

# Appendix J

## Objective Evidence for KPP's

### >50 mA plasma shot

#### NSTXU Demonstrated Performance Objective Evidence #1

KPP: The major milestone marking the transition from a fabrication project to an operating facility is the first plasma milestone (CD-4). First plasma is defined as an ohmically heated discharge > 50 kA at a toroidal magnetic field of > 1 kG.

Status: Achieved 8/10/2015.

	<u>KPP Goal</u>	<u>Achieved</u>
OH Discharge	>50kA	>100kA
TF Magnetic Field	>1kG	5kg

Supporting objective evidence attached.

#### Independent Certification

**David A. Gates**

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David Gates  
Head, Advanced Projects-Stellarators

#### Approval

**Ron Strykowski**

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Ronald Strykowski  
NSTXU Project Manager

#### Approval:

**Stewart Prager**

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Stewart Prager  
PPPL Director

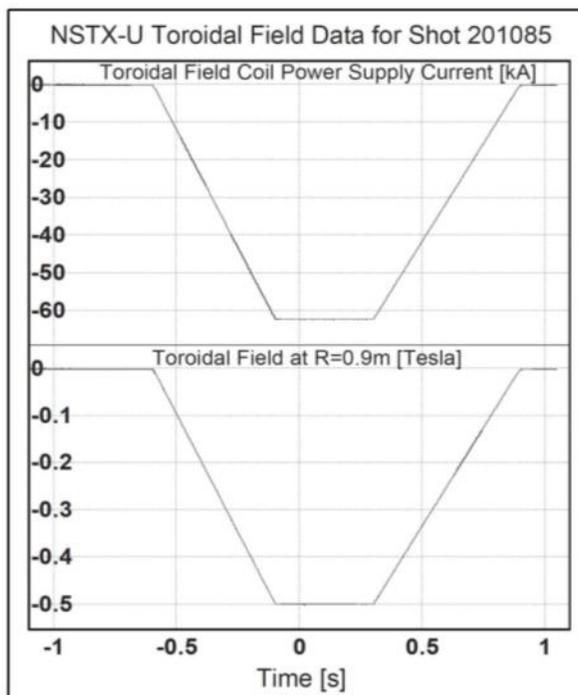
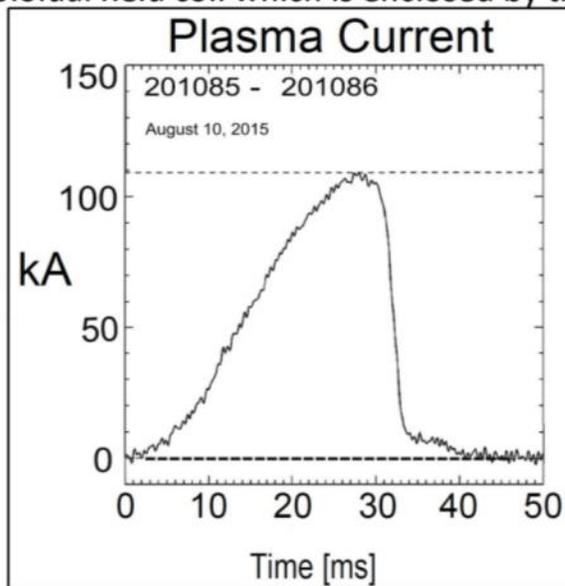
# Appendix J

## Objective Evidence for KPP's

### >50 mA plasma shot (continued)

Plasma current (top) and toroidal field data (bottom) for ~100kA,  $B_T = 0.5T$  plasma in NSTX-U for CD-4 KPP (note:  $0.5T = 5kG$ ).

The NSTX-U plasma current Rogowski loop was calibrated using the PF1C Lower poloidal field coil which is enclosed by the Rogowski.

