
## Drum-Separator physical dimensions:

- Size (L x D) – 33 x 2.9 m
- Mass – 300 t
- Wall thickness –115 mm
- Materials: vessel – carbon steel



## The following equipment is associated with DS dismantling:

- Metal constructions within the room: columns, beams, platforms, stairs, supports, ceilings, brackets, hangers, fuel claddings integrity monitoring system boxes, etc. (room 506/1(2), 615/1-8, 639/1(2), 706/1(2))
- Trolleys of fuel claddings integrity monitoring system (room 615/1-8)
- Various cables and casings, monitoring system devices, automation boxes, etc. (room 506/1(2), 615/1-8, 706/1(2))
- Drum-Separators (room 506/1(2))
- Balance vessels (room 506/1(2), 706/1(2))
- Pipe valves > Ø100, etc. (room 506/1(2), 706/1(2))
- Pipelines (room 506/1(2), 706/1(2))
- Removal of thermal insulation (room 506/1(2), 706/1(2))





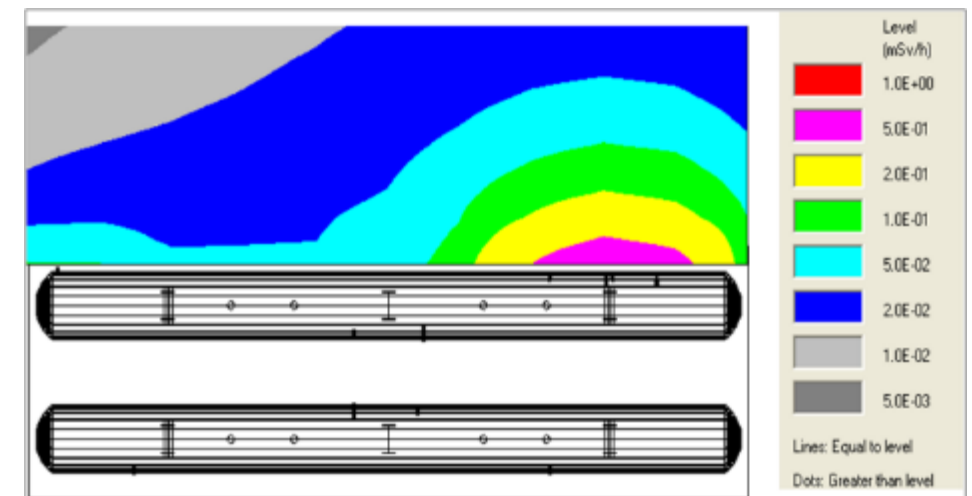
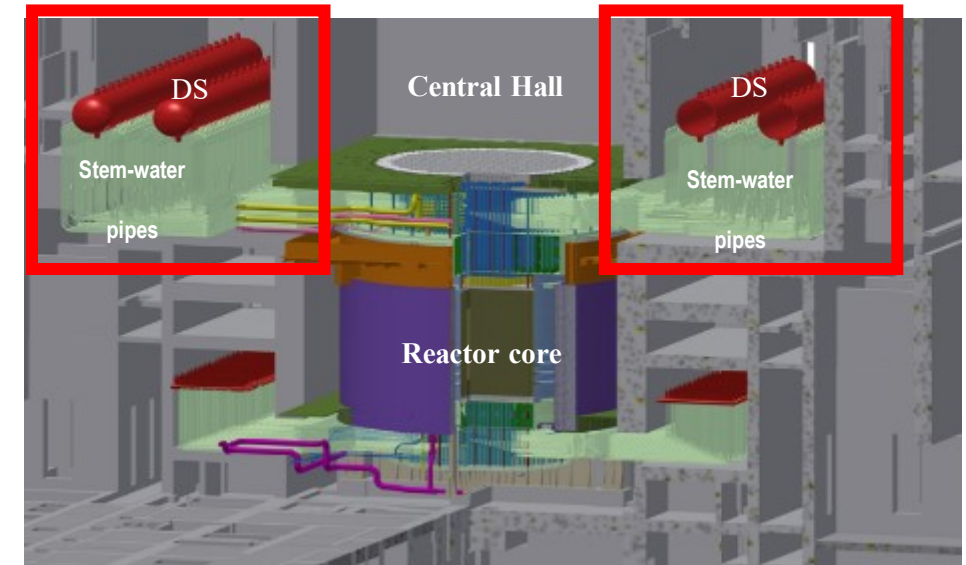
# D&D project for Steam Drum-Separator and primary piping at block A (4)

