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NEUTRINO FACILITY AT J-PARC

PARTICLE PHYSICS JOINT LAB JAPAN - FRANCE

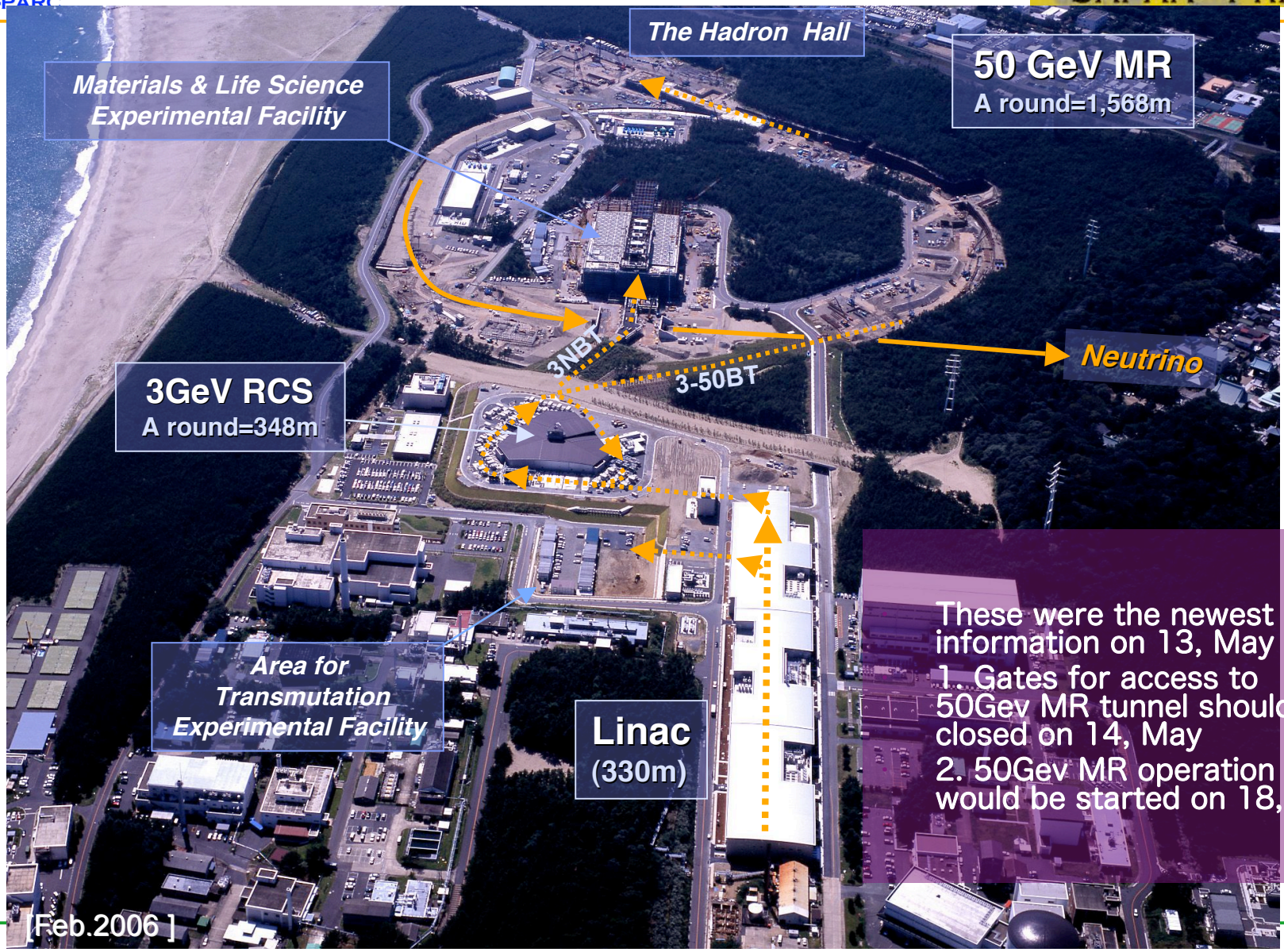
NU_1
Recent status of J-PARK T2K beam line and plan for FY08

Nobuhiro KIMURA/KEK

Contents

- Recent status of J-PARK T2K beam line
- Construction schedule for FY08
- Proposal for FJPPL R&D program

J-PARC Accelerators



Commissioning Plan

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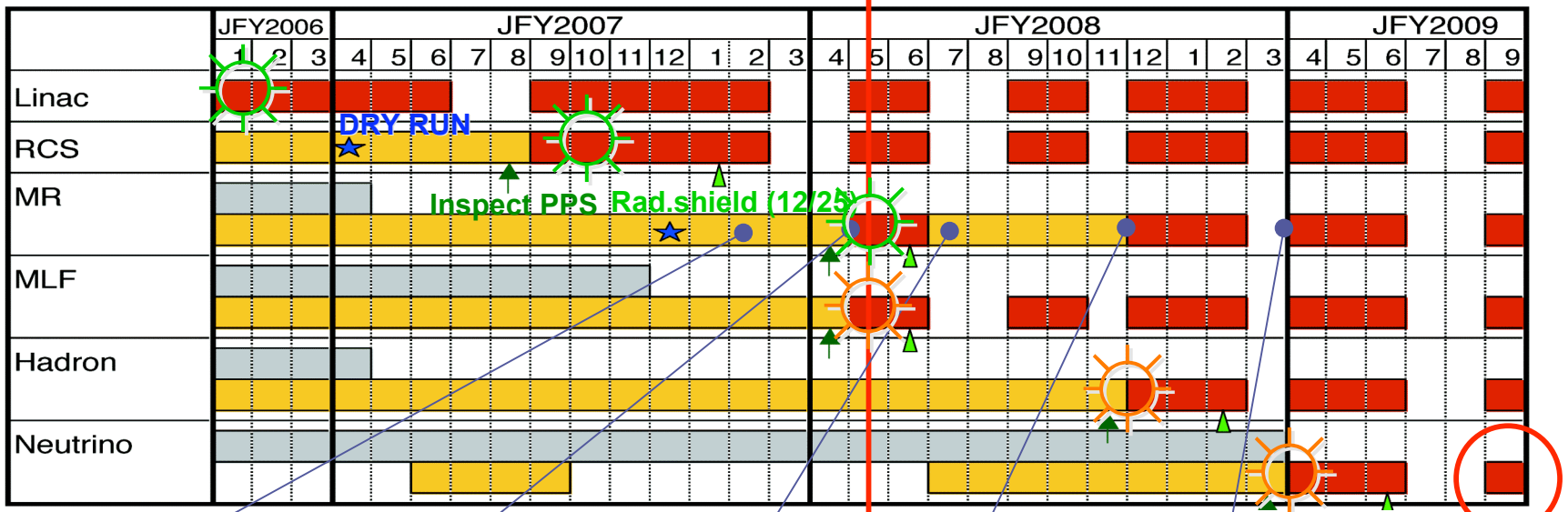
NOW

