CHALLENGES TODAY.
RESPONSIBILITY FOR AGES

IGNALINA
NUCLEAR
POWER PLANT

“Installation of Radioactive Metal Waste Treatment Facility in the Former INPP Workshop (Building 130/2)”

ACI's 9th Nuclear Decommissioning & Waste Management Summit
22-23 February 2023, London

ACCREDITED
MSCB-113

ISO 9001:2015
GKLT-0199-QC

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

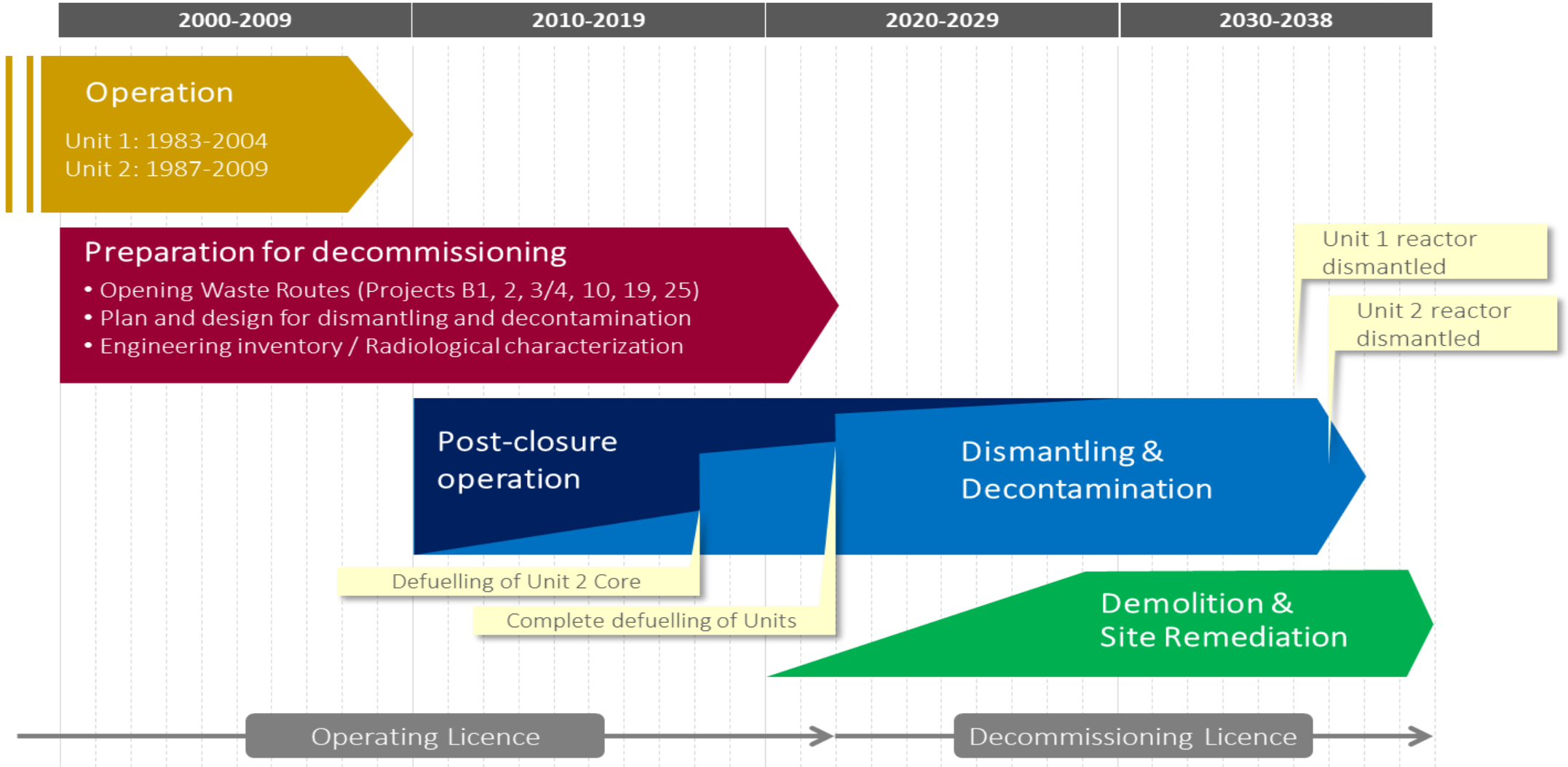
INPP general information

Location: Far north-east corner of Lithuania. Immediately bordering Latvia and Belarus

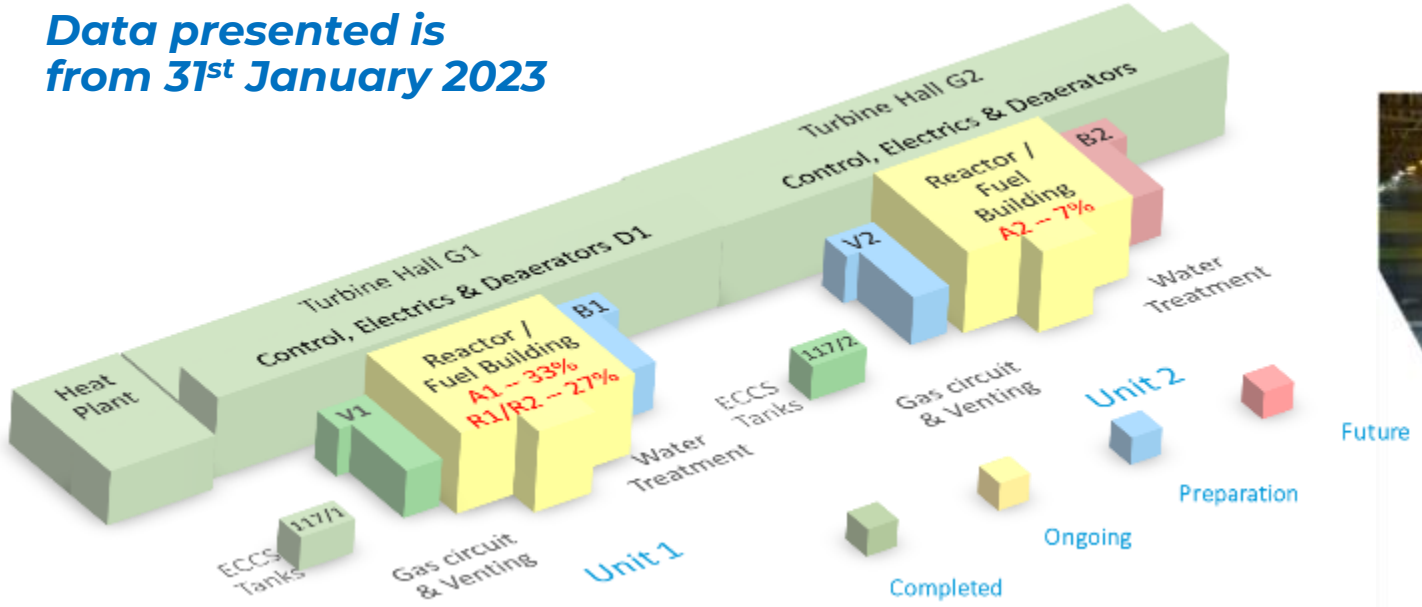
Design: 2 × RBMK-1500 water-cooled, graphite-moderated channel-type power reactors

Capacity: Intended to supply NW region of the former USSR (not Lithuania). After independence, one unit could produce 80% of Lithuanian electricity demand

Operation:
Unit 1 commissioned Dec 1983 / closed Dec 2004
Unit 2 commissioned Aug 1987 / closed Dec 2009

