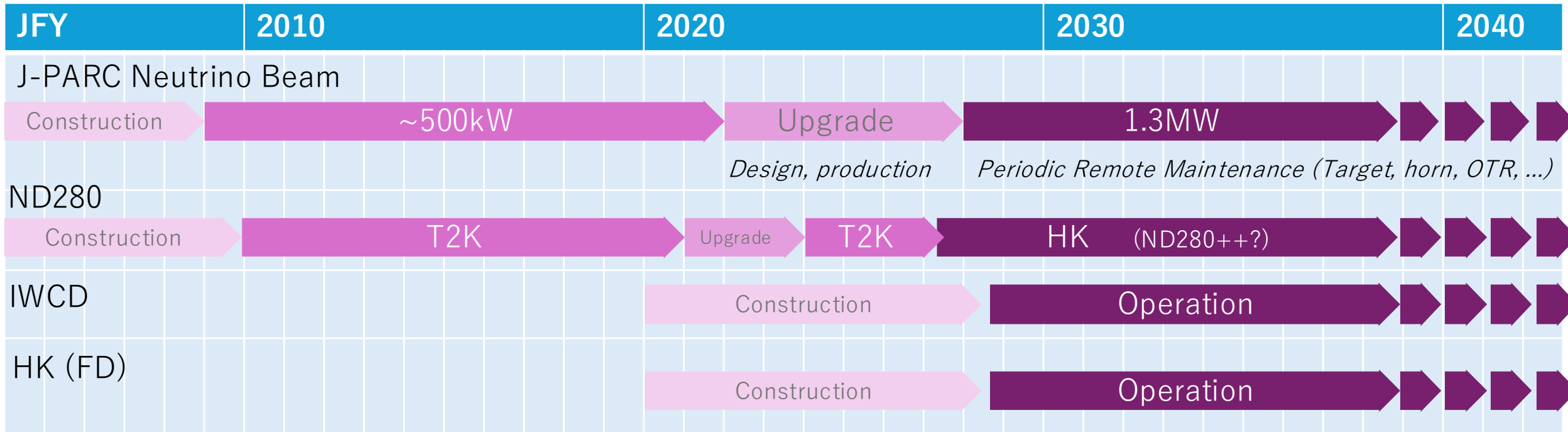


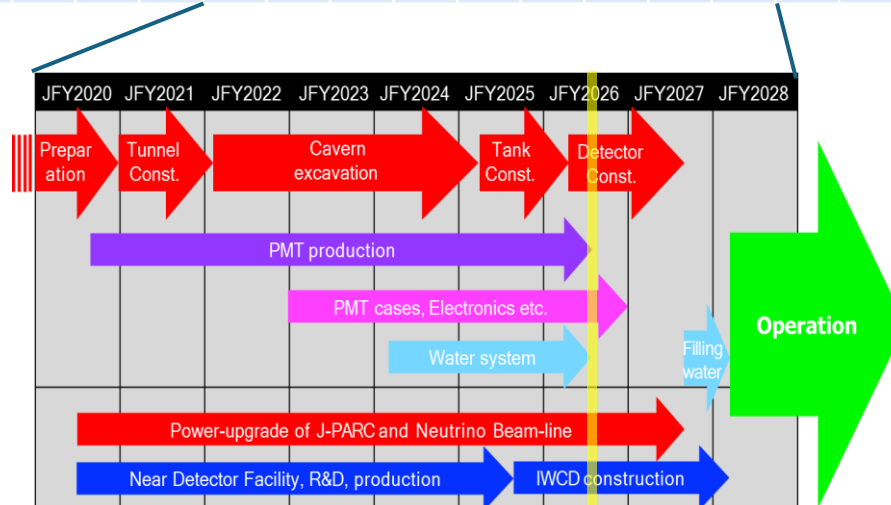
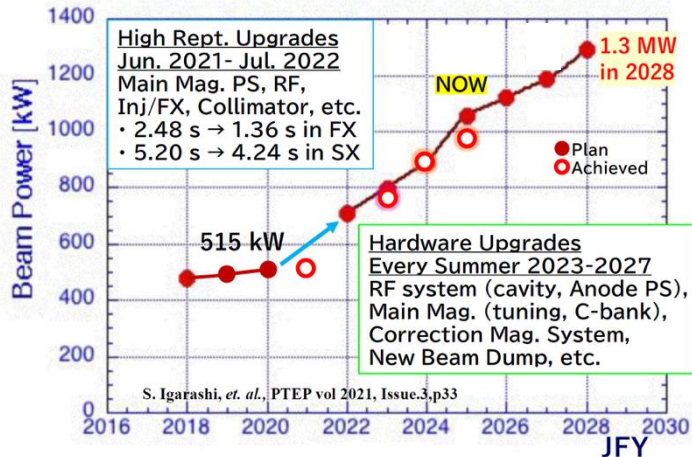
KEK–TRIUMF Collaboration for Hyper-Kamiokande Construction and Operations