## Preliminary data on equipment to be dismantled (for one Unit):

- mass of equipment to be dismantled – **3 100 t**
- mass of class 0 waste – **0.8 t (Free Release Waste)**
- mass of class A waste – **1 861 t (VLLW-Very Low Level Waste)**
- mass of class B waste – **37 t (LLW - Low Level Waste)**
- mass of class C waste – **1 200 t (ILW – Intermediate Level Waste)**

## The radiological conditions in the DS work zone are caused by this:

- the  $\gamma$  dose rate from the drum-separators is up to **1 mSv/h**
- the  $\gamma$  dose rate from the drum-separator water cross junctions, downflow pipes and drains is up to **3 mSv/h**
- the  $\gamma$  dose rate from the steam-water reserve branches is up to **10 mSv/h (hot spots)**
- the  $\gamma$  dose rate from the plugs of dismantled water cross junctions is up to **20 mSv/h (hot spots)**



# Project scope (1)

## Development of new/modification of existing D&D Technological Project and SAR:

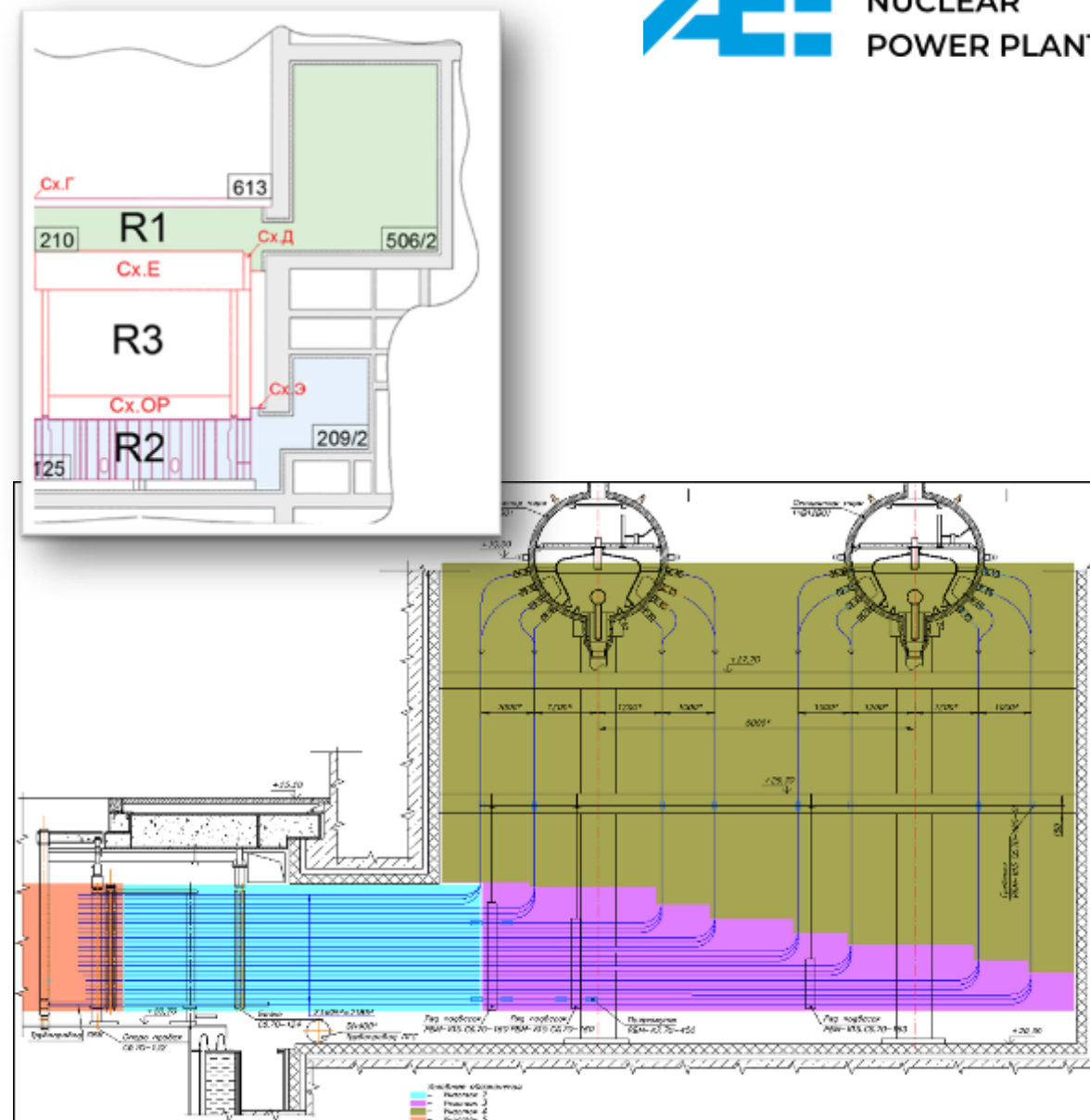
- TD and SAR for Unit A1 D&D were approved by VATESI and TSO experts in **May 2021**
- Dismantling of drum separators and auxiliary equipment is a part of the agreed documents
- In order to reduce radiation exposure of personnel, the scope of supply includes the development of a new, more advanced technology for dismantling
- The Supplier shall provide:
  - ✓ Technological Project for Dismantling of the equipment, Safety Analysis Report and associated technical documentation (justifications, calculations, etc.)
  - ✓ Licensing support to INPP, to obtain regulatory approval (VATESI) of licensing documents (TP and SAR) for drum separators dismantling and fragmentation