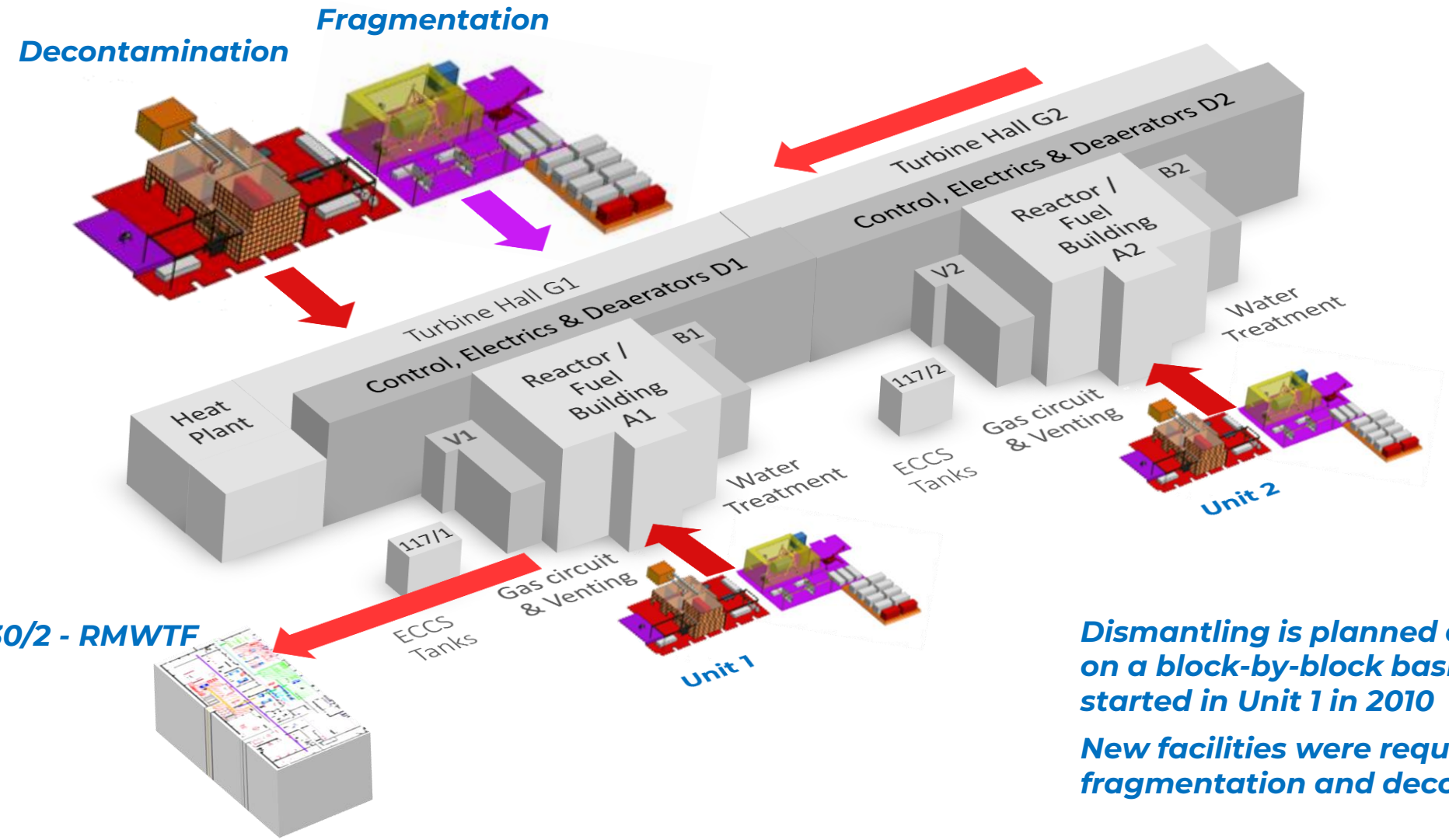

2000-2009
2010-2019
2020-2029
2030-2038
Operation
Unit 1: 1983-2004
Unit 2: 1987-2009
Preparation for decommissioning
• Opening Waste Routes (Projects B1, 2, 3/4, 10, 19, 25)
• Plan and design for dismantling and decontamination
• Engineering inventory / Radiological characterization
Unit 1 reactor dismantled
Unit 2 reactor dismantled
Post-closure operation
Dismantling & Decontamination
Defuelling of Unit 2 Core
Complete defuelling of Units
Demolition & Site Remediation
Operating Licence
Decommissioning Licence

Data presented is from 31st January 2023



	x 1000 tons	*2010-2022*	*2010-2038*
		(in all)	*(in all)*
Dismantled:	***Equipment***	66,4	176,3
	Construction	14,0	1 919,4
Waste free-released:	***Equipment***	54,1	124,4
	Construction	12,7	1 754,5

As the result of INPP technological equipment dismantling, around 180 thousand tons of waste are generated.



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

The areas for G1 Turbine Hall waste treatment were organized in bl. G1 in 2013.

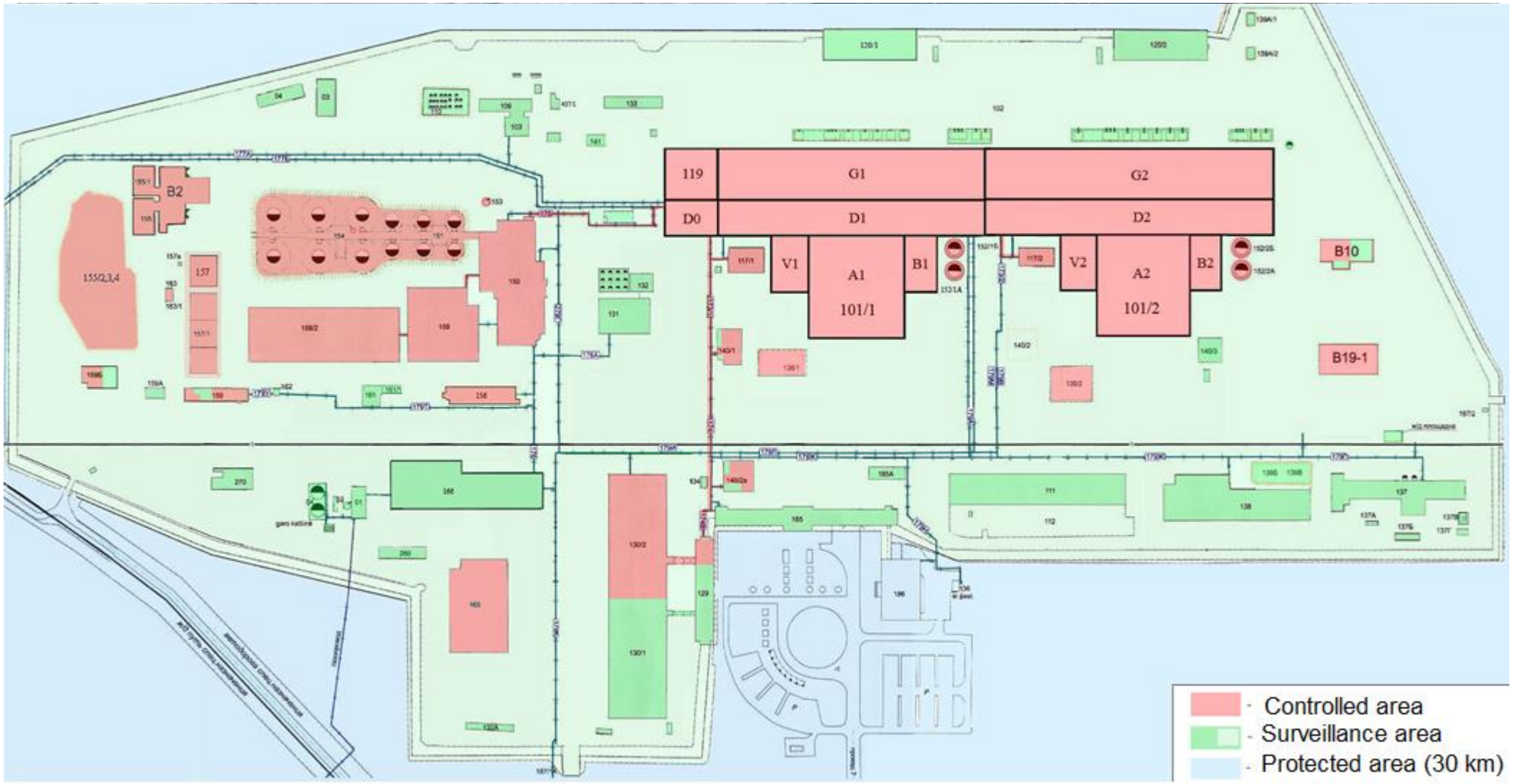
After starting the equipment dismantling of Units G2 and D1 in 2015, the following risks appeared:

- The pace of dismantling will outstrip the pace of decontamination.
- Loading of decontamination areas in bl. G1 will exceed the throughput of these areas (bottleneck effect).
- Temporary waste storage areas in bl. G1 will overflow.
- Failure of decontamination equipment will stop the process for the duration of unscheduled repairs.

