

# Status of the SKS spectrometer and Experiments at K1.8

2011 July 9

J-PARC 12<sup>th</sup> PAC

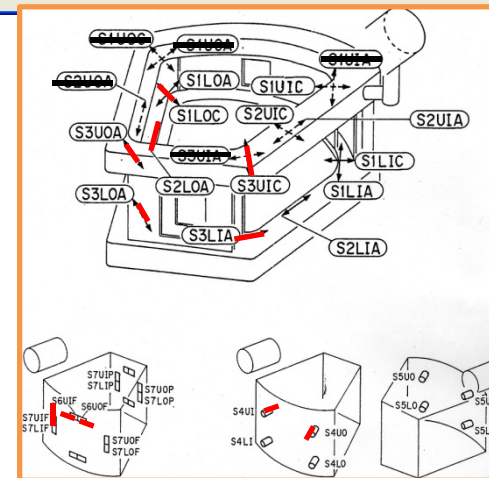
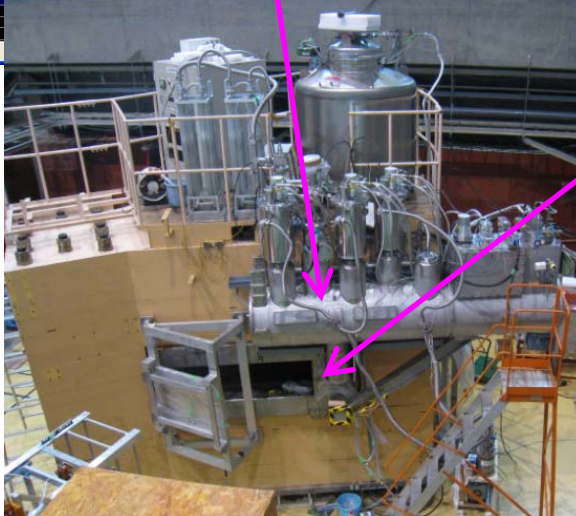
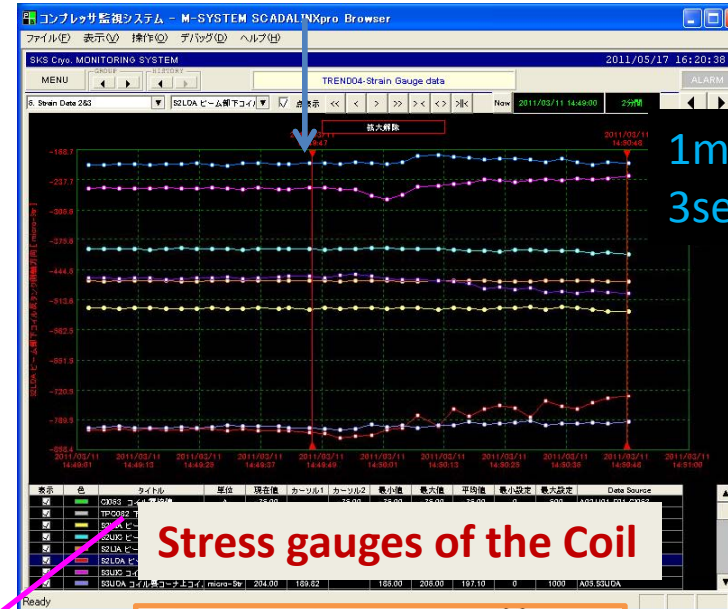
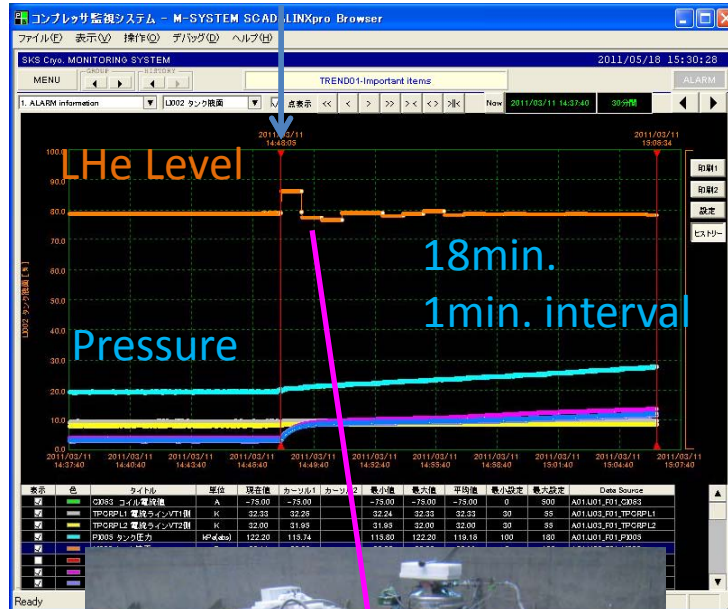
T.Takahashi (INPS-KEK)