[CONSTRUCTION] [INSTALATION] [COMMISSIONING]



Install Septum Magnets

1st STAGE: Establish Closed Orbit

Install Fx Kickers & Sx devices

2nd STAGE: Acceleration (30GeV)

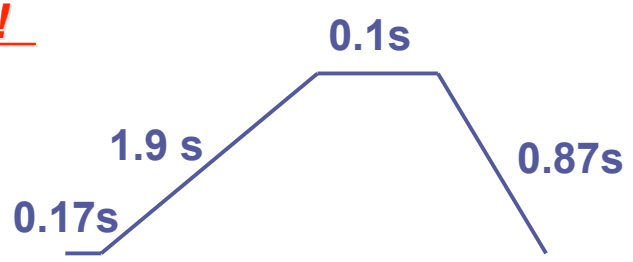
3rd STAGE: Fast Extraction

High Intensity Run

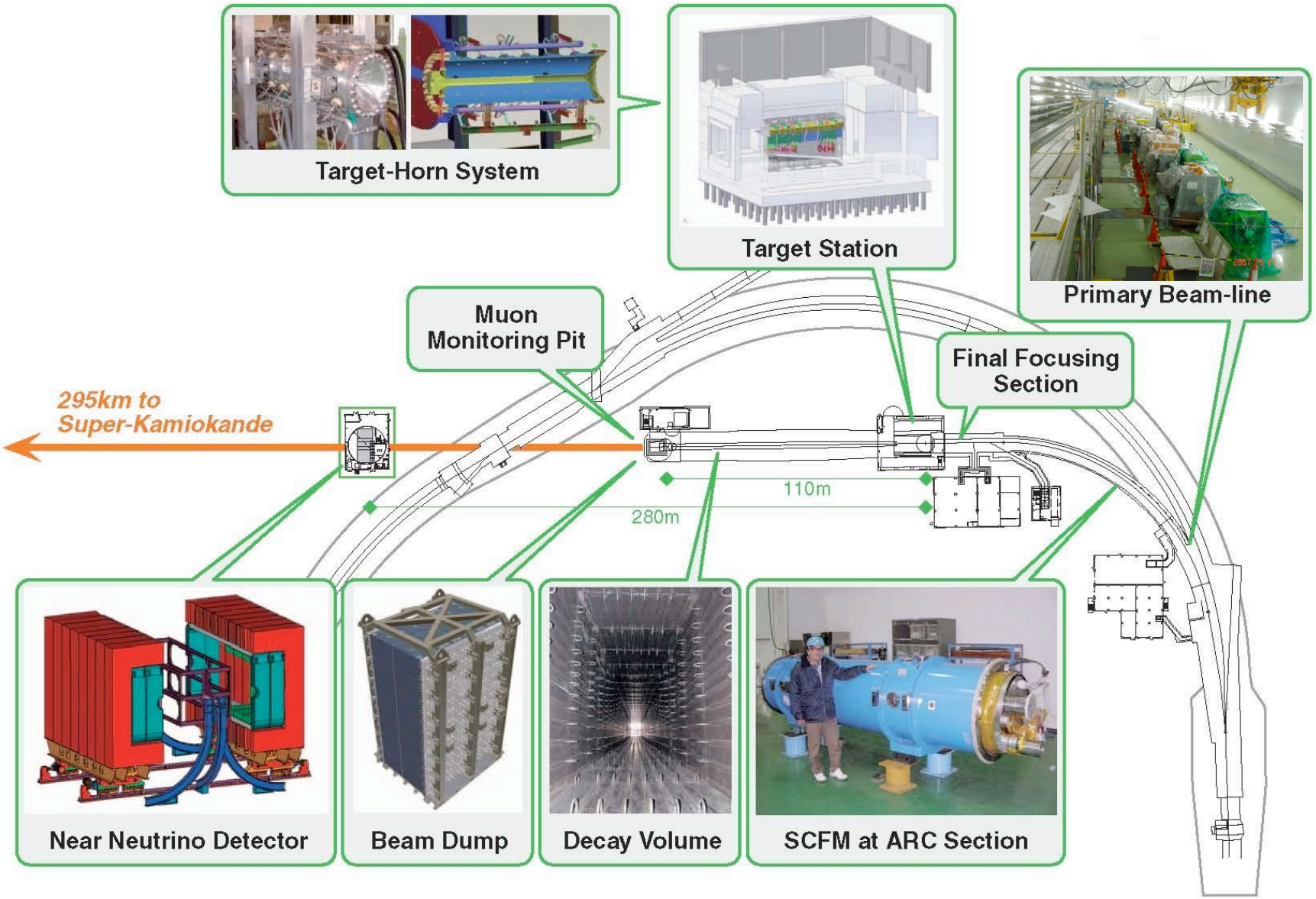
MR beam commissioning will be started on 18 May !

[Day-one Fx Operation Parameters]

