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Summary for Advanced Scenarios and Control Topical Science Group

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Research Forum for FY'11-12

- Goals
 - Develop improved plasma formation and ramp-up techniques for reduced density and collisionality (R12-3)
 - Assess the impact of increased aspect ratio and elongation on the integrated performance of the spherical torus (R11-2)
 - Develop and implement improved plasma control techniques to achieve advanced operating scenarios (NSTX-U)
 - Experimentally realize high non-inductive current fraction plasmas with high-beta under sustained conditions (NSTX-U)
 - Create & validate models for integrated plasma performance, to develop predictive capability for next-step ST scenario & control design (NSTX-U)

Allocation Aims at Milestones and NSTX-U but Run-Time Marginal and Some Worthy XPs Left Out

	Title	Proposer	Milestone	Requested rundays		FY-11 rundays		FY-12 rundays		Total rundays	PCS-dependent rundays	Alternate TSG support	Comment
				Optimum	Minimum	1st	2nd	1st	2nd				
1	Low Density Startup	Mueller	R12-3	5	2	1	0.5	1	0.5	3			Primary vehicle for ASC part of R12-3
	Low Density, Low EF Startup	Mueller	R12-3	2	1								Incorporate elements into primary proposal.
	Triggered Ohmic H-mode	Battaglia	R12-3	0.3	0.1								Incorporate elements into primary proposal.
	Early PID and LQG RWM Control	Sabbagh	R12-3	0.5	0								Incorporate elements into primary proposal.
2	Long-Pulse EPH	Canik		1	1			0.5	0.5	1			
3	Integrated Performance vs. A and κ	Gerhardt	R11-2 (NSTX-U)	1	0.5	1				1			
4	Snowflake Control	Kolemen	R11-3	1	0.5	1				1			Primary ASC support of snowflake divertor
5	HHFW for higher H-mode NBCD	Bell	R12-3 (R11-2)	1.25	0.5			0.5	0.5	1		WEP	Combined experiment contingent on good HHFW performance
	HHFW for q-profile control	Menard	R12-3	1.5	1								
6	Vertical Control Improvements	Gerhardt	R11-2 (NSTX-U)	1	0.5	0.5				0.5			
7	Advanced Scenario Snowflake	Soukhanovskii	R11-3	2	1				0.5	0.5			Allocated 1/2 day for highest priority scenario development not covered in other XPs
8	MIMO Shape Control	Kolemen	R11-2	1	1		0.5			0.5			
9	USN H-modes	Maingi		1	0.5			0.5		0.5			TSG leader has some preference for high-delta scenarios
10	Early Error Field Correction	Menard	R12-3	1.5	0.5			0.5		0.5			Not folded into D. Mueller's XP because of scenario specific EFC requirements
17	Rotation Control	Kolemen	(NSTX-U)	1	0.5						1		If diagnostic capability is demonstrated, XP will rise in priority
18	Density Feedback	Lee	R12-3	0.5	0.5						0.5		If diagnostic capability is demonstrated, XP will rise in priority
15	Rampdown Development	Gerhardt	(NSTX-U)	1	0.5							CC&E	Important for upgrade and other TSGs: suggest CC&E run time support
16	Controlling Early MHD	Gerhardt	R12-3	0	0							MS, CC&E	Was presented in the MS group; suggest transfer to CC&E
19	Testing Magnetic Diffusion	Petty		0.5	0.5								Preface with XMP to test method in NSTX.
20	RWM PID Control	Sabbagh	(ITPA)	0.5	0.5							CC&E	Suggest CC&E run time support
21	PID RWM Checkout (XMP)	Gerhardt		0	0								XMP during ISTP
22	rt-Vphi checkout (XMP)	Podesta		0.5	0.3								XMP
23	State-Feedback RWM Checkout (XMP)	Sabbagh		0.5	0								XMP (during ISTP or piggyback?)
TOTALS:				17.55	12.9	3.5	1	3	2	9.5	1.5		
										Nominal Allocation:	9.5		