T. Nakadaira
IPNS/J-PARC Center, KEK

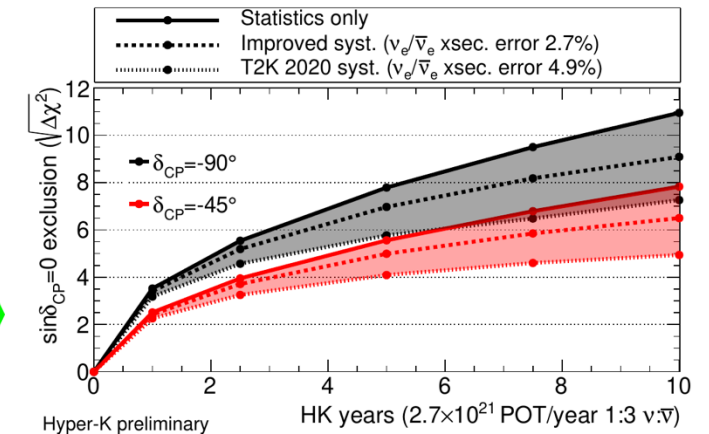
Hyper-Kamiokade Timeline



Stable 1.3MW neutrino beam is crucial, and challenge at intensity frontier.



Crucial phase of detector construction



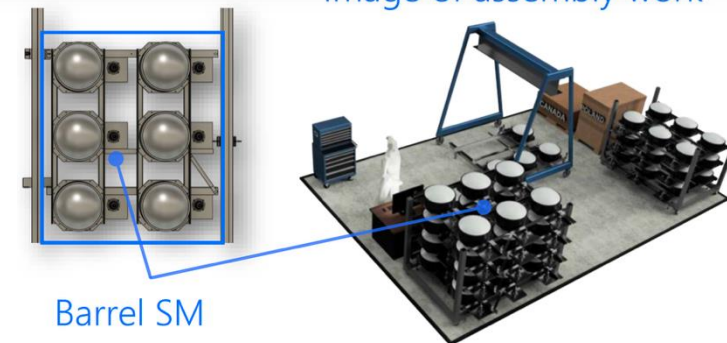
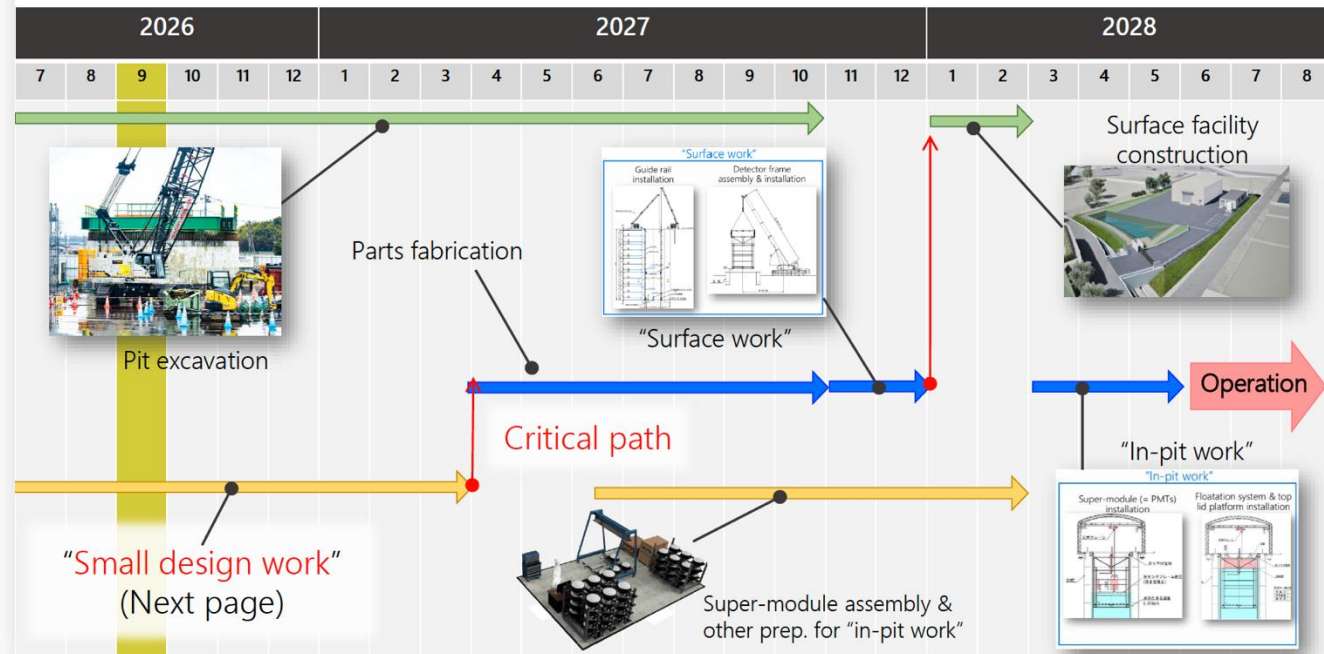
Commissioning → Operation
Physics Analysis and next future planning

IWCD: Key Milestones: 2027–2029

- April 2027:
Large-scale mockup of IWCD inner structure and super-modules to finalize installation procedure
- - June 2027:
multi-PMTs production and delivery to J-PARC
- July - Nov. 2027
Initial assembly of super-module frames and installation of multi-PMTs
- Dec. 2027-Feb. 2028:
Final preparation of super-module frames
- Mar. - June 2028:
Installation of all detector components in IWCD
- July - Dec. 2028:
IWCD commissioning
- Jan. 2029-:
Operation of IWCD with beam

