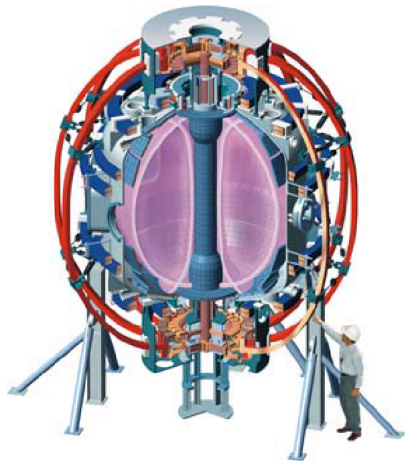


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# Update on ALIST Plans for NSTX

R. Kaita  
for the NSTX Group



Plasma Facing Components Meeting  
May 9-11, 2005  
Princeton, NJ

Columbia U  
Comp-X  
General Atomics  
INEL  
Johns Hopkins U  
LANL  
LLNL  
Lodestar  
MIT  
Nova Photonics  
NYU  
ORNL  
PPPL  
PSI  
SNL  
UC Davis  
UC Irvine  
UCLA  
UCSD  
U Maryland  
U New Mexico  
U Rochester  
U Washington  
U Wisconsin  
Culham Sci Ctr  
Hiroshima U  
HIST  
Kyushu Tokai U  
Niigata U  
Tsukuba U  
U Tokyo  
JAERI  
Ioffe Inst  
TRINITI  
KBSI  
KAIST  
ENEA, Frascati  
CEA, Cadarache  
IPP, Jülich  
IPP, Garching  
U Quebec

# Outline



- 1) NSTX Module Concepts
- 2) Project Position on Module Program
- 3) Activities Certification Committee Meeting
- 4) Present Boundary Physics Plan
- 5) Budget and Schedule Issues

# NSTX Module Concepts



- [0) Lithium Pellet Injection - in progress]
- 1) Module A (Phase I): Lithium deposition on graphite - divertor and/or center stack
- 2) Module A (Phase II): Lithium deposition on less permeable substrate - divertor and/or center stack
- 3) Module B: Flowing liquid lithium divertor module

# Project Position on Module Program



- ◆ NSTX committed to Module A (Phase I)
  - Lithium evaporation on carbon part of baseline program
- ◆ Commitment to Module A (Phase II) contingent on Phase I results
  - Effect on recycling and edge plasma parameters observable but transient with carbon substrate
  - Results consistent with intercalation of lithium in carbon
- ◆ Decision point for Module B presently scheduled for FY07

# Activities Certification Committee Meeting



- ◆ M. Ulrickson and NSTX personnel met with PPPL Activities Certification Committee (ACC)
  - Discussion occurred during NSTX PAC meeting last January
  - Presentations made on proposed lithium research by R. Kaita titled “NSTX Perspective on FY06 Particle Control and ALIST Module” and by M. Ulrickson (Sandia National Laboratories) titled “Safety Considerations for Lithium Handling.”
  - No fundamental objections raised to use of liquid lithium in NSTX
    - » Suggests importance of broad involvement in addressing safety concerns well before decision point for implementing systems like Module B

# Present Boundary Physics Plan



Plasma Operations	FY 05	FY 06	FY 07
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**Wall Conditioning**  
(Gas/plasma Boronization, Between-shot GDC)

- Li Pellet Injector
- Hot-boronization
- Between-shots boronization
- Moveable GDC probe
- Lithium Evaporator

- - Available
- - Base
- - Revised
- - Incremental
- ◊ - Decision Point

**Power / Particle Control**

- Divertor IR Camera (ORNL)
- Fast IR Camera (ORNL)
- Divertor Probe
- Vert. Divertor Bolometer

◊ **Divertor Cryopanel / Liquid Li Module**

- Horiz. Divertor Bolometer
- Div. Spectrometer

**Fueling**  
(In-board gas Injectors)

- Supersonic Gas injector

- Pellet injector in "suitcase" (ORNL)
- CT injector Lab. Test

# Budget and Schedule Issues



- ◆ Present FY06 budget for NSTX does not include funds for *any* plasma operations
  - Eliminates detailed evaluation of lithium evaporation in Module B concept
- ◆ Delay in decision point likely for Module B past FY07