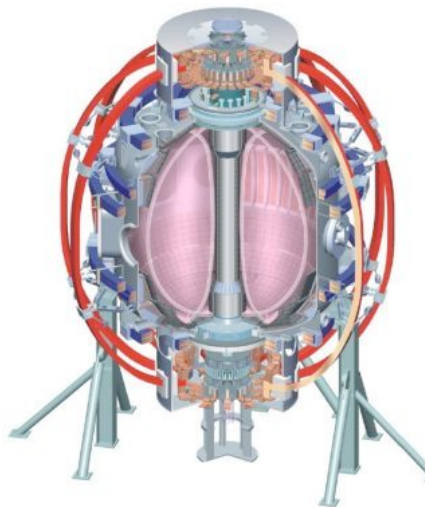


NSTX Team Meeting

February 4, 2009

College W&M
 Colorado Sch Mines
 Columbia U
 Comp-X
 General Atomics
 INEL
 Johns Hopkins U
 LANL
 LLNL
 Lodestar
 MIT
 Nova Photonics
 New York U
 Old Dominion U
 ORNL
 PPPL
 PSI
 Princeton U
 Purdue U
 SNL
 Think Tank, Inc.
 UC Davis
 UC Irvine
 UCLA
 UCSD
 U Colorado
 U Maryland
 U Rochester
 U Washington
 U Wisconsin



Culham Sci Ctr
 U St. Andrews
 York U
 Chubu U
 Fukui U
 Hiroshima U
 Hyogo U
 Kyoto U
 Kyushu U
 Kyushu Tokai U
 NIFS
 Niigata U
 U Tokyo
 JAEA
 Hebrew U
 Ioffe Inst
 RRC Kurchatov Inst
 TRINITY
 KBSI
 KAIST
 POSTECH
 ASIPP
 ENEA, Frascati
 CEA, Cadarache
 IPP, Jülich
 IPP, Garching
 ASCR, Czech Rep
 U Quebec

NSTX Team Meeting Agenda

Time: 1:00 ~ 2:30, Place NSTX LSB 318, Feb. 4, 2009

- **General Items (30 minutes)**
- **Outage Updates (20 minutes)**
- **Research Operations / Program items (40 minutes)**

Safely, Safely, Safely

- **ES&H Issues (J. Levine) -**
- **Heath/Safety is the foundation of what we do!**
- **Let us work together to keep our NSTX team safe!**
 - Our team is quite a diverse group! (Institutional, Cultural, Language....)
 - Every team member receives the same safety-related training as PPPL engineering and research staff.
 - The NSTX Chief Operating Engineers will work with you in the performance of a Job Hazard Analysis as required in all test cell work permits.
 - We try to help and look out for each other:
 - PPPL hosts help our collaborators / visitors
 - Longer term collaborators help shorter term collaborators from respective institutions
 - Engineering staff are here to help

If you have any questions and/or concerns, please let us know!

NSTX had strong showing at APS, and broad participation in the FY2009 research forum

- **NSTX had a strong showing at the 50th Annual Meeting of the APS Division of Plasma Physics held in Dallas, Texas, November 17-21**
 - **6 invited talks, 11 contributed talks, and 45 contributed posters were presented by members of the NSTX Team. The invited speakers/titles were:**
 - **M. Podestà (UC Irvine) "Experimental studies on fast-ion transport by Alfvén waves on NSTX"**
 - **N. Gorelenkov (PPPL) "BAAEs in NSTX and DIII-D Driven by Beam Ions"**
 - **J.K. Park (PPPL) "3D perturbed tokamak equilibria and the importance of plasma response"**
 - **R. Maqueda (Nova Photonics) "ELM filament structure in the NSTX"**
 - **H. Yuh (Nova Photonics) "Suppression of turbulent transport in NSTX ITBs"**
 - **D. Smith (PPPL) "Electron gyro-scale fluctuations in NSTX plasmas".**
- **NSTX Research Forum for 2009 was held December 8-10, 2008 at PPPL.**
 - **The forum began with a plenary session where programmatic issues for the 2009 run were discussed, MAST, Pegasus, C-Mod, DIII-D, plans presented.**
 - **NSTX Topical Science Groups discussed over 100 proposals for experiments**
 - **TSG leaders presented the prioritized list of proposals and the NSTX Run Coordinator for 2009, R. Raman, presented the plan for organizing the run time.**