There was a need to increase the capacity of radioactive waste treatment areas by increasing the fleet of equipment for cutting, decontamination, packaging and transportation of metal waste. It was also clear that independent treatment lines are preferable to ensure redundancy and uninterrupted processes.

INPP began to consider options for organization of metal waste treatment facility (complex) on the territory of the main building 101/1,2 or outside, in other buildings of the INPP controlled area.

Site selection criteria



Consideration of options:

- Main buildings 101/1,2, buildings G1, G2, D1, D2, A1, etc.
- Building 130/2, in the former main workshop.

Buildings 101/1,2

Advantages:

- Organization of decontamination processes near the dismantling areas.
- Minimization of waste movement/transportation outside the main buildings 101/1,2.

Disadvantages:

- High buildings maintenance costs (including heating), high heat losses due to the low energy efficiency of buildings.
- Limited lifetime of buildings (before demolition projects start).
- Space limitation and complexity of organizing transportation routes between sections inside buildings.

Building 130/2

Advantages:

- Relatively low building maintenance costs (including heating).
- Sufficiency of space and good infrastructure adapted for decontamination.
- Centralization of waste management processes.
- Long service life of the building.

Disadvantages:

- Additional operations: packaging and transportation of waste to building 130/2.

It was decided to organize activities for the initial processing/treatment of metal waste in the premises of building 130/2. For that purpose, the equipment and tools for cutting, decontamination, packaging and radiation monitoring were procured by INPP. These equipment and tools are combined into the Complex for Initial Treatment – "Radioactive Metal Waste Treatment Facility" – RMTF.

The advantages of the building 130/2 infrastructure are:

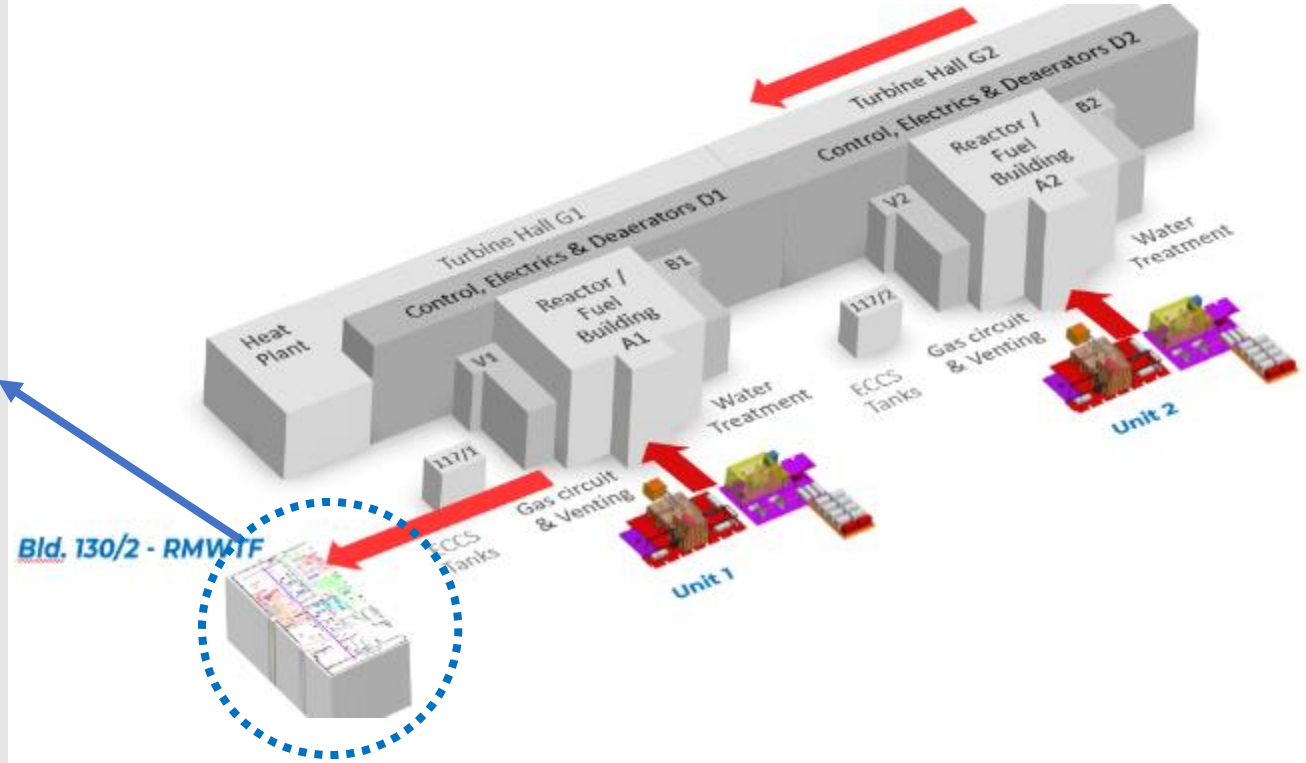
- Zoning: division of premises into different categories based on radiation classification.

- Transport routes to the building and inside the building: level 0.00, presence of gates along the perimeter of the building, high allowable floor load, the presence of rail tracks, bridge cranes of 10 and 57 tons covering the entire area of the building, etc.

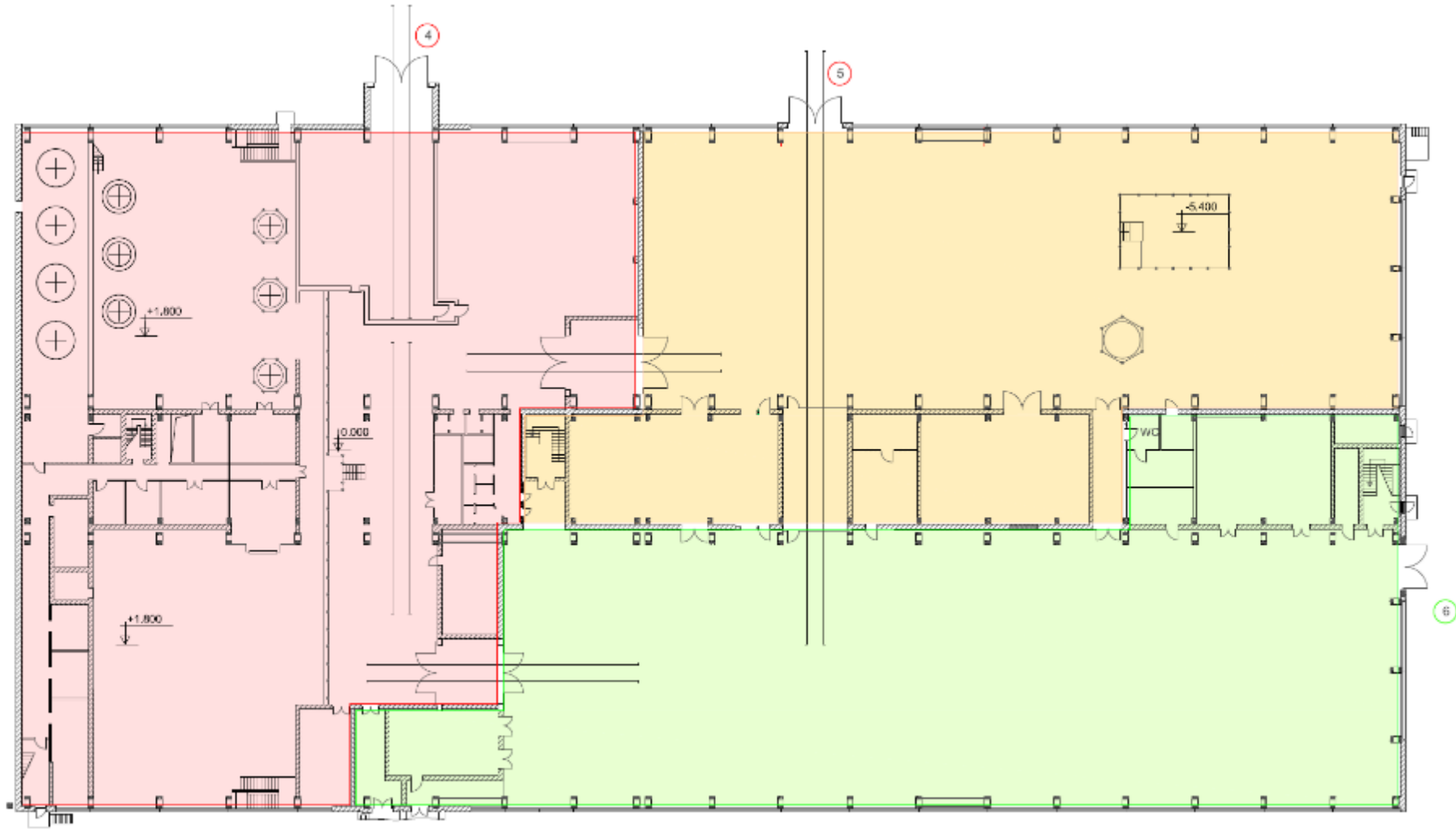
- Engineering systems: power supply, lighting, water supply, heating, special ventilation, communications and fire alarm, sewage, compressed air, etc.

