

4 Month Summary after the Earthquake

In front of Linac



Present

Urgent recovery of cooling water system is required.

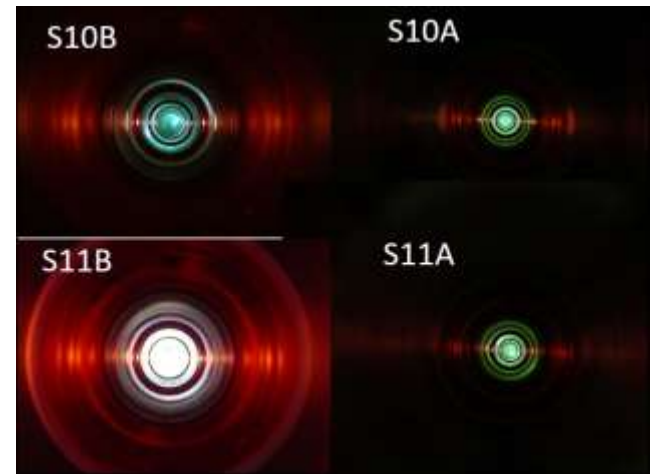
Linac Tunnel as of March 24



On March 17 the water level was only 1 cm, but it increased to 10 cm (100 tons) on March 24. The water was pumped out with an in-house electric generator, and the problems were resolved afterwards.



Floor sagged ~4 cm in the middle. However, other places, except beam monitors, were normal. (Beam was aligned step by step through repetition of dropping the beam power and being bent by magnets. A perfect alignment is planned in the next year.)



Current Status of Linac

Big Issues

- **Cooling water** (Being restored in September)
- **Electricity** (Low voltage is OK, and high voltage will be OK when wiring is repaired.)
- **Crane** (Will be operating shortly)
- **Alignment** (Operation with straight line will be in the next year.)



Close inspection of substruction of building with impact elastic wave method and taking cores

~80 cm void was found. The repair plan is discussed. Floor leveling is also investigated.



Inspection of crane in the tunnel

Confirming it can be operated with a weight limit.



Repair of water leaks in the tunnel

The leakages were stopped by injection of a foaming urethane material.

Road Condition around 3 GeV



Wavy road!

The side of the road got sagged. The center part remained because the RCS accelerator tunnel for the beam-line was present underneath.

The road was repaved by the end of June. It provides an access to the cooling tower beyond this point. Repair of the electric power supply facility near here has been also kicked-off.



3 GeV Electric Power Supply, Condenser (Capacitor) Bank, Cooling Tower, etc



Leaned to the left.

Around the building entrance, approximately 100 cables had been buried, and all of them were distorted.

A condenser (capacitor) bank was tilted. Cables were distorted due to its weight.



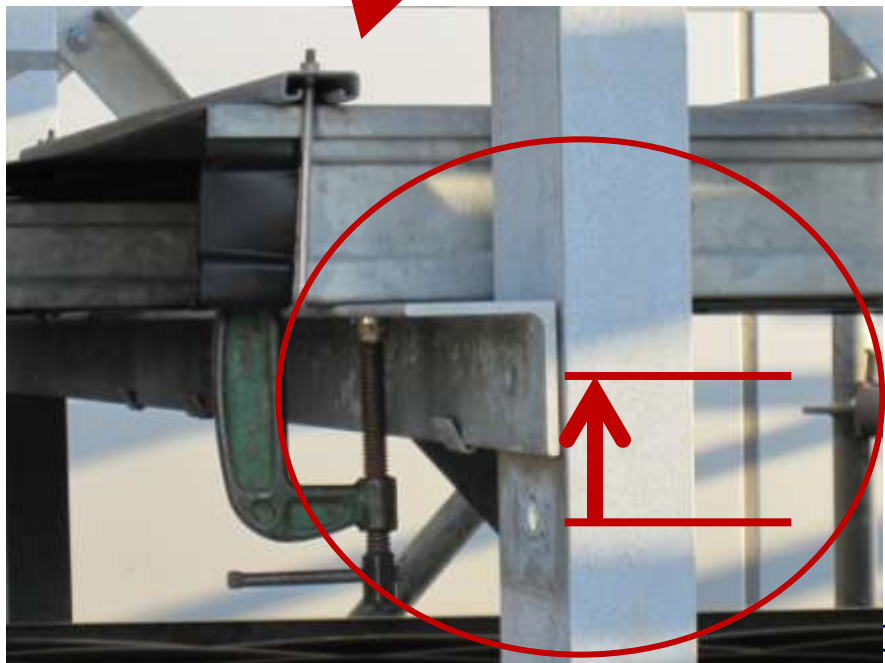
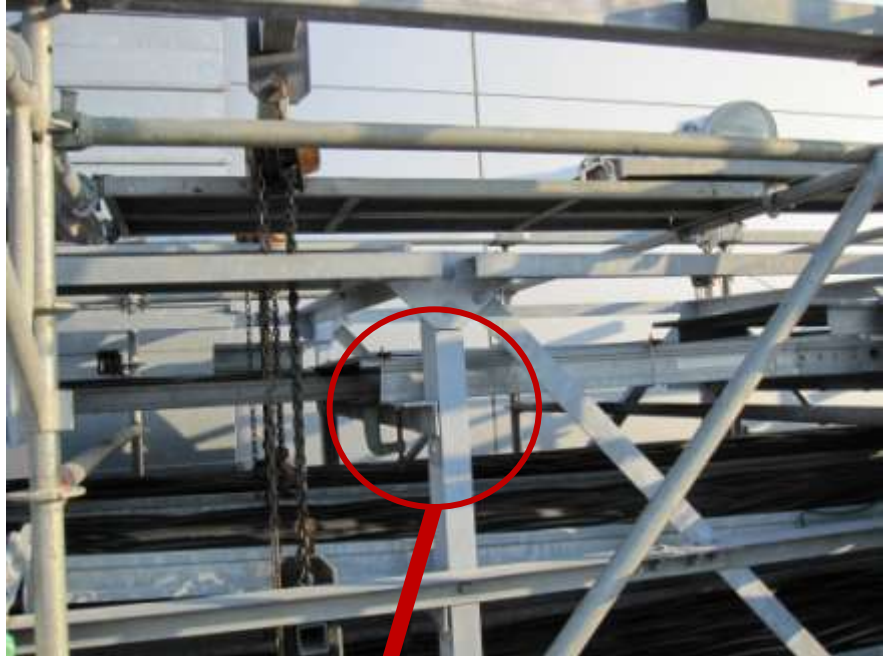
Repair of Electric Power Supplies