- 30GeV
- 6 bunches / h = 9 (kicker rise time problem)
- Rep. period: ~3 s

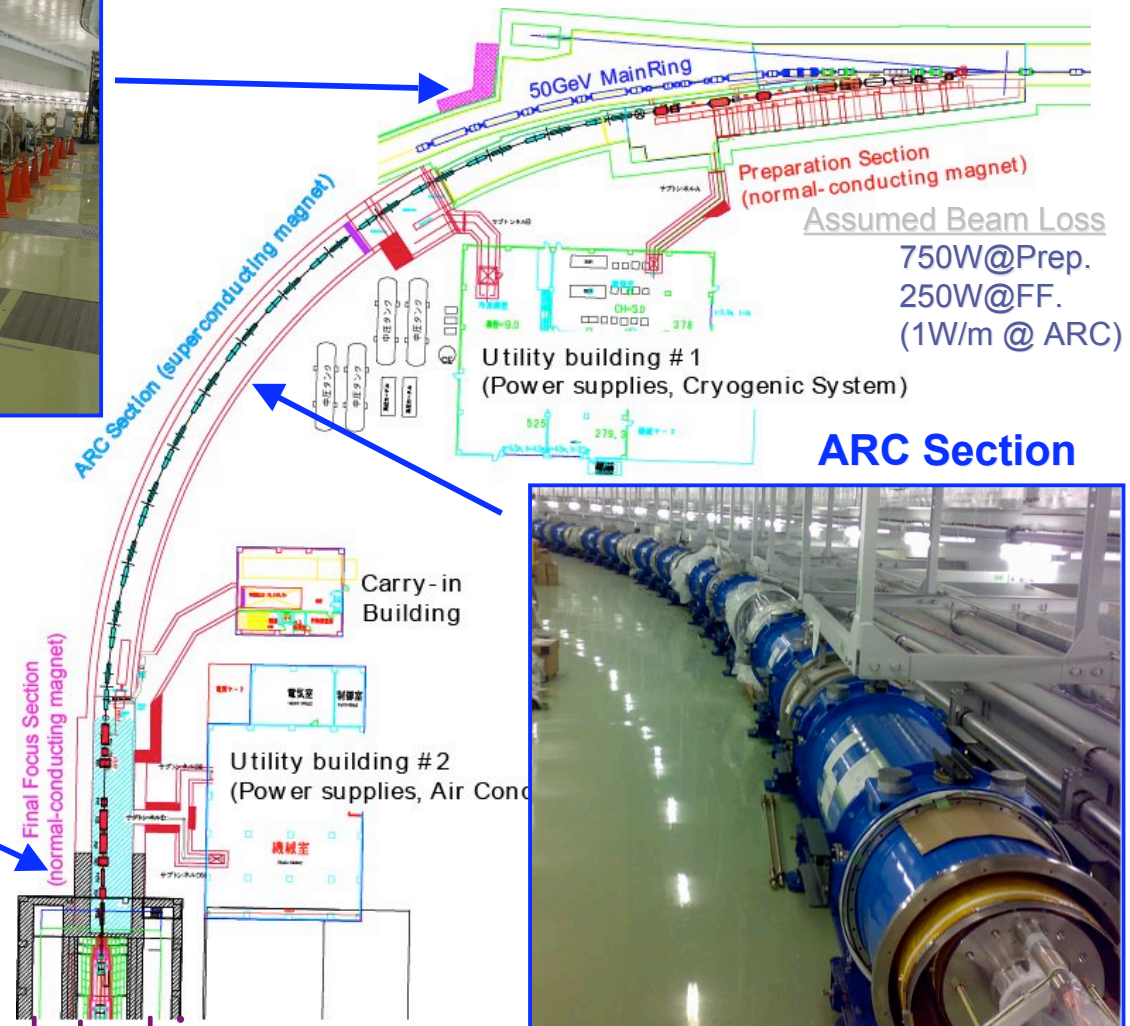


The Neutrino Beam-Line



Primary Beam-line

Preparation Section

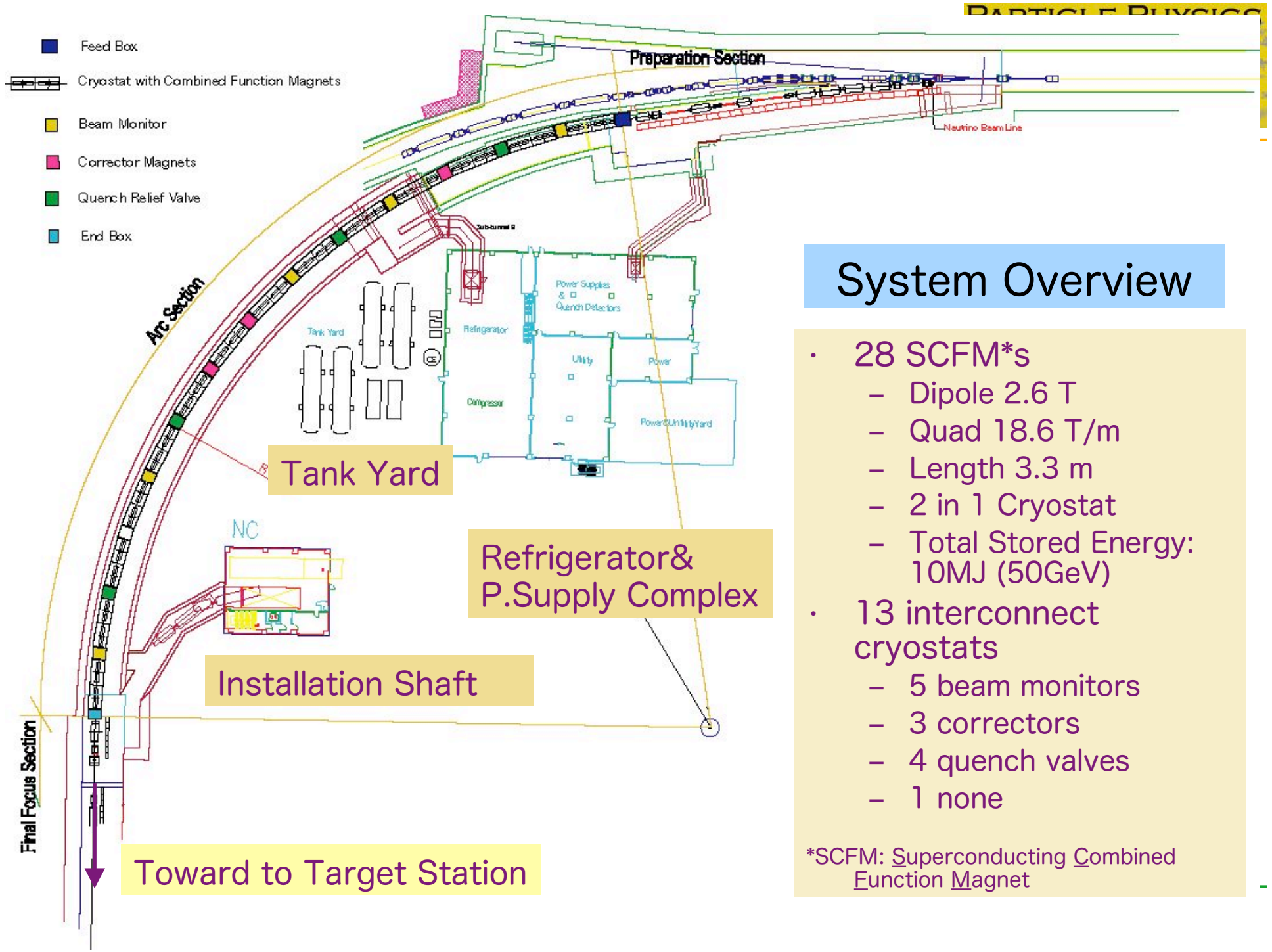


Assumed Beam Loss
750W@Prep.
250W@FF.
(1W/m @ ARC)

