Spectrometer Solenoid Update

MICE CM36
Illinois Institute of Technology

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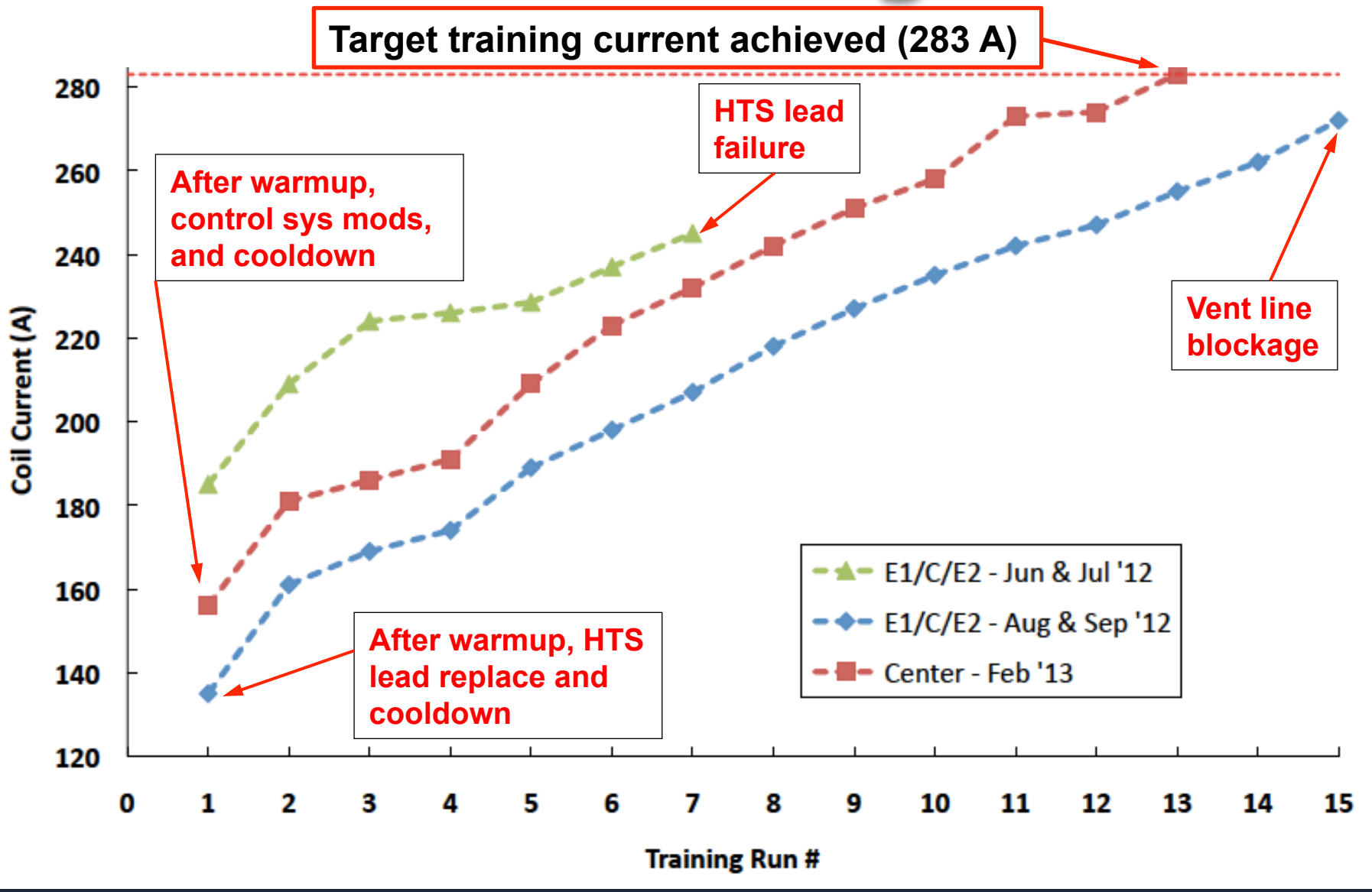
Topics