Repair of Cooling Tower & Removal of Pipes



Repair of Condenser (Capacitor) Bank

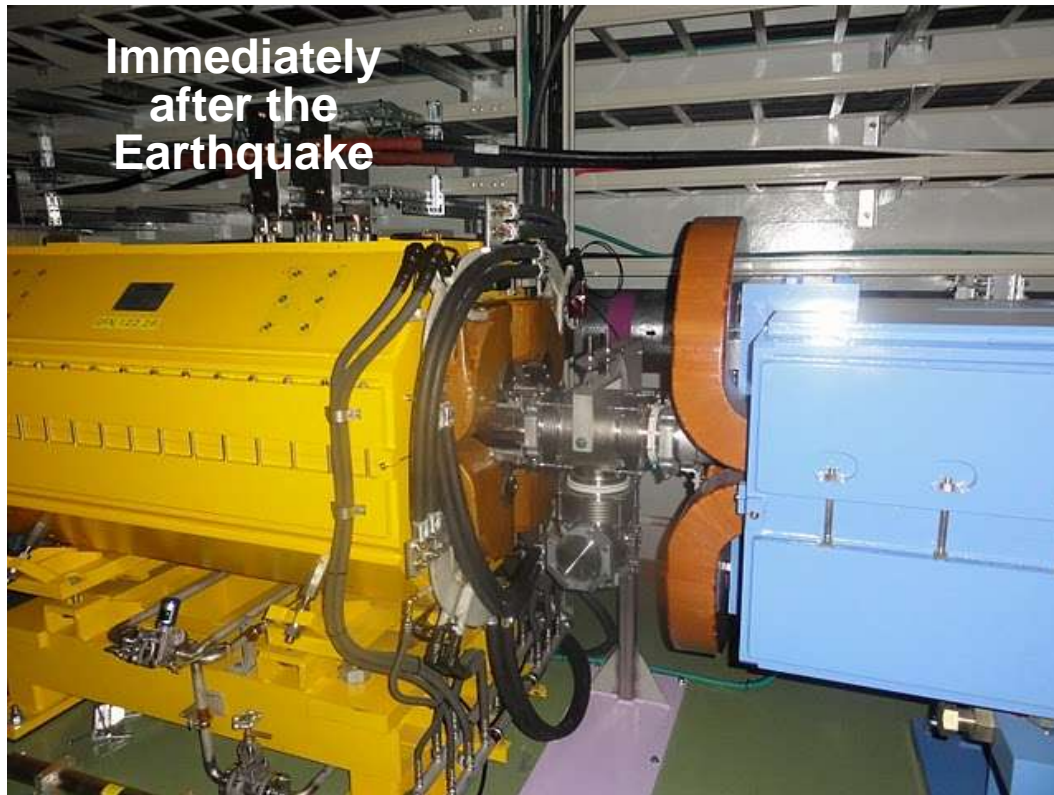


3 GeV Main Ring



No obvious damages were observed.
(Photo taken on March 29)

50 GeV Main Ring



No damages were observed through an inspection from the outside alone.
(Photo taken on March 17)

Current Status of MR (50 GeV)

✂ Recovery has been progressing smoothly.

