

NSTX Boundary Physics TSG Meeting



Discussion of

**XP1: Initial Use of Dual LITER for ELM Mitigation (D. K. Mansfield) and
LITER Characterization (H. W. Kugel)**

XP2: Lithium Powder Characterization (D. K. Mansfield)

Monday, 31 March 2008,
3:00 PM, B252

Status of LITER and Li Powder Shaker



- LITER FY08

- LITER-K

- welded to vessel
 - alignment issue (may impede Li loading 4/5/08)
 - cabling in progress

- LITER-F

- to be welded to vessel 4/5/08
 - Li loading 4/5/08

- Schedule

- 4/5-14/08: pumpdown and bakeout at 150°C
 - 4/14-18/08; install controls, condition at high temp in vessel
 - 2 LITER availability goal 4/22/08

- Lithium Powder Shaker

- installation next maintenance; work on controls continues
 - project priority: lower than other jobs in progress
 - schedule dictated by availability of controls

Prerequisites for Optimum Results

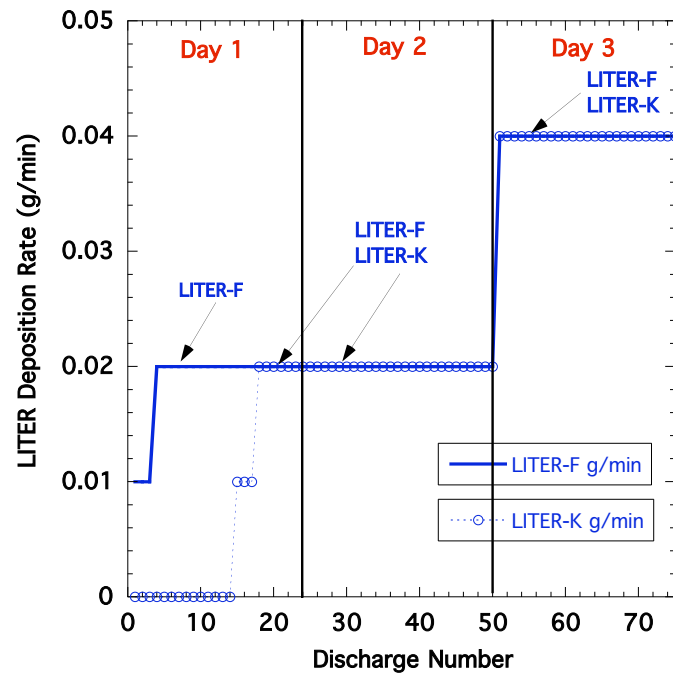


1. **Optimum schedule: 3 contiguous days, midweek starting on a Tuesday**
 - not straddling a weekend; not starting Mon or Wed.
2. **Perform an XP to measure Gas Inventory (sources and sinks) before Lithium-XP (PAC-23 2008 request)**
3. **Perform an XP to develop a suitable discharge**
 - LSND, 2 or 3 NBI heated, 800KA
 - reproducible, low power threshold, H-mode
 - Zero HFS/CS fueling; use only SGI/LFS fueling
 - reproducible ELMing

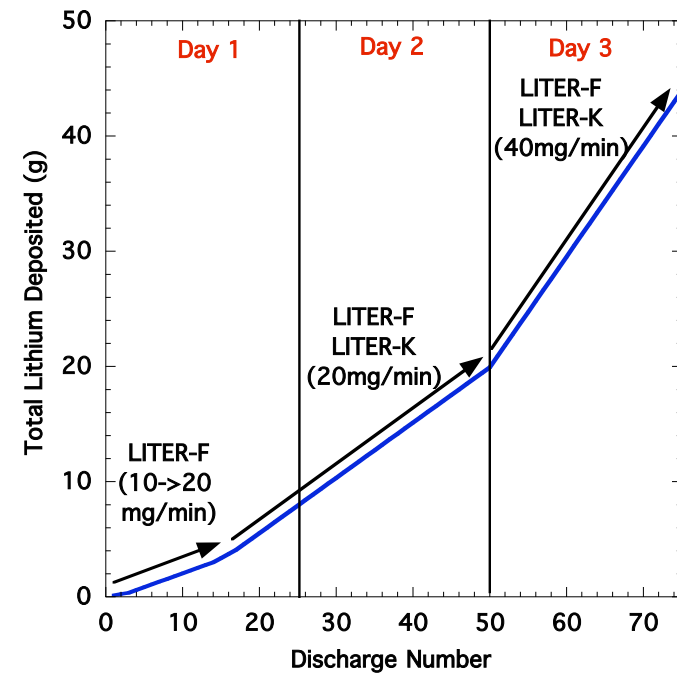
LITER FY08 Evaporation Profile for ELM and Characterization XP



- Start with 1 LITER operation, & increase deposition rate slowly
- to make contact with FY07 database and see possible transition from ELMs to no-ELMs



- Measure effect of increased coverage for increased pumping



Comparison of Previous Approach and FY08 Requirements



XP719	FY08 ELM Mitigation	FY08 2 LITER Characterization	Shot Count	Comments
<p>1 LITER</p> <p>- <u>deposition per shot</u> increased from 0-1.7 g in 200 mg increments</p>	<p>1 LITER</p> <p>- <u>deposition per shot</u> increased from 0-1g in 200 mg increments. If see transition Slow down</p>	<p>1 LITER</p> <p>- <u>deposition per shot</u> increased from 0-1g in 200 mg increments</p>	<p>15 Shots</p> <p>3 shots per step (0, 0.2, 0.4, 0.6, 0.8, 1g)</p>	<p>Makes contact with FY07 db</p> <p>- to make contact with FY07 database and see possible transition from ELMs to no-ELMs</p>
	<p>2 LITER</p> <p>- <u>deposition per shot</u> increase from 1-45g in increasing Li increments</p>	<p>2 LITER</p> <p>- <u>deposition per shot</u> increase from 1-45g in increasing Li increments</p>	<p>60 Shots</p> <p>3 shots per step</p>	<p>Measure effect of increased coverage on WMHD, Te, Ti, taue, ELMS, Xe, Xi, edge..</p>

Comparison of Previous Approach and FY08 Requirements



XP719	ELM Mitigation	2 LITER Characterization	Shot Count	Comments
MPTS	MPTS	MPTS		
Filterscopes: D α , Li, C, O	Filterscopes: D α , Li, C,O	Filterscopes: D α , Li, C,O		
Magnetics	Magnetics	Magnetics		
	D α camera	D α camera		Plasama TV with Da filter
	IR cameras	IR cameras		How does emissivity change
Edge electric field	Edge electric field	Edge electric field		How does Er change as collisionality decreases
	Li radial profile	Li radial profile		Gratings arrive mid April
Edge neutral density	Edge neutral density	Edge neutral density		Need for all shots
Far-to-near SOL fast probe	Far-to-near SOL fast probe	Far-to-near SOL fast probe		Some shots for XP719. Need systematic measurements

Comparison of Previous Approach and FY08 Requirements



XP719	ELM Mitigation	2 LITER Characterization	Shot Count	Comments
Uncalibrated SPRED	Calibrated SPRED spectroscopy	Calibrated SPRED spectroscopy		SPRED database requires calibration
Bolometry	Bolometry	Bolometry		Will metals be confined as taue improves
	Langmuir Probes	Langmuir Probes		Divertor n_e and T_e
EBW	EBW	EBW		Effect of increased coverage
TRANSP	TRANSP	TRANSP		Need good pre-Li ref discharges