# ***The effect of the Earthquake (Summary)***

- SKS cryogenic system & coil
  - Evaporated gas of LHe was safely released.
  - Cryogenic system and HTC Power Lead are OK.
  - Coil & its supporting structure should be checked.
- SKS magnet was moved.
  - SS41 base, SUS plate, and Yoke were slipped.
  - Beam height is changed.
- Area structure
  - Shields were moved by ~20cm.
  - Cable rack was damaged.
- No serious damage on detectors
  - Some of PMT's were disconnected in TOF & LC wall
- Counting Hut, Compressor House, Gas cylinder station were damaged.

# Monitor Data at the Earthquake

Refrigerator OFF



# **SKS cryogenic system**

## **— checked items —**

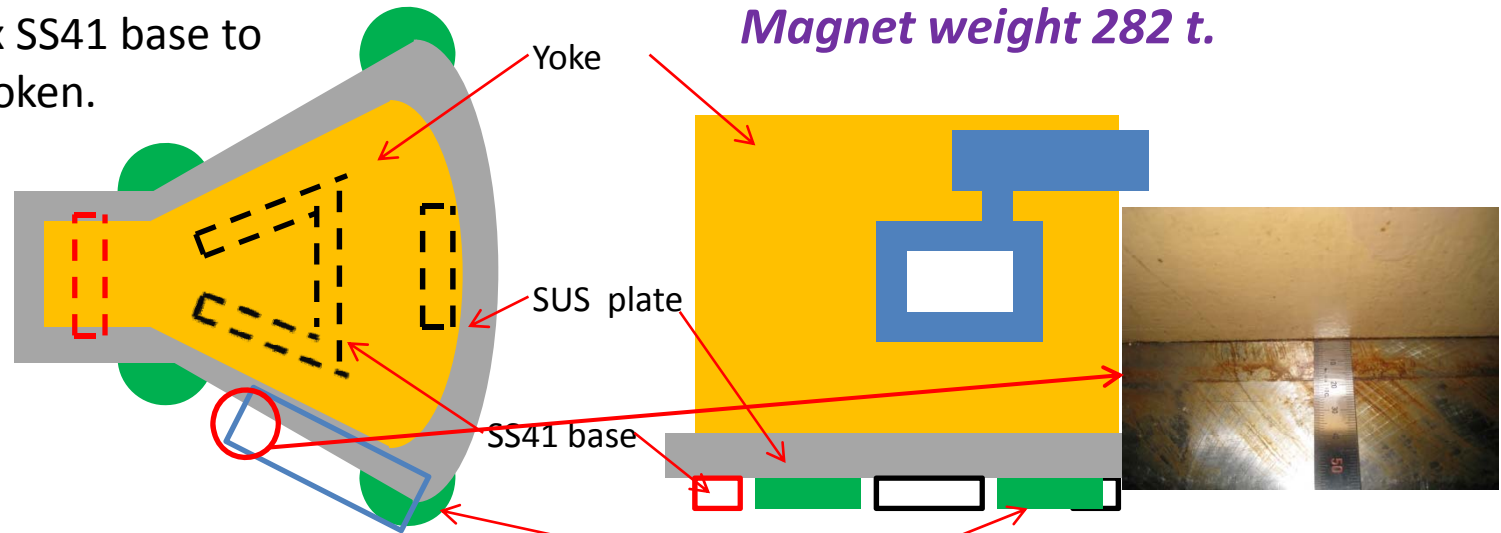
- March 29
  - Operation of the control & monitor system. **OK!**
  - Resistance of the coil, coil-earth. **normal**
- April 20—28
  - Leak check of vacuum of the coil vessel at normal temp. **No leak**
  - Test operation of all refrigerators, pumps and a chiller. **OK**
  - HTC PL was confirmed to **“S.C. state”** at <100K