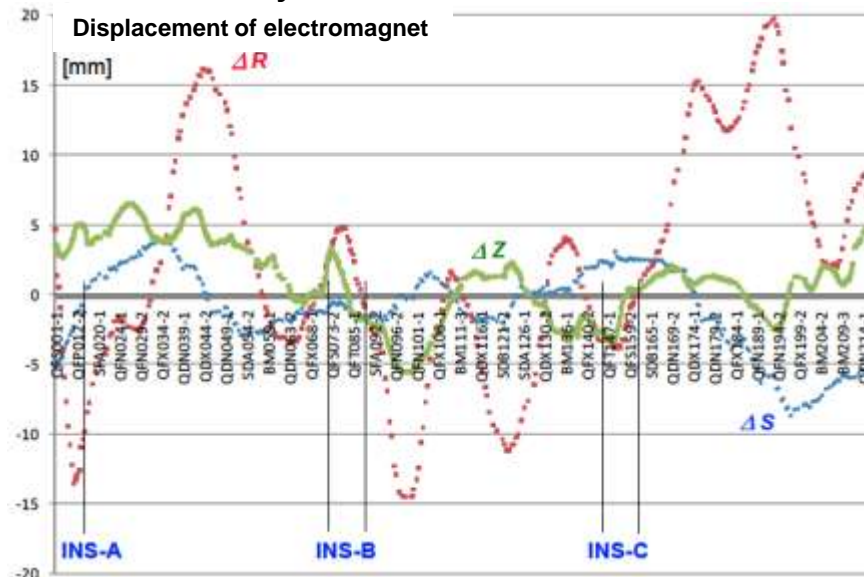
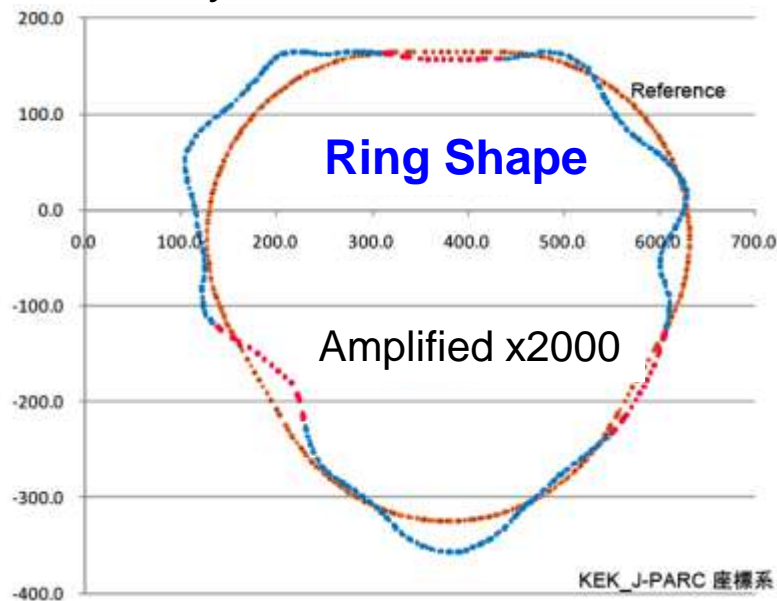
Repairing the leakages in the tunnel is almost completed.

Conducting test of a power supply for a main electromagnet

- No specific problems in electric current and temperature. No strange noise or smell was detected, either.
- Confirming the soundness of submerged magnets.

No damages were found in the radio frequency systems.

Preliminary Results of Circumference Measurement by Laser Tracker



- It appeared there was a large misalignment in both horizontal and vertical directions.
- ~20 electromagnet mounts shifted more than a limit of simple adjustment.
- All magnets will be realigned by three teams from August to October.

