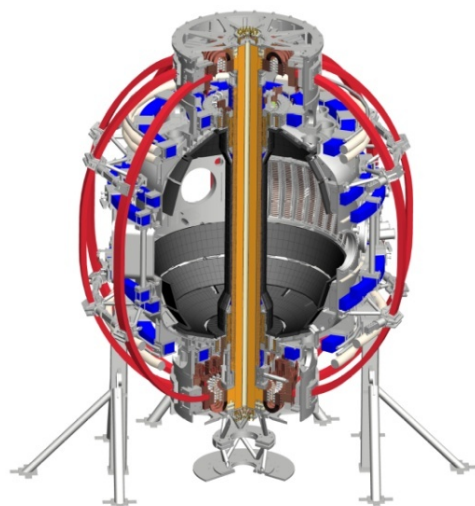


Research Operations Update

Stefan Gerhardt

Coll of Wm & Mary
Columbia U
CompX
General Atomics
FIU
INL
Johns Hopkins U
LANL
LLNL
Lodestar
MIT
Lehigh U
Nova Photonics
ORNL
PPPL
Princeton U
Purdue U
SNL
Think Tank, Inc.
UC Davis
UC Irvine
UCLA
UCSD
U Colorado
U Illinois
U Maryland
U Rochester
U Tennessee
U Tulsa
U Washington
U Wisconsin
X Science LLC

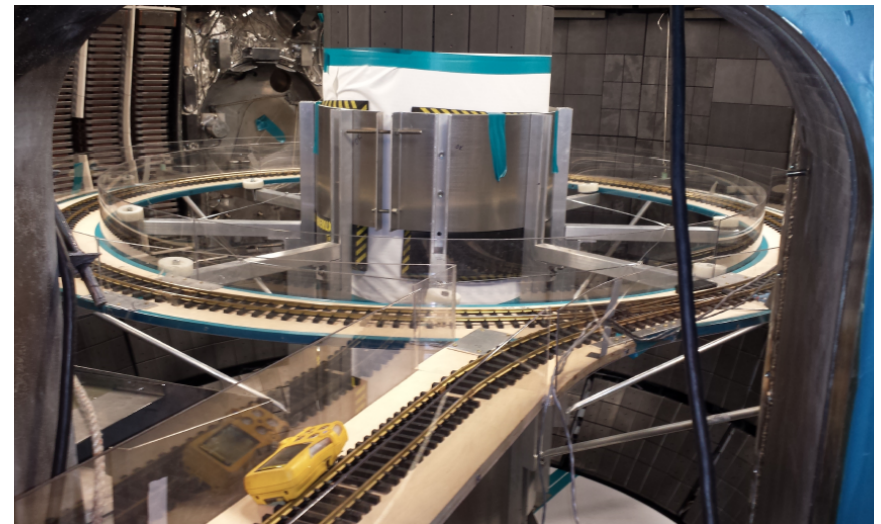
NSTX-U Team Meeting
B-318
December 4th, 2014



Culham Sci Ctr
York U
Chubu U
Fukui U
Hiroshima U
Hyogo U
Kyoto U
Kyushu U
Kyushu Tokai U
NIFS
Niigata U
U Tokyo
JAEA
Inst for Nucl Res, Kiev
Ioffe Inst
TRINITI
Chonbuk Natl U
NFRI
KAIST
POSTECH
Seoul Natl U
ASIPP
CIEMAT
FOM Inst DIFFER
ENEA, Frascati
CEA, Cadarache
IPP, Jülich
IPP, Garching
ASCR, Czech Rep

Progress on: **Diagnostics**

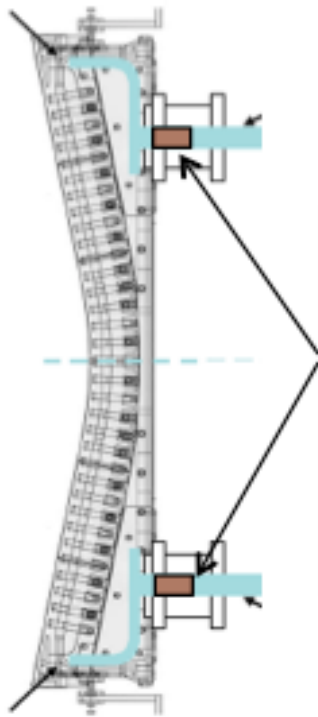
- Thomson scattering collection optics aligned, vacuum boundary established.
 - On track to calibrate & support experiments on the schedule to be presented later
- New diagnostics in final stage of fabrication/installation:
 - Three new SSNPAs (UC-Irvine)
 - Bolometer, multi-energy SXR system (PPPL & JHU)
 - EUV spectroscopy systems (LLNL)
- Other major profile diagnostics reinstalled, spatially calibrated, intensity calibrated where appropriate:
 - CHERS, FIDA, T-FIDA, P-CHERS. MSE, MSE-LIF
- Magnetic diagnostics on CS expanded as part of the upgrade project.
 - Legacy magnetics on the outer vessel tested, repaired as the very last job before the duct was installed.
- Neutron calibration completed
 - Two track radii completed
 - Three fission chambers calibrated
- Next steps
 - Will send the source to NIST for strength calibration.
 - Will need low power beam shots to transfer the calibration from count mode to current mode.