**No abnormal behavior was found at normal temp. and 100K.**

**Further inspections require full cooling to 4K.**

# SS41 Base and Yoke

6 bolts (M20) to fix SS41 base to SUS plate were broken.



10-30mm displacement between SS41 base and SUS plate.



Temporary, SS41 base will be fixed to SUS plate by welding or hanging mechanically with chain clamps.



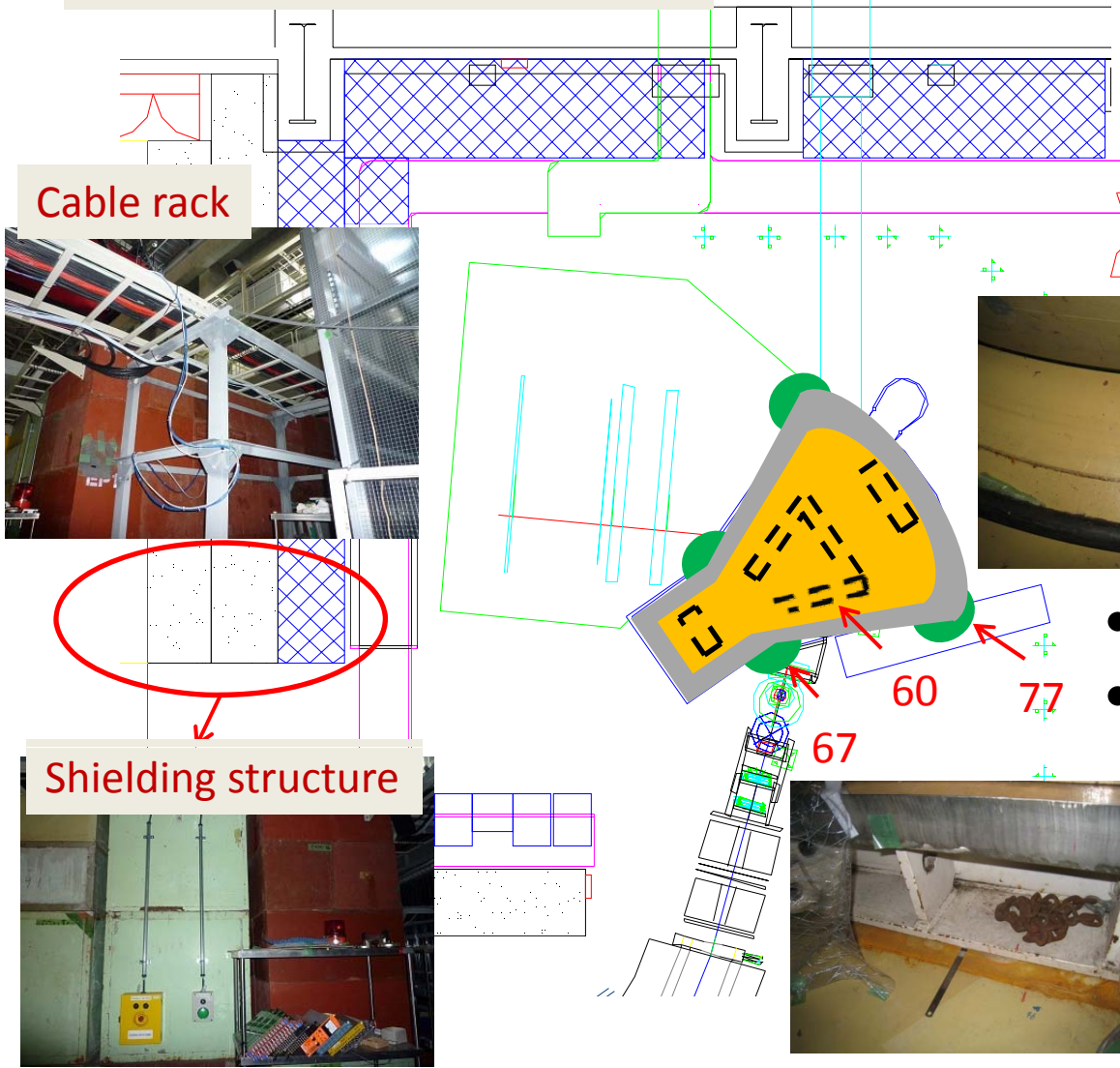
Yoke slipped by 18mm on the SUS plate.



