



# Development of irradiated specimens transport system within the two semi-hot cells refurbishment project

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## ■ Semi-hot / hot cell facility

- General overview

## ■ Refurbishment project

- Two semi-hot cells reconstruction (cells No. 9 and No. 16)
- Development of transport system connecting refurbished cell No. 9 with cell No. 1

## ■ Photo documentation of construction and present state

## ■ Previous projects experience

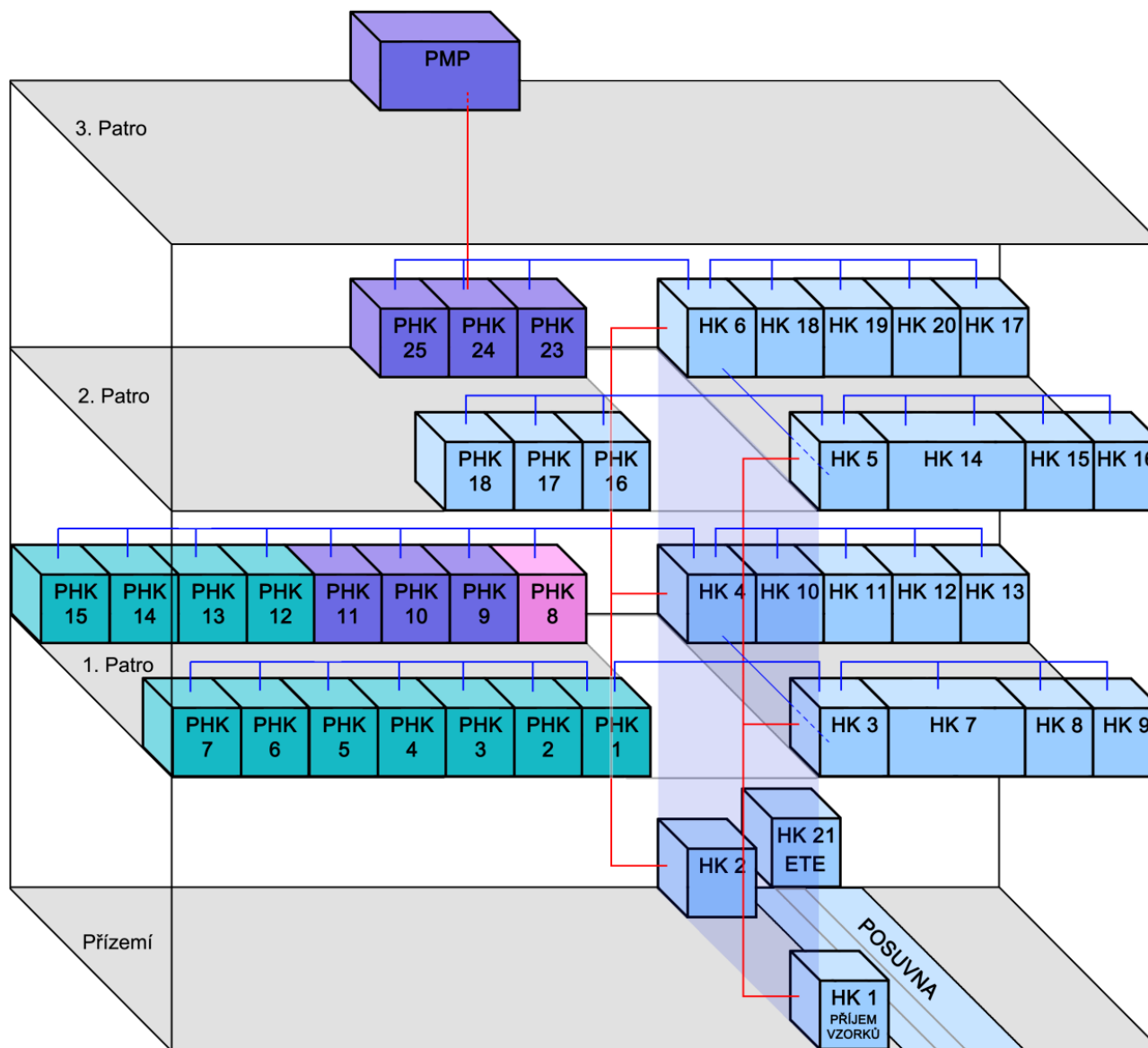
# Facility – general overview



- Operating fleet of 51 hot / semi-hot cells



# Facility – general overview



## ■ Reconstruction

- Dismantling of two old semi-hot cells (No. 9 and No. 16)
- Construction of new steel shielded cells with stainless steel interior cladding
- Installation of the new experimental equipment
  - No. 9 – Fatigue precracking machine Zwick / Roell
  - No. 16 – EDM machine EMOTEK
- Development of transport system for irradiated specimens between refurbished cell No. 9 and laboratory for mechanical testing on the opposite side of building

