Current Status of J-PARC Facilities

September, 2011

LINAC-1

Immediately after the Earthquake

Outside of LINAC building is also heavily damaged.

We are getting water from an outside fire-hydrant, as original cooling water system has not yet been fixed.

Placing a temporal bridge for carrying in materials for repair.

LINAC-2

Inside of underground tunnel immediately after the Earthquake

・Many spiles reached to a basement rock minimized a direct damage to the tunnel. However, groundwater leaked into the tunnel and the water depth increased to 10 cm (100 tons) within two weeks after the earthquake.

・Repairing water leaks in the tunnel is almost completed.

・Many damages on partitions and ceiling boards of the building.

・The restoration work continues.

LINAC-3

・Fortunately, there were no severe damages on the equipment/instruments, except some monitors, in the tunnel. Damaged monitors have already been replaced.
・The floor level sagged 4 cm downward in the tunnel. Because accelerator cavities should be aligned within ±1 mm to each other along the beam line for the operation, they have been leveled and realigned where necessary.
・Restoration work on the cooling water system and power supply is going smoothly.

Realigned accelerator cavities of DTL and SDTL were tested for water-tightness.

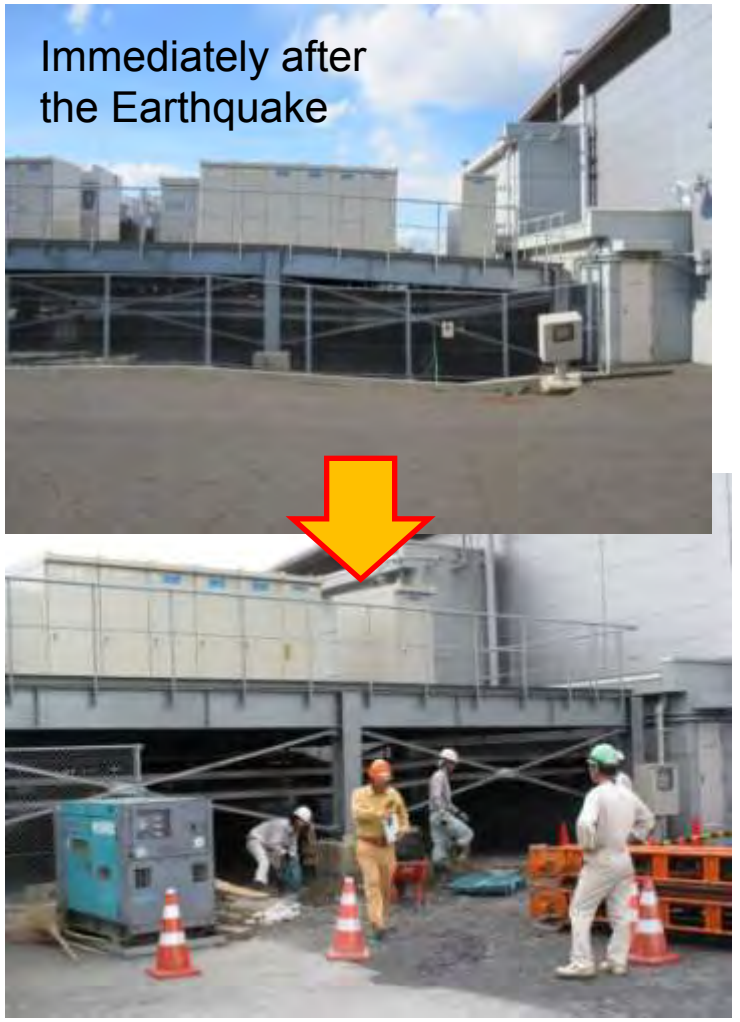
Cleaning work on cooling water tanks

Restoration work on power supply

3 GeV Synchrotron (RCS)-1

・There were severe damages on many facilities around the RCS building.
・The restoration work was started after repaved roads for carrying in materials and instruments for the work. The work is progressing smoothly.

The road was repaved.



The bent stage was repaired. Power has been supplied to the RCS building.

3 GeV Synchrotron (RCS)-2

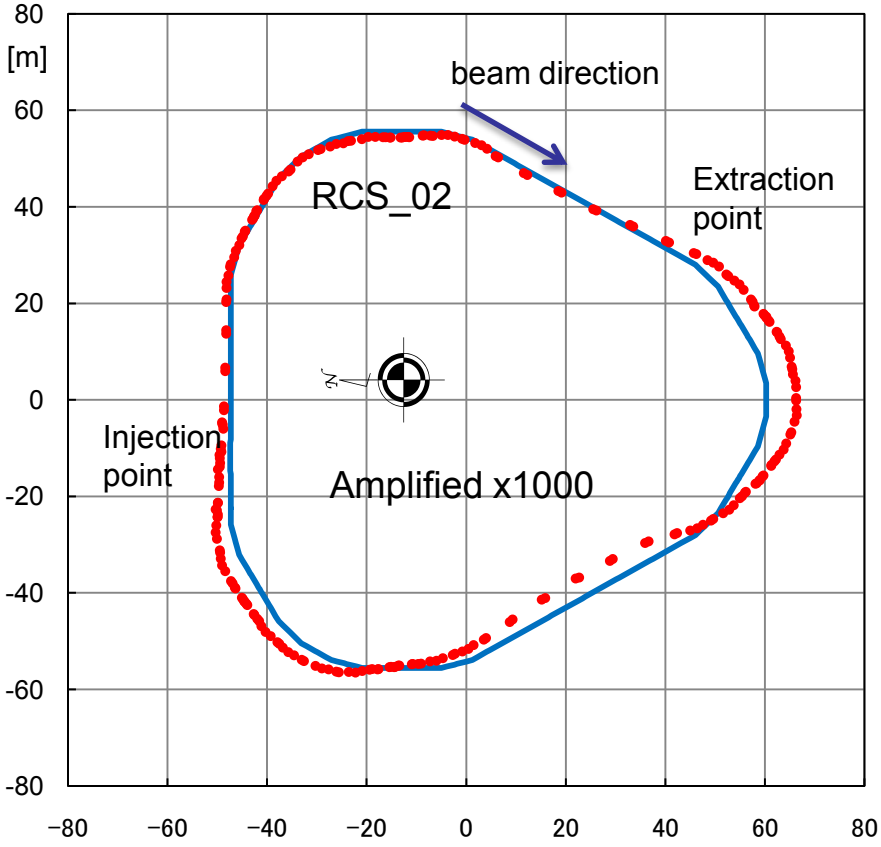
Tilted condensers were straightened after relabeling the bases.

Damaged water pipes were replaced to enable cooling.

Reinforced foundation for a cooling tower (right)
Adjusting alignment of pump/motor (left)

3 GeV Synchrotron (RCS)-3

・No serious damages on the equipment/instruments in RCS tunnel.
・Position of all equipment/instruments, such as electromagnet, were precisely measured. It appeared they misaligned ~3.7 mm vertically and up to ~10 mm horizontally.
・However, realignment work is not needed, because we can adjust a beam orbit position with correction electromagnets.
・The restoration of power supply system is going smoothly.



Blue: Reference positions of electromagnets
Red: Actual positions after the earthquake
(Please note the magnitude of displacement is amplified x1000.)

50 GeV Synchrotron (MR)-1

・Repair of water leaks has been done. The facilities for electric power supply and cooling water supply have been restored as well.
・All electromagnets (~400) are being realigned at 5 magnets/day.
・Magnets moved more than 1 cm are realigned to change a stage position (Photos).

Jacking up an electromagnet to make a space between the magnet and the stage

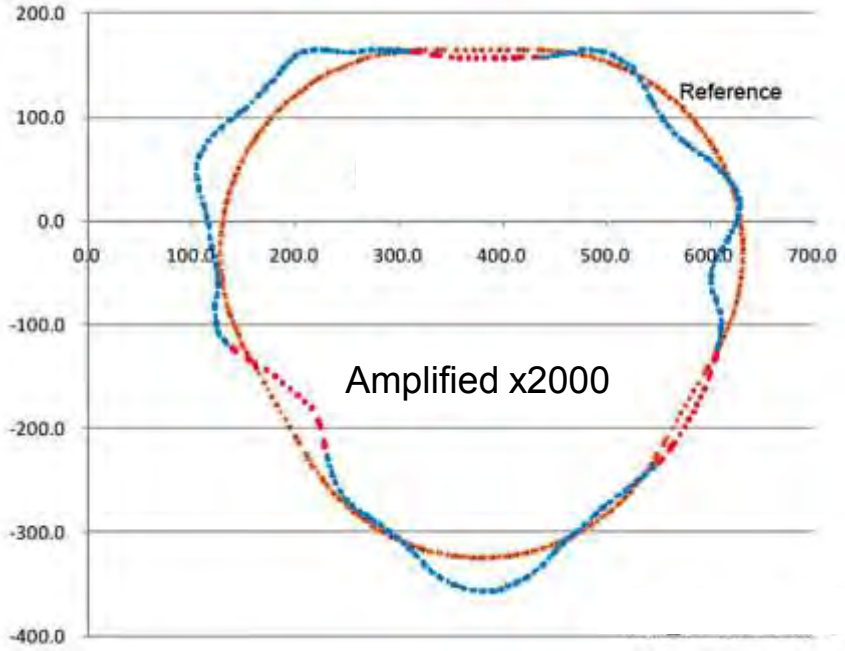
Hanging up the magnet

Pulling out the stage to put new longer height-adjust screws

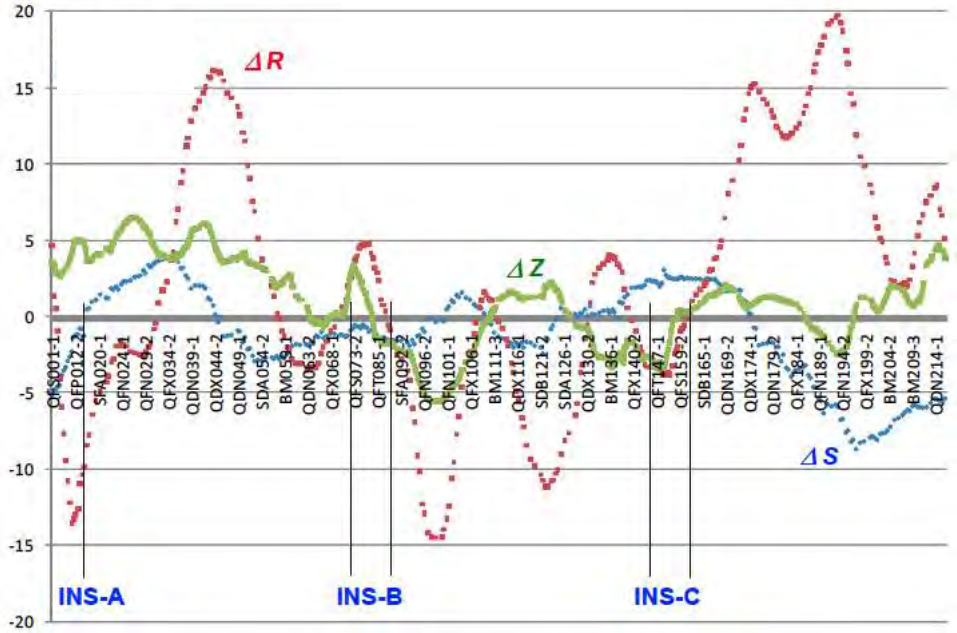
Sometimes we need to place an adapter to put a new longer anchor bolt.

50 GeV Synchrotron (MR)-2

・There were no serious damages on all MR equipment/instruments, such as electromagnets. It, however, appeared they misaligned in both vertical and horizontal directions.
・Some electromagnets that misaligned greatly are realigned with replacing a stage and/or an anchor part.
・Inspection of the high-frequency power amplifying system has been completed.



Red: Reference positions of electromagnets
Blue: Actual positions after the earthquake
(Please note the magnitude of misalignment is amplified x2000.)



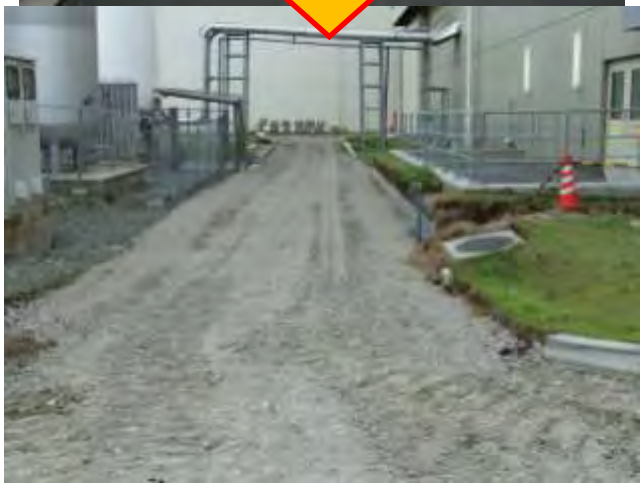
Electromagnet misalignment in a vertical direction

50 GeV Synchrotron (MR)-3

・Not only restoration but also improvement/upgrade of the equipment/facility are conducted to increase beam intensity when the operation will be resumed.

Putting new hanging racks on ceiling for pipes for new cooling system to supply clear water

Materials & Life Science Experimental Facility (MLF)-1



The road was re-opened after filling depressions with pebbles.

Immediately after the Earthquake

A tilted He tank was removed to repair the foundation.

Inspection by the fire department

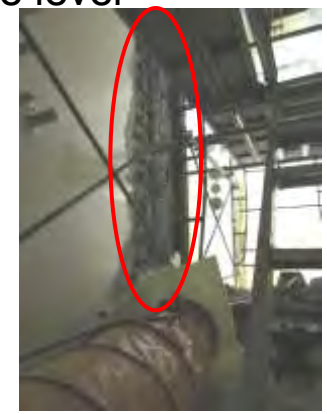
Materials & Life Science Experimental Facility (MLF)-2

Immediately after the Earthquake

An attached building to the west side of the main MLF building sank ~20 cm. The building is jacked up with 24 hydraulic lifters (blue). Created interspace will be filled with cement injected from holes of the floor.

Immediately after the Earthquake

Putting new clay to maintain the level



Repairing cracks on the floor of 3NBT tunnel (left), and repairing a joint wall with removing concrete (right).

Materials & Life Science Experimental Facility (MLF)-3

Immediately after the Earthquake

Reassembling work of shielding blocks for neutron beams in the 2nd experimental hall (above). Inspection of the inside of the muon beam facility after removing shielding blocks (right). This area does not have any serious damage.

Neutrino Experimental Facility-1

Immediately after the Earthquake

AC device tilted toward a depression of a road. Many pipes were damaged

Repairing roads and plumbing have been completed.

Realignment work of electromagnets (above) and superconducting magnets (below) is progressing smoothly. We also try to improve cooling power.

Neutrino Experimental Facility-2

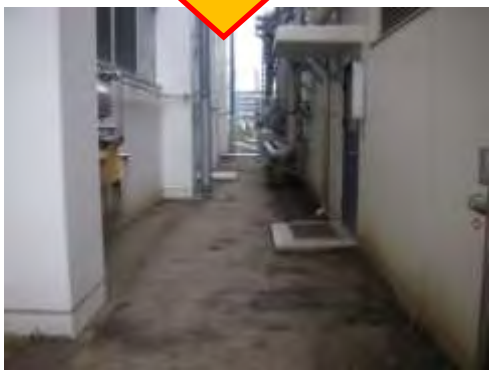
・Inspection of highly radiated parts, such as a target station, is progressing smoothly.
・The soundness of all equipment and devices, including three horns, have been visually confirmed.

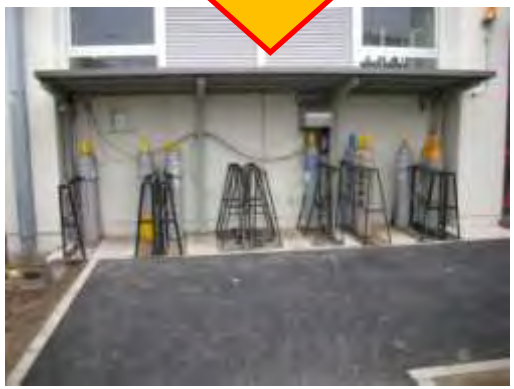
The soundness of Beam Dump and Decay Volume was visually confirmed. There were no water leaks.

The 3rd horn hung by a crane for inspection (left) and the 3rd horn in a shielding maintenance area.

Hadron Experimental Facility-1

Immediately after the Earthquake



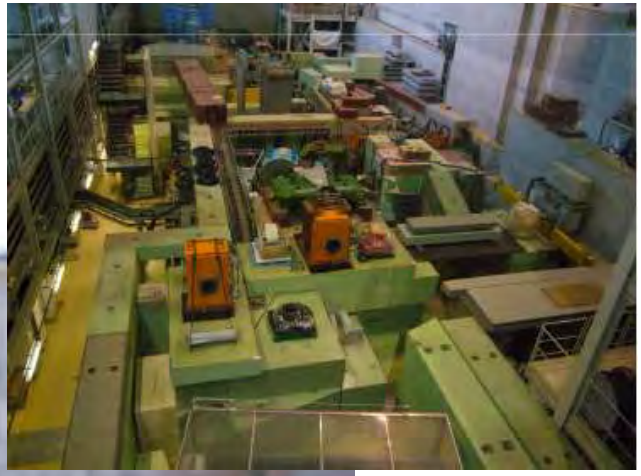


Repairing roads and plumbing have been completed.

Electromagnets in the switchyard need to be realigned. The work is progressing smoothly.

Hadron Experimental Facility-2

・After removing shields temporally, the soundness of all equipment and devices have been confirmed.
No realignments are required.



Inspection work in Hadron Hall

No damages in the device

Summary

- Restoration work of buildings and outside utilities, such as cooling water plumbing and power supply devices, have been progressing smoothly on schedule.
- Inspection of equipment/instruments/devices to confirm their soundness has been almost completed. The repairing and restoration work is in progress.
- Realignment work of electromagnets for accelerators is also in progress.
- We are making our best efforts to complete the restoration of J-PARC on time following the recovery schedule presented in May.

J-PARC Recovery Schedule （@2011.5.20）