Overall Construction Schedule

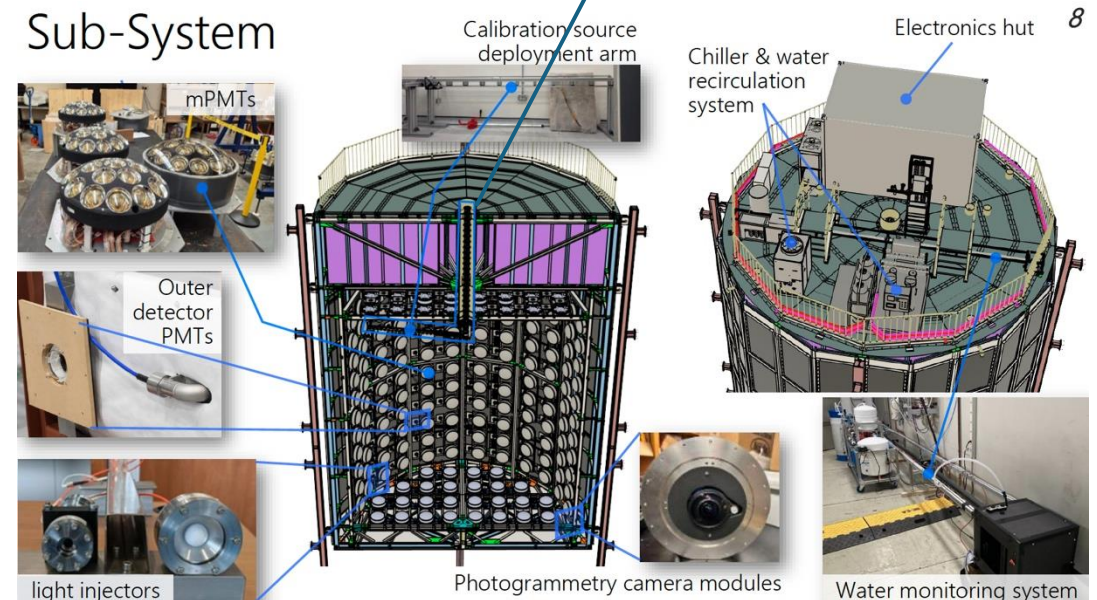
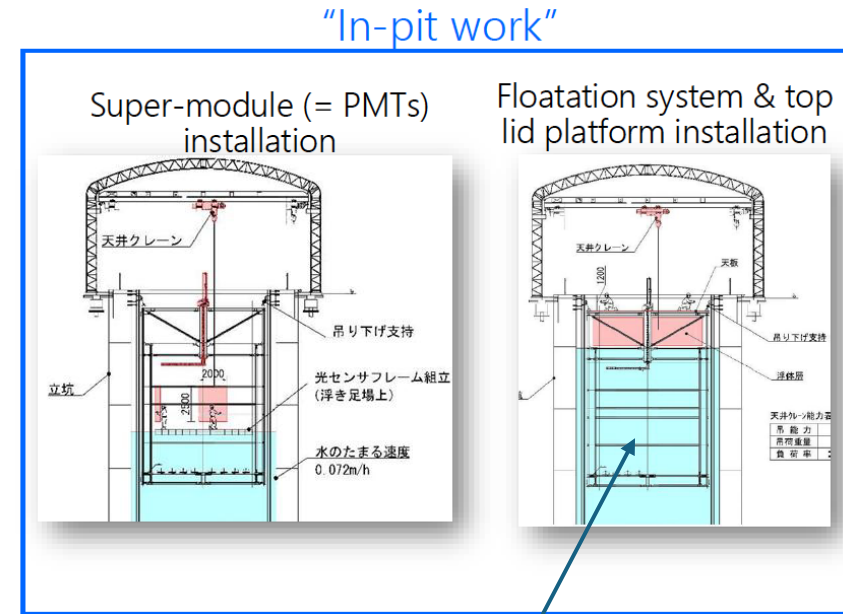
11



Collaborative work by KEK, TRIUMF, and the Hyper-Kamiokande Collaboration.

IWCD Construction Peak: 2027–2028

- Collaboration Needs
 - Installation planning
 - Super-module assembly
 - Detector integration
 - QA/QC support
 - On-site coordination
 - Logistics support
- local support at J-PARC is important.
 - Logistics support
 - Engineering and Technical support.



Cooperation item on Engineering: Required Now

- Priority Items

- Installation procedures
- Electrical integration
- Material qualification
- System validation
- Interface management

Remaining "Small Design Work"

12

The inner side of geomembrane will be lined with **Tyvek sheets** prior to "surface work"

→ Need to develop "installation procedure"

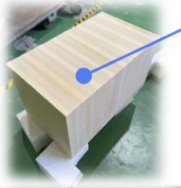


Geomembrane

A

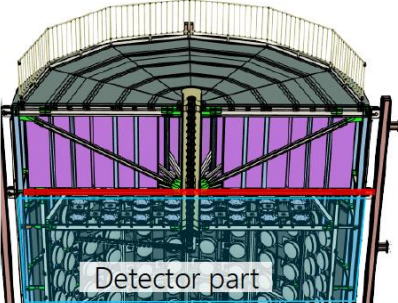
PVC foam block must be wrapped with a **waterproofing sheet**, in order to avoid deterioration of detector water quality