Material and Life Science Experimental Facility (MLF) Area



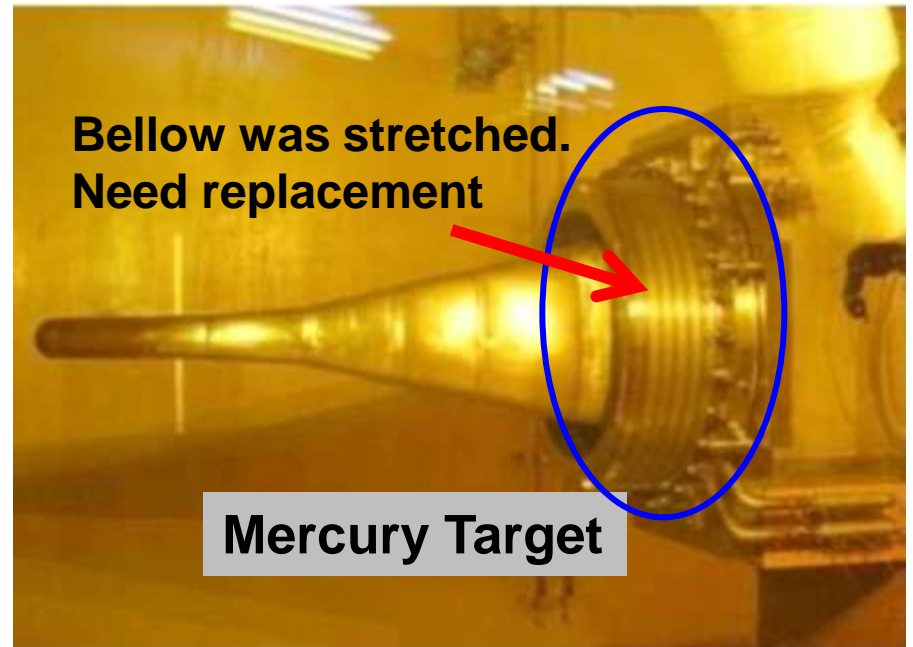
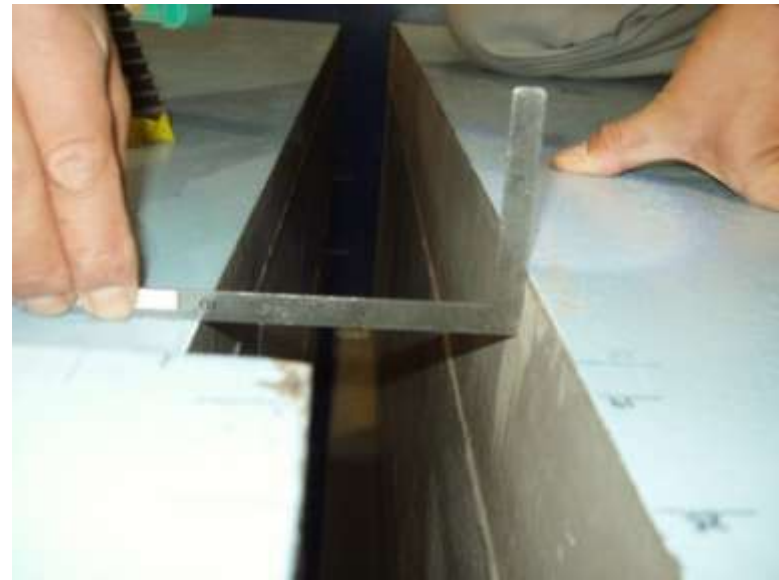
Immediately
after the
Earthquake

Road at the west side of the MLF
building fell in ~1.5 m.



Present

Shielding Walls for Neutron & Target



Bellow of the target shifted ~30 cm.
Replacement is planned.

Displacement of shielding walls in MLF
1st Hall: BL04 Area (left)
2nd Hall: BL20 Area (right top)

