NSTX-U

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Research Operations Update
NSTX-U Team Meeting

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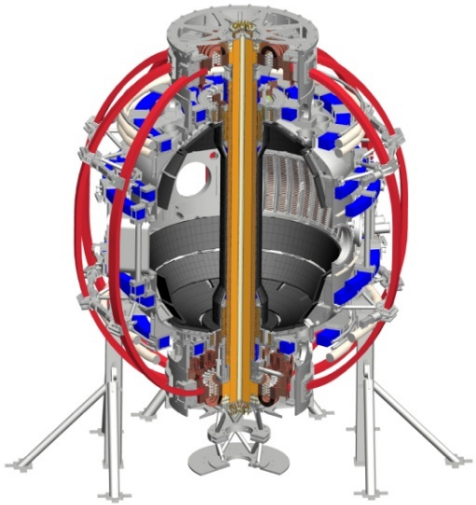

Culham Sci Ctr
York U
Chubu U
Fukui U
Hiroshima U
Hyogo U
Kyoto U
Kyushu U
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I&C

- *Windows XP retirement:* 39 of 85 NSTX PC's loaded with Windows 7. LabVIEW upgrades requisitioned. Orders for the balance of parts have made it through Procurement.
- *Network upgrades:* 10 Gbit/sec network upgrade between PPLCC and FCC/ Control Room: requisitions approved.
  - 10 Gb upgrade to D-site DARM funded through upgrade project.
- *Gas Injection upgrade:* Conceptual design underway to have all gas injectors controlled by PCS.
  - Currently about half were open-loop controlled by CAMAC.
  - Would allow restores of waveforms, use in feedback applications.
- New control room projectors installed.
- *Bill Davis tools*:
  - IDL Data-quality check routine. Will alert users if data doesn't show up in the tree or has unacceptable characteristics.
    - For instance, immediate notification if the rtEFIT χ^2 value gets too high
  - Web-tool for plotting upgraded to use a file to retrieve/store a list of signals.
    - Made an accompanying IDL program to convert dwscope or simple jScope configuration files to the web-tool file format.
- *PCS and related:* Have begun to design the new power supply control software archictecture.

Diagnostics (1 of 3)

- All 13.25” port covers on vessel top/bottom have been installed
- IR and visible windows have been ordered to support ORNL/ UT-K and LLNL diagnostics
- Check-out of the Cat. 4 magnetic sensors is underway, and numerous sensors have been repaired
- New Cf-252 calibration source was delivered
  - Will allow faster and more accurate calibrations of the neutron diagnostics
- In-vessel metrology for diagnostics has started
  - If you need something measured, speak up now
- Profile diagnostics calibrations now on the rollover schedule for mid/late May.

Diagnostics (2 of 3)

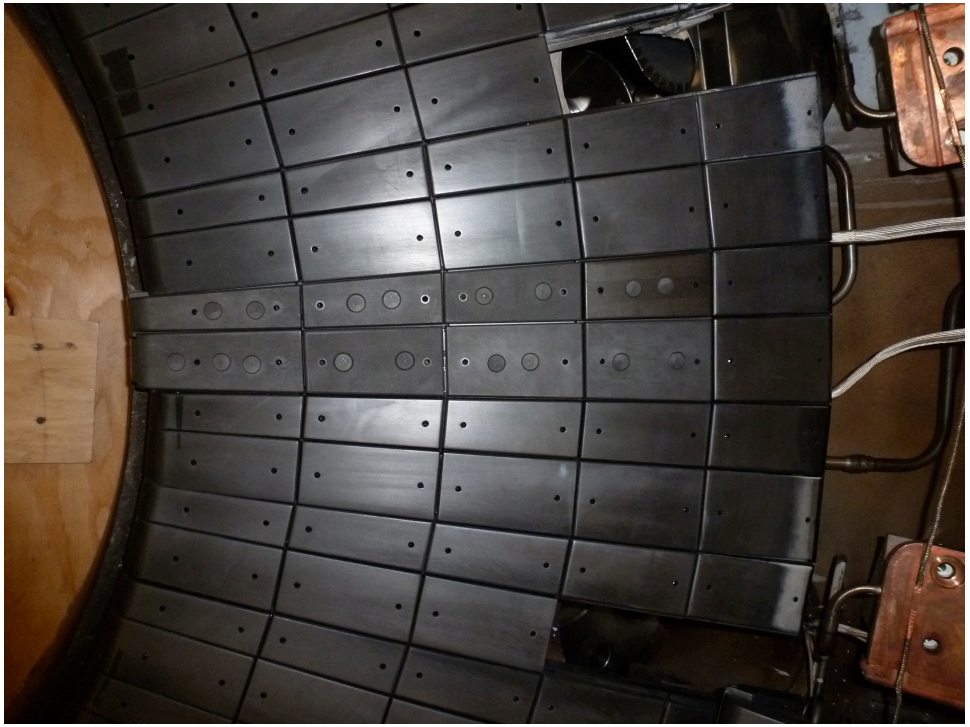
- Retro-reflector is being installed for the FIReTIP chord, and a new geometry for the single channel VB chord has been determined
- Divertor Tangential Imaging diagnostic had a successful FDR
- New SSNPAs under fabrication, Bay L unit being blackened & assembled
- Working with LLNL to install new EUV instruments for first plasma
- Grinding of the vessel at bays J upper/lower horizontal dome is complete
  - Supports divertor SPRED and Divertor Imaging Radiometer
- Installed a new fiber-bundle for the MSE-LIF system
- Putting holes in the bay I port cover to support the shutter for the SAMI diagnostic and the QMB
- At the PDR stage for the midplane bolometer/MEUSXR system at Bay G.

