NSTX
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Discussion of NSTX operation options following TF fault

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J. Menard, M. Ono

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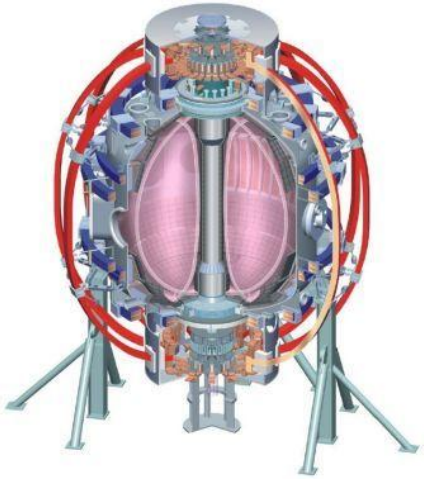
NSTX Team Meeting
MBG Auditorium, PPPL
August 17, 2011



Outline

- Advantages of accelerating Upgrade
- Disadvantages of not operating before Upgrade
- Present perspective
- Researcher/program concerns, questions

Advantages of accelerating Upgrade

- Gain access to Upgrade capabilities, parameters sooner
- NSTX Upgrade has been highest priority of NSTX Program
  - This approach has served NSTX and the Upgrade project well
  - We are lucky to have option to start Upgrade early
  - Much of the research planned for the FY2011-12 run can be carried out in the first 1-2 years of NSTX Upgrade operation
- Budget will likely get more challenging in out-years (2013+)
  - ITER ramp-up, pressures on US discretionary spending, …
  - Upgrade window of opportunity could close if delayed too long
- Expecting the existing OH to last 10-20 run weeks also carries risk (and spare OH has not been qualified for ops)
  - Spent 5+ weeks of last run fixing water leaks, insulation problems
  - Safer to move to improved Upgrade CS design

Disadvantages of not operating before Upgrade

- Period without new data from NSTX would increase from 2.5 to 3.5 years (last new data was Oct 2010)
  - Previously planned 2ish years already carries some risk
  - Concern is that non-operational facility is easier to cancel
- Just spent 9 months and substantial resources preparing machine for FY11-12 run
  - Mo tiles, LLD refurbishment, MAPP, MSE-LIF, many others
  - Data on control, PMI, snowflake preparation for Upgrade will not be obtained, potentially impacting initial Upgrade operation
- Careers of young NSTX researchers, collaborators will be most strongly impacted
  - Need for new data, scientific progress, publications is strong

Discussion

- There are advantages and disadvantages to both paths
- Presently leaning toward option that accelerates Upgrade
  - If we accelerate upgrade, it will likely be completed
  - If we delay Upgrade, chances increase it will not be done
  - Accelerating Upgrade start and completion is likely better long-term strategy for NSTX program
  - Near-term: accelerating Upgrade is more challenging for researchers, and for maintaining programmatic/scientific presence
  - Need full researcher engagement for Upgrade to succeed
  - If we do choose the Upgrade acceleration path, need to push to get back to operation as quickly as possible

- Last Monday's meeting: heard researcher opinions, concerns, questions prior to making a decision

Some issues raised by research team members
(thanks to research team for the input, and to Stan for gathering it)

- There is desire to have data sooner rather than later, but many expressed support for moving to accelerated Upgrade path
- Some concern of not putting research as high enough priority, too conservative in assuming Upgrade is at risk if delayed
- Is it wise to pick accelerated path prior full DOE approval?
  - Don't want to do anything irreversible in NTC until Upgrade path is secure
  - Argues for keeping machine in “ready” (as possible) state until path is clear
- Can we accelerate the accelerated Upgrade even more?
  - Should we go with 2nd beam right away?
  - Can we do vessel modifications but not connect the beam?
  - Would this get the Upgrade operating sooner?
  - Would we avoid having to remove diagnostics and put them back on?
- We should not necessarily jump immediately to collaborations; there is plenty of NSTX data that is not yet analyzed/published