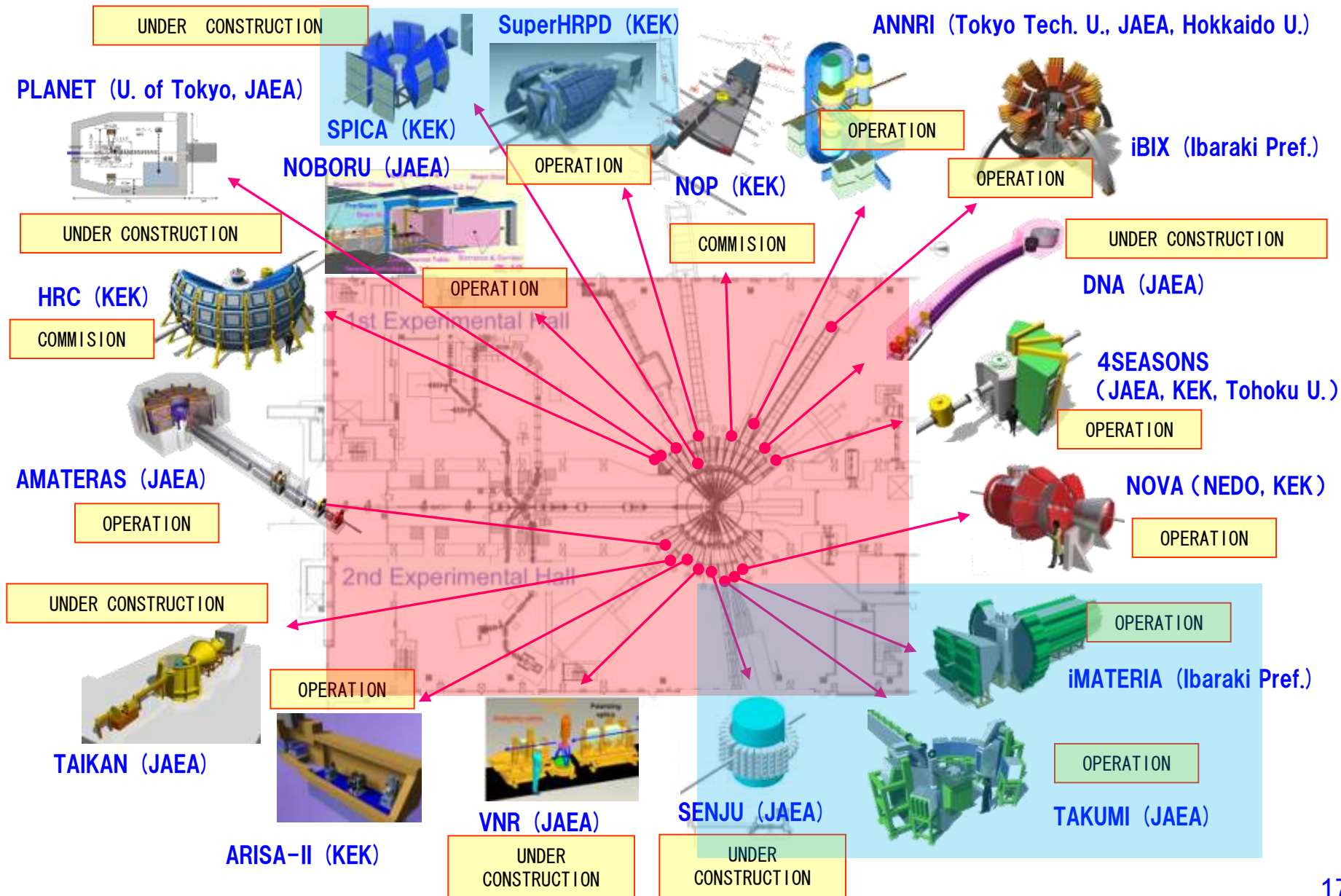


Reassembling of the sealing device is in progress in the MLF. Fortunately the inside laboratory does not require repair.



Neutron Instruments at Materials and Life Science Facility

In operation: 10, Beam commissioning: 2, Under construction: 6



MLF West-side Added Building



A 30 cm gap between the MFL and the west-side added building (left)
BL18, BL19 and BL20 were damaged.

Dropped shield (right)

The repair has been already completed.

Beam Transfer System of 3 GeV

MLF sagged, being 12 mm lower compared to RCS (3 GeV synchrotron).



Surveying work in the 3NBT tunnel

Mending cracks of walls and floors by injection of plastics

Muon and the Other

Investigating a status of the Muon facility with removing the shield



Inspection of the Muon Target



Inspection of Expansion Turbine

Checking up the Super Low Temperature Hydrogen System, including Expansion Turbine

Neutrino: Air Conditioning and Beam Dump



Guiderail for the Horn and On Site Detector



Remote maintenance guide cell for Neutrino Horn
Very dangerous situation, but it was repaired (below).

No significant damages through outside inspection. About 1 cm deep water at the bottom. This problem has been already solved.

Current Status of Neutrino

✂ Recovery has been progressing smoothly.

Building, electric & machine facilities have been almost restored.

Electromagnets and superconducting magnets

- There are no serious damages in electromagnets. Superconducting magnets were energized up to their rated current and were dumped, confirming not to have any damages.
- Submerged cables and connectors will be replaced.
- 31 out of 35 magnets will be realigned.

Target Station

- Inspection of inside of a He container has begun.
- All three magnet horns shifted a few – 10 mm horizontally. All bolts to maintain the horizontal level were broken, but no damages in vertical bolts.
- While continuous current test will be conducted on all horns, the 1st horn will be replaced.
- The carbon target will be also replaced.

Pre-detector

- Visual inspection and current test have been conducted. No problems were found.



Submerged cables and connectors



Measuring radiation level with opening a cover of the station 23

Superconducting Beam Line for Neutrino (below) and the Beam Line for Hadron (right)

Switchyard Magnets

- Need to be aligned.
- To minimize the restoring time, the beam orbit will be adjusted with using steering magnets.