Diagnostics (3 of 3)

- sFLIP:
  - The sFLIP diagnostic structure has been modified to fit into the considerably smaller radial build available in NSTX-U.
  - sFLIP re-wiring is underway on account of its new position and new feedthrough position.
  - These modifications should extend the range of fast ion loss sampled.
- MPTS:
  - Design of all components for laser input part of system complete and parts are in fabrication-expect parts to be complete in May-June
  - Will start installation soon (next week?) by establishing laser beam path through vessel and mounting optics box on south wall-have completed procedure
  - Design of laser exit nearly complete-expect to start fabrication in May
  - Light collection optics box components have been modified and the box will be reassembled and tested in the lab in the next couple of weeks

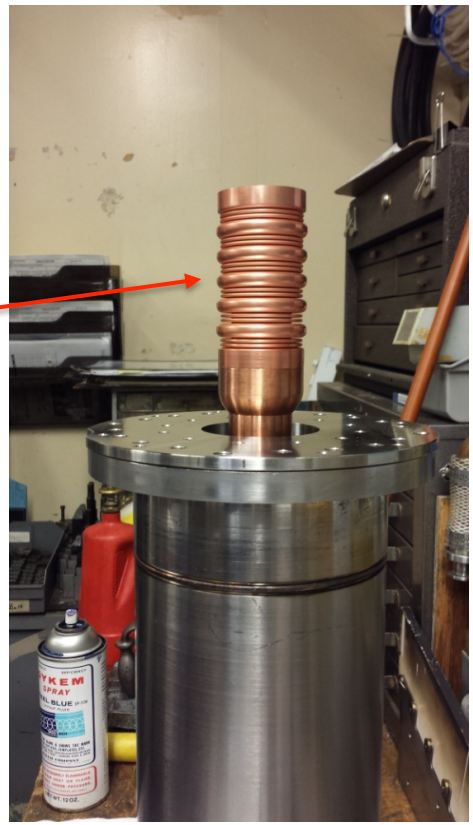
Boundary Physics Diagnostics & Operations

- MAPP was successfully fit-up at its new location on Bay J
  - Some modifications to the stand were made, allowing it to be reinstalled with confidence when NSTX-U runs
  - Is now back at LTX, apparently needs an additional fit-up to test interferences with new CHI
- New OBD bull-nose tiles are being installed
  - Custom fit-up to achieve concentricity with the mail vessel flange and avoid large "steps" and exposed edges
- New lithium chemist, Steve Rossi, has been here this week.
  - Will be here full time starting June 23rd.
- New high-density langmuir probe arrays added in the upper and outer lower divertors
  - 17 probes in each divertor