## ■ Project schedule

- Start of the project – 2012
- End of the project – August 2014

## ▪ Supported by the Ministry of industry and trade, Czech Republic within the frame of „POTENCIAL“ project

- Aim is to support the enlargement of experimental capabilities of Czech industrial companies by partial participation on the investment costs
- Project was realized within the 2<sup>nd</sup> call of the project and the provided grant was 40% of the whole investments volume



# Semi-hot cells dismantling phase



- Initial state – Old monolithic design „GOLEM“



# Semi-hot cells dismantling phase



## ■ Dismantled state





# Semi-hot cells construction phase



## ■ Construction – preparation of supporting structure



# Semi-hot cells construction phase



## ■ Construction – assembly of the supporting structure





# Semi-hot cells construction phase



## ■ Construction – assembly of the front wall



# Semi-hot cells construction phase



## ■ Construction – SS interior





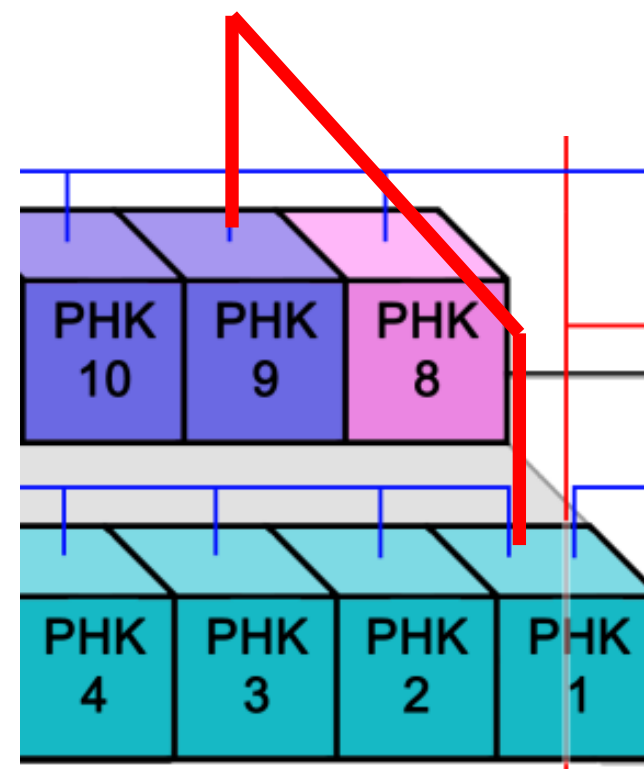
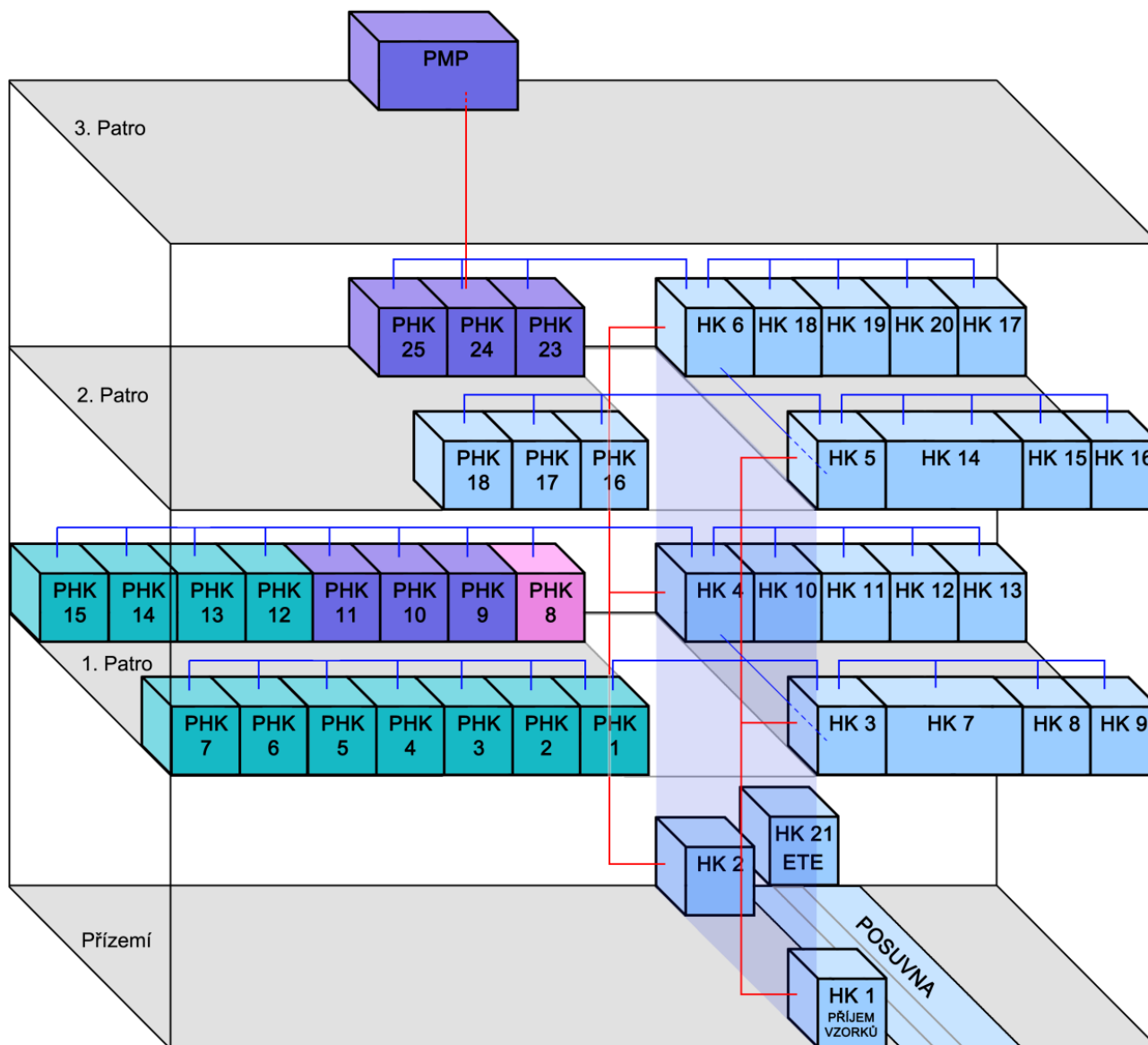
# Semi-hot cells construction phase