→ Need "material selection & develop development of wrapping procedure"



Polyethylene sheet - a **candidate**

B



Detector must be light-tight at the **upper boundary**

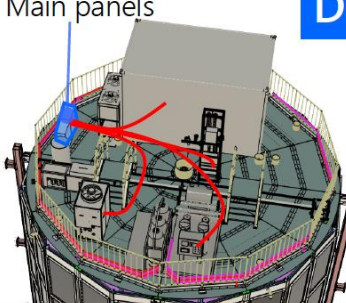
→ Need "method to block light, including Tyvek lining method"

Detector part

C

For each sub-system, **power & communication distribution** from main panels need to be done by IWCD group

→ Need "semi-conceptual electrical design with specification"



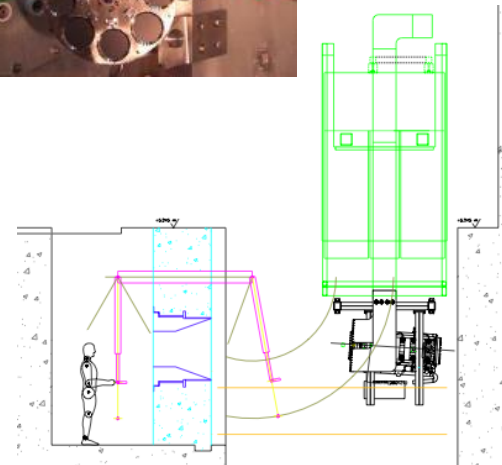
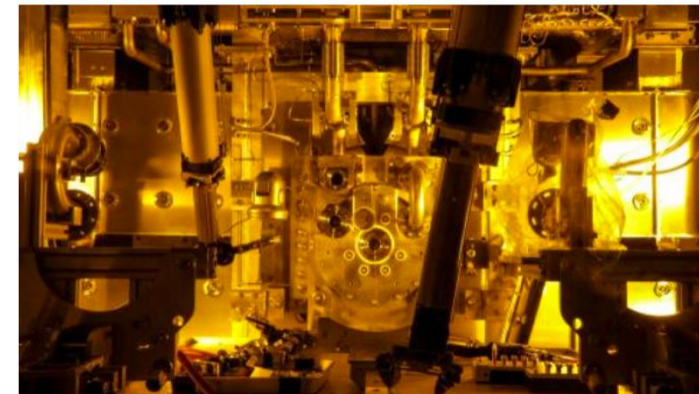
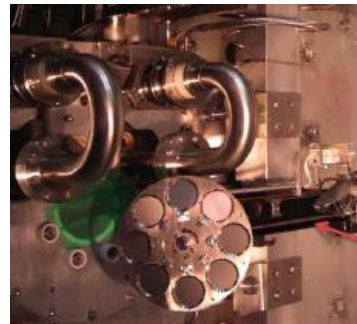
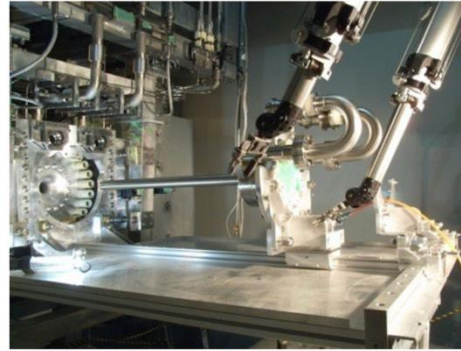
Main panels

D

Innovative R&D to realize the IWCD moving mechanism, which is essential for achieving Hyper-Kamiokande's target sensitivity.

Beamline Support and Remote Handling

- Upcoming Activities
 - OTR : Operation/Improvement
 - Beam commissioning for each run-period
 - Spare OTR for Spare Horn-1
 - Remote handling operations
 - Beam window replacement
 - Target/home replacement
 - Maintenance preparation.
- Challenges at Intensity Frontier
 - Periodic preventive maint. for high-power
 - Operation and Flexible and responsive maint. when unexpected situation.