# Project scope (2)

## The main initial conditions for design:

- Dismantling works of SWP in the rooms 506/1(2) are completed (works are carried out within the framework of the project UP01)
- To improve the radiological conditions, drum separators “hot spots” will be removed in the scope of projects 2203 and 2210
- Complete information on equipment items is available in the database (DMSD)
- The amount of waste resulting from dismantling should be consistent with the capacity of the Waste Pre-treatment Workshops in Block A1/A2
- When developing a strategy for dismantling and waste management, the Supplier may consider alternative options for waste buffer storage

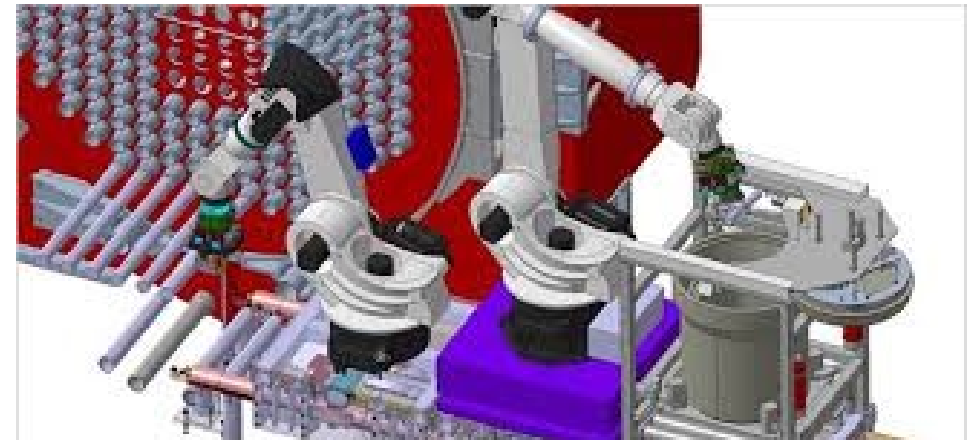
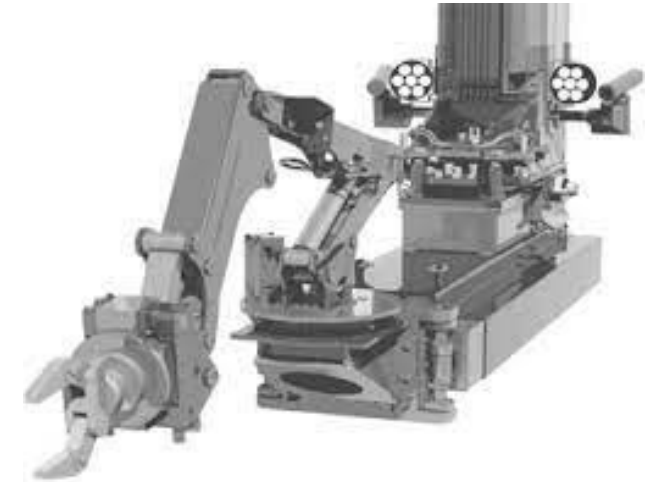