NSTX researchers contributed to ITPA, and will contribute to NSTX PAC meeting and ReNeW workshops

- **Stan Kaye attended the Seventh IEA Large Tokamak Workshop (W69) on Implementation of the ITPA Coordinated Research Recommendations, held at PSFC, MIT on Dec. 11-13, 2008.**
 - The meeting was attended by Program leaders of the major fusion devices and ITPA Chairs and IO representatives.
 - The objectives of the meeting were to:
 - Discuss and agree to various ITPA groups' plans to address ITER High Priority Issues
 - Establish levels of commitment to ITPA Joint Experiments, Programmatic Activities
- **NSTX Program Advisory Committee (PAC) will be held Feb 18-20, 2009**
 - Program will seek advice on FY2009-11 plans
- **Upcoming ReNeW workshops:**
 - March 2-6 – Harnessing fusion power, plasma-material interface (Themes 4, 3)
 - March 16-19 – Configuration optimization (Theme 5)
 - March 23-27 – Burning plasmas, high-performance steady-state (Themes 1,2)

Two Possible Operational Scenarios

20 Run Weeks Request Submitted for the Stimulus Bill

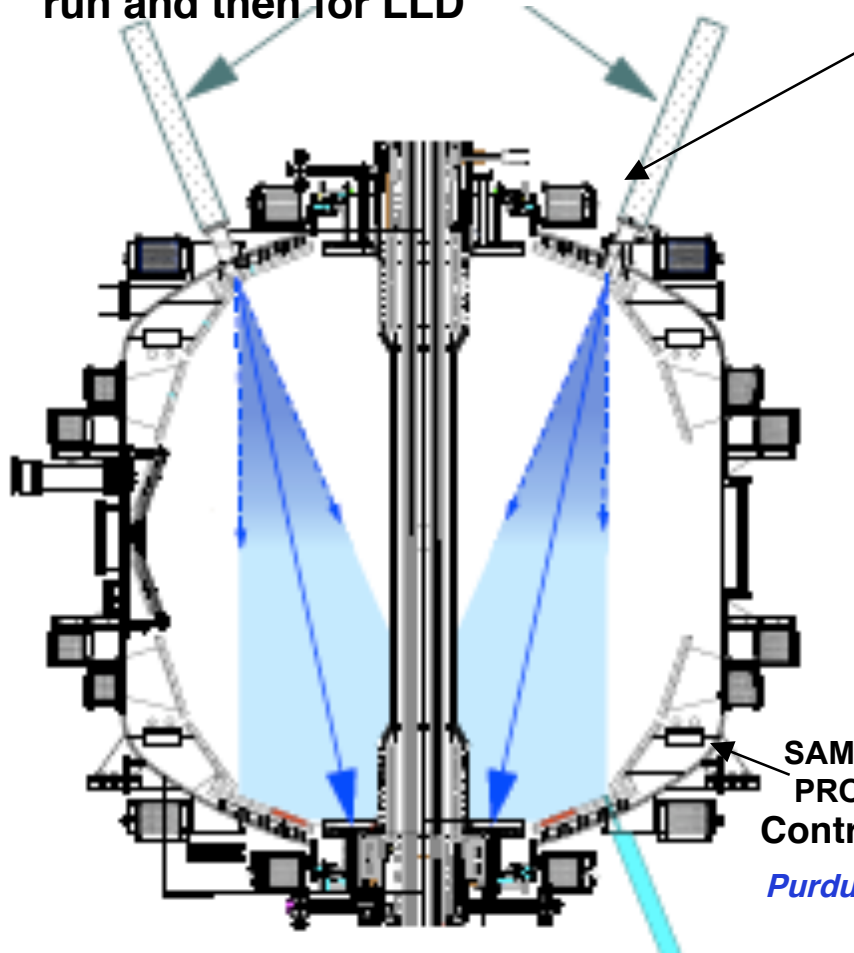
		February				March				April				May				June				July				August				Sept						
		26-Jan	2-Feb	9-Feb	16-Feb	23-Feb	2-Mar	9-Mar	16-Mar	23-Mar	30-Mar	6-Apr	13-Apr	20-Apr	27-Apr	4-May	11-May	18-May	26-May	1-Jun	8-Jun	15-Jun	23-Jun	28-Jun	6-Jul	13-Jul	20-Jul	27-Jul	3-Aug	10-Aug	17-Aug	24-Aug	31-Aug	7-Sep	14-Sep	21-Sep
		Meetings >>>>>>>				snow				TTP				IEEE ReNeW				EPG																		
		~14 Weeks of Plasma Operations																																		
Calib	ISTP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Cal	Vent																			
		~20 Weeks of Plasma Operations																																		
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- There are outstanding milestones in FY 09 - Liquid Lithium Divertor Target (LLD) and Beam Emission Spectroscopy (BES).
- For the 14 run weeks case, we should be able install LLD and BES in NSTX (but not commission them.)
- For the 20 run weeks case, since we will be running till ~ September, we can fabricate necessary components for LLD and BES to be ready for installation but the installation and commissioning will by in FY 10.

