

**Princeton Plasma Physics Laboratory
NSTX Machine Proposal**

Title: Initial Operations of beams from the PCS

OP-XMP-60

Revision: 0

Effective Date: 7/7/08
(Ref. OP-AD-97)
Expiration Date: 7/7/10
(2 yrs. unless otherwise stipulated)

Procedure Approvals

Responsible author: David A. Gates

Date 7/7/08

ATI (NSTX Physics Ops):

Date

RLM (NSTX Expt. Research Ops):

Date

Responsible Division: **Experimental Research Operations**

Procedure Requirements
designated by RLM

	NSTX Work Permit		T-MOD (OP-AD-03)
	Independent Review		ES&H Review

MINOR MODIFICATIONS

REVIEWERS (designated by RLM)		
<u>Organization/Position</u>	<u>Name</u>	<u>Signature</u>
ATI	D. Mueller	
Test Director	D. Gates	
Independent Reviewer		
NB	M. Cropper	
RF		
Diagnostics		

TRAINING (designated by RLM)			
Training required: No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Instructor _____			
Personnel (group, job title or individual name)	Read Only	Instruction	Hands-On
Training Rep. _____			

RLM _____

NSTX MACHINE PROPOSAL

TITLE: Initial operations of NBI from the PCS	No. OP-XMP-60
AUTHORS: D. A. Gates	DATE: 7/7/08

1. Overview:

The purpose of this XMP is to verify and utilize for the first time the PCS control of NBI.

2. Justification:

This is the first step for feedback control of the beams.

3. Plan:

1. In the NB control area, switch to cable controlling the timing of the NB system from local control to remote control by the PCS.

NB timing control switched to PCS

Test Director

2. Disable all NSTX coil power supplies. Load 3 10ms beam blips into the first 50ms. (A from 10 to 20, B from 20 to 30, C from 30 to 40)

Run a shot cycle and verify that all three beams fired at appropriate times.

Shot number

3. Reload fiducial discharge. Enter standard fiducial beam waveforms through the PCS. (A from 40ms to 1.5s, B from 80ms to 1.5s, C from 500ms to 1.5s).

Run a shot and verify that all three beams fired at appropriate times.

Shot number

4. Reload the fiducial discharge using the archived data from the shot at Step 3. Verify that the NB waveforms have been restored successfully from the archived data

At the discretion of the Physics Operator, run a shot and verify that the beams fired correctly.

Shot number

4. Required machine, beam, ICRF and diagnostic capabilities:

Normal plasma ops requirements - Sources A, B, and C at ~90kV.

5. Sign off at run time:

5.1 Permission to Proceed:

Physics Operator

5.2 Test was successfully completed:

Test Director

5.3 Final status of system.

If test is completed, consult with the Physics Operator, the Session Leader for the following experiment and the Head of Physics Operation (or his designee) as whether the system is to be left in PCS control or returned to its previous (local) control configuration

NB system is to be left in _____ timing control
PCS (remote) or **NB** (local)

Physics Operator

Session Leader

Physics Operations Head

5.4 Documentation of results

Documentation of the results completed, attached to proposal and sent to Ops. Center with copies to Cognizant Physicist and Head of Physics Operations.

Test Director

PHYSICS OPERATIONS REQUEST

TITLE: Initial Operations of beams from the PCS	No. OP-XMP-60
AUTHORS: D. A. Gates	DATE: 7/7/08

Machine conditions (specify ranges as appropriate)

I_{TF} (kA): **54kA** Flattop start/stop (s): **From fiducial**

I_p (MA): **900kA** Flattop start/stop (s): **From fiducial**

Configuration: **DN**

Outer gap (m): **10cm** Inner gap (m): **6cm**

Elongation κ : **2.3** Upper/lower triangularity δ : **0.4/0.8**

Z position (m): **0cm**

Gas Species: **D** Injector(s): **As per fiducial**

NBI Species: D Sources: **ABC** Voltage (kV): **90kV** Duration (s): up to **1.5s**

ICRF Power (MW): Off Phasing: Duration (s):

CHI: Off Bank capacitance (mF):

LITER: On or Off (either way)

Either: List previous shot numbers for setup: **130394**

Or: Sketch the desired time profiles, including inner and outer gaps, κ , δ , heating, fuelling, etc. as appropriate. Accurately label the sketch with times and values.

DIAGNOSTIC CHECKLIST

TITLE: Initial Operations of beams from the PCS	No. OP-XMP-60
AUTHORS: D. A. Gates	DATE: 7/7/08

Note special diagnostic requirements in Sec. 4

Diagnostic	Need	Want
Bolometer – tangential array		√
Bolometer – divertor		√
CHERS – toroidal		√
CHERS – poloidal		√
Divertor fast camera		√
Dust detector		√
EBW radiometers		√
Edge deposition monitors		√
Edge neutral density diag.		√
Edge pressure gauges		√
Edge rotation diagnostic		√
Fast ion D_alpha - FIDA		√
Fast lost ion probes - IFLIP		√
Fast lost ion probes - SFLIP		√
Filterscopes		√
FIReTIP		√
Gas puff imaging		√
H α camera - 1D		√
High-k scattering		√
Infrared cameras		√
Interferometer - 1 mm		√
Langmuir probes – divertor		√
Langmuir probes – BEaP		√
Langmuir probes – RF ant.		√
Magnetics – Diamagnetism		√
Magnetics – Flux loops	√	
Magnetics – Locked modes		√
Magnetics – Pickup coils	√	
Magnetics – Rogowski coils	√	
Magnetics – Halo currents		√
Magnetics – RWM sensors		√
Mirnov coils – high f.		√
Mirnov coils – poloidal array		√
Mirnov coils – toroidal array		√
Mirnov coils – 3-axis proto.		√

Note special diagnostic requirements in Sec. 4

Diagnostic	Need	Want
MSE		√
NPA – ExB scanning		√
NPA – solid state		√
Neutron measurements		√
Plasma TV		√
Reciprocating probe		√
Reflectometer – 65GHz		√
Reflectometer – correlation		√
Reflectometer – FM/CW		√
Reflectometer – fixed f		√
Reflectometer – SOL		√
RF edge probes		√
Spectrometer – SPRED		√
Spectrometer – VIPS		√
SWIFT – 2D flow		√
Thomson scattering		√
Ultrasoft X-ray arrays		√
Ultrasoft X-rays – bicolor		√
Ultrasoft X-rays – TG spectr.		√
Visible bremsstrahlung det.		√
X-ray crystal spectrom. - H		√
X-ray crystal spectrom. - V		√
X-ray fast pinhole camera		√
X-ray spectrometer - XEUS		√