	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	8/2/2011	**NSTX Upgrade Project Risk& Opportunity Registry, rev 19 draft**					**Revisions shown in blue.**				VL=	90%			L=	60%	U=	25%	VU=	5%	
2								<SORT>											Project Manager's		
3	Updated	Number	**Affected Job**	Job Title	Risk Description	Mitigation Plan	Corrective Action if Risk Occurs (task id if appl)	**Deadline to Retire Risk or Absorb Impact**	Cost incurred plan (if not retired)	**Owner**	Current Status	Likelihood of Occurrence	Consequences	Risk Ranking	Basis of Estimate	Cost Impact ($K)	Critical Path Schedule Impact (weeks)	Cost and Schedule Impact Calculation Basis	**Cost considered**	**Weighted Cost included in contingency**	Rationale
4																		**Retired=**	**$ 2,116**		
5																		**Open=**	**$ 2,044**	**$ 53**	
6	12/08/09	3400a	**3400**	Gas Delivery system mods for Centerstack upgrade	Fueling lines do not adequately deliver gas because of occlusions or leaks	Replace gas delivery line	3400-0052	**Sep-2014**	FY14	**Blanchard**	open	VU	Negligible	Low	Project manager's estimate	10		Similar installation on NSTX	**$ 10**	**$ 1**	
7	08/02/11	1304c	**1304**		Copper extrusion vendor has difficulty making full length conductors			**5/1/2011**	FY11	**Chrzanowski**	Retired	U	Marginal	Low	manager's estimate	100			100	25	
8	12/08/09	1307a	**1307**	Centerstack Casing Assembly Design and Fabrication	Components arrive late	OT required to recover schedule	1307-2030	**Feb-2013**		**Chrzanowski**	open	U	Negligible	Low		0	0		**$ -**	**$ -**	
9	06/15/10	1305b	**1305**		TF quadrant - poor VPI impregnation	Engineering of the fill locations and vents will be performed as part of developing the fabrication procedure.	Evaluate condition of coil Local dry areas could be repaired, but larger failure would require rebuilding TF quadrant 1304-1870	**Mar-2013**	FY13	**Chrzanowski**	open	U	Marginal	Low	manager's estimate	200	0	repeat fabrication tasks	**$ 200**	**$ 100**	
10	06/15/10	1305c	**1305**		TF quadrant fails electrical tests	Include tests (meggar, hydro and hi-pot) at several points in the fabrication process so non-conformances can be identified and corrected as they occur.	If unable to repair short, rebuild quadrant 1304-1890	**Mar-2013**	FY13	**Chrzanowski**	open	U	Marginal	Low	manager's estimate	200	0	cost to cut off coil and repeat fabrication tasks	**$ 200**	**$ 100**	
11	06/15/10	1305d	**1305**		TF full bundle - poor VPI impregnation	Engineering of the fill locations and vents will be performed as part of developing the fabrication procedure.	Evaluate condition of coil Local dry areas could be repaired, but larger failure would requireseparating quadrants and re-assy and VPI of bundle 1304-5400	**Apr-2013**	FY13	**Chrzanowski**	open	U	Marginal	Low		250			**$ 250**	**$ 63**	
12	06/15/10	1305e	**1305**		TF full bundle fails electrical tests	Include tests (meggar, hydro and hi-pot) at several points in the fabrication process so non-conformances can be identified and corrected as they occur.	Repair electrical short 1304-5400	**Apr-2013**	FY13	**Chrzanowski**	open	U	Negligible	Low		75			**$ 75**	**$ 19**	
13	06/15/10	1306a	**1306**	Inner PF Coils Design and Fabrication	Poor impregnation	Engineering of the fill locations and vents will be performed as part of developing the fabrication procedure.	Local dry areas can be repaired. Extensive areas of poor VPI may require rewinding new coil. 1306-5050	**Apr-2013**	FY13	**Chrzanowski**	open	U	Negligible	Low	manager's estimate	10 to 50	0	repeat fabrication tasks	**$ 50**	**$ 13**	
14	06/15/10	1306b	**1306**		Coil fails final acceptance tests.	Include tests (meggar, hydro and hi-pot) at several points in the fabrication process so non-conformances can be identified and corrected as they occur.	If coil cannot be repaired, a new coil will need to be wound. 1306-5050	**Apr-2013**	FY13	**Chrzanowski**	open	U	Negligible	Low	manager's estimate	50	0	repeat fabrication tasks	**$ 50**	**$ 13**	
15	06/15/10	1301a	**1301**	Outer TF Coil Repairs	After press mold operation, numerous dry areas are found	Engineering of the fill locations and vents will be performed as part of developing the fabrication procedure.	Attempt local repair; if unsuccessful, rebuild coil 1301-0060	**May-2013**	FY13	**Chrzanowski**	open	U	Negligible	Low	manager's estimate	50	0	repeat existing tasks	**$ 50**	**$ 13**	
16	06/15/10	1301b	**1301**		Coil does not pass final acceptance tests	Include tests (meggar, hydro and hi-pot) at several points in the fabrication