- Staff accommodations, storage rooms, etc;

- Machine tools, hoisting equipment (Q=5.0t, Q=10t, Q=57.0t - 2 cranes), furnaces for thermal treatment of components.



Building 130/2 - Radioactive Metal Waste Treatment Facility.



Layout/space distribution.

Criteria for selecting processing methods

Fragmentation/cutting

Decontamination

Packing

Cutting methods:

- hot cutting – plasma cutting, acetylene oxygen cutting.
- cold cutting – band saws, electric hand saws, electric and hydraulic shears, etc.

Decontamination methods:

- physical (mechanical) techniques such as blasting, jetting, wiping, brushing, etc
- ultrasonic techniques
- chemical techniques (CORD concept)

Dismantling waste:

- Material class: carbon steel, stainless steel, non-ferrous metals.
- Level of radioactive contamination: VLLW, LLW, ILW.
- Place of waste generation: block, technological system.
- Contamination nature: weakly fixed/strongly fixed.
- Surface nature: smooth, rough, porous, etc.
- Component type: complex/simple geometric shapes.

The choice of methods and equipment is carried out taking into account:

- International experience: recommendations of foreign consultants, cooperation with colleagues from other countries.
- INPP experience: waste decontamination under dismantling projects, trial decontamination.
- Engineering analysis: feasibility assessment, comparison of the cost of different methods of decontamination with the cost of disposal.
- Opportunities of the existing infrastructure and geography of buildings.

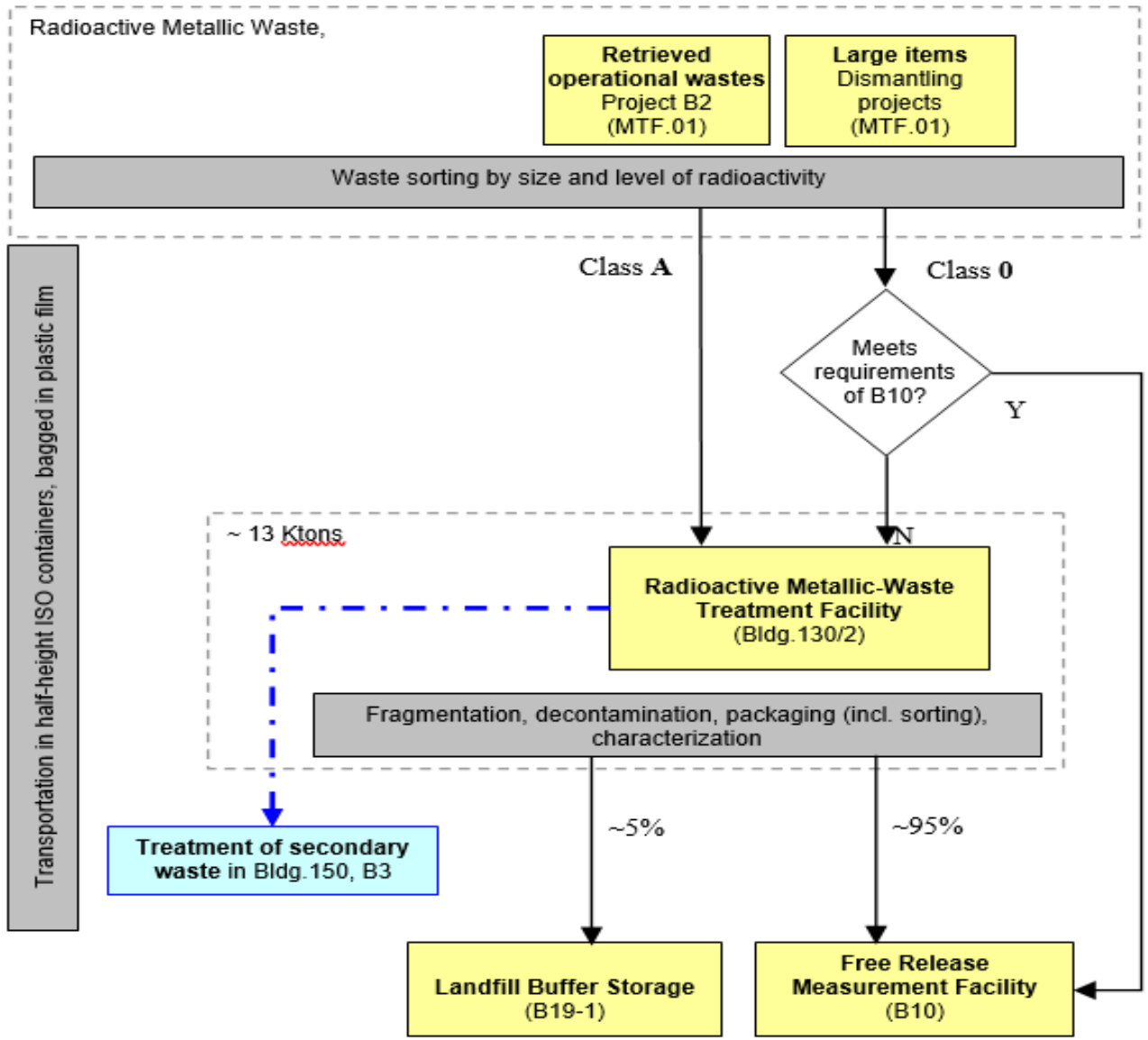
The new line of waste processing arranged in Bldg. 130/2 will provide parallel decontamination of metallic wastes of dismantling from Blocks G2, D1, D2, A1, A2, etc., that will enable INPP:

- to carry out decontamination of metallic wastes of dismantling in due time, including the peaks of their generation (in parallel work of both lines);
- to maintain redundancy of decontamination lines, specifically uninterrupted decontamination process in case of the main equipment failure in one line;
- to unload buffer sites (areas of dismantling wastes temporary storage) in Blocks G1 and G2;
- to clear Block G1 and G2 areas for separate buffer areas for wastes of different classes, from different dismantling facilities, with different nuclide vectors, etc.;
- to have a positive impact on the decontamination works performance schedule and, accordingly, on the whole INPP decommissioning schedule.