## ■ Construction – sanding of interior, installation of windows



# New transport system - motivation



## ■ Existing building

- In operation from 1970
- Strict limitations on the floor loading (approx. 800 kg / m<sup>2</sup>)

## ■ Transport system requirements

- Distance between cells – approx. 12 m.
- Transportation of one set of specimens in transport can (e.g. 12 Charpy type specimens)
- Activity up to 40 GBq

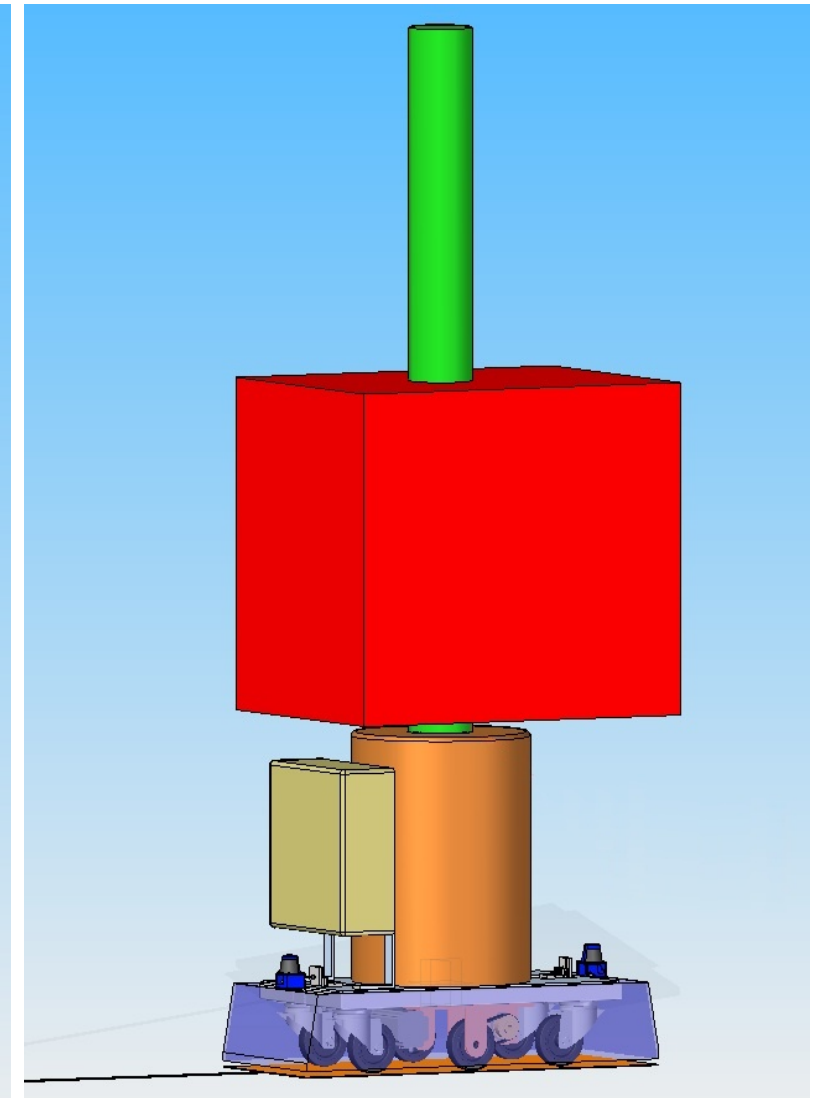
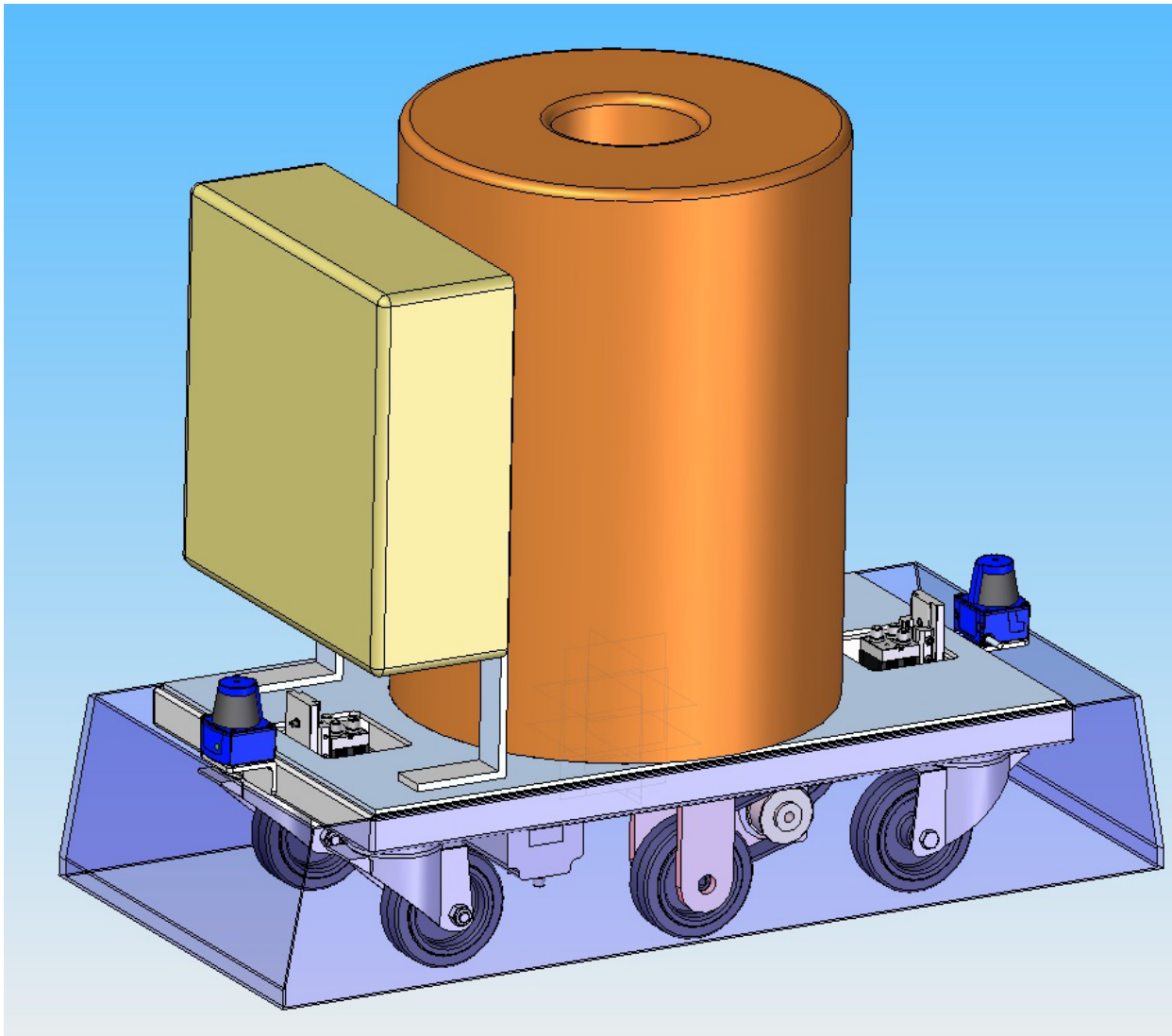
## ■ Calculations of necessary shielding, weight and load on the building