- First magnet training results
- Field mapping progress
- Control system/power supplies
- Second magnet progress
- Schedule

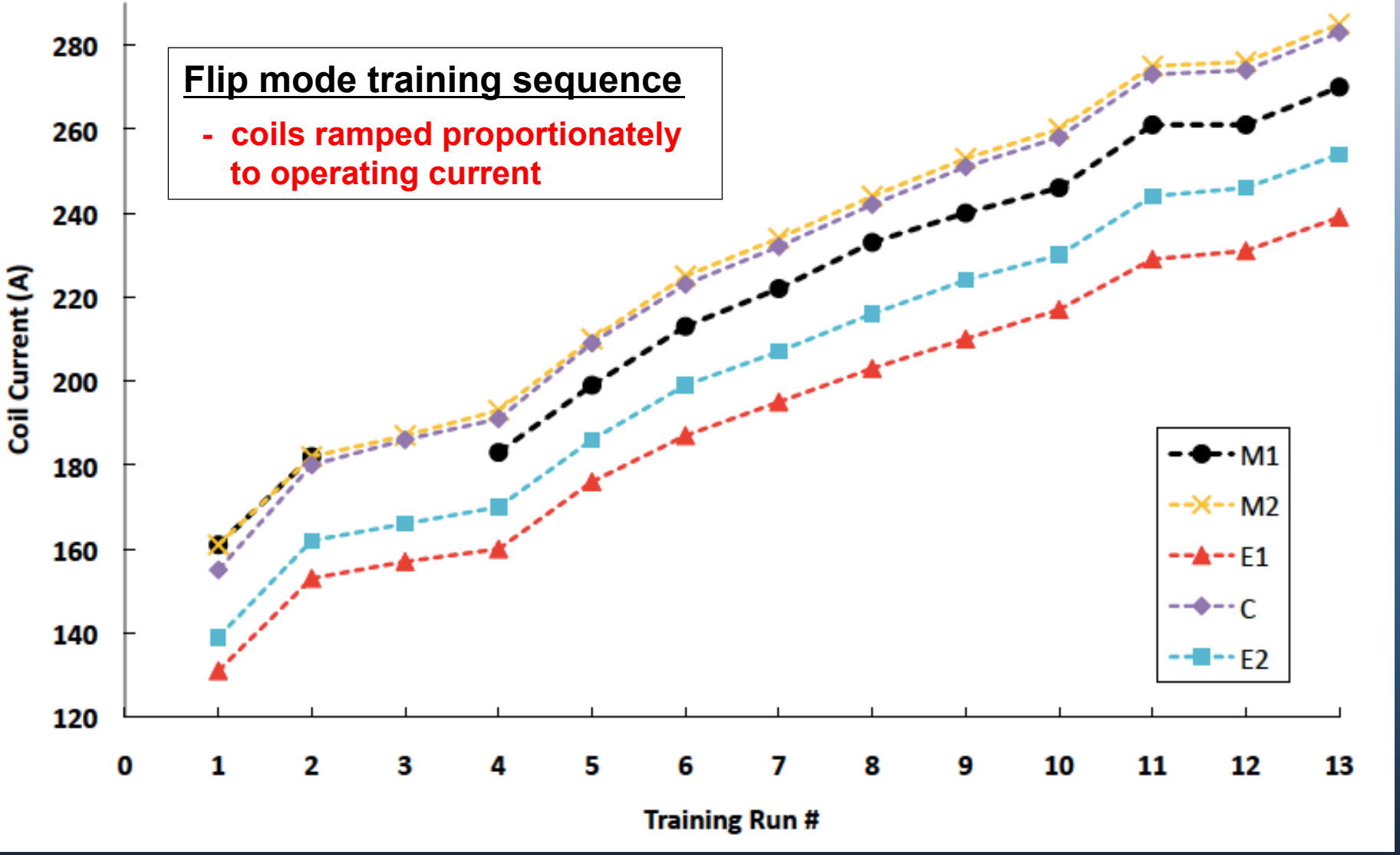
Training Progress

- The first magnet (designated SS#2) was successfully trained to full flip and solenoid mode currents at the end of February 2013
- Current was maintained at full flip mode for a period of 24 hours with no quench followed by direct ramp to solenoid mode
- All five power supplies were used at various ramp rates and under computer control
- All vendor acceptance tests for SS#2 are complete
- Cold mass was held at 4K and full of LHe for a period of 3 months prior to start of 3D magnetic mapping

Recent Training Runs



Final Training Progression



Magnet Field Mapping

- CERN mapping equipment arrived at the end of May
- Mapper installed by CERN crew and aligned to magnet by LBNL laser tracker group
- Preliminary mapping runs carried out without iron shield in place
- Iron shield successfully installed on magnet without removing mapping system
- Minimal effect on magnet training by addition of iron shield (quenched at ~98% of solenoid mode full current on first try, reached full current on 2nd run)