In the longer term (outside the scope of this project), it was considered advantageous to plan the transfer of all metallic waste decontamination from Block G1 to Bldg. 130/2 due to the sub-optimal working conditions in Block G1 and the cost of its maintenance and heating. The establishment of a separate radioactive waste processing facility was also supported by international experience and consistent with CPMA's recommendations on improvement of decontamination processes at INPP

Purpose: Establishment of a Radioactive Metal Waste Treatment Facility in the former main workshop (Building 130/2) making use, of available equipment and support systems, as well as installation of additional new equipment

Focus: Reconstruction of the building and equipping of RMTF for processing of metal waste extracted from temporary storage facilities under the INPP B2 project and large metal components



The following tasks were planned under Stage-1, MTF.01:

- Installation of a dividing partition with doors between Rooms 160 and 198 (40 m2) - 2 pieces;
- Installation of gates between Rooms 160 and 198 - 2 pieces;
- Replacement of metal-framed windows by plastic windows ~2560 m2;
- Repair of basement walls;
- Supply of new equipment required for the RMTF and training of personnel to work with the mentioned equipment:
    - Arc plasma cutting device -1 piece;
    - Dry shot-blasting machine with vacuum removal and filtration equipment - 2 pieces;
    - Wet decontamination high-head plant (pressure up to 1000 bar) -1 piece;
    - Transfer mechanisms (electric loader) - 2 pieces;
    - Compressor with receiver - 2 pieces;
    - Local filtering installation - 2 pieces;
    - Prefabricated portable tents from fireproof material for use during waste treatment -3 pieces;
    - Mobile device for aerosols measurement - 4 pieces;
    - Hands and feet contamination measurement device - 2 pieces;
    - Surface contamination measurement radiometer - 2 pieces;
    - Dosimeter - 2 pieces.

The activities that were carried out by INPP within the frame of Stage-1, MTF.01:

- Development of the design and engineering documentation for preparatory and auxiliary works;
- Disassembly of existing partitions (160/1, 160/2, 160/4, 160/5) in Bldg. 130/2;
- Re-commissioning of existing equipment required for the RMTF and dismantling of equipment not suitable for re-use;
- Progressive restoration of Building 130/2 systems;
- Commissioning of new equipment for fragmentation, decontamination and radiological measurement following procurement;
- Agreement of documents on modifications.

Zone division #1

Zone division #2

Windows replacement

Walls repair

Supply of new equipment

Description

Installation of a dividing partition with doors between Rooms 160 and 198 (40 m^2) - 2 pieces.

Key decisions

The overall area of Bldg.130/2 is subdivided into two principal rooms: Rooms 160 and 198. It was proposed that the RMTF be divided into clean and contaminated areas for the creation of radiation monitoring zones. To achieve this, two partitions with doors, as well as two gates between Rooms 160 and 198 were installed

Zone division #1

Zone division #2

Windows replacement

Walls repair

Supply of new equipment

Description

Installation of gates between Rooms 160 and 198 - 2 pieces.

Key decisions

The overall area of Bldg.130/2 is subdivided into two principal rooms: Rooms 160 and 198. It was proposed that the RMTF be divided into cleanse and contaminated areas for the creation of radiation monitoring zones. To achieve this, two partitions with doors, as well as two gates between Rooms 160 and 198 were installed

Zone division #1

Zone division #2

Windows replacement

Description

Replacement of metal-framed windows by plastic windows ~2560 m^2.

Key decisions

The replacement of metal-framed windows by double-glazed plastic units is economically justified on the basis of thermal losses. Before the works are undertaken, a justified investment project and technical design was prepared. Since the building is expected to operate until 2031, it is advisable to carry out work to reduce energy consumption. The economic effect of energy saving is 277.888 MW / year, which, considering the current energy prices, is a good saving.

Zone division #1

Zone division #2

Windows replacement

Walls repair

Supply of new equipment

Description

Repair of basement walls.

Key decisions

There is a partial basement in the building 130/2 containing technological equipment and supply lines. The surface finish of the basement walls has deteriorated and requires repair to prevent distribution of contamination, including radioactive and chemical in cases of pipe leakage .

Zone division #1

Zone division #2

Windows replacement

Walls repair

Supply of new equipment

Description

Supply and installation of new equipment required for the RMTF and training of personnel to work with the mentioned equipment.

Key decisions

- Arc plasma cutting device - 1 piece;
- Dry shot-blasting machine with vacuum removal and filtration equipment - 2 pieces;
- Wet decontamination high-head plant (pressure up to 1000 bar) - 1 piece
- Transfer mechanisms (electric loader) - 2 pieces;
- Compressor with receiver - 2 pieces;
- Local filtering installation - 2 pieces;
- Prefabricated portable tents from fireproof material for use during waste treatment - 3 pieces.
- Mobile device for aerosols measurement - 4 pieces;
- Hands and feet contamination measurement device - 2 pieces;
- Surface contamination measurement radiometer - 2 pieces;
- Dosimeter - 2 pieces.

Arc plasma cutting device Cutmaster 40SL 100 - 1 piece

- El. power – 23,6 kW
- Pressure – 4,1÷6,5 bar
- Air consumption – 0,212 m^3/min

Key decision

The plasma cutting has certain advantages, including faster cutting times and lower initial investment and operational costs. Typical materials cut with a plasma torch include steel, stainless steel, aluminum, brass and copper, although other conductive metals may be cut as well. Plasma cutting is an effective way of cutting thin and thick materials alike, up to 200 mm thick.

Dry shot-blasting machine with vacuum removal and filtration equipment - 2 pieces:

Dry shot-blasting machine with vacuum removal and filtration equipment DINO JUNIOR II

- El. Power – 5,5 kW
- Pressure – 7 bar
- Air consumption – >2 m^3/min
- Filter efficiency - 99.9%

Key decision

It is a compact and mobile vacuum blasting machine. The machine provides a clean working environment, low shot usage (due to the recycling unit) and low waste disposal costs.

It is used to clean small contaminated areas, remove hot spots and treat blind spots where a roller conveyor shot blasting machine is not effective.

Dry shot-blasting machine with vacuum removal and filtration equipment - 2 pieces:

Dry shot-blasting machines with filtration equipment CABILUX PC-CL 433

- El. Power – 18 kW
- Pressure – 7 bar
- Air consumption – 6,2 m^3/min
- Filter efficiency - 99.9%

Key decision

Medium-size blastroom dedicated to surface cleaning of workpieces from a few centimeters to several meters in length.

Highly effective blasting machine used to clean the contaminated areas, remove hot spots and treat blind spots where a roller conveyor shot blasting machine is not effective.

Wet decontamination high-head plant (pressure up to 1000 bar) DYNAJET - 1 piece

- Pressure – 1000 bar
- El. power – 30 kW
- Water consumption – 17 l/min

Key decision

This is small, simple to operate, easy to transport and flexible for wet decontamination. It is used to remove poorly fixed contamination from the surface.

Transfer mechanisms (electric loader) VENI KM.AC 1200/2.0 - 2 pieces

- Load capacity - 1200 kg
- Lifting height - 1910 mm
- Battery - 300 Ah

Key decision

Transfer mechanisms are highly maneuverable and easy to control – ideal for containers and metal fragments handling.

Compressor with receiver OSC60 OZEN - 2 pieces

- Power - 45 kW
- Max. pressure - 15 bar
- Capacity - 6.7 m^3/min

Key decision

Initially, the compressors were used to support the shot blasting machines, but during Stage-2, an additional compressor was purchased and two of the three were used in the modification of the compressed air system of building 130/2. Today, the building has a redundant compressed air system.

Local filtering installation AirBravo DK223 - 2 pieces

- Power - 4.1 kW
- Working pressure - 5÷7 bar
- Capacity - 2200 m^3/hour
- Degree of purification - HEPA H13, filter efficiency - 99.95%

Key decision

Filtering installation for the local exhaust ventilation and filtration of dust and smoke generated from processing of waste. The device is mobile, it can be used anywhere in the building 130/2, depending on the need. According to the requirements, the release of purified air is into the central ventilation system.

Prefabricated portable tents from fireproof material for use during waste treatment - 3 pieces

Electric and pneumatic grinders – 4 pieces.

Key decision

Indoors, in separate tents, mechanical decontamination points are organized using angle grinders and a dry shot-blasting machine DINO JUNIOR II.

The KEMPER filtering unit provides both local air extraction directly from the tents, and air extraction from the general volume of the room.

