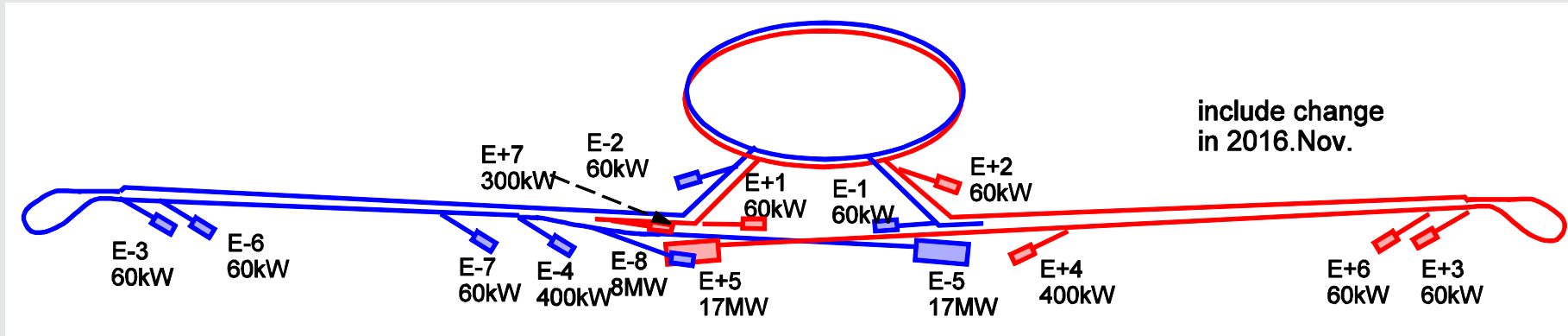


IDT-WG2 Dump

2020/10/2 Nobuhiro Terunuma, KEK

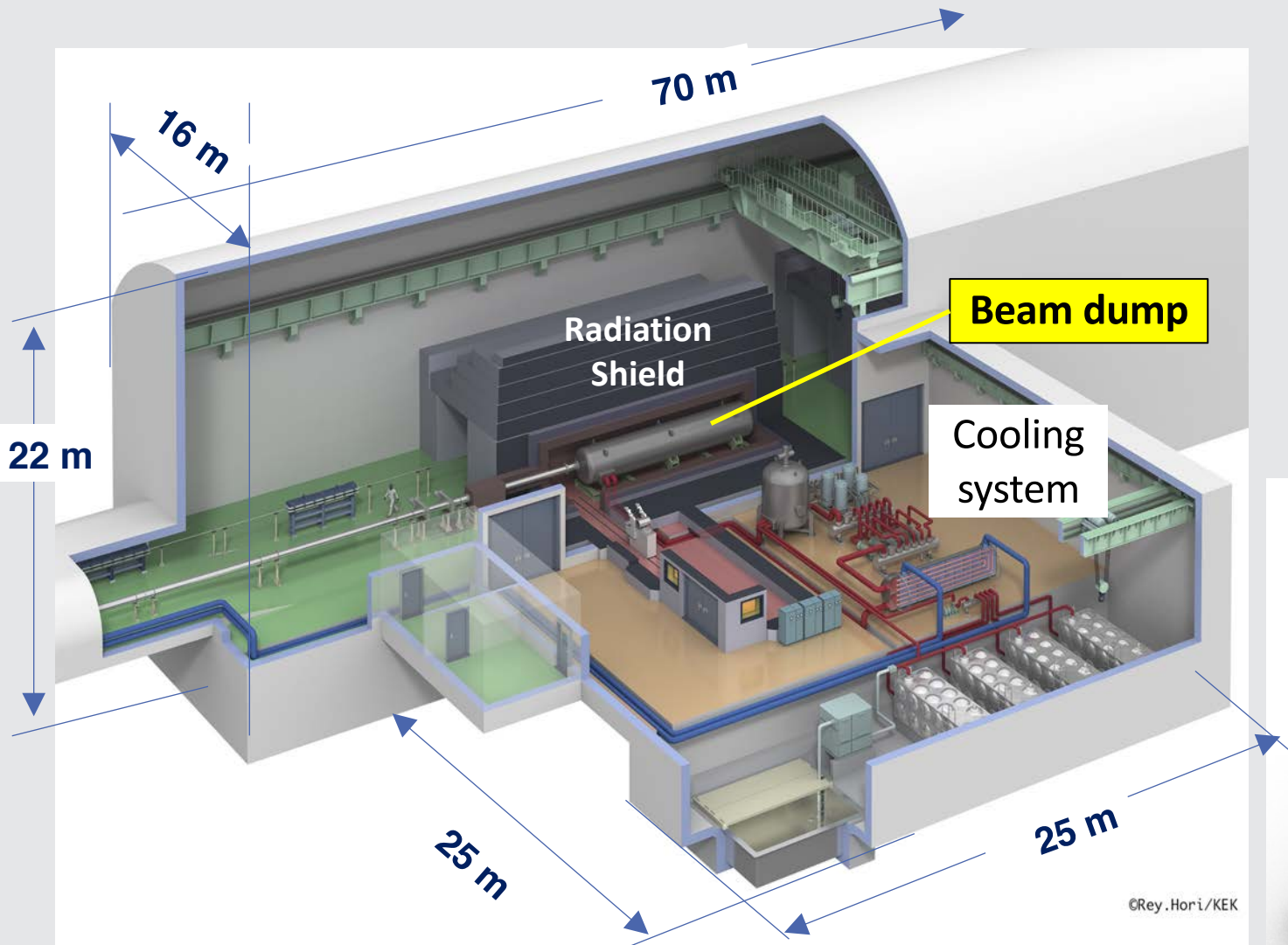


Dump		Num	Examples (design)	
Tune-up	60 kW	9	Many	
Tune-up ML	400 kW	2	XFEL (300kW), LCLS-II (250kW)	
Undulator photon	300 kW	1	-none-	Conceptual designs (graphite, water)
Main dump	17 MW	2	SLAC (2.2MW), JLAB (1MW)	~1MW achieved
Undulator 5+5Hz	8 MW	1		Use main dump design

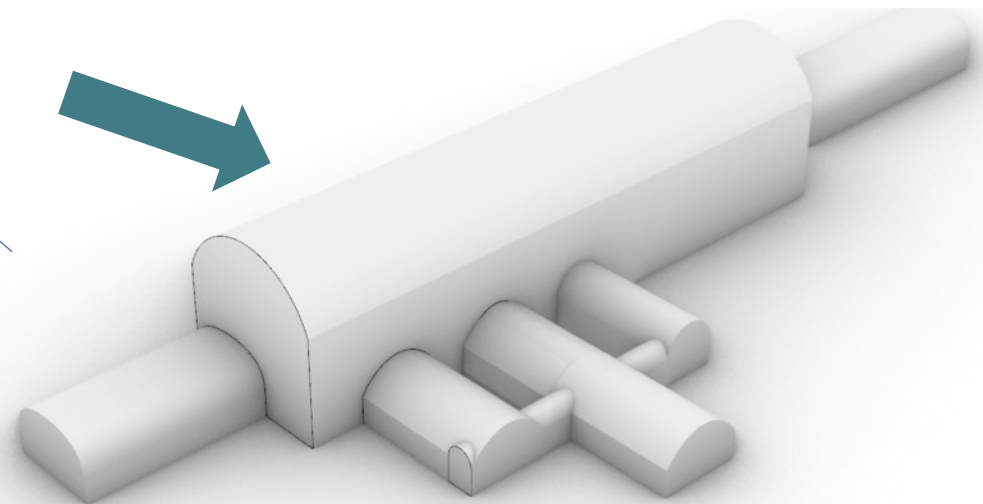
■ 17 MW main dump and 8 MW(5+5 Hz) dump

- Basic design as **water dump** has been established. (TDR)
- need technical design for **window exchange, activated water flow system, radiation safety and CFS.**

Main beam dump



- Big cavern to install the 5m-thick shields.
- Water dump capable for 17MW beam power (1TeV).
- Optimization of cavern is ongoing with AAA.
- Avoid big-flat utility cavern



Charges of sub-group

- Technical preparation (remaining topics) at Pre-lab
- Preparation for mass production at Pre-lab
 - It may be out of the scope for beam dump ... max 9 units for 60kW tune-up dump
- Possible schedule at Pre-lab
- International sharing candidates of these activities

Technical preparation (remaining topics) at Pre-lab

■ Technical Design: What we do not have now as a confirmed design

● 300 kW photon dump

● 17 MW main dump

- Water flow system (include vortex flow in dump vessel)
- Window sealing and remote exchange (30cm in diam., 10 atm activated water)
- Measure for failure on window, ...
- Civil and utility design under the condition of candidate site

■ Robustness test of window for 17 MW main dump

- Prototyping of window and its attachment
- Beam test of window material if possible

Possible schedule at Pre-lab

- Some committees by SCJ and MEXT show concerns about the safety on the main beam dump. Radioactive product is a concern by people in candidate site.
- A convincing main dump design with maintenance and failure scenarios should be prepared as soon as possible, say within a few years.
- It is desired that the robustness checkout of window by prototyping to be done in Pre-lab phase. But it will not be a showstopper.

International sharing candidates of Pre-lab activities

- Collaboration on the technical Design of dump system
 - SLAC, JLAB ... experience of the 1MW water dump
 - CERN, DESY ... High power dumps
 - Spain ... IFMIF dumps (1MW)

- Study of the window material
 - Industries
 - possibly with RaDIATE collaboration for a high power target