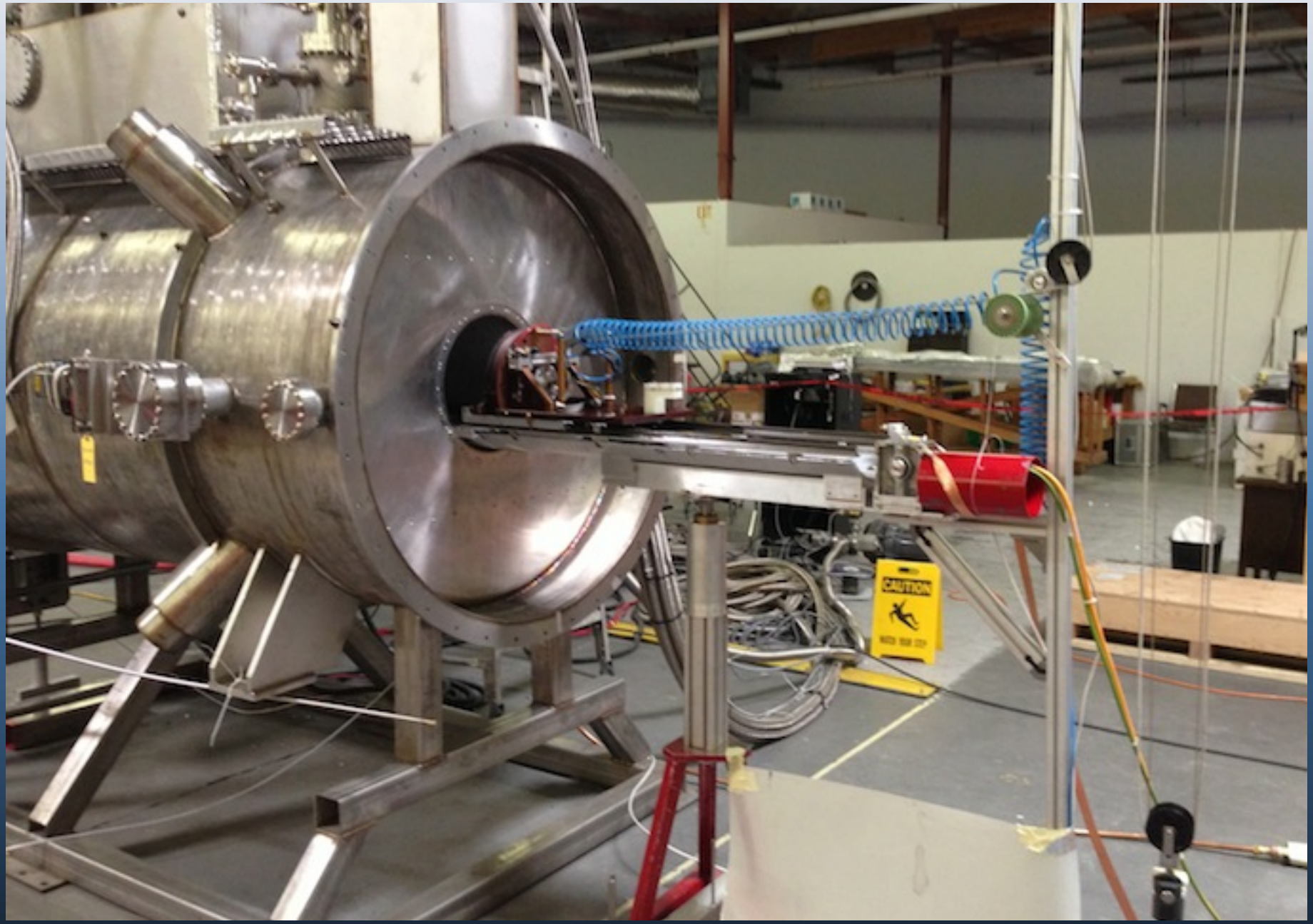
Recent on Site Effort at Wang

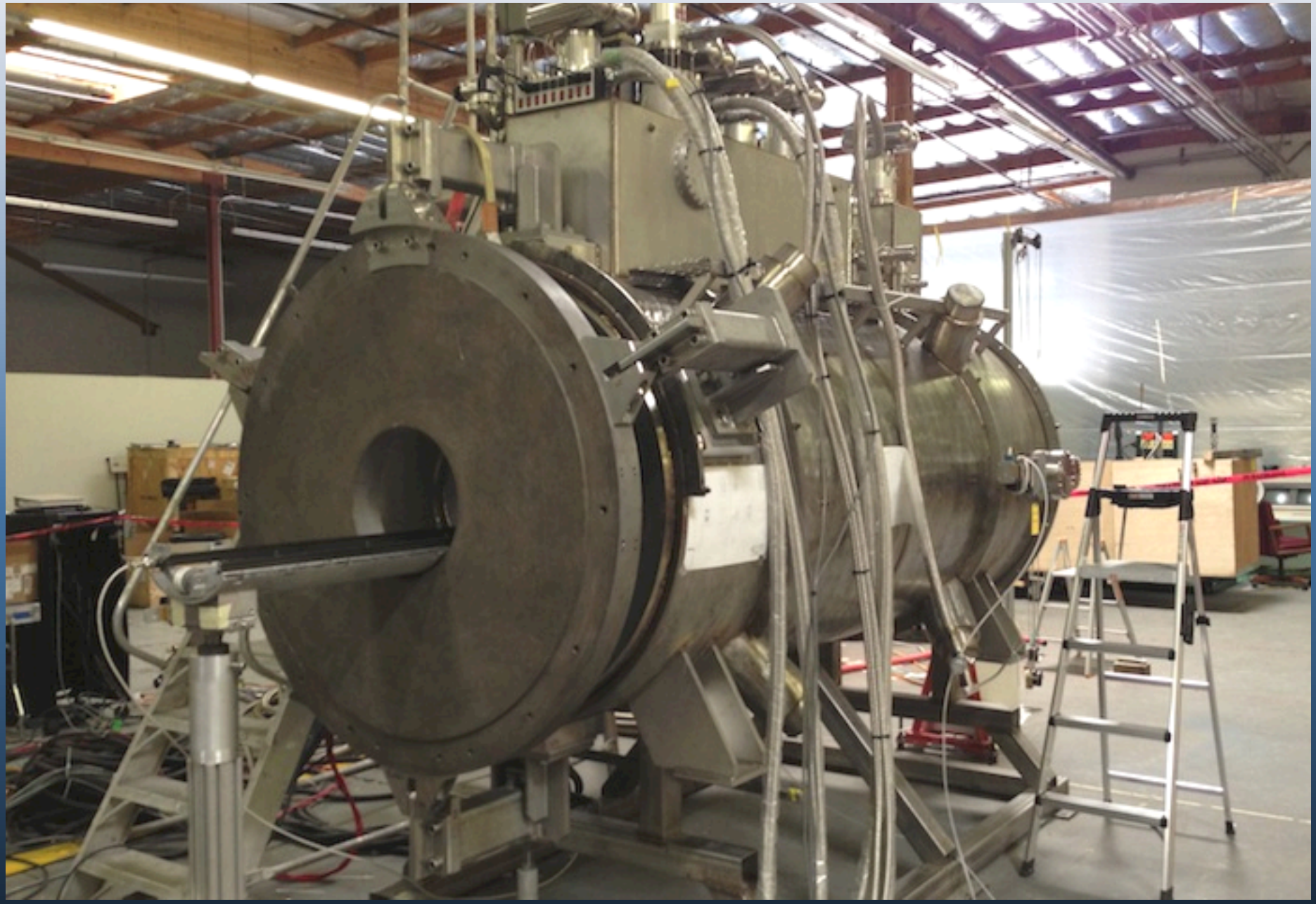
Many people have come to Wang NMR in the last two months to assist. Thanks to:

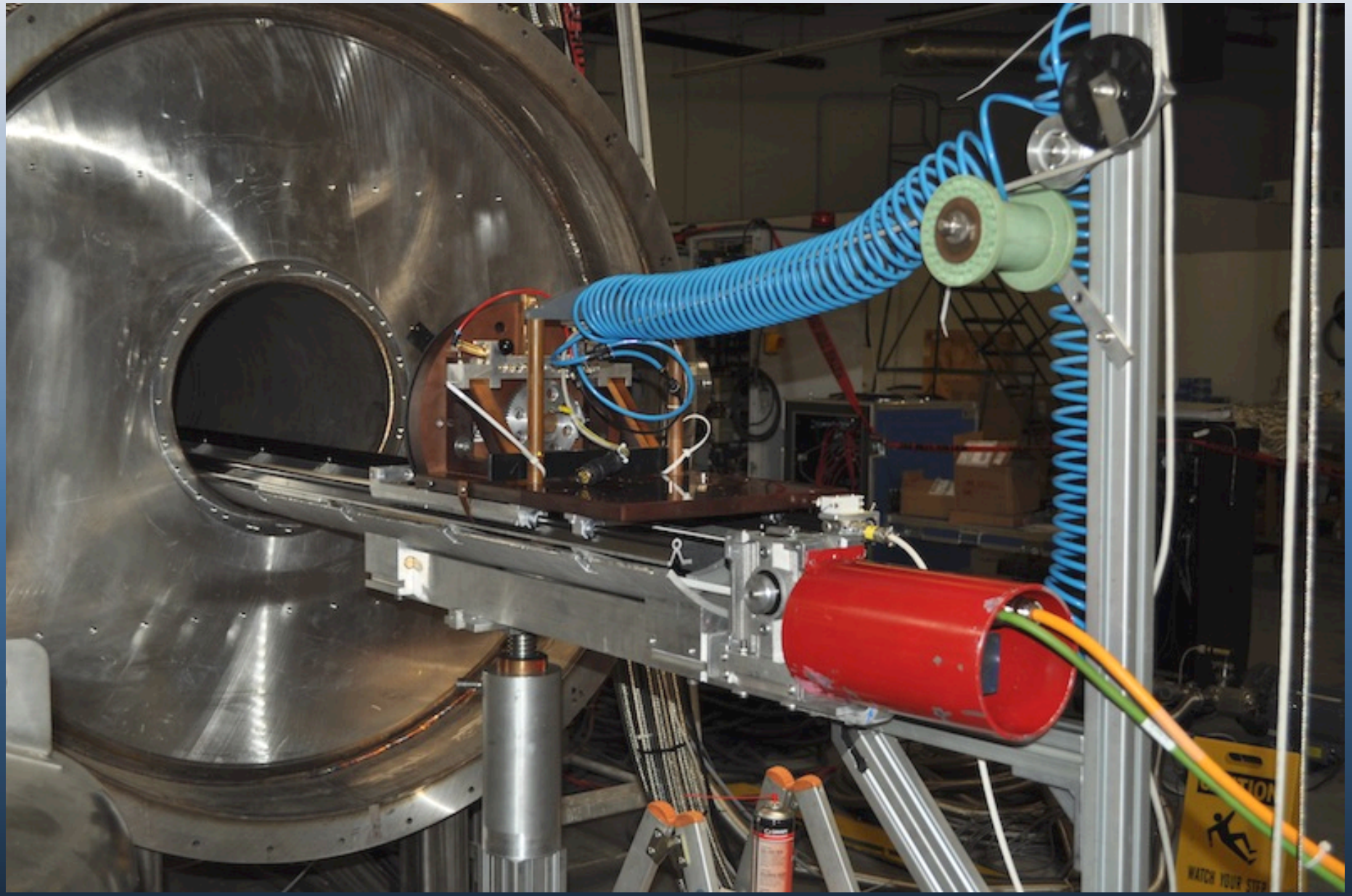
- Pierrick Hanlet (controls, etc.)
- Maria Leonova, David Adey (operation for mapping)
- Pierre-Ange Giudici, Felix Bergsma, Francois Garnier (magnet mapping system)
- Roy Preece (iron shield installation)
- Kyle McCombs and Adrian Williams (mech techs)
- Heng Pan (QD system) and Roman Pilipenko (phone)
- John Joseph (power supplies)
- Dave Humphries and crew (laser tracker system)
- And numerous others helping behind the scenes