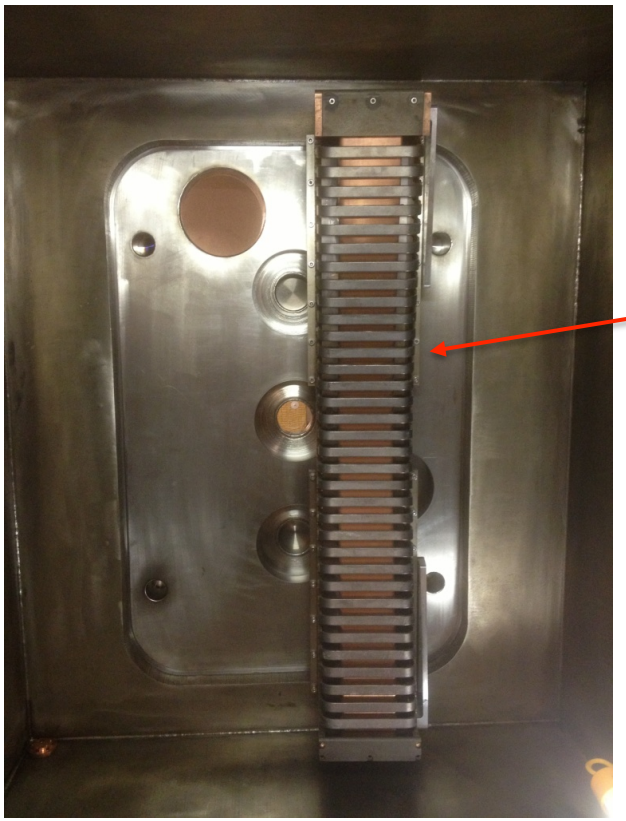


Compliant coupler for HHFW antenna tested successfully on the RF test facility

- New couplers required to accommodate NSTX-U disruption loads
- Visible detection of the arc locations performed and analyzed