Beam Line for Hadron

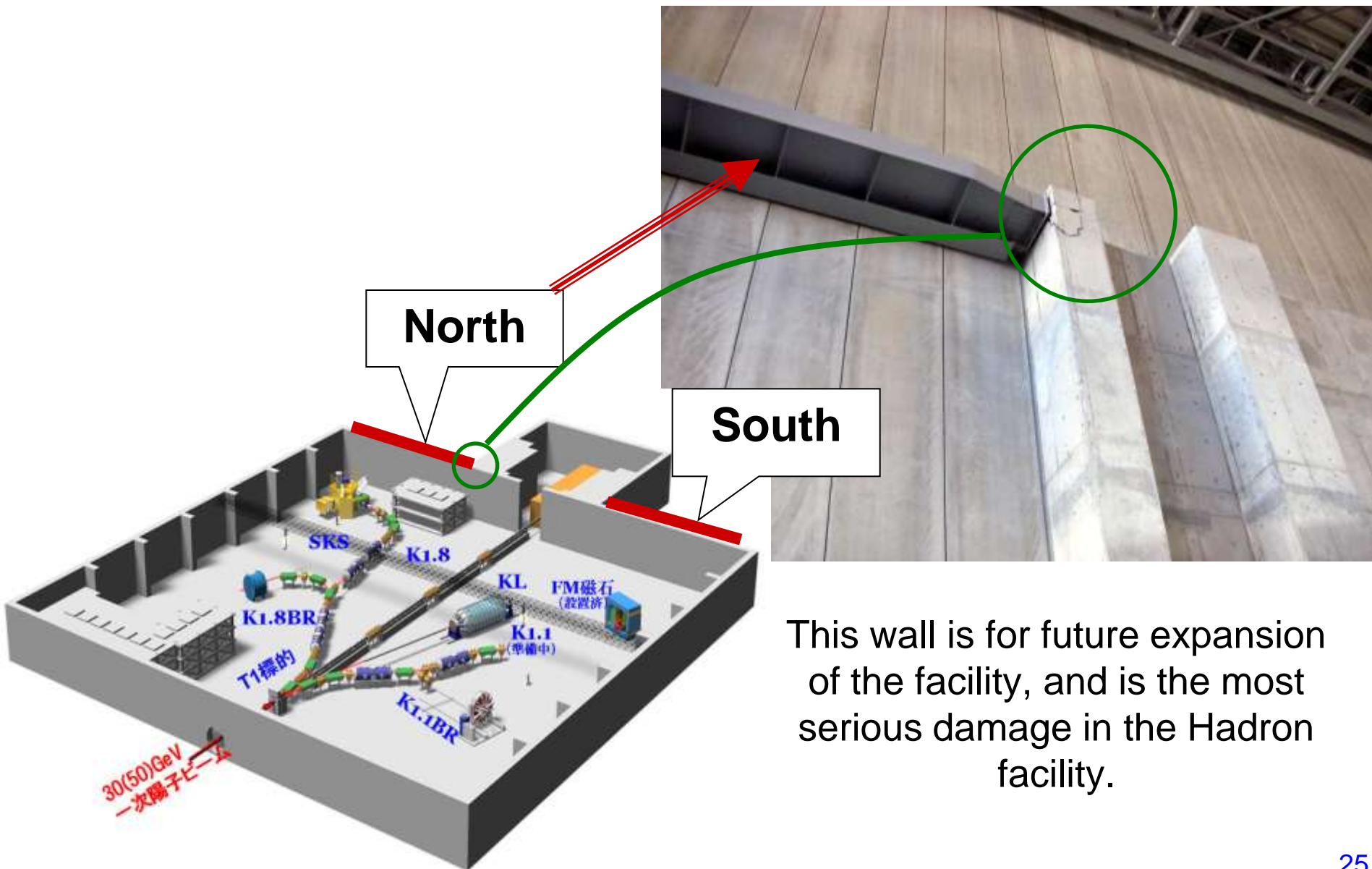


Superconducting Beam Line
(very healthy)

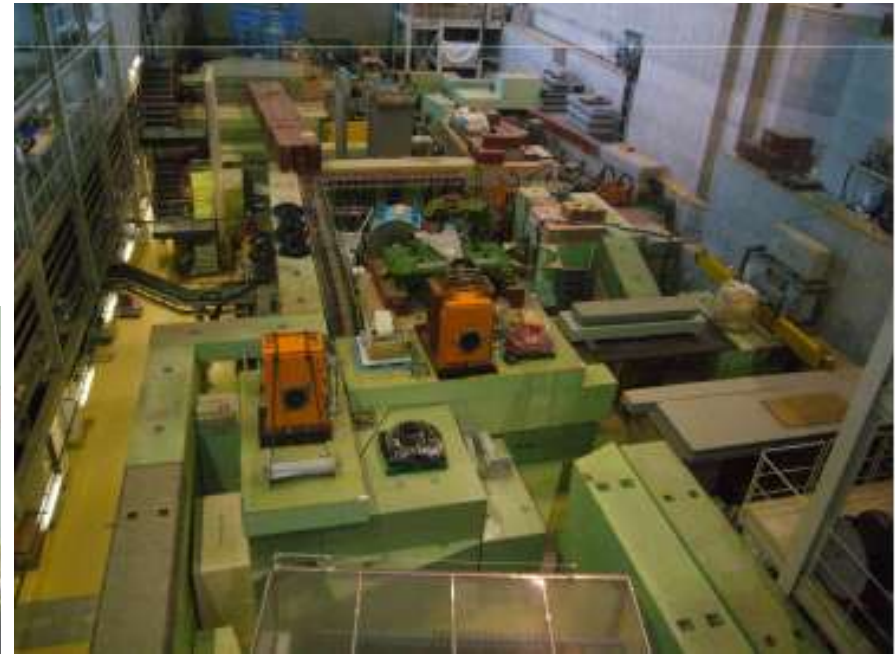


Realignment of switchyard magnets is in progress.