- Resulting in two preliminary designs

# Preliminary design



## ■ Container following marked path

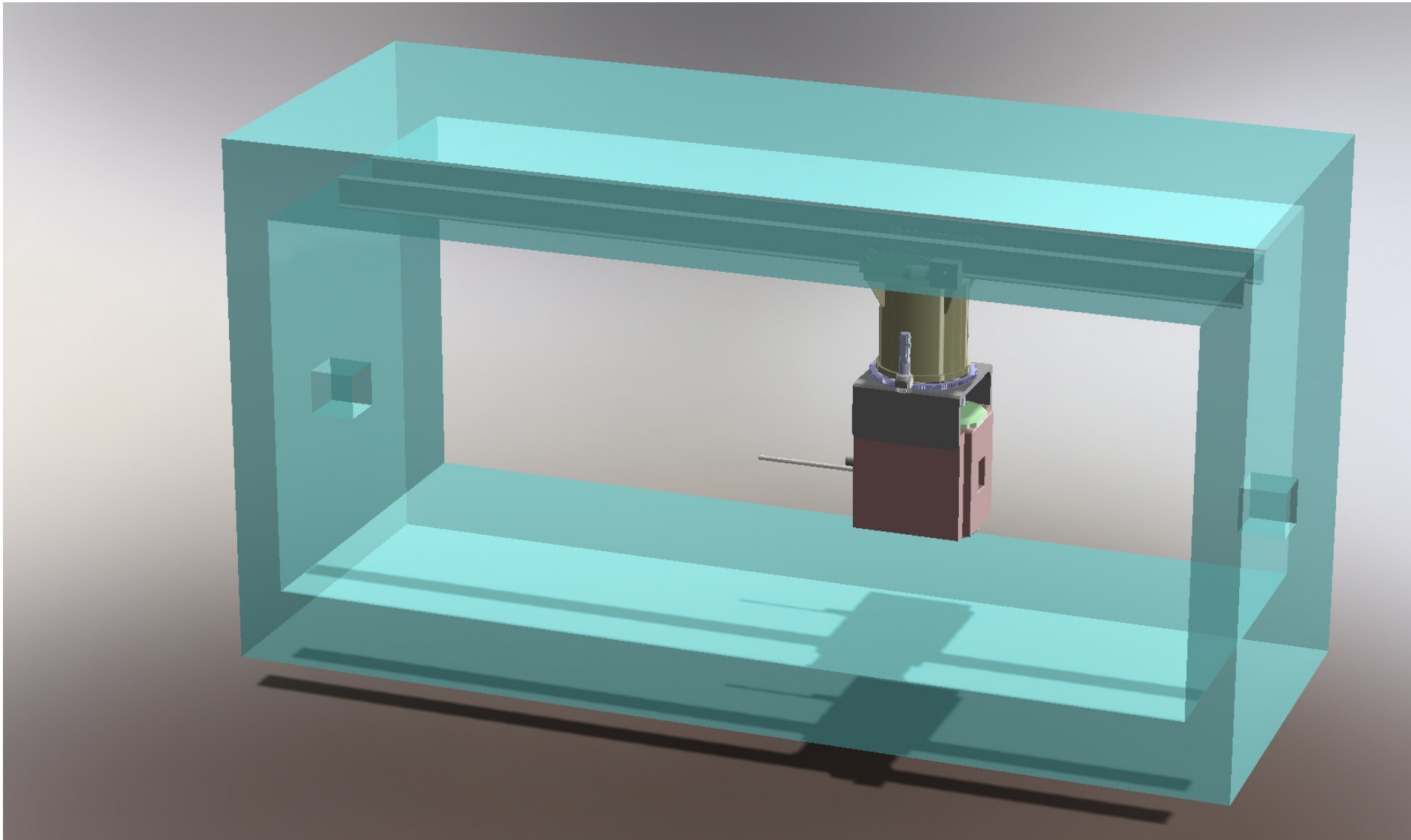




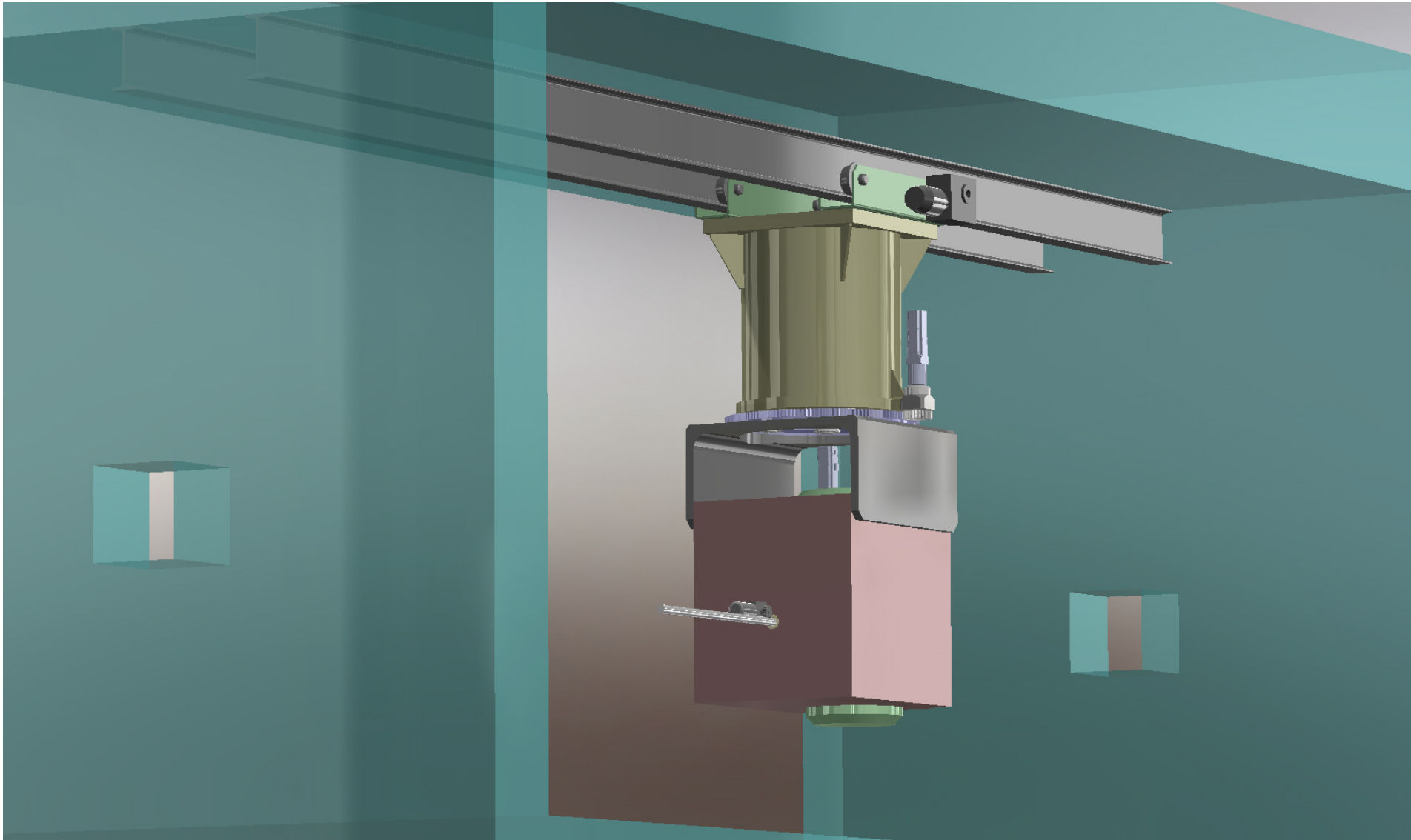
# Preliminary design



## ■ Transport system on rails



## ■ Transport system on rails



## ■ Assembly of the rails





# Construction



## ■ Modification of cell No. 1





# Construction



## ■ Modification of cell No. 9



## ■ Installation of container and threaded rod





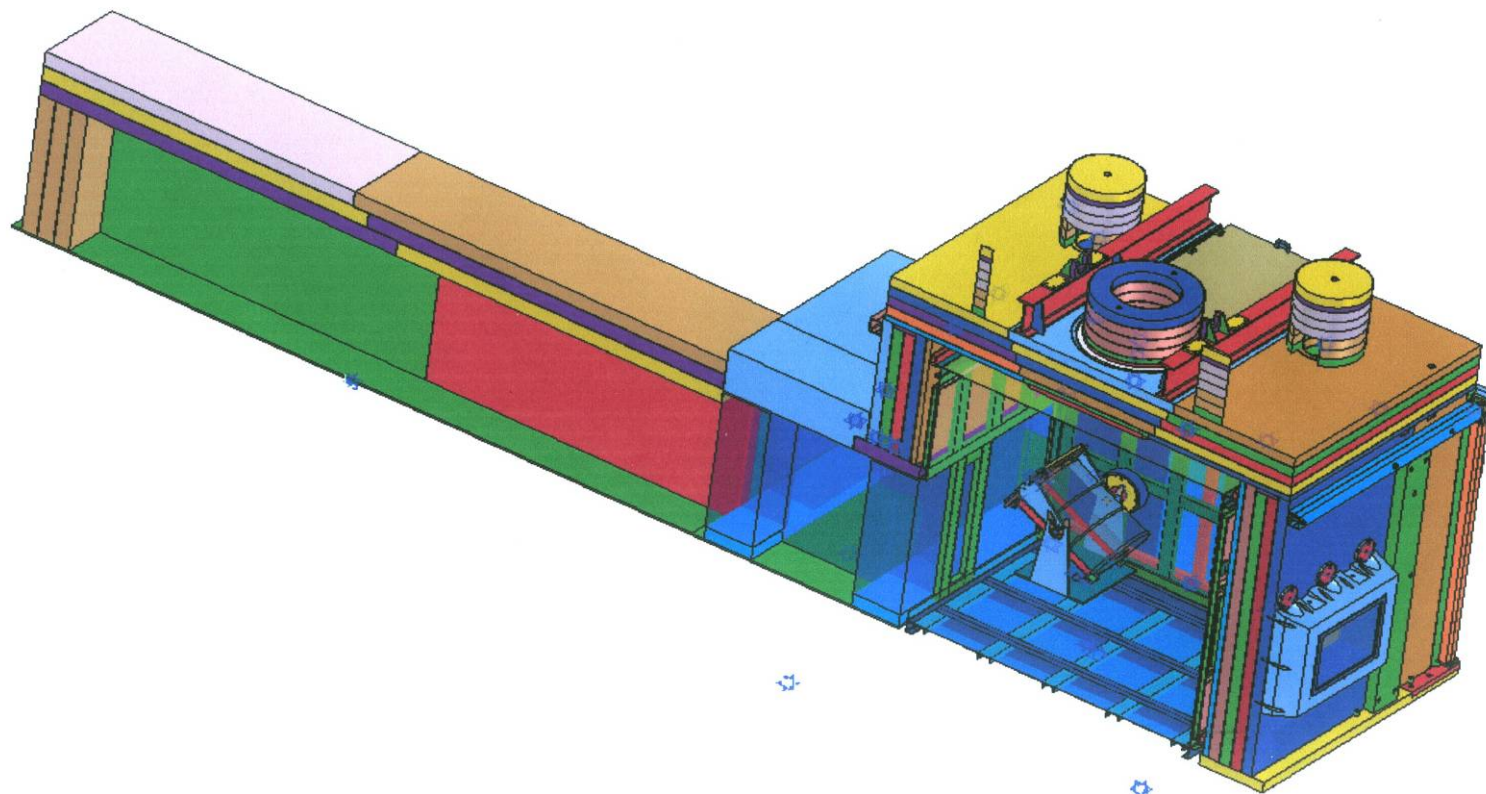