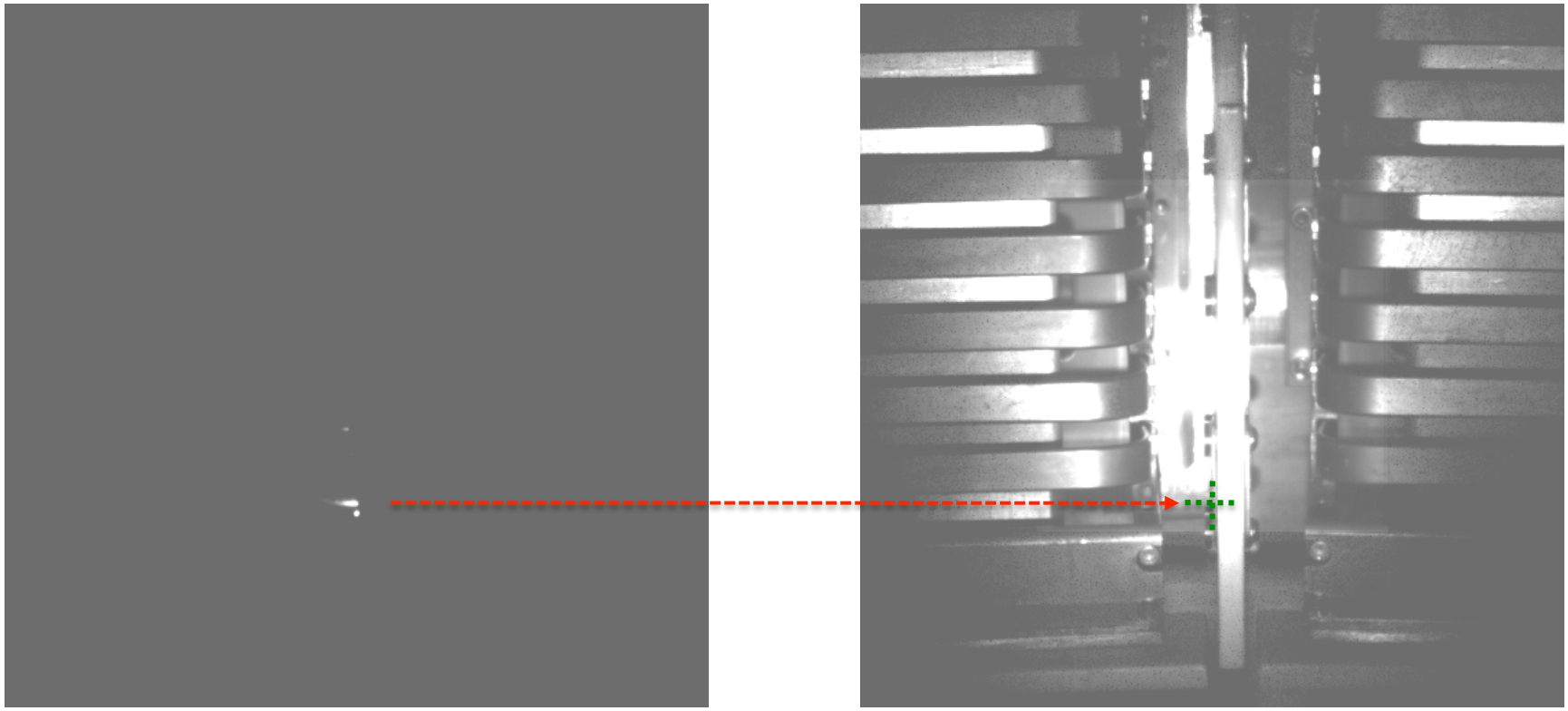


Compliant coupler connected to the center conductor of the feedthrough.



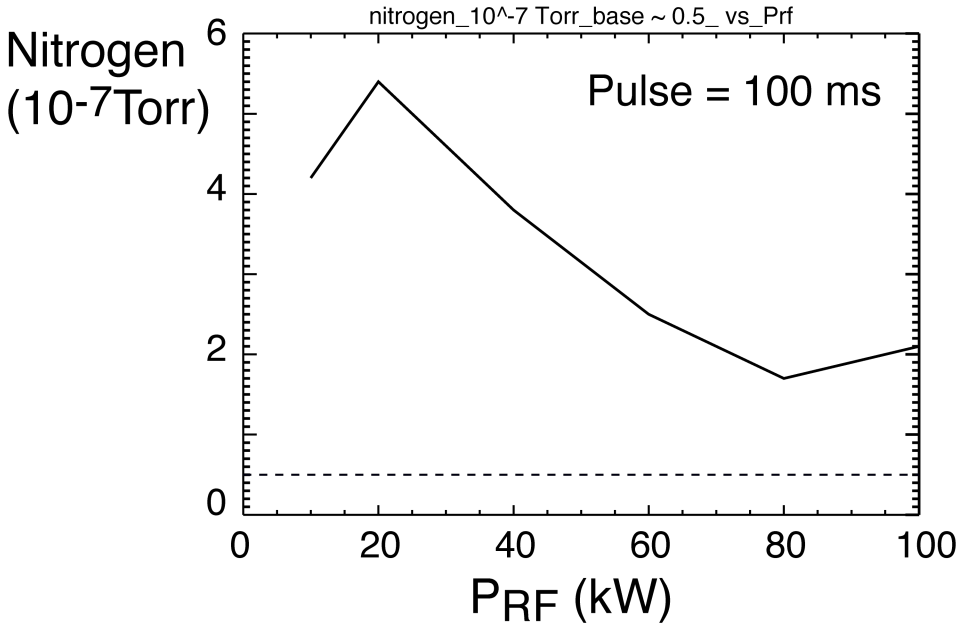
Inside of RF Test Stand with one antenna assembly.

Arc/sputtering was found near the bottom of the antenna boxes – between the boxes in unexpected region



- Insulating boxes did not remove this arc/sputtering effect
- Grounding box ends to the tank did remove this arc/sputtering effect and permitted operation up to 46 kV at antenna feeds

Present Status and Plans for HHFW



- Present test-stand work examining the pressure rise in the antenna box when RF is applied.
  - Observed pressure rise mimics what is observe during operations in NSTX
  - Will involve IR measurements.

- Successful FDR held for the compliant center conductor upgrade
- Antennas have been removed from NSTX
  - Faraday cages, BN limiters, current straps, center conductor extensions
- Full set of compliant center conductors have been fabricated
  - 16 delivered, the rest to be delivered next week.
- After modification to the center conductor extensions and fabrication of some adapters, the antenna will be reinstalled
  - (in coordination with construction project).