Radiation monitoring equipment:

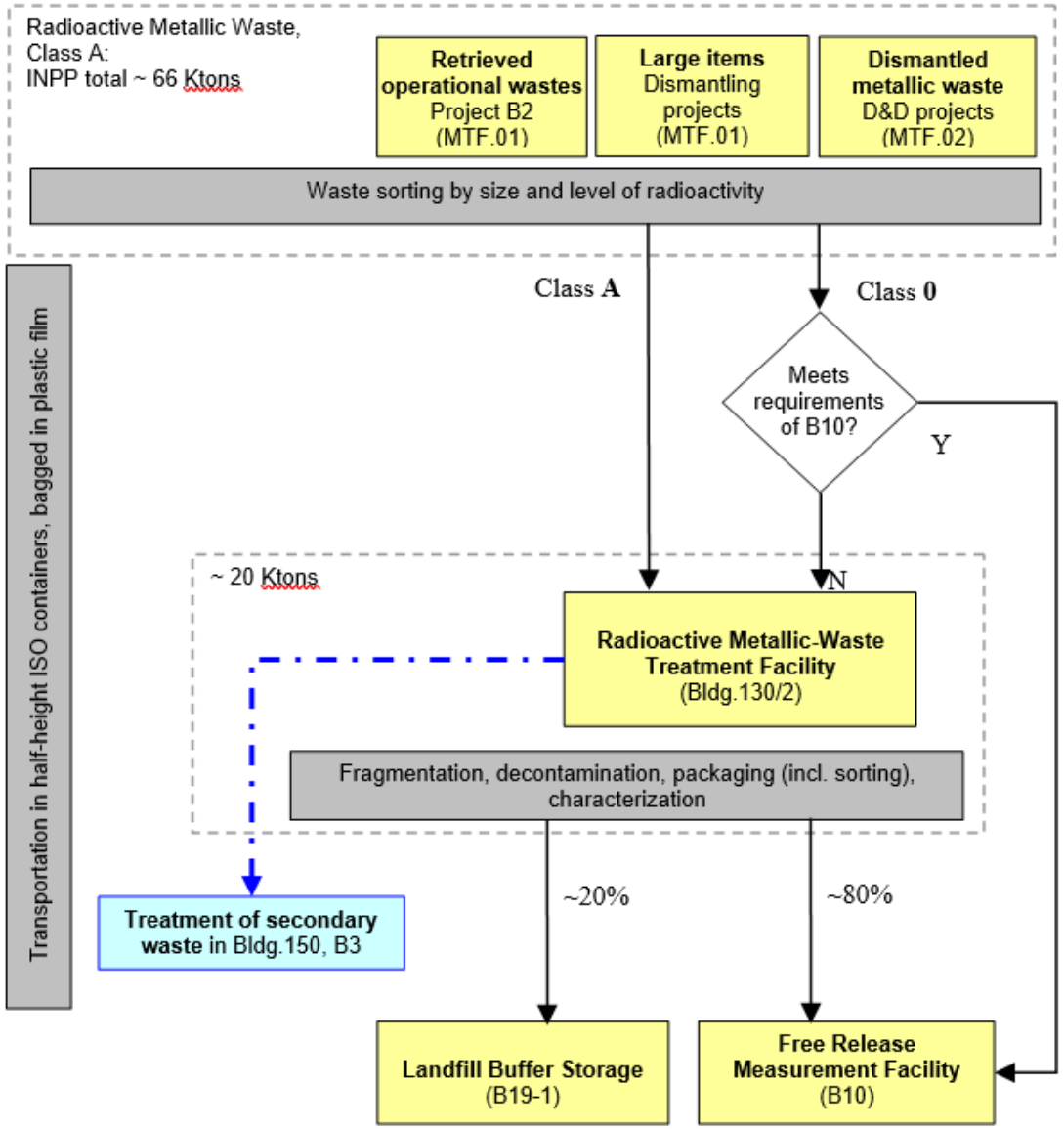
- Mobile device for aerosols measurement - 4 pieces
- Hands and feet contamination measurement device - 2 pieces
- Surface contamination measurement radiometer - 2 pieces
- Dosimeter - 2 pieces

Key decision

To monitor the contamination of the surface of the skin and clothing of workers, there are “Hands and Feet” monitoring devices in building 130/2. The control of radioactive aerosols in the workplace is carried out using portable devices and mobile measuring installations.

Purpose: Create additional capacities in the RMTF in order to increase decontamination throughput and ensure timely treatment of metallic waste coming from other Buildings.

Focus: Procured tools and equipment will increase the RMTF throughput from 5 t up to 6 tons per shift. At the RMTF, the received wastes will be further sorted according to required treatment method, fragmented, decontaminated and their residual activity measured. It is intended that approximately 80% of radioactive wastes passing through the RMTF will be suitable for free release.



The following tasks were planned under Stage-2, MTF.02:

- Supply of new equipment required for the RMTF and training of personnel to work with the mentioned equipment:
  - Through-type shot blasting facility with roller conveyer having the capability of processing the waste 1000÷1200 mm in width and 400÷600 mm in height - 1 piece;
  - An air compressor with a receiver to support the shot blasting facility and other tools - 1 piece;
  - Cranes/hosting devices with carrying capacity 0.5÷1 t - 2 pieces;
  - Hook-conveyor shot-blasting machine with T-track, Y-track, or O-track rail - 1 piece;
  - High-pressure water-jet facility (2500÷3000 bar) - 1 piece;
  - Band saw with cutting capability of up to 1.2 m - 2 pieces;
  - Forklift loader (electric truck) with carrying capacity 1.6 t - 2 pieces.

The following tasks were planned under Stage-2, MTF.02:

- Supply of new equipment required for the RMTF (consumables and mobile equipment) that are not funded under MTF.02 but required in the frame of Stage-2:
  - Radiological monitoring equipment for: dose rate measurement (3 off), surface contamination measurement (3 off), and hand/foot contamination monitoring (3 off);
  - Overalls for safe water-jet facility operation: boots, trousers, jacket, protective helmet with forced air supply for work at facility 2500÷3000 bar, apron, foot protection, hand protection, half masks with filtering devices (8 sets);
  - Shot for shot-blasting.
- Activities/procurements which are not funded under MTF.02 but required in the frame of Stage-2:
  - Preparation to tender (investigation of market, analysis of suppliers, development of technical specification, etc.);
  - Commissioning of new equipment for fragmentation, decontamination and radiological measurement following procurement;
  - Development of supporting documentation required to confirm that the upgraded facility meets all regulatory requirements.

Supply of new equipment

Consumables and mobile equipment

Modernization

Authorities' approval

Description

Supply of new equipment required for the RMTF and training of personnel to work with the mentioned equipment.

Key decisions

- Through-type shot blasting facility with roller conveyer having the capability of processing the waste 1000÷1200 mm in width and 400÷600 mm in height - 1 piece;
- An air compressor with a receiver to support the shot blasting facility and other tools - 1 piece;
- Cranes/hosting devices with carrying capacity 0.5÷1 t - 2 pieces;
- Hook-conveyor shot-blasting machine with T-track, Y-track, or O-track rail - 1 piece;
- High-pressure water-jet facility (2500÷3000 bar) - 1 piece;
- Band saw with cutting capability of up to 1.2 m - 2 pieces;
- Forklift loader (electric truck) with carrying capacity 1.6 t - 2 pieces.

Through-type shot blasting facility with roller conveyer BV S.R.L. DR 10x7-8TR - 1 piece

- Capacity – > 4 m^2/min
- Turbines quantity – 8 pieces
- El. power – 112 kW
- Compressed air consumption - 10 ÷ 24 m^3 / hour
- Fan capacity – 13000 m^3/h, degree of purification - HEPA H13, efficiency - more than 99.95%

Key decision

According to operation experience at Block G-1, the shot blasting facility is the most effective tool for metallic waste decontamination. This is due to the high efficiency (4-5 t per shift) of the facility and comparatively low cost of decontamination (the procurement included 10 tons of shot for commissioning purposes)

Air compressor with two receivers Vortex ERS45DD - 1 piece

- Power - 45 kW
- Max. pressure - 10 bar
- Capacity - 6.8 m^3/min

Key decision

An air compressor with a receiver to support the shot blasting facility and other tools.

Cranes/hosting devices TAV1250/4/5 and TAV1250/8/5 - 2 pieces

- Load capacity – 1,25 tons
- Lifting height – 4,2 m
- TAV1250/4/5 Length – 10 m, Width – 4 m
- TAV1250/8/5 Length – 10 m, Width – 8 m

Key decision

Cranes/hosting devices are required for delivery of the wastes being decontaminated on the conveyer at the entrance to the shot blasting cell and their withdrawal from the conveyer at the exit from the shot blasting cell.