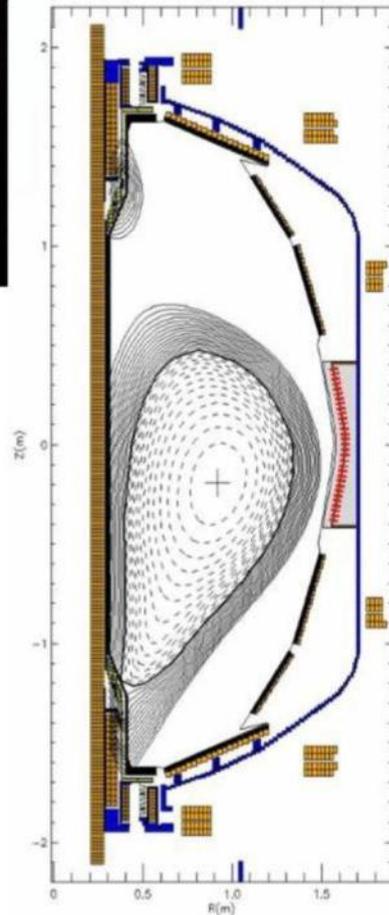
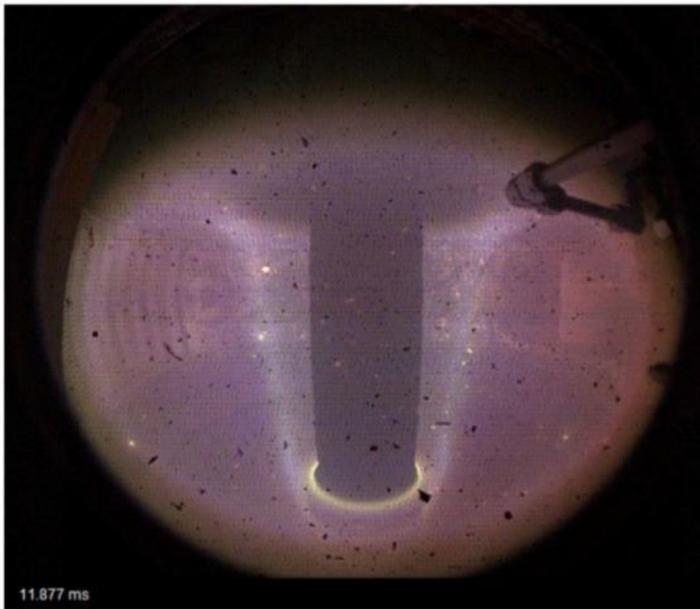


## Appendix J

Objective Evidence for KPP's

>50 mA plasma shot (continued)

Camera image (left) and EFIT reconstruction (right)  
for NSTX-U CD-4 KPP plasma  
NSTX-U Shot 201085



# Appendix J

## Objective Evidence for KPP's

### >40 kV Neutral Beam Shot

#### **NSTXU Demonstrated Performance Objective Evidence #2**

KPP: The installation of the second neutral beam on NSTX shall be considered complete at the stage where each item below has been demonstrated:

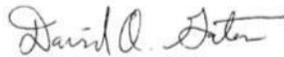
- a. Beamline water, vacuum, cryogenics, and feedstock gas services have been attached to the beamline;
- b. A Torus Isolation Valve and duct interconnects the NSTX vacuum vessel and the neutral beamline;
- c. Local Control Centers have been powered on to monitor power supply status, and;
- d. Project will be verified as complete when a 40,000 electron-volt beam has been produced and injected into the armor for .050 seconds.

Status: Achieved 5/11/2015.

Five 45KV @ 12 amps shoots into the armor for >50ms. Attached are PDF's of the armor TC's(pre and post shoots), RSView page showing the status of the beam systems, and the scope traces showing the wave forms.

Supporting objective evidence attached.