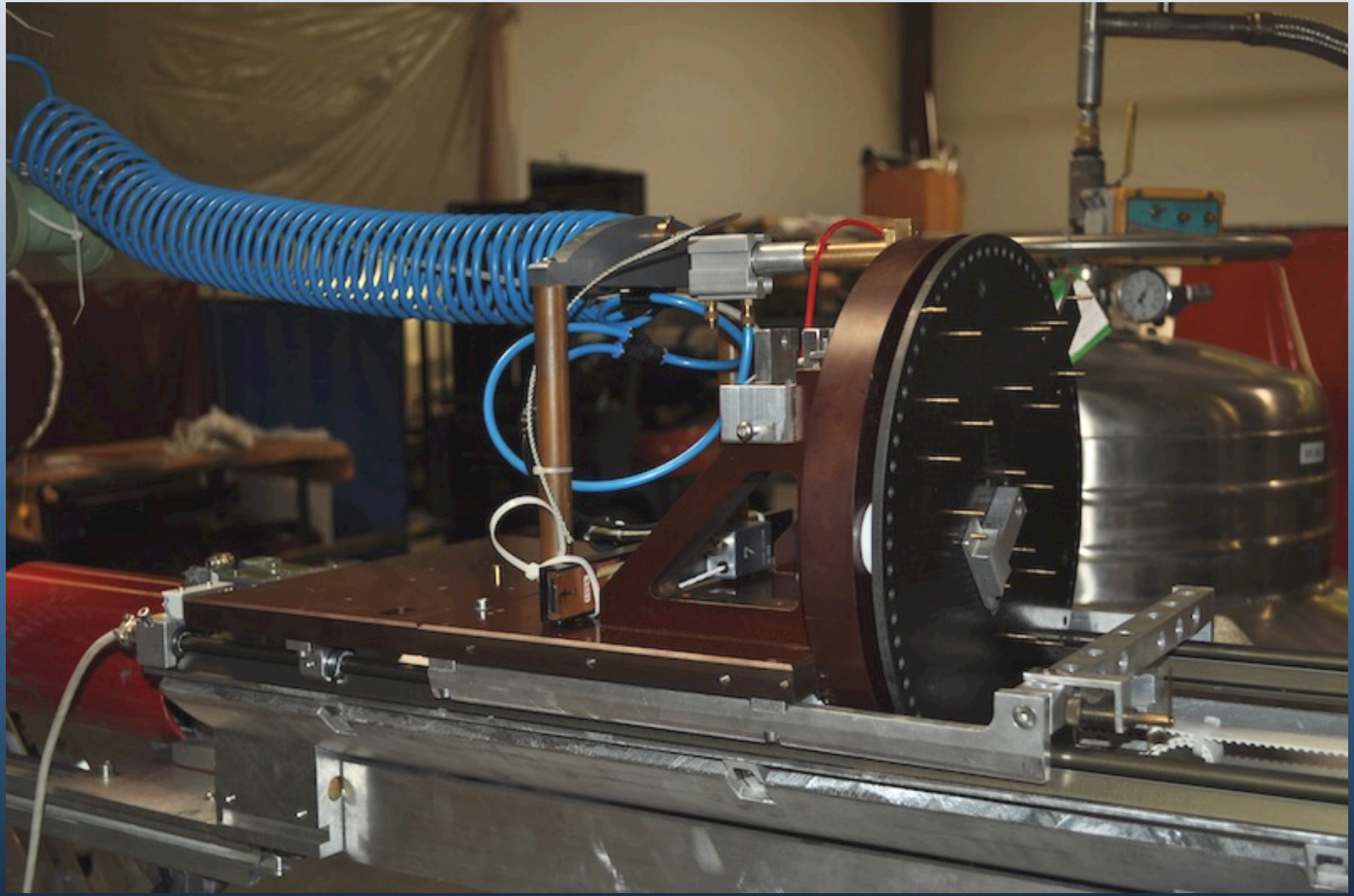
Magnet Field Mapping (cont'd)