# Project scope (3)

## Procurement, manufacturing, testing and commissioning of the equipment:

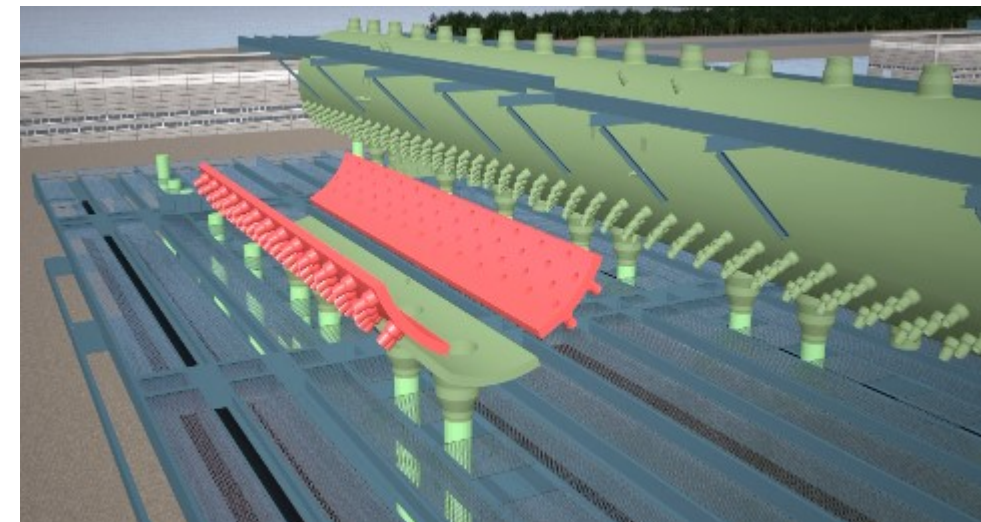
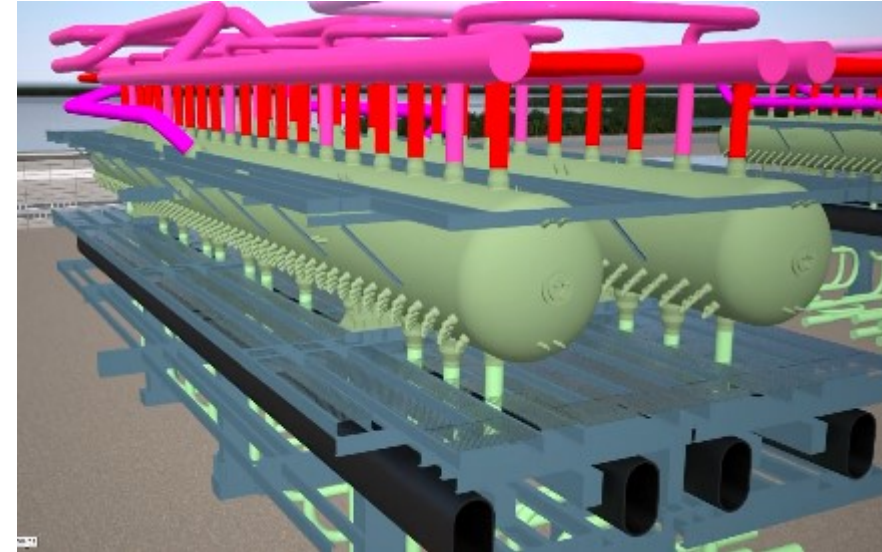
- Based on the technological solutions agreed with INPP and the regulator (VATESI), the Supplier must ensure the delivery and commissioning of the equipment necessary for the implementation of the project
- Design and manufacturing of equipment should be provided in case there is no off-the-shelf equipment
- It must be taken into account that during the performance of work the equipment will be contaminated and cannot be taken out of the INPP controlled area after completion of dismantling.