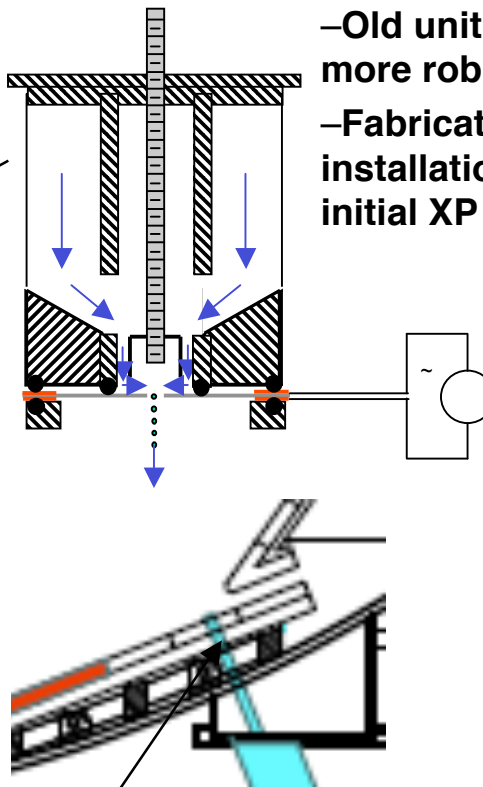
FY 09 Joint Research Milestones - "Conduct experiments on major fusion facilities to develop understanding of particle control and hydrogenic fuel retention in tokamaks. ..NSTX is pursuing the use of lithium surfaces in the divertor,..."

Dual Liquid Lithium Evaporator

- Spare LITER being fabricated
- Use for coating carbon tiles in FY09 run and then for LLD



Dual Lithium Powder Dropper



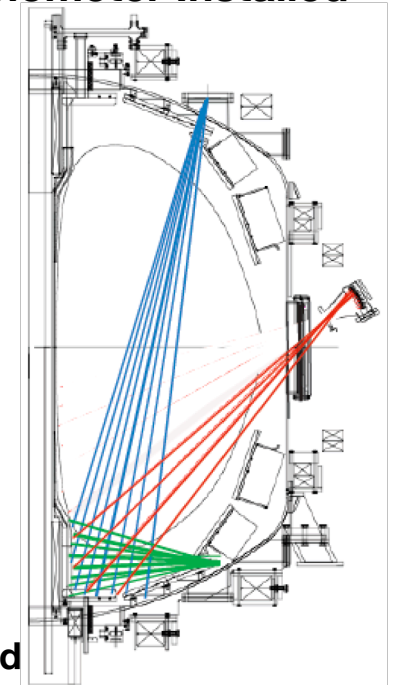
- Gate valves and guide tubes for 2 units installed prior to pumpdown
- Old unit has been modified to be more robust and reliable
- Fabricating second dropper for installation pending outcome of initial XP