## ■ Final state



# Experience - Recent projects

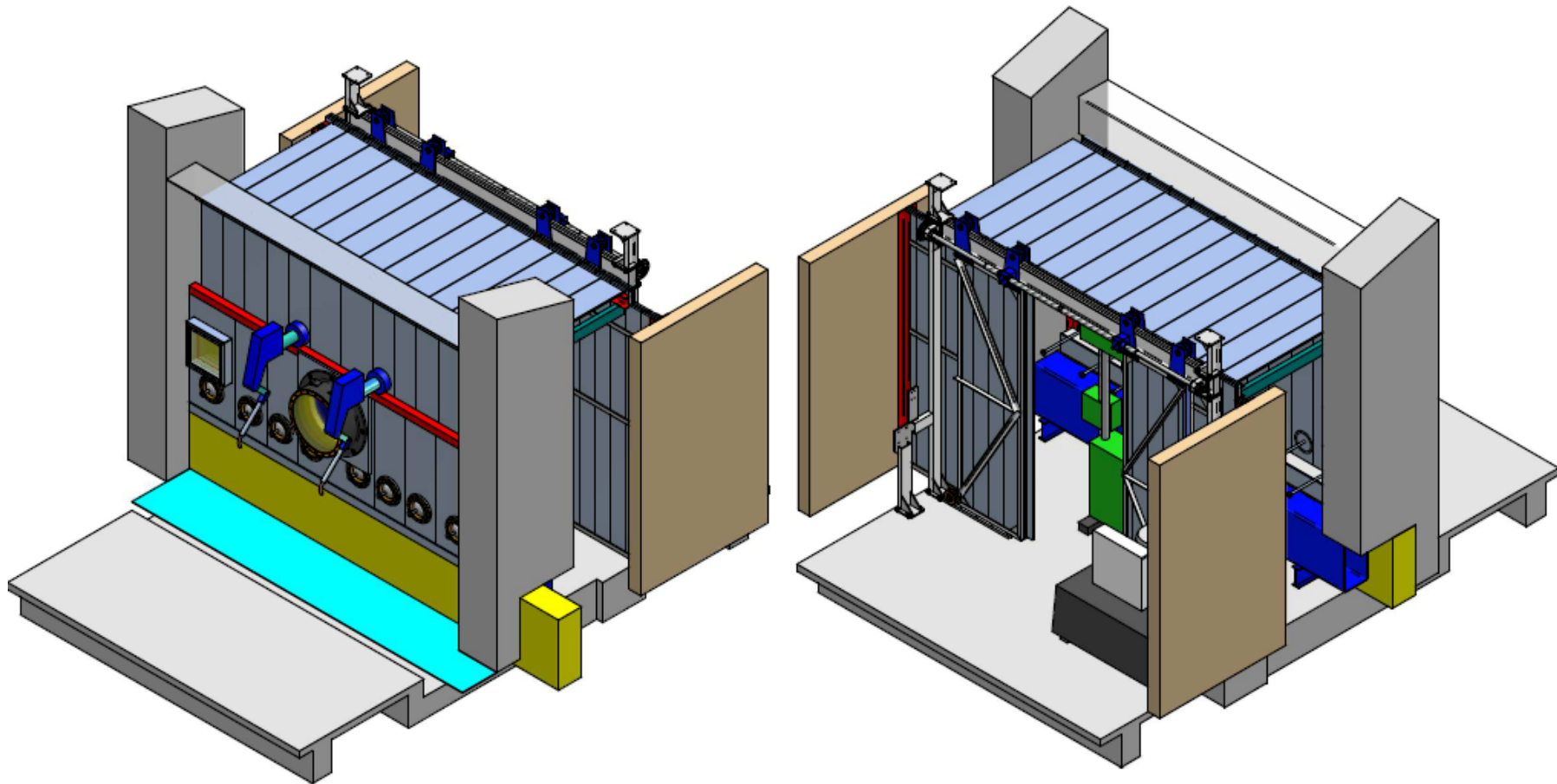


- Hot Cell for unloading of surveillance irradiation containers from Temelin NPP
- Hot Cell for repacking of SNF from LVR-15 research reactor