Outside Wall of the Hadron Hall



Hadron Experimental Hall



Removed Shield

Examinations of beam-line electromagnetrode, wiring of power-supply, and plumbing of cooling water are in progress in order to confirm their soundness. However, thousands tons of the shield has to be removed for these tests.

Outside of the Hadron Hall



A sagged access road to an entrance for trailers was repaired. It allows to transport heavy items.

Current Status of Each Facility in J-PARC

(4 month after the Earthquake: July 6, 2011)

Linac

- Void was found under floor of the building. Cooling water system has not yet been restored. Crane can be operated with a weight limit.
- Restoring work of instruments, including realignment, is progressing smoothly.

RCS (3 GeV synchrotron)

- Restoring work of building, including repaving a road, is progressing smoothly.
- Results of instrument inspection in the tunnel are satisfying. However, high electric power test in the future would be challenging.

MR (50 GeV synchrotron)

- Electric power supplies & cooling water facility have been almost restored. Repair of water leakages has been completed.
- All electromagnets need to be aligned in the future.

MLF (Material and life science experimental facility)

- Restoring work of building is progressing smoothly.
- Reassembling of the shield is continued.

Neutrino

- Restoring work of building has been almost completed.
- Inspection of the target station and replacement of electromagnet horn will be conducted.

Hadron

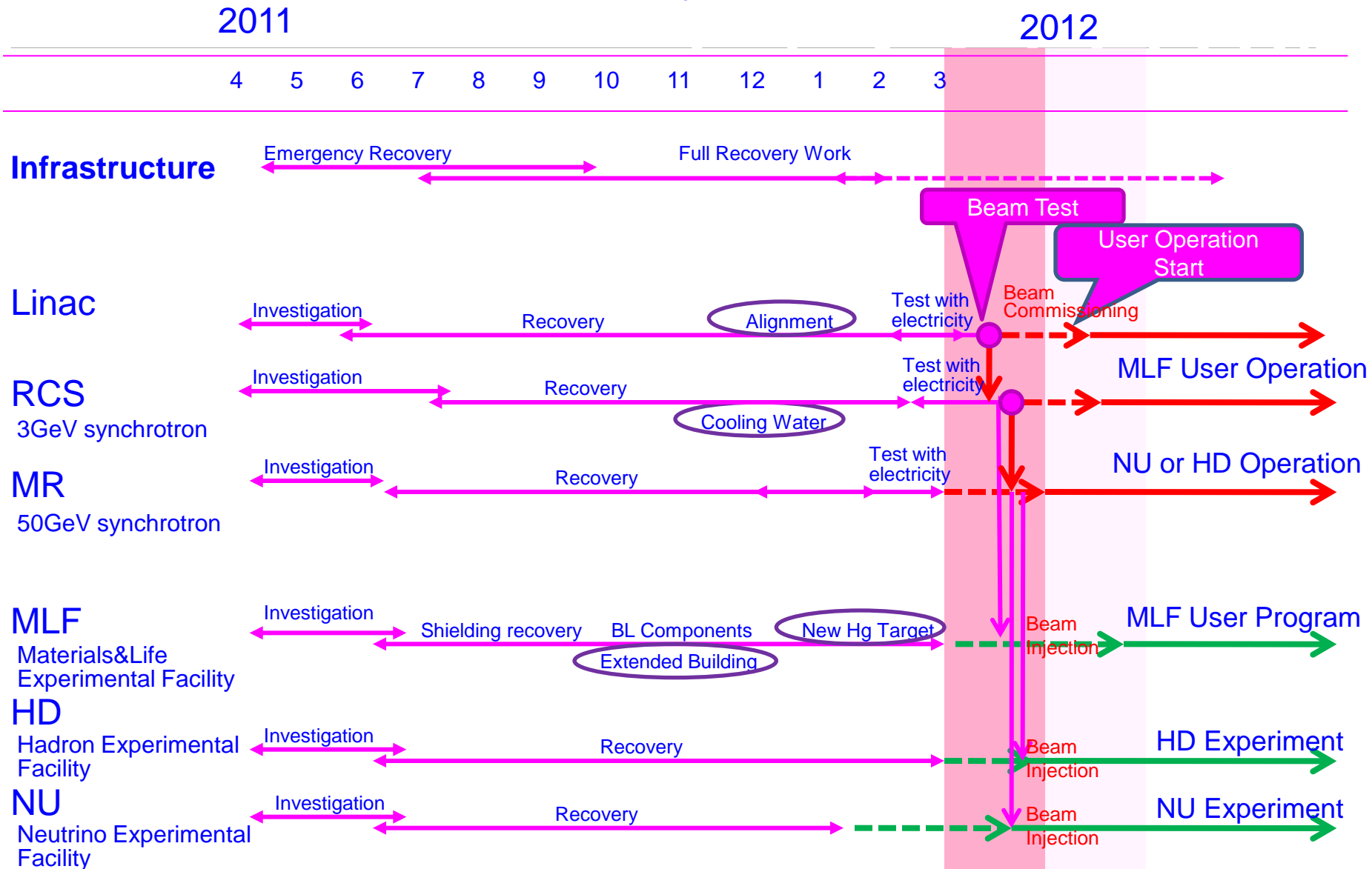
- Restoring work of building has been almost completed.
- Inspection of instruments in the shield and alignment of switchyard electromagnets need to be conducted.



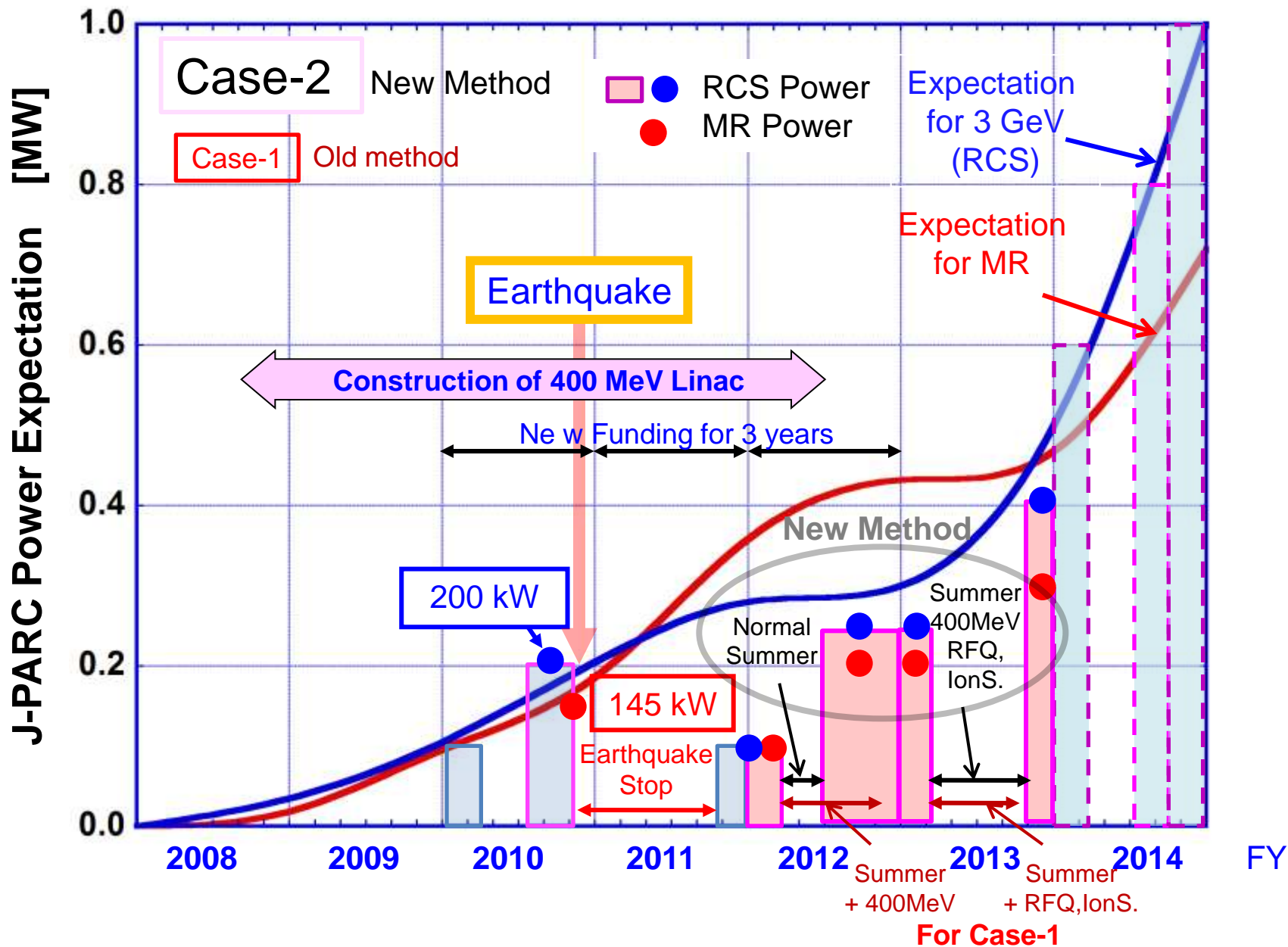
RCS (3 GeV synchrotron)

Restoring work of a surrounding road has been completed.

J-PARC Recovery Schedule (@2011.5.20)



Operational Plan for JFY2012 and JFY2013



Summary of Damages

- No Tsunami Effect
 - We prepared for up to 8 m Tsunami.
- Main Buildings were almost OK
 - Many underpins for major buildings
- However, many utility buildings, roads, and added buildings had significant damages.
- When to recover ?
 - Aiming at recovering by the end of this year
 - Expect to have 2 cycle (about 2 month) running this year
- Operation of Next Fiscal Year
 - Full 9 cycle (200 day) operations for users