ARC Section

Final Focusing Section

- Beam-line tunnel was completed in December 2006
- Installation is started from July 2007



System Overview

- 28 SCFM*s
  - Dipole 2.6 T
  - Quad 18.6 T/m
  - Length 3.3 m
  - 2 in 1 Cryostat
  - Total Stored Energy: 10MJ (50GeV)
- 13 interconnect cryostats
  - 5 beam monitors
  - 3 correctors
  - 4 quench valves
  - 1 none

*SCFM: Superconducting Combined Function Magnet

Status of SCFM

- In our project plan, thirty two SCFMs products for T2K.
- All of the SCFM's are tested using with holzontal cryostat in KEK.
- In this time, twenty eight SCFM's have been finished performance test without serious troubles.
- These magnets install in the tunnel equipped with vacuum vessels.
- Left four SCFMs will be done performance test until mid of 2008.
- These SCFMs will use as reserve magnet.

Status of SC system

Twelve doublet cryostats were completed, and have been installed in the tunnel.
Left two cryostats and two reserved cryostats are now under production at Mitsubishi Electric Co..

Status on Doublet Cryostat (1)

On 8th Feb. 2008, installation work of
the doublet cryostats were started
in the tunnel at Tokai.
The above photograph shows
the first cryostat into the tunnel by crane.
Left three photographs show
the first cryostat pulling by folk lift
to put on the right position in the tunnel.

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Status of Transfer Line

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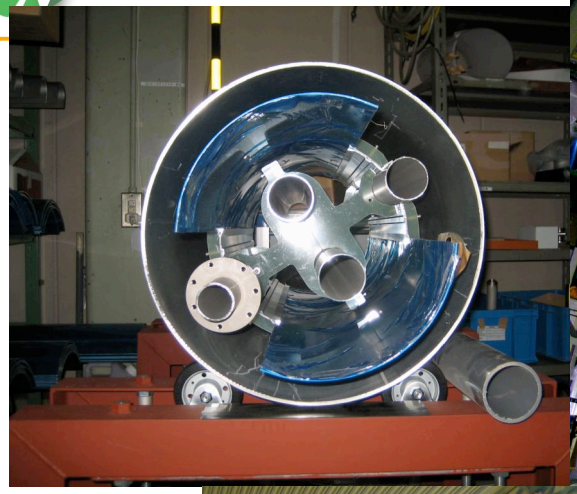
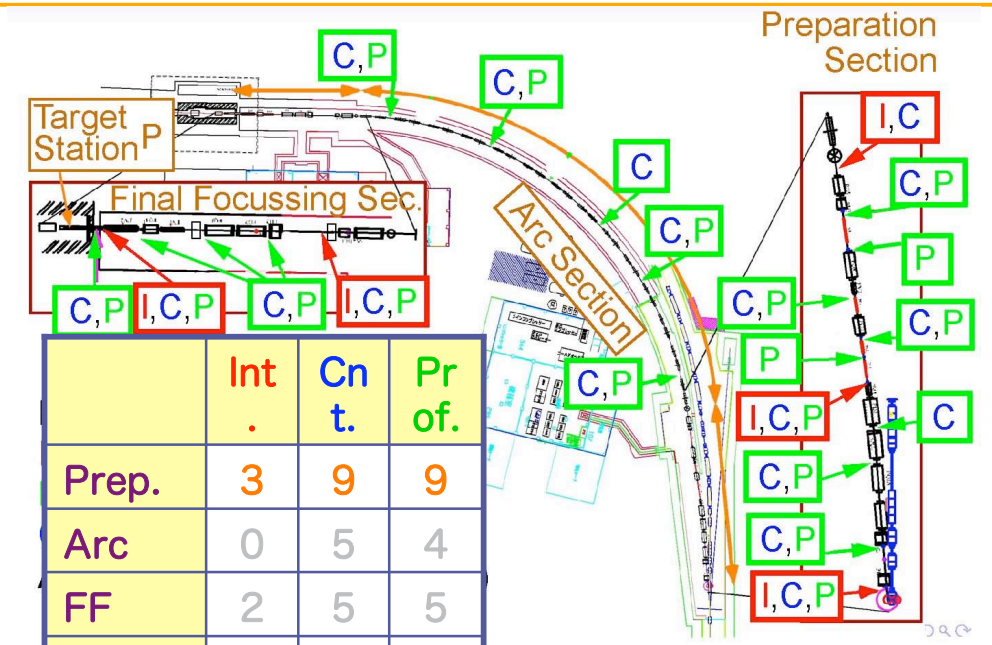


Production of Transfer line was started on end of 2007

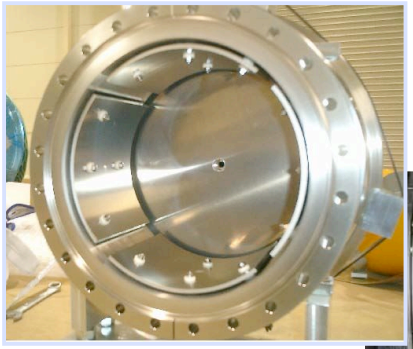
First of four units of transfer line were delivered for KEK.
These units will be installed in the tunnel on this July.