# Project scope (4)

## D&D of DS and associated systems :

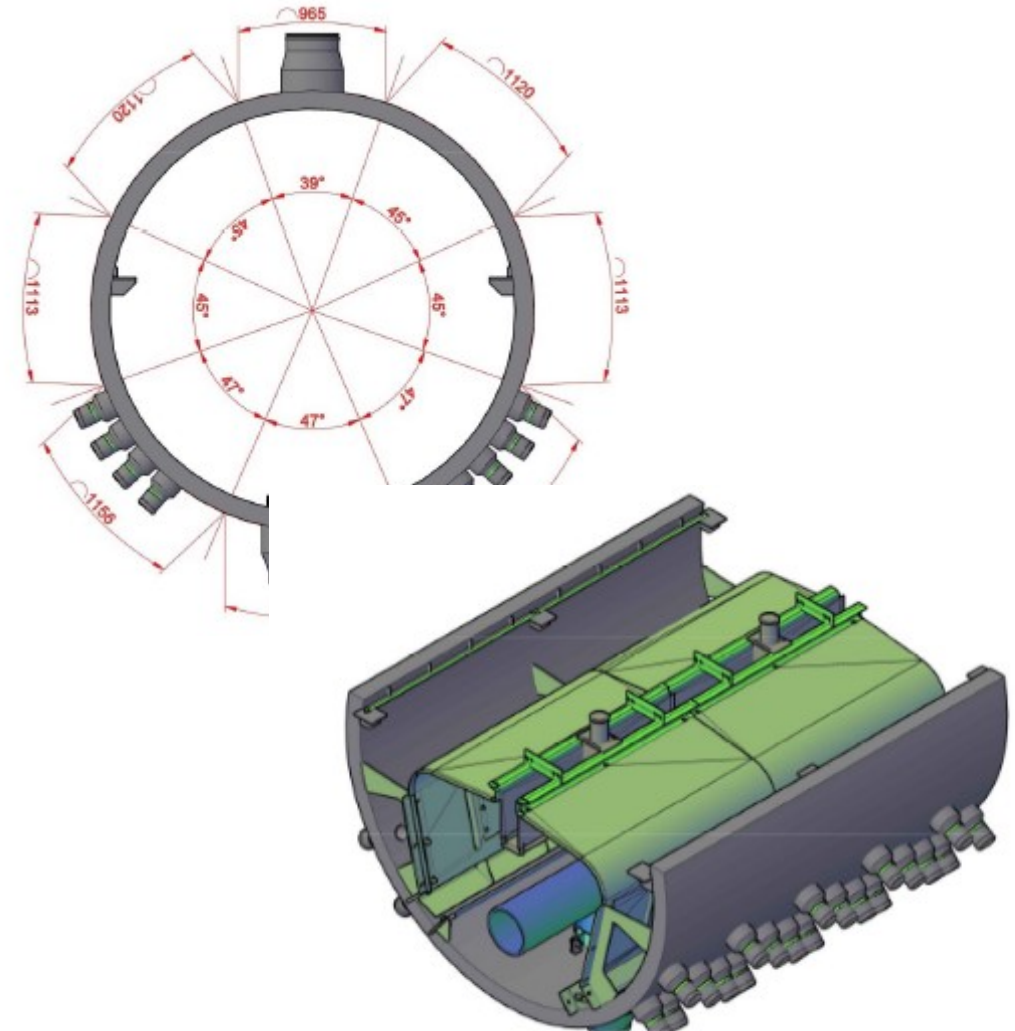
- Works will be performed in INPP building 101/1 Unit A1 and Unit A2, rooms 506/1 (2), 706/1 (2), 615/1-8 and 639/1. These are category I and II rooms according to INPP radiation safety criteria;
- The Supplier must ensure that it has sufficient capacity, resources, equipment, spare parts and consumables necessary to fulfil completely the Contract
- Implementation of site works for the dismantling and fragmentation of the Steam Drum Separators, pipelines, fuel cladding monitoring system, control measuring devices and other local metal structures
- **animation of existing technology [\(video\)](#)**



# Project scope (5)

## D&D of DS and associated systems :

- Removal of the dismantled and fragmented sections to the initial processing location for handover to INPP operators or placement of dismantled sections into temporary buffer storage location (if any) for handover to INPP operators at a later date:
  - ✓ All disassembled and fragmented waste must not be larger than 1000 mm x 1000 mm
  - ✓ the weight of each fragment should not exceed the carrying capacity of the lifting mechanisms
- **Closing works** - after the completion of dismantling, the equipment used for D&D must be uninstalled, rooms shall be emptied





# Project scope (6)

When providing the services, the Service Provider must comply with:

- The Law on Safety and Health at Work of the Republic of Lithuania
- The requirements of regulations, normative, technical and other documents applicable in the field of nuclear energy in the Republic of Lithuania
- The requirements of the regulations and local legislation of occupational health and safety, fire and radiation safety applicable in SE INPP
- [video of work areas](#)



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Ignalinos AE eksploatacijos  
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