Hook-conveyor shot-blasting machine with Y-track BV S.R.L. H-11x17 2TR - 1 piece

- Capacity – > 10 m^2/h
- Turbines quantity – 2 pieces
- El. power – 45 kW
- Compressed air consumption - 5 ÷ 8 m^3/h
- Fan capacity – 8000 m^3/h, degree of purification - HEPA H13, efficiency - more than 99.95%

Key decision

In the machine, the metallic elements to be shot-blasted are hung on a rotary hook. During the shot-blasting operation, the hook is turning and moving while the abrasive is blasted sideways at different angles. The hook-conveyor machine will be used for treatment of waste with a complex shapes that are not suitable for shot blasting facility with the roller-conveyer machine.

High-pressure water-jet facility Hamelmann HDP 124 – 1 piece

- Pressure – 2800 bar
- El. power – 75 kW
- Water consumption – 12 l/min

Key decision

According to operational experience at Block G1, a high-pressure water-jet facility is an effective tool for dust-free decontamination of metallic waste with poorly fixed (easily removed) radioactive contamination. The water-jet facility is also applied in a combination of decontamination methods, for example, during preparation of waste for the further decontamination in the shot blasting facility enabling most effective initial processing and reduction of secondary waste amount.

Band saw Siloma Coloss 1200/1200 HP – 2 pieces

- El. power– 11 kW.
- Cutting capability – Ø200мм÷1200мм.
- Work piece length – <3000 m

Key decision

Band saws are an effective tool for cold, dust-free cutting of metal. It is supposed that two facilities will be sufficient for all metal waste from building 101/1,2.

Forklift loader (electric truck) EV 698.30.242 S – 2 pieces

- Load capacity - 1600 kg
- Lifting height - 3000 mm
- Battery - 600 Ah

Key decision

Forklift loaders (electric trucks) will enable effective waste transfer along the new transportation routes generated in Bldg.130/2. Since the radioactive waste stream and already decontaminated waste stream are separated (in different rooms), it is assumed that two forklifts will be enough to cover both transportation routes.

Supply of new equipment

Consumables and mobile equipment

Modernization

Authorities' approval

Description

Procurement of consumables and mobile equipment (radiological monitoring equipment, overalls for safe water-jet facility operation, shot for shot-blasting, containers, extraction systems, platform scales, vacuum cleaners, lead mats, etc.) that may be used elsewhere in INPP decommissioning were conducted out MTF.02.

Containers - 200 pieces

- External length – 1200 mm ±2 mm
- External height – 620 mm ±2 mm
- External width – 830 mm ±2 mm
- Carrying capacity - >1000 kg

Key decision

Containers have been purchased to ensure transportation processes inside building 130/2.

The dimensions and load capacity of the containers are selected considering the existing INPP experience in order to carry out the efficient transportation of metal waste segments.

To avoid mixing of waste, the containers are labeled depending on the class of transported waste.

Welding smoke extraction system KEMPER 811000100 and 811300120 – 2 pieces

KEMPER 811000100

- Power - 7.5 kW
- Working pressure - 2500 Pa
- Capacity - 10000 m^3/hour
- Filter efficiency - >99.99%

KEMPER 811300120

- Power - 11 kW
- Working pressure - 2500 Pa
- Capacity - 13000 m^3/hour
- Filter efficiency - >99.99%

Key decision

The welding smoke/fume extraction system are equipped with filter cartridges and are suitable for setting up central extraction systems. System is ideally suited for factory buildings and welding shops with high levels of smoke and dust, for example, for welding shops, grinding shops, training facilities, robot lines, etc. These systems provide air filtration in the RMTF VLLW mechanical decontamination area and VLLW thermal cutting area.

Platform scales – 1 piece

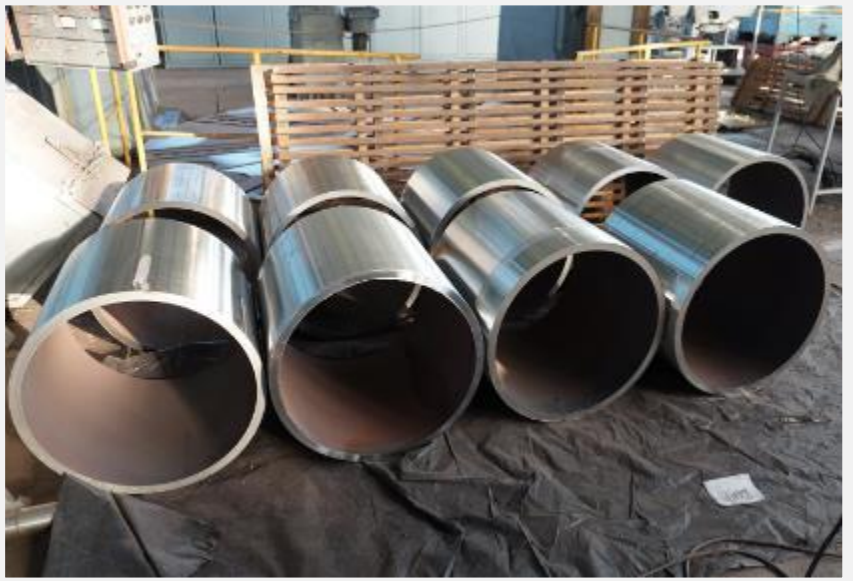
- Weight limit – 3000kg
- Dimensions of the platform: length – 1500mm, width – 1500mm

Key decision

In order to ensure the packaging process with an effective measuring tool for weighing containers with waste or separate elements, as well as in order to reduce electricity consumption associated with weighing using a crane, it was decided to purchase and install in the room. 198 building 130/2 platform scales with a loading capacity of 3 t.

Screw-cutting machine 1H65 – 2 pieces

- El. power– 23 kW.
- Cutting capability – 2 m² per shift
- Maximum length of a pipeline fragment – 0,6m



Key decision

The use of turning machine is reasonable in cases of contamination of surfaces with a deep level of penetration, for example, into cracks, pores, etc. To decontaminate fragments of pipelines of the live steam system, a mechanical decontamination area (with a screw-turning machine) was organized.

Supply of new equipment

Consumables and mobile equipment

Modernization

Authorities' approval

Description

The modernization of engineering networks and building structures was also carried out the modernization of lighting, the modernization of the compressed air system, the modernization of the electrical network, the modernization of ventilation systems, modification of lifting mechanisms, update of emergency exits, etc.

The implementation of modernizations, modifications, updates was carried out during the entire lifetime of Stage-2 until the end of 2019.

Compressor with receiver OSC60 OZEN - 2 pieces

- Power - 45 kW
- Max. pressure - 15 bar
- Capacity - 6.7 m^3/min

Key decision

Initially, the compressors were used to support the shot blasting machines, but during the second stage, an additional compressor was purchased and two of the three were used in the modification of the compressed air system of building 130/2. Today, the building has a redundant compressed air system.

Key decision

In order to reduce the cost of energy consumption and maintenance of lighting, as well as to improve the reliability of lighting, all ceiling lamps (400W and 700W) were replaced with modern LED lamps 150 watt.

Replacement of lamps in certain areas of rooms 160 and 198 of building 130/2 (totally 160 pieces) ensured compliance with design requirements and hygiene standards for illumination at workplaces. Replacement of lamps was carried out with saving the existing design scheme, incl. cable lines and mounting points (lamp holders).

Main lighting ROOMLUX B60750-150W – 160 lamps

- Power – 150W
- Rated luminous efficacy – 18000lm

Air filter cassette – 100 pieces

- Cleaning class according to EN779 – F5(M5)
- Rated airflow – 1440$m^3/h/m^2$
- Dust capacity - >300g/m^2

Key decision

The building 130/2 central special filtering station ВЦ-1 with filters Д-23 is designed for fine and ultra-fine cleaning, with an efficiency of up to 99.9%. Since the intensive work are carried out in the building, associated with a large release of gases, soot, dust, etc., the risk of quick failure of the filter elements was raised.

To reduce operating costs and increase the service life of fine aerosol filters of a ventilation system ВЦ-1, additional coarse filters (preliminary cleaning stage) were installed in the inlet collector of the filtering station ВЦ-1.