Beam Monitors

- Configuration
  - Position : Electro-Static Monitor (ESM)
  - Profile : Segmented Secondary Emission Monitor (SSEM)
  - Intensity : CT
  - Loss monitors: 50 Ionization chambers
- Readout by COPPER/KEK-DAQ
- *All monitors in beam-line by October.*
- OTR in front of the target
- A monitor remote-handling stack in front of TS vessel by TRIUMF

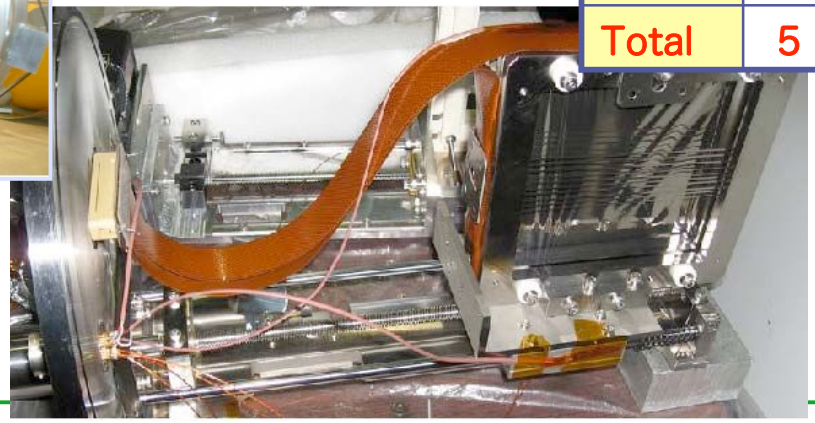


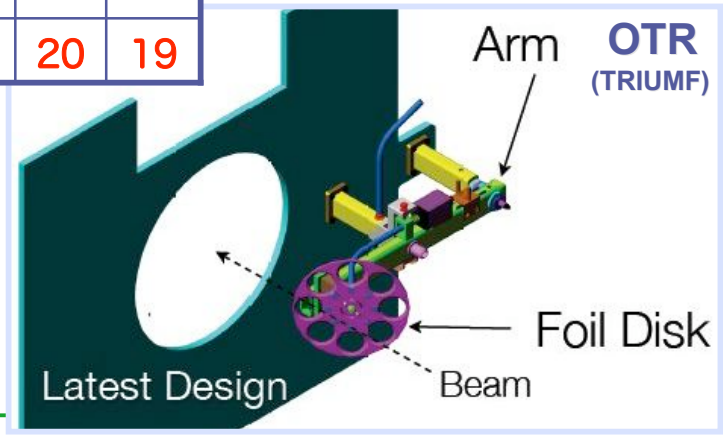
	Int.	Cnt.	Prof.
Prep.	3	9	9
Arc	0	5	4
FF	2	5	5
M.Stack	0	1	1
Total	5	20	19



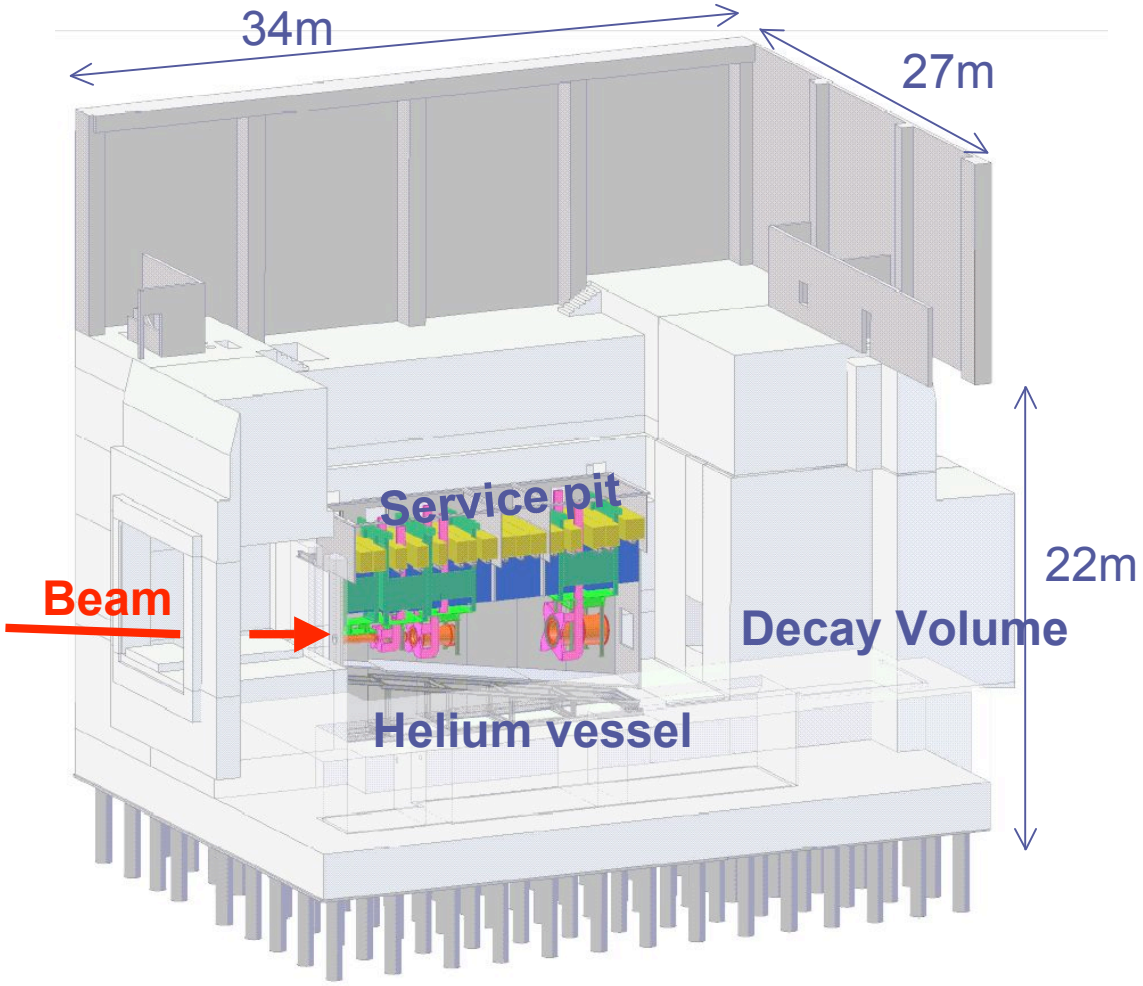
ESM

SSEM





Target Station



- 40tons crane for remote maintenance installed on March '08
- Construction of the building to be completed in June '08

Helium Vessel Construction


Upper box on the Super-Carrier


Evacuation test(1000m^3)
Passed in the 1st try
Installation of the Vessel
Completed on Nov.30'07