SAMPLE PROBE
Contribute to FY 09 Joule Milestone

Purdue U

Fast IR Camera (ORNL) installed

Three-view Divertor Bolometer Installed



Draft FY 2009 FEAs

14 Run Weeks Base Case

Research	Description	Baseline	Forecast	Actual
R(09-1)	Understand the physics of RWM stabilization and control as a function of rotation .	Sep 09	Sep 09	
R(09-2)	Study how $j(r)$ is modified by super-Alfvénic ion driven modes .	Sep 09	Sep 09	
R(09-3)	Perform high-elongation wall-stabilized plasma operation .	Sep 09	Sep 09	
Facility				
F(09-1)	Operate NSTX Facility for 14 Experimental Run Weeks .	Sep 09	Sep 09	
F(09-2)	Install the liquid lithium divertor target for particle pumping .	Sep 09	Sep 09	
Diagnostic				
D(09-1)	Upgrade the divertor bolometer to three views with 20 channels.	Sep 09	Mar 09	
D(09-2)	Install the Beam Emission Spectroscopy system for transport studies .	Sep 09	Sep 09	

Draft FY 2009 FEAs

20 Run Weeks Enhanced Operations Case

Research	Description	Baseline	Forecast	Actual
R(09-1)	Understand the physics of RWM stabilization and control as a function of rotation .	Sep 09	Sep 09	
R(09-2)	Study how $j(r)$ is modified by super-Alfvénic ion driven modes and integrate it into optimized operation .	Sep 09	Sep 09	
R(09-3)	Perform high-elongation wall-stabilized plasma operation .	Sep 09	Sep 09	
Facility				
F(09-1)	Operate NSTX Facility for 20 Experimental Run Weeks .	Sep 09	Sep 09	
F(09-2)	Complete fabrication of the liquid lithium divertor target for particle pumping.	Sep 09	Sep 09	
Diagnostic				
D(09-1)	Upgrade the divertor bolometer to three views with 20 channels.	Sep 09	Mar 09	
D(09-2)	Complete fabrication of the Beam Emission Spectroscopy system for transport studies.	Sep 09	Sep 09	

Extra run weeks will enhance research productivity in lithium related research (FY 09 Joule Milestone), ELM control, energetic particle transport, HHFW current ramp-up, ITER/ITPA experiments, and possible counter injection.

Other On-Going Activities

- **NSTX Field Work Proposal Preparation**
 - PPPL Research Council Presentations Discussions (Jan. 12)
 - Text being prepared
 - Upgrade cost and schedule being reviewed by Engineering
 - PAC meeting in Feb. 18 - 20
 - Submission / presentation in March
- **ARRA Incremental Fund for NSTX requested**
 - Increased Facility Utilization
 - Research Augmentation
 - Major Upgrades (CS and NBI)
- **NSTX CS and NBI Upgrades**
 - Germantown OFES visit (Dec. 3, 2008)
 - CD-0 (Mission Needs) submitted (Jan. 2009)
 - CD-1 (Conceptual Design) approval by end of this calendar year

NSTX Upgrades

Engineering Management Cost & Schedule Reviews

Task	Engineering Cog	Research Cog
HHFW Antenna Upgrade	R. Ellis	J. Hosea
HHFW ELM Resilience	E. Fredd	J. Hosea
Liquid Lithium Divertor	M. Viola	H. Kugel
Beam Emmission Spectroscopy	G. Labik	B. Stratton
MSE-LIF	S. Raftopoulos	B. Stratton
Additional MPTS Channels	H. Schneider	B. LeBlanc
New Center Stack	L. Dudek	M. Ono
Second NBI	A. von Halle	M. Ono
ECH/EBW	E. Fredd	J. Hosea
Divertor Thompson	G. Labik	B. Stratton
OH Replacement	J. Chrzanowski	M. Ono

- **Responsible engineering managers designated to manage each upgrade.**
- **Cost and Schedule will be independently reviewed by Engineering Department for FWP.**