- Full 3D mapping runs completed w/shield in place and at both flip and solenoid modes (full current)
- Additional mapping and calibration runs have been carried out
- Iron shield to be removed today
- Final mapping runs to be completed by Wednesday
- Refer to talk by Maria Leonova for details


CAUTION







Control System Update

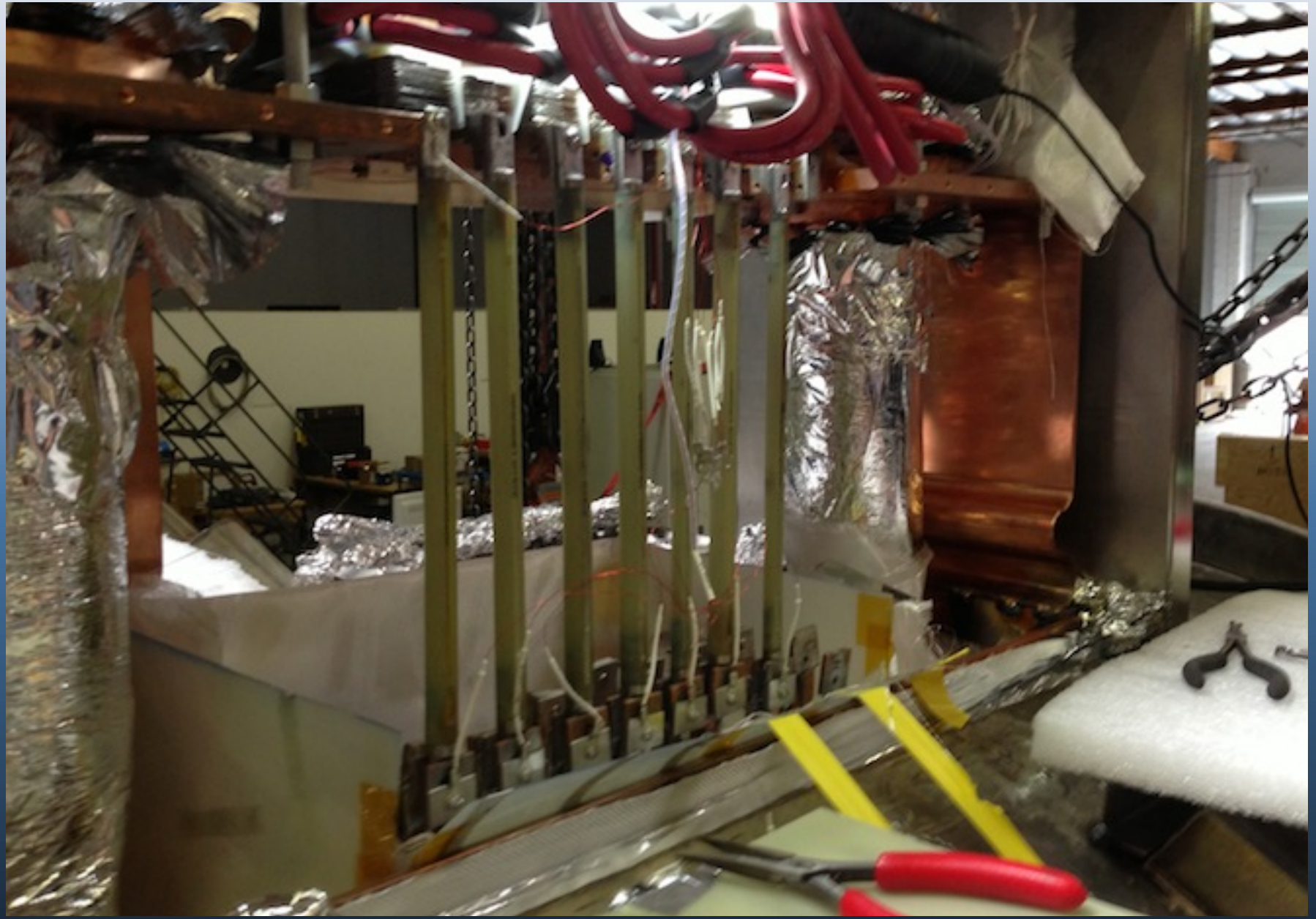
- Stand alone PID controller for the cold mass heater circuit has worked well
- Gas bottle backup system to prevent negative cold mass pressures remains in place
- Current shunts to directly measure the coil currents have been useful
- No issues with the charge/discharge circuits since all four units were rebuilt
- Improvements to the control system and its GUI have continued to be incorporated

Control System Update

- An issue with the voltage taps on the M2 coil has appeared during the mapping runs
  - The problem results in inductive type voltages across the HTS and LTS leads during ramping, resulting in PS instability and at least one quench
  - Operation has continued by desensitizing the QD system to the spurious voltages and adjusting the power supply stability control
  - Issue with taps will be investigated when magnet is warm
- Continued problems with loss of PS control parameters, mainly w/the Lakeshore trim supplies
  - Have a workaround, problem is being investigated at Daresbury

2nd Magnet Progress

- All vacuum vessel assembly and welding has been completed
- Cryocooler tower is complete and the coolers have been installed
- Leak check of the vacuum vessel completed last week (no leaks after one weld joint repair)
- Upcoming tasks: final weld of fill and vent towers, installation/welding of iron shield mount pads and support feet, vacuum vessel pump/purge



Kimwipes

Schedule

- Mapping of first magnet to be complete this week, followed by warm up
- Second unit expected to be in place and ready for cool down ~July 8th
- After vacuum pumpout of 2nd magnet, cooldown and training to start in June
- Training and mapping w/shield to follow
- Shipping of commissioned magnets to RAL still tentatively planned for July and Sept.