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Decay Volume

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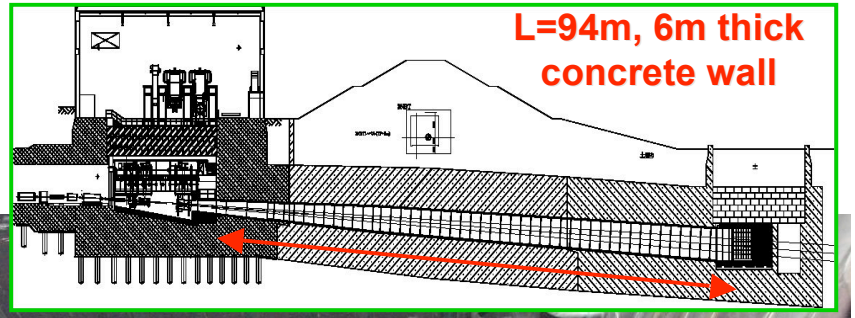
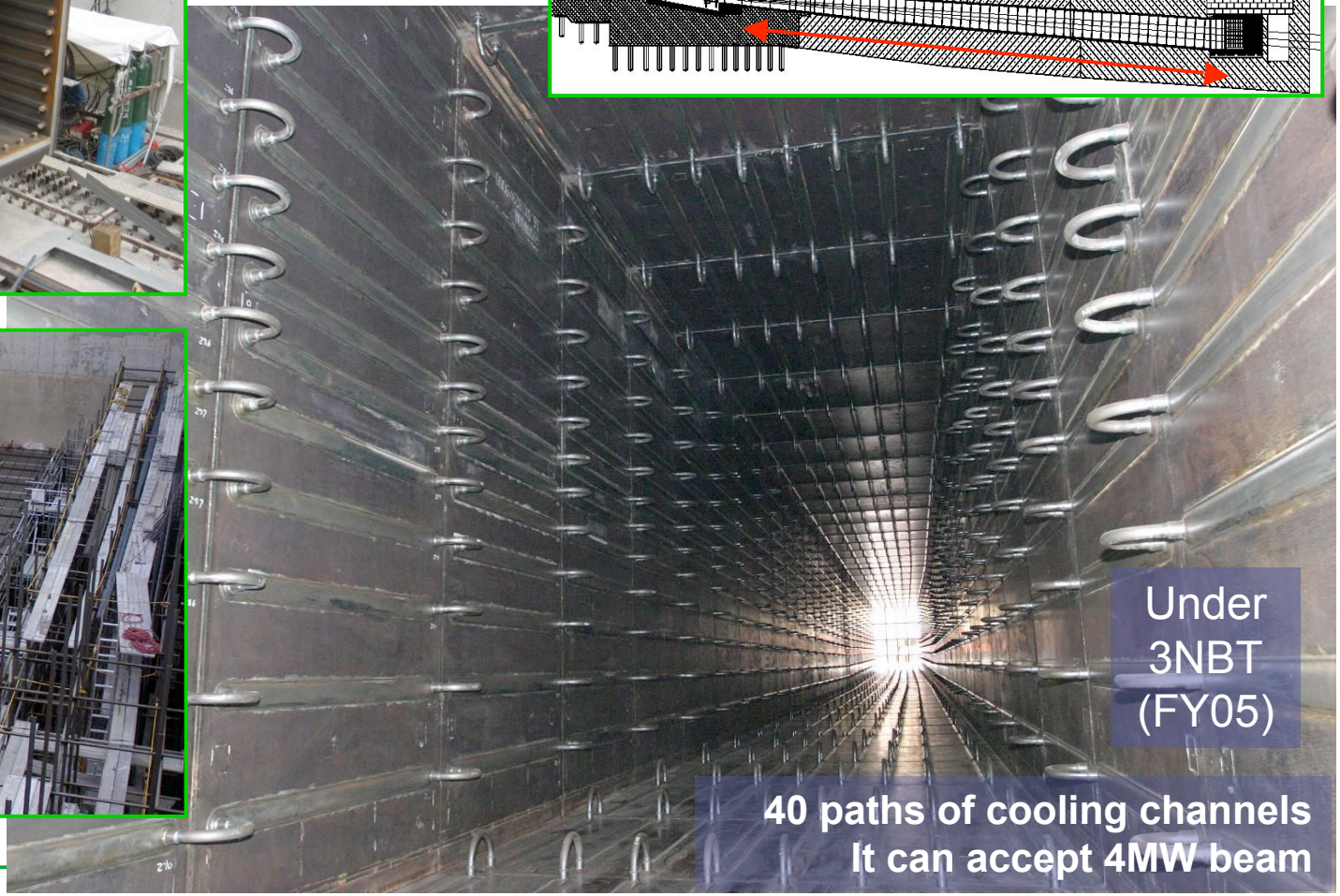
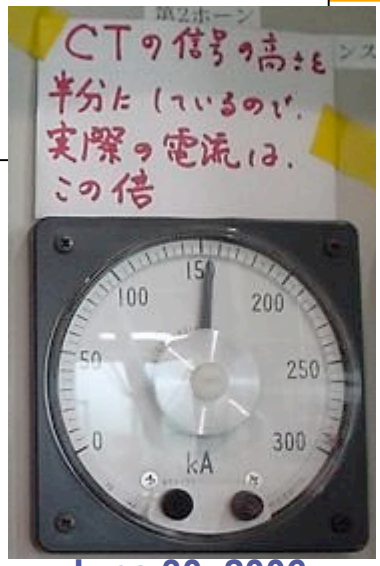