Emergency exits doors – 7 pieces

Key decision

Emergency exits are organized in the outer walls of the building 130/2 - 7 doors.

In order to ensure fire safety requirements, the wooden doors of emergency exits were replaced with metal ones.

Doors replacing also had a positive effect on heat savings.

Supply of new equipment

Consumables and mobile equipment

Modernization

Authorities' approval

Description

Before the start of operation of the equipment, the necessary design documentation, instructions for the operation of the equipment, internal procedures for working at the initial processing areas, etc. were developed and approved at the Ignalina NPP.

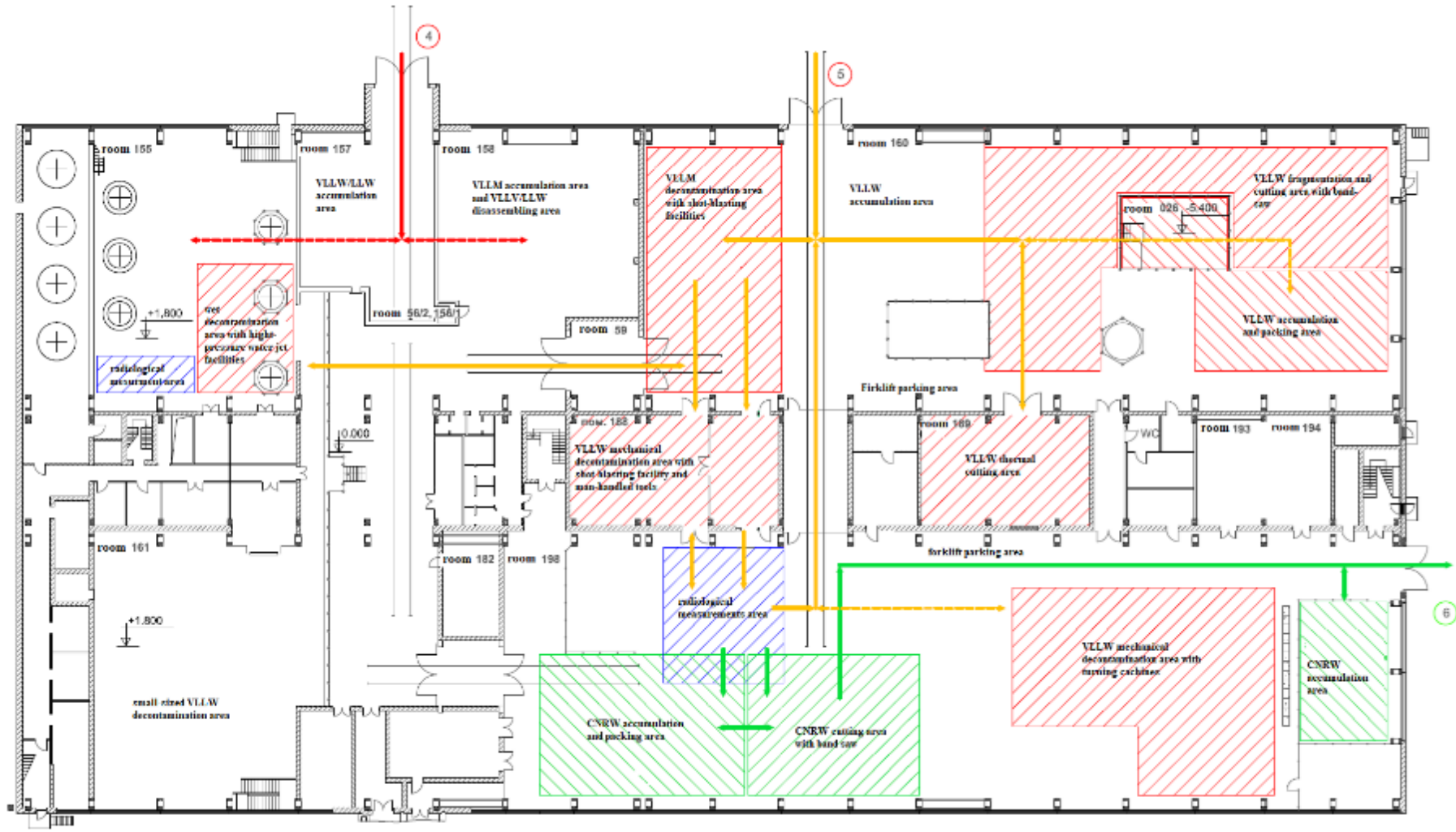
Safety justification and environmental impact analysis were developed and agreed with VATESI (State Nuclear Power Safety Inspectorate).

The following list of activities has been carried out by INPP personnel to support both projects MTF.01 and MTF.02:

- Preparation to tender and tender arranging (investigation of market, analysis of suppliers, development of technical specification, evaluation of proposals, etc.).
- Development of the designs and engineering documentation for preparatory and auxiliary works;
- Disassembly of existing partitions (160/1, 160/2, 160/4, 160/5) in Bldg. 130/2;
- Re-commissioning of existing equipment required for the RMTF and dismantling of equipment not suitable for re-use;
- Progressive restoration of Building 130/2 systems (light, electricity, water, ventilation, heating, fire protection, radiological control, etc.);
- Commissioning of new equipment for fragmentation, decontamination and radiological measurement following procurement;
- Development of supporting documentation required to confirm that the upgraded facility meets all regulatory requirements, including performing of safety assessment of works with the use of new equipment in bld. 130/2.

In order to ensure proper logistics in the building 130/2 during the treatment of radioactive waste, separate zones and areas for packing, cutting and decontamination were organized. The areas for treatment of conditionally non-radioactive waste, very low level waste, low level waste have been separated as well.

Stage-1/Stage-2 Results



The purpose of the Stage-3 is the modification of ventilation systems in building 130/2.

INPP has carried out the considerable amount of work to adapt the ventilation systems in bldg. 130/2 to ensure proper operation of Radioactive Metal Waste Treatment Facility (RMTF). The existing ventilation systems (Spec ventilation system ВЦ-1, Input ventilation systems П 1÷П-5, Exhaust ventilation systems В-1÷В-12) should completely cover all RMTF needs.

Implementing the "global" modification of 130/2 ventilation systems would be interesting for the following reasons: increasing the system efficiency and reducing the power consumptions.

The purpose of the Stage-3 is the modification of ventilation systems in building 130/2.

Efficiency: Installation of electric valves on ventilation lines (bldg. 130/2 has 11 lines for main ventilation and 17 lines for supporting ventilation), as well as installation of automatic control system will allow to selectively control the ventilation without operator's constant involvement; more effectively distribute the airflow between the zones and areas; remove the contaminated air directly from the rooms their work is carried out, but not from the entire volume of bldg.130/2; etc.

Power consumptions: There are 22 big and small old-type ventilation units in the bldg. 130/2. The total electric power of the motors is around 525 kW. The use of modern ventilation units (electro motor+frequency regulator) can reduce the electricity consumption by 30-50%.

The following tasks are planned under Stage-3:

- Upgraded Ventilation System. Owing to increases in capacity and usage, improved ventilation is required in particular for the filtration of dust arising from dry decontamination activities. The improvement will include:
  - installation of automatic control system to allow effectively distribute the airflows between the areas in building 130/2;
  - upgrade of ventilation equipment in building 130/2 to reduce the heat and electricity consumption.

To achieve these goals the following minimum is required:

- Replacement of ventilation units;
- Installation of frequency regulators;
- Installation of electric valves, check valves, fire dampers, etc.;
- Installation of equipment for automatic temperature control of the heat transfer agent in the heaters;
- Integration of automatic control system;
- Design development;
- Implementation of installation works.

VIDEO

IGNALINOS ATOMINĖ ELEKTRINĖ

Elektrinės g. 12/1
Drūkšinių k. 31152
Visagino sav. Lietuva

Valstybės įmonė
Ignalinos atominė elektrinė
www.iae.lt

Telefonas +370 386 28985
Faksas +370 386 24396
El. paštas iae@iae.lt

THANK YOU

ACCREDITED MSCB-113

ISO 9001:2015 GKLT-0199-QC

Ignalinos AE eksploatacijos nutraukimo veikla yra bendrai finansuojama Europos Sąjungos