Independent Certification



8/6/2015

David Gates

Head, Advanced Projects-Stellarators

Approval **Ron**

**Strykowski**

Ronald Strykowski

NSTXU Project Manager

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**Stewart Prager**

Stewart Prager

PPPL Director

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# Appendix J

## Objective Evidence for KPP's

### >40 kV Neutral Beam Shot (continued)

Armor shot



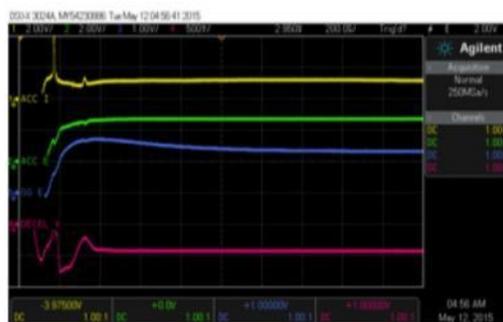
Armor shot probes



Armor shot



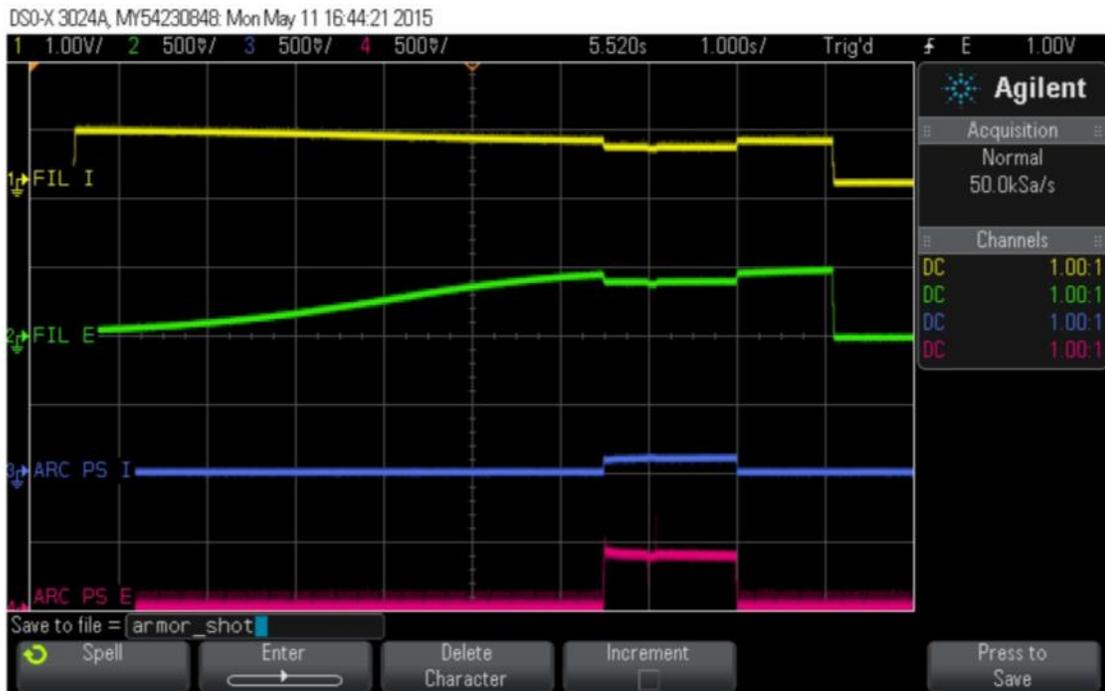
Armor shot fast



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## Objective Evidence for KPP's

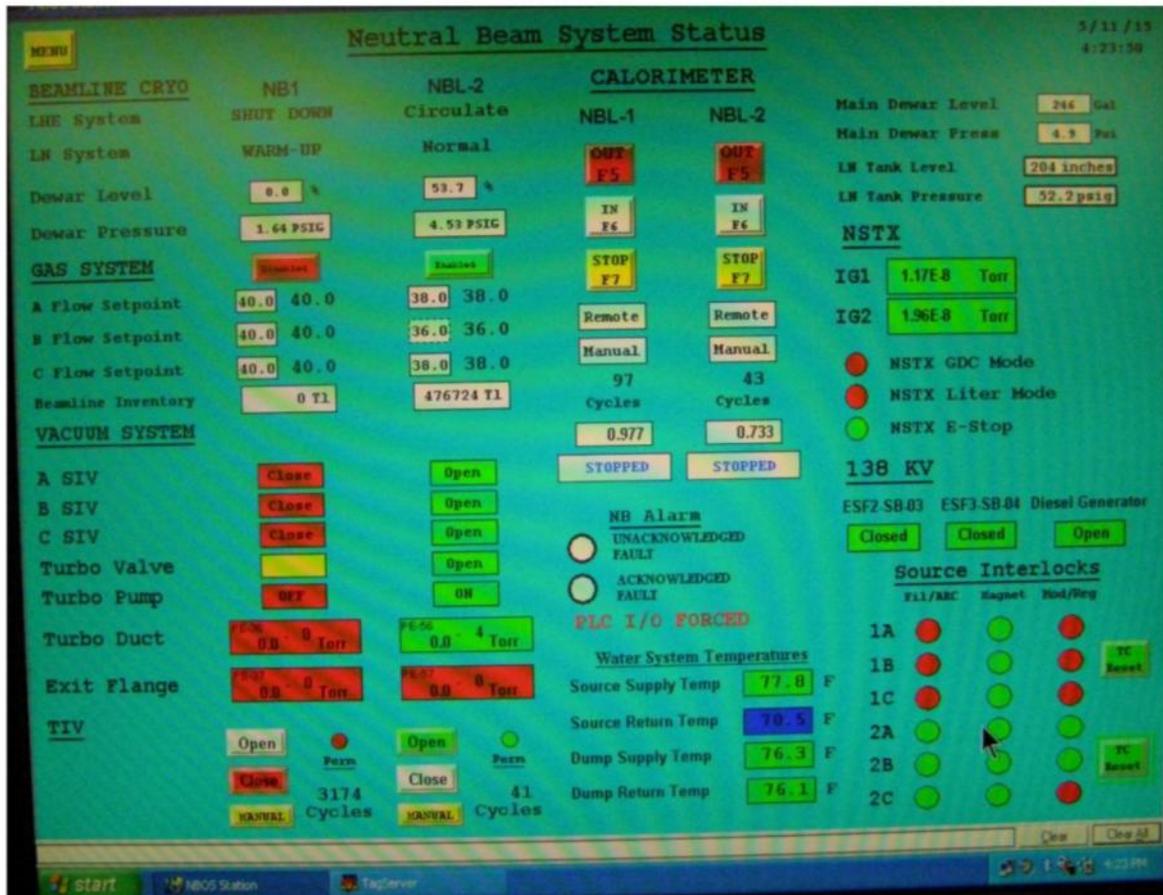
### >40 kV Neutral Beam Shot (continued)



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## Objective Evidence for KPP's

### >40 kV Neutral Beam Shot (continued)



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## Objective Evidence for KPP's

### >40 kV Neutral Beam Shot (continued)

NB ARMOR TC rev 2.vi

C:\Users\grossi\Desktop\NB injection sys Armor TC project\NB ARMOR TC rev 2.vi

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