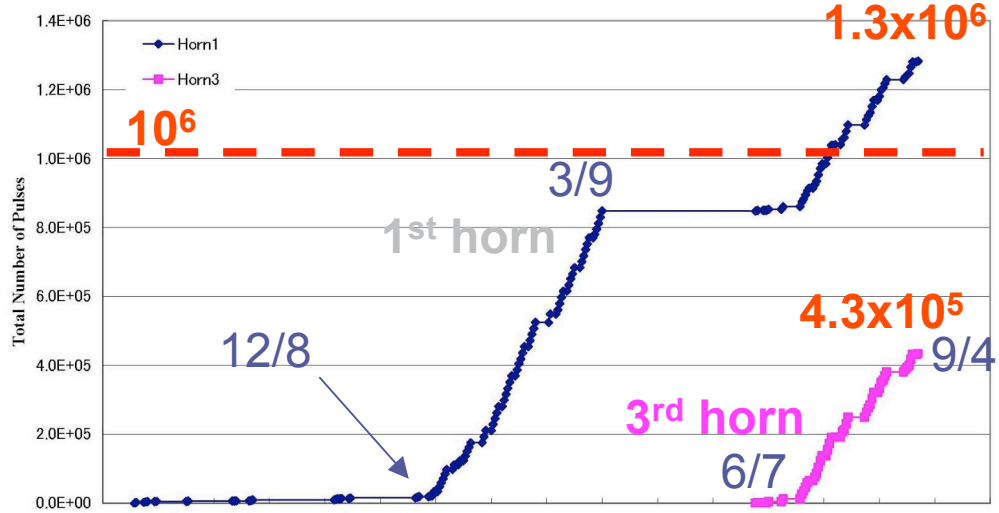
2008/03/07

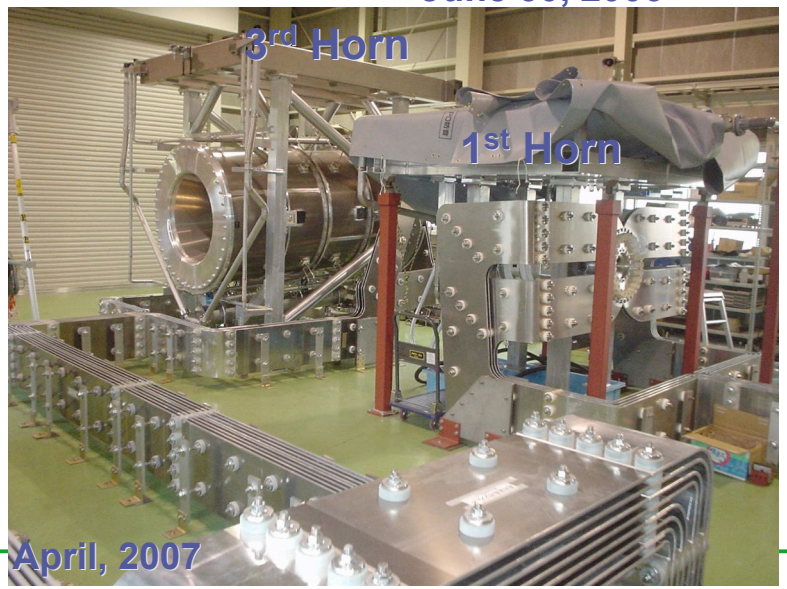


1st / 3rd Horn Operation Test

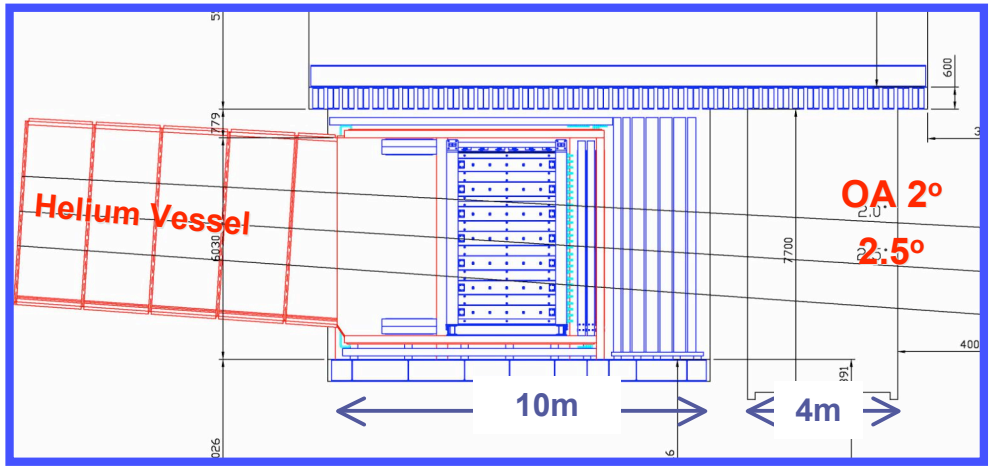


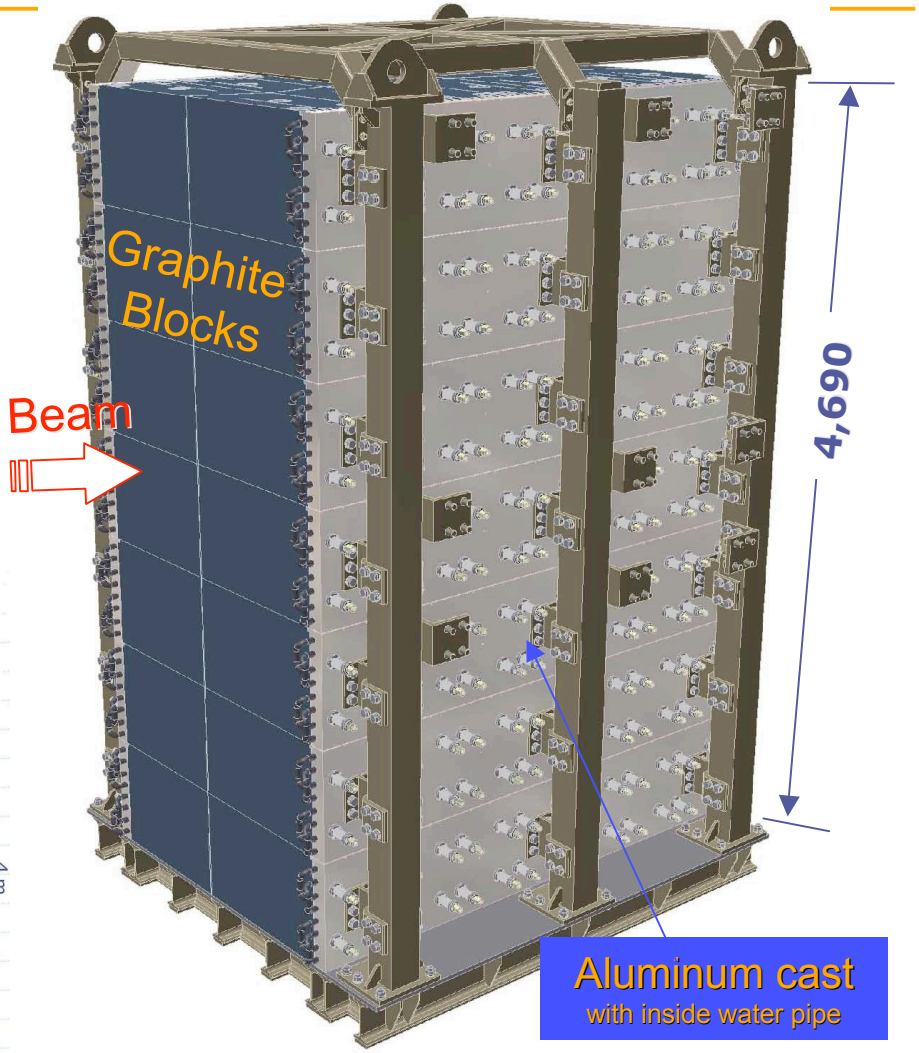
June 30, 2006



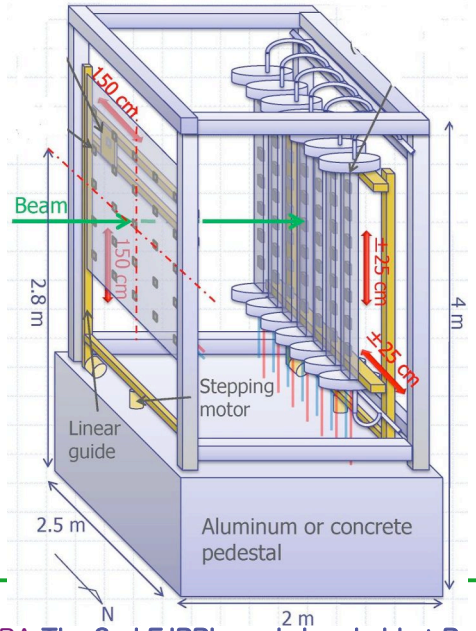


Beam Dump / Hadron Absorber





Muon Monitors



- It can accept future MW beam

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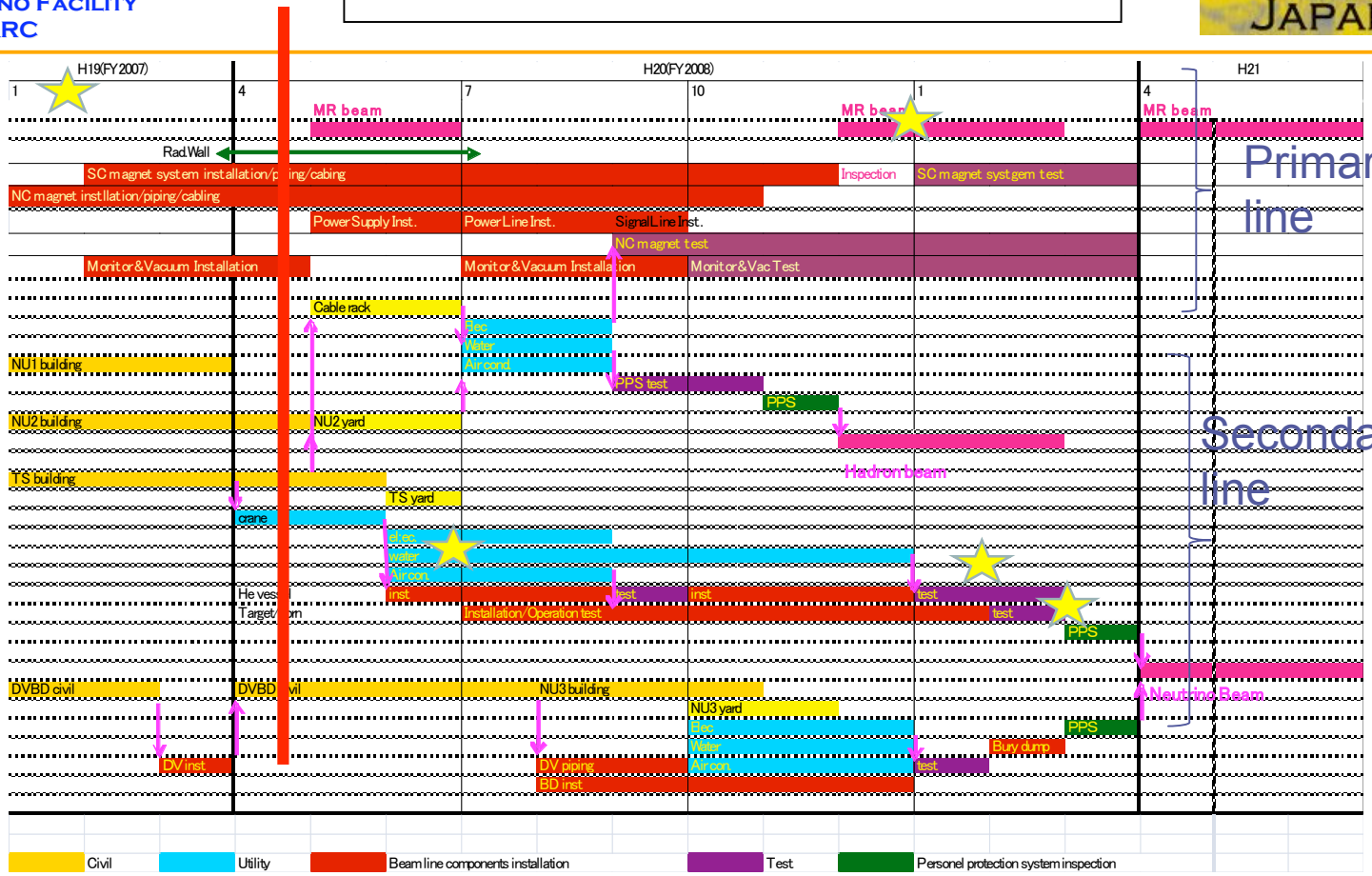
Construction schedule



Primary line

Secondary line

- Installation of almost all components in 2008
  - SC magnets from Feb, Target/Horn from July,
  - SC/Horn in-situ operation test from 2009, Interlock inspection Mar. 2009
- Construction is *on schedule!!*
- Beam commistioning will start in April 2009

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Proposal Nu_1: "R&D of neutrino beam production for future (Multi-)MW proton facility" (R&D on T2K beam)

- Members
  - Saclay: J.-P.Charrier, F.Pierre, C.Cavata, A.Bouty, T. Boussuge, M.Zito
  - KEK: T.Kobayashi, K.Sakashita, T.Nakadaira, T.Ogitsu, K.Sasaki
- Research items
  - KEK is in charge of the design, provisioning and commissioning of the Primary Proton Beam Line.
  - CEA/Saclay is in charge of the design, provisioning and commissioning of the Magnet Safety System (MSS).
- Request for support
  - CEA/Saclay: 24950 Euro for travels
  - KEK: One million Yen for travels