No recovery. Precise measurements of the position will be taken into the analysis.

# Displacement of SKS Magnet etc.

Displacement to the floor (mm)



• SKS magnet was moved from the normal position.



set to the normal position



• Floor sinks by 1-2mm  
• Beam height  $\neq$  Mid-plane



No recovery.  
Precise measurements of the position will be taken into the analysis.



# Other infra-structure

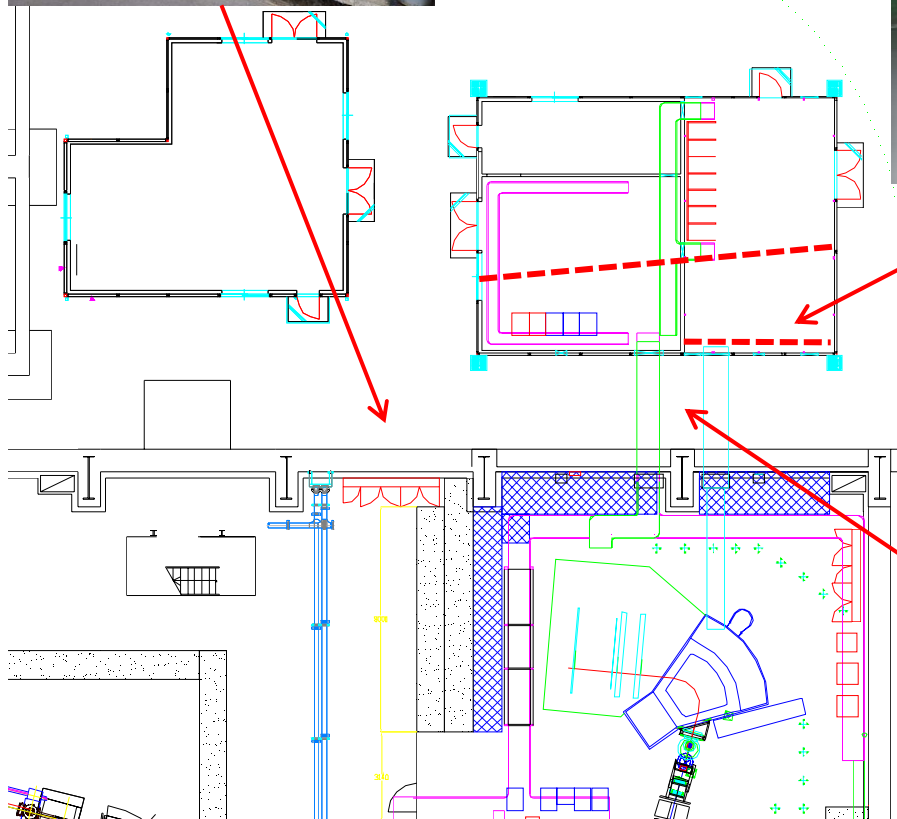
gas cylinder station



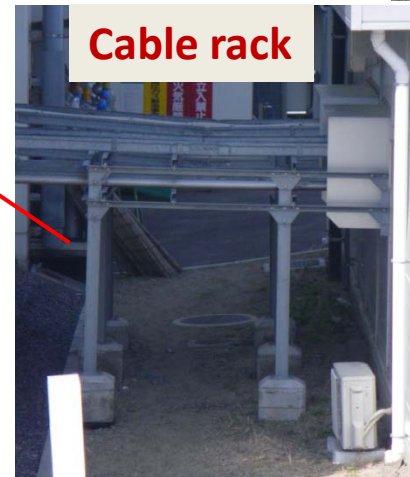
