

Challenges of Ignalina NPP decommissioning



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



Ignalina NPP general information.



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Ignalina NPP general information.

Two similar design units of RBMK-1500 water-cooled graphite-moderated channel-type power reactors (1500 MW electrical power)



Construction
1974 - 1987



Operation
1983 - 2009



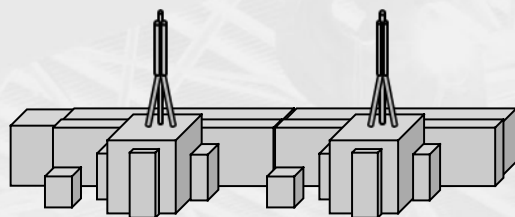
Decommissioning
2010 - 2038



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Types of radioactive waste



Ignalina NPP
3000 MW (RBMK)

0 Free Release Waste

Short-lived Low Level and Intermediate Level Waste:

A Very Low Level Waste (<0,5 mSv/h)

B Low Level Waste (0,5-2 mSv/h)

C Intermediate Level Waste (>2 mSv/h)

Long-lived Low Level and Intermediate Level Waste:

D Low Level Waste (<10 mSv/h)

E Intermediate Level Waste (>10 mSv/h)

Stored Operational Waste

Decommissioning Waste

Reactor

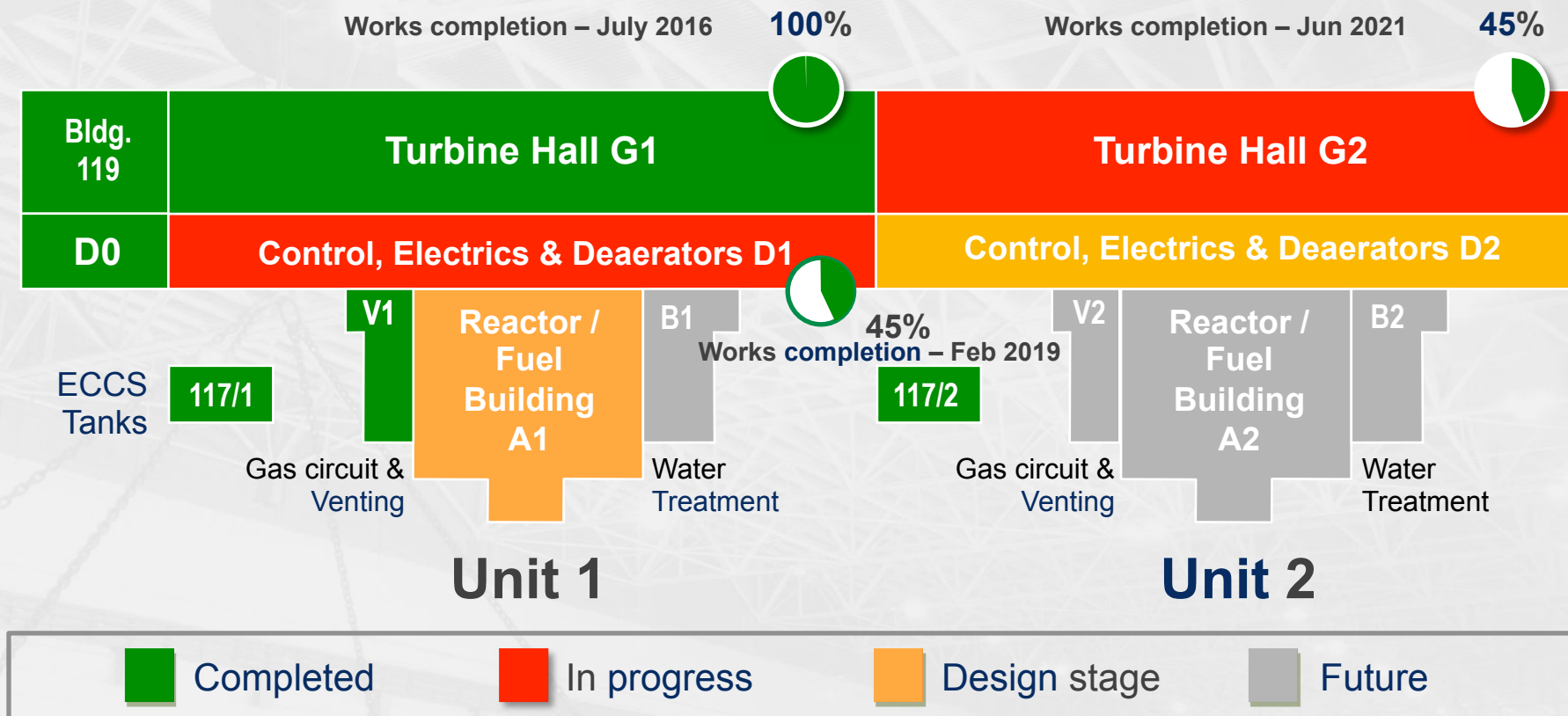
Buildings

**Dismantled Waste
end of 2016**





Dismantling progress





Dismantling progress



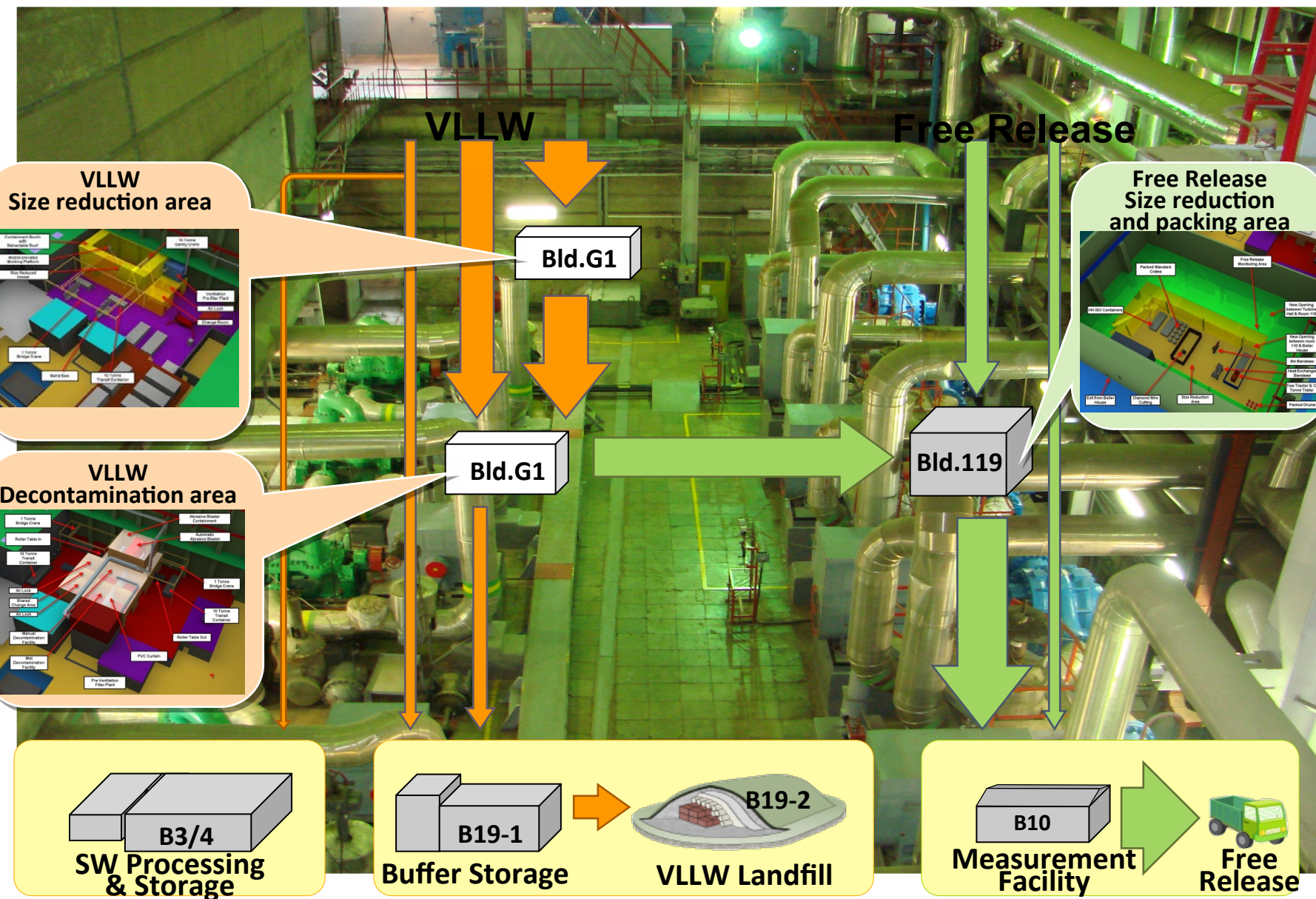
Unit 2 Turbine Hall equipment dismantling



Unit 1 Turbine Hall equipment dismantling



D&D technologies and facilities



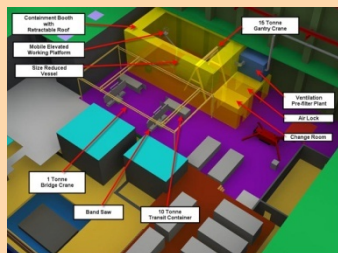
D&D technologies and facilities



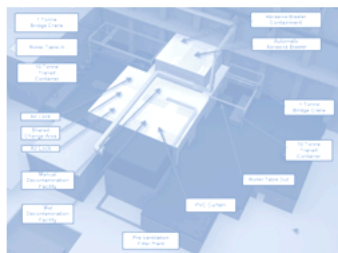
Containment Booth
with
Retractable Roof

15 Tonne
Gantry Crane

VLLW Size reduction area



VLLW Decontamination area



SW Processing &
Storage



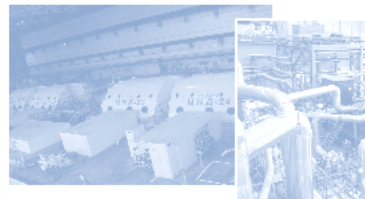
Buffer Storage

VLLW Landfill

Measurement
Facility

Free
Release

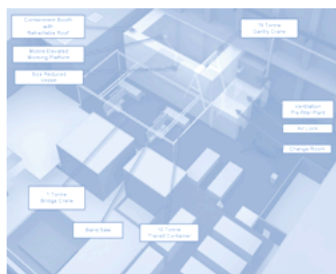
D&D technologies and facilities



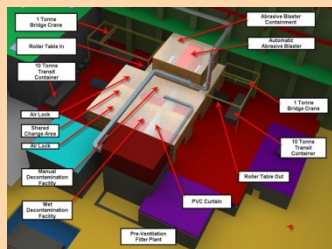
1 Tonne
Bridge Crane

Abrasive Blaster
Containment

VLLW
Size reduction area



VLLW
Decontamination area



B3/4
SW Processing &
Storage

Buffer Storage

VLLW Landfill

Measurement
Facility

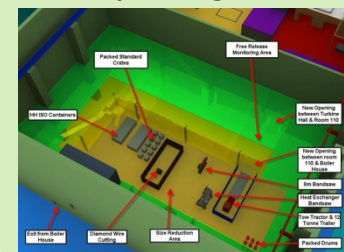
Free
Release



100

VELVET LAMINATE

Free
Release



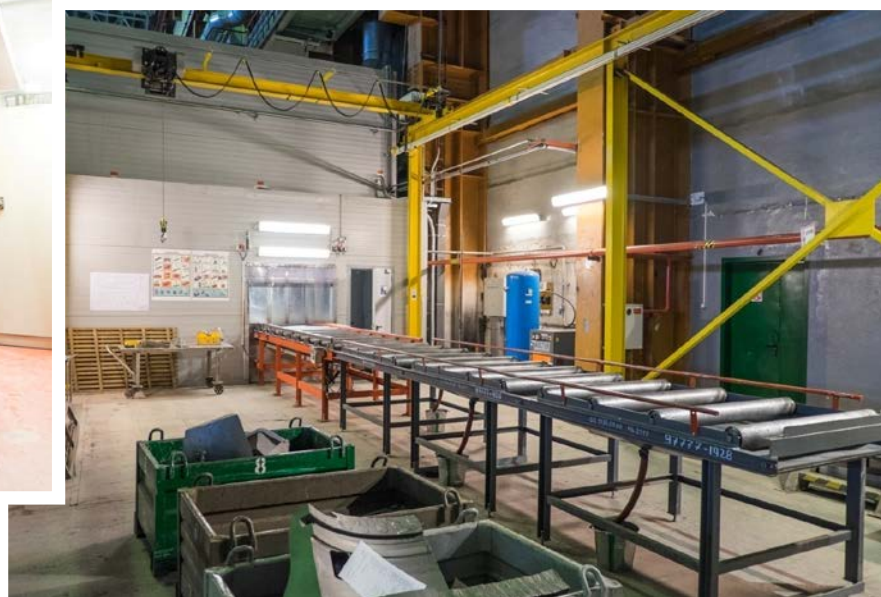


Challenges related to D&D activities

“Shot blasting is a physical decontamination technique which is very effective at removing strongly adhered contamination. High decontamination factors are achievable and the technique is good for decontaminating to free release levels...”, ref. Basic Design for INPP Unit 1 Turbine Hall Equipment D&D, UKAEA.



Automatic Dry Shot Blasting Machine inside the Containment Booth.





Challenges related to D&D activities

Expectations:

For very low level metal waste: “One pass through the blaster should be sufficient to clean all surfaces of the work piece without the need for turning.”, ref. Basic Design for INPP Unit 1 Turbine Hall Equipment D&D, UKAEA.

Realities:

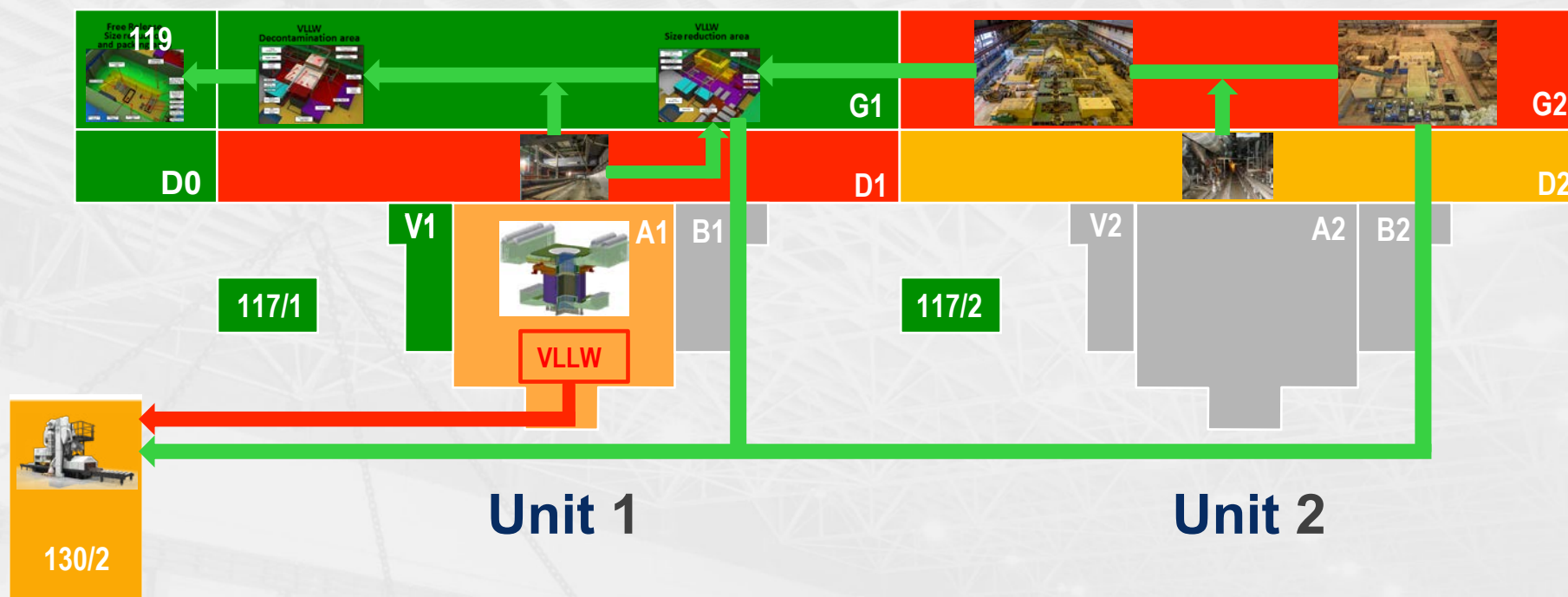
It was revealed during D&D implementation that there were a number of components that had failed radiological examination after the first pass through the shot blasting machine. It became necessary to pass the components more than once. Some of contaminated components required five and more iteration in order to reach "free release" level.

For today the average number of iterations for very low level metal waste – two or three times.





Challenges related to D&D activities



Radioactive Metallic-waste Treatment Facility (RMTF) in building 130/2





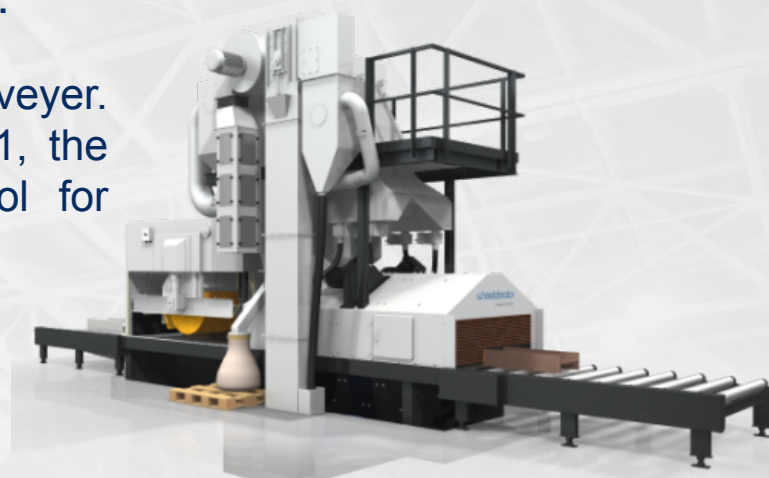
Challenges related to D&D activities

To increase RMTF throughput, the following main equipment will additionally be procured and commissioned in building 130/2:

- Through-type shot blasting facility with conveyer. According to operation experience at Block G1, the shot-blasting facility is the most effective tool for metallic waste decontamination.



- Hook-conveyer shot-blasting machine with T-track, Y-track or O-track that will be used for treatment of waste with a complex shapes.



- Two band saws with cutting capability of up to 1.2 m for cold, dust-free cutting of metal.



- High-pressure water-jet facility for dust-free decontamination of metallic waste with poorly fixed radioactive contamination.





Challenges related to D&D activities

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:

- 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.





Thank you for attention



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