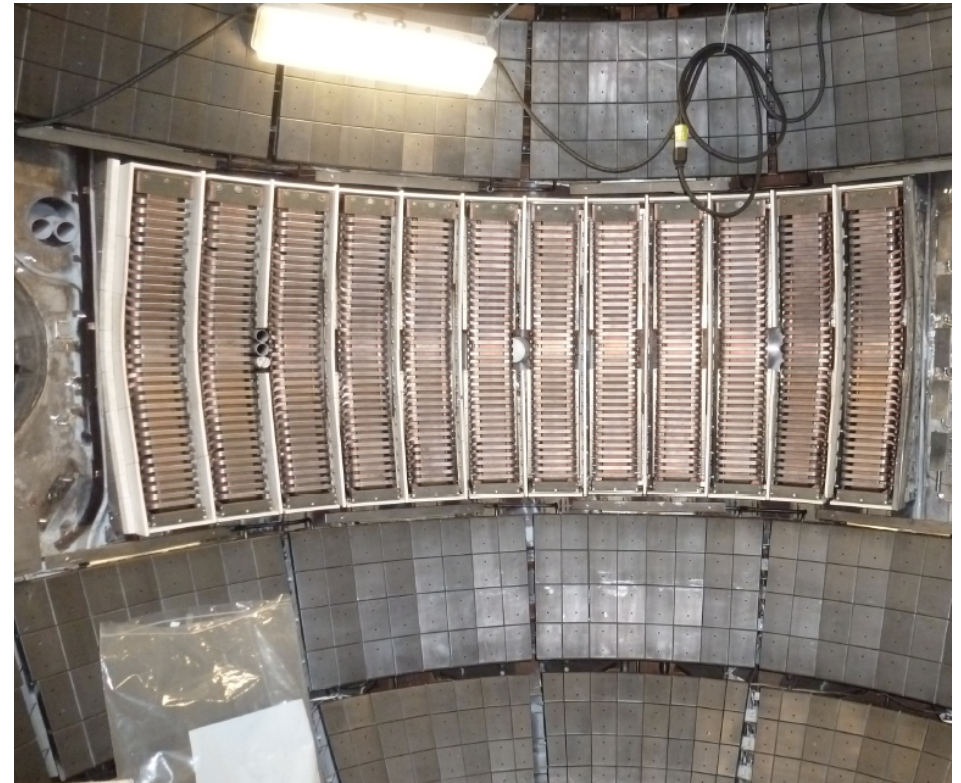
Progress on: HHFW Operations

New Compliant Antenna Feeds Have Been Designed, Tested, Fabricated, Installed.

Will allow HHFW antenna feedthroughs to tolerate 2 MA disruptions



Prototype electroformed compliant section



- Transmission lines are in the process of being installed & tuned. 10 of 12 lines have been installed in the NTC
- Remaining tasks:
 - RF power supplies to be re-energized in March 2015 time-frame to be ready for research operation in May 2015.

Progress on: **Boundary Physics Operations**

- New boronization (dTMB) system.
 - System designed through successful FDR.
 - Components have been ordered.
 - Electric service 85% complete...will use vacuum system PLC for controls.
 - Plan for it to be available for initial research operations.
- LIThium EvaporatoR (LITER)
 - LITERs were carefully stored during the outage.
 - Mounting locations are being repositioned
 - Modifications to the umbrella preclude using the previous mounting system
 - New fume hood and other laboratory upgrades complete for LITER filling and maintenance.
 - Plan for LITER to be available for research operations.
- Materials Analysis Particles Probe (MAPP) probe has been fit-up w/ a new stand.
 - Allows material samples to be exposed to the plasma and then examined in-situ with surface science techniques.

Progress on: Physics Ops. And Plasma Control

- New I_p measurement systems and associate permissive generators designed, fabricated, in testing.
 - Will have both high and low gain signals for each rogowski.
 - Low gain to fit up to 4 MA of linked current (I_p + 4 divertor coils)
 - High gain to measure very small currents
- Magnetics racks largely re-wired to support Upgrade operations, integrators now being tested.
- Low-level plasma control software is being revisited, upgraded.
 - Includes moving power supply control software from stand-alone code to an algorithm within PCS.
 - System is in the final testing stages to support power supply control.
- In the process of revisiting all physics algorithms
 - Have assigned a cognizant physicist to each algorithm to provide accountability....you know who you are.

Operations Aspect of Run Prep.:

- Speakers lined up for the late January operations meetings.
 - S. Gerhardt : Intro, Magnetics
 - A. von Halle : Engineering Operations (Power systems, NBI, ORR)
 - D. Mueller : Physics Operations (operator training, PCS,...)
 - R. Kaita : Boundary Operations (GDC, LITER, Boronization,...)
 - B. Stratton : Diagnostic Operations
 - J. Hosea : RF Operations
- Draft 2015 XP forms available for comment in http://nstx.pppl.gov/DragNDrop/XP_Folder/XP_Template/
 - We will listen to comments (especially about the diagnostic checklist), but no guarantee to adopt them.