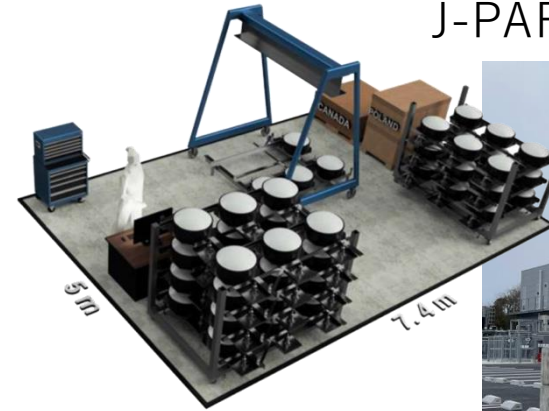


Beam availability is crucial for HK CPV search.

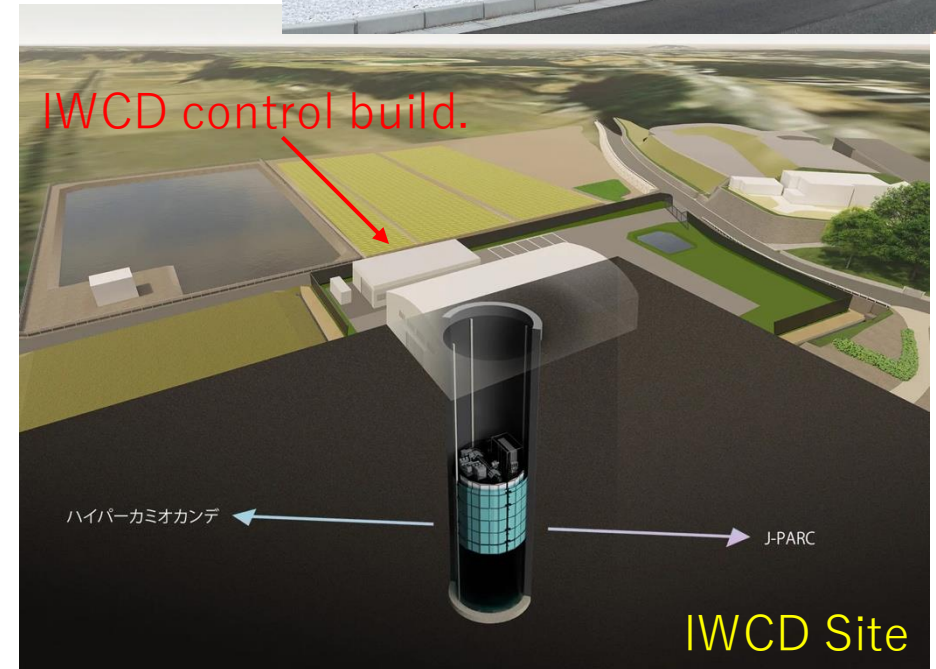
Extensive on-site work at J-PARC.

- Many collaborators stationed at J-PARC
 - Postdocs
 - Students
 - Engineers and Technicians
 - Scientists
- Outcome
 - Knowledge transfer
 - Operational readiness
 - Leadership development

Developing the scientific research hub at J-PARC together!



J-PARC Research Development Bld.



Commissioning and Early Operations

- Areas for Joint Leadership
 - Calibration
 - Detector monitoring
 - Data quality
 - Performance validation
 - Early operations support
- Advantage from the experience at WCTE



Summary

- Hyper-K enters its most resource-intensive phase in 2027
- Engineering and on-site contributions are especially valuable
- Long-term presence at J-PARC strengthens both KEK and TRIUMF, by leading the IWCD and beam efforts, which are crucial to achieving Hyper-Kamiokande's physics sensitivity.
- Long-term partnership extends from construction through operations