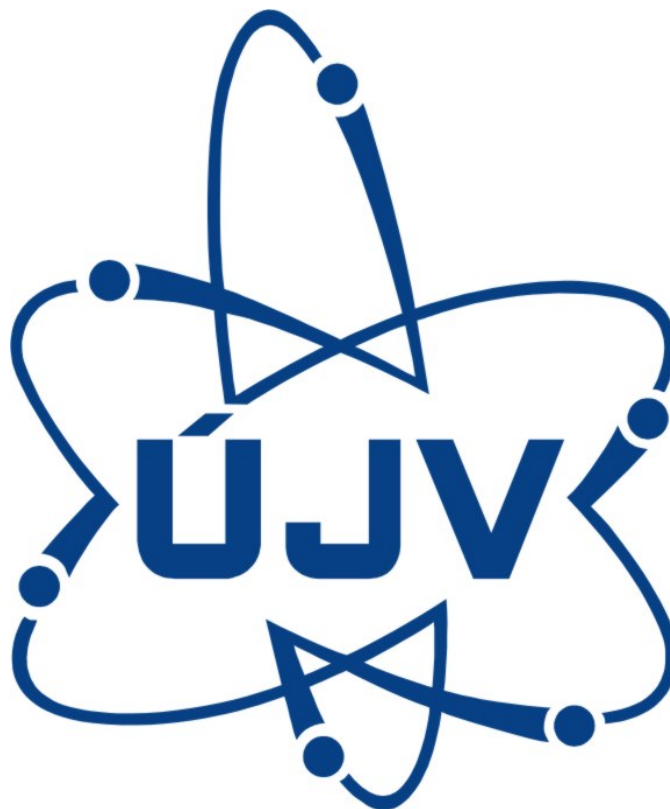


- Refurbishment of five semi-hot cells at Rez (former radiochemistry facility)



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**Thank you for your attention**



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