Cracks on the base of Counting Hut & Compressor House

- Part of floor inclines.

Large crack along the wall



Cable rack



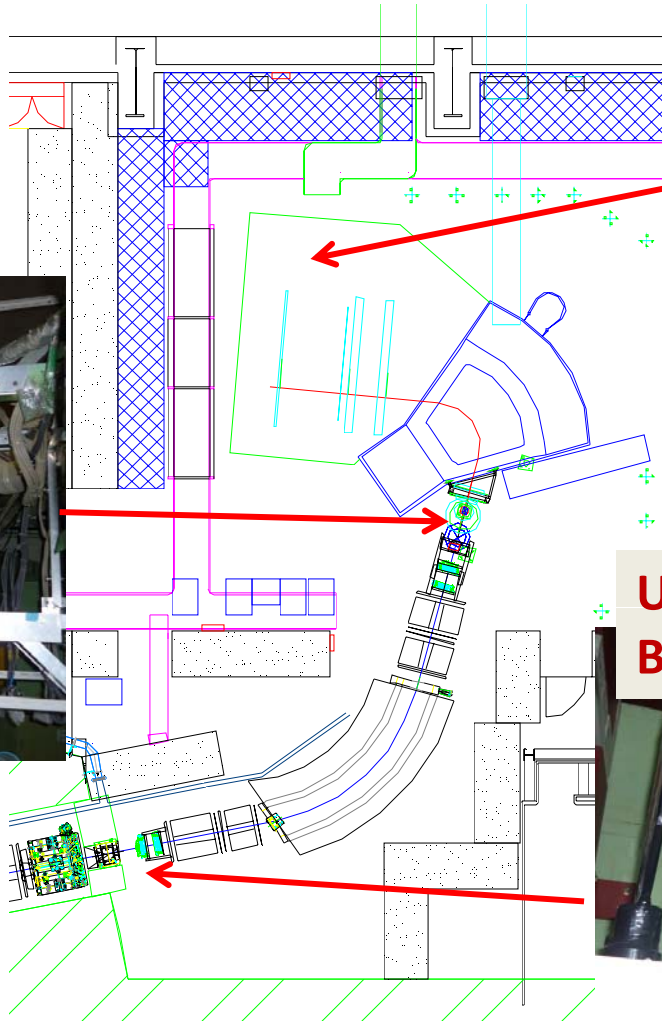
# Detectors & LH<sub>2</sub> Target

- March 29-31 checked LH<sub>2</sub> target OK
- April 14,15 checked Detectors
  - Wire Chambers No broken wires
  - BH1/BH2 OK
  - TOF, LC Total 14 PMTs were disconnected.
  - Electronics, DAQ OK
- May 12, 19
  - Dismount all detectors and moved to Assembly Building
- June 7,8 checked Aerogel Counter OK



# All detectors were dismantled ...

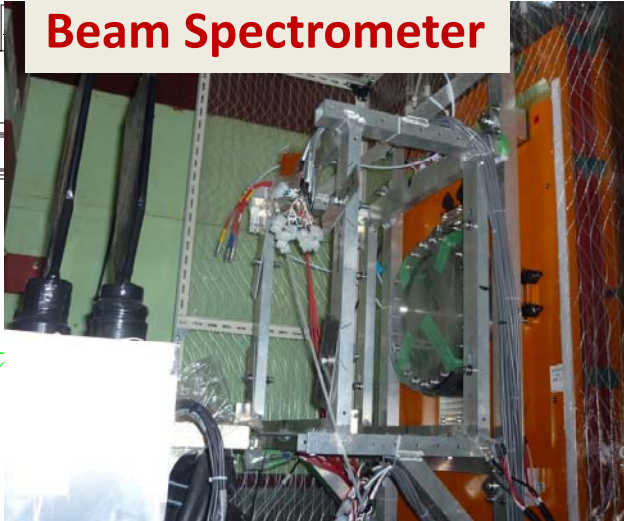
Target region



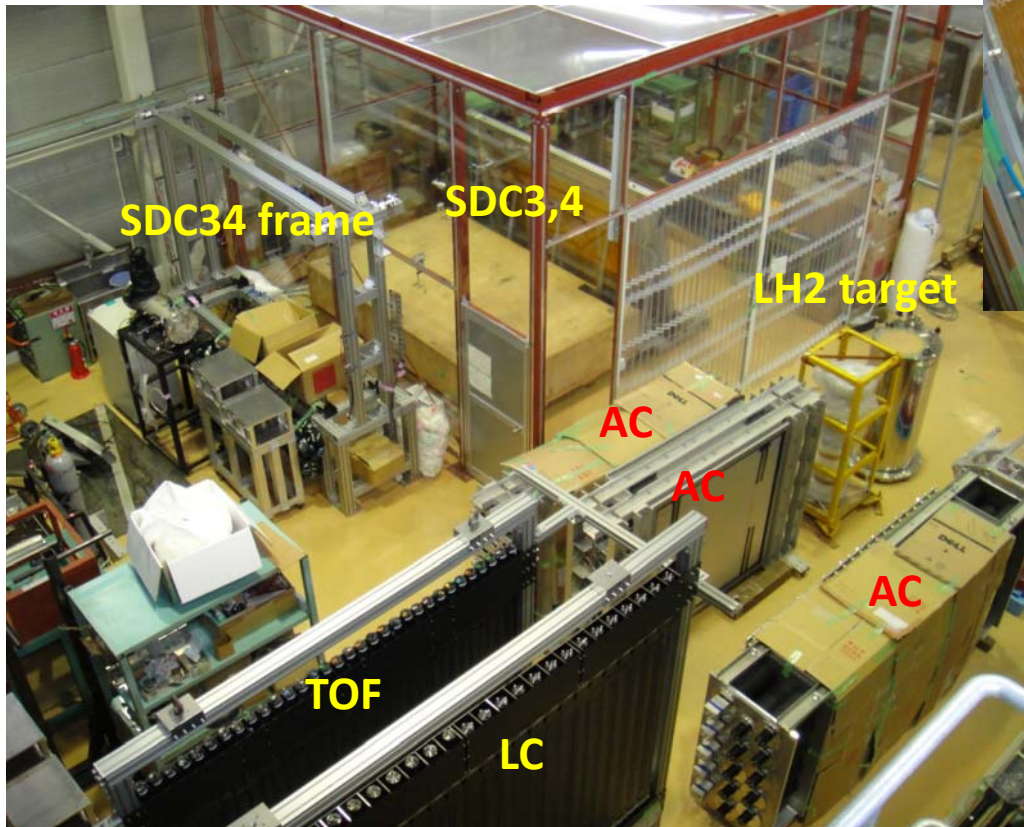
SKS downstream



Upstream of Beam Spectrometer



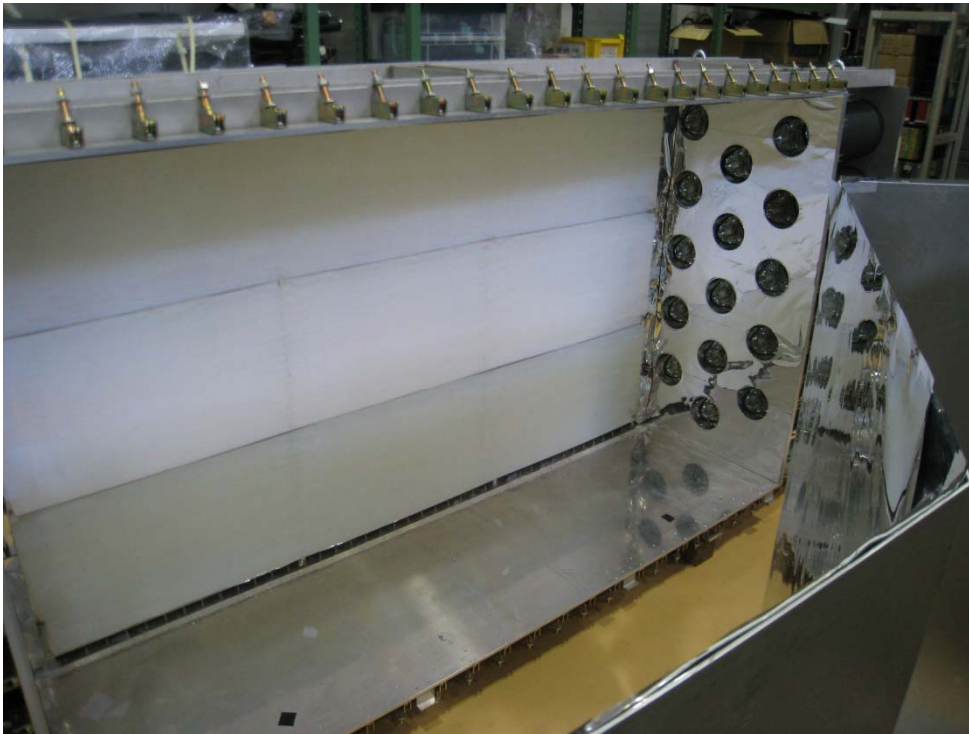
# And stored in Assembly Building



We can repair detectors here, if necessary.

# **Aerogel Counter (AC)**

AC was moved much due to the poor supporting and fixing structure. Some of radiators ( 11 cm x 11cm x 2cm ) were broken or slipped. But no serious damage.



**AC was already repaired and is ready to install.**

# Recovery schedule (SKS magnet)

- Aug. end - Repair SS41 base, re-positioning
- Sep. 10, 11 Power outage
- Sep. middle Regular inspection of refrigerators.
- Oct. beginning Cooling by LN<sub>2</sub> (~2 weeks)
- Oct. 15, 16 Power outage
- Oct. middle Cooling by LHe (~3 weeks)
- Nov. Normal operation of all refrigerators  
Inspection of the coil & support  
Tests for safe operation  
Excitation

# **Recovery schedule (detectors)**

- Oct. Alignment of the beamline magnets.  
Repair shielding structure and cable rack etc.
- Nov. Installation of beamline detectors.
- Nov. end-Dec. Installation of SKS detectors
- Dec. Beam commissioning  
to check detectors, beam tuning
- Jan. - Installation of LH<sub>2</sub> target, range counter, ...  
**Resume experimental plan (E19@2GeV/c, E27 ... )**

# Summary

- SKS magnet (coil) was warmed up due to blackout.
  - Cryogenic system and HTC PL were confirmed to OK.
  - No abnormal behavior was found so far.
  - Start cooling from October and check all system in November.
- SKS magnet was moved.
  - Fix the broken SS41 base and re-positioning in September.
- No serious damage on detectors.
  - Start installation from October.
- We would like to resume the planned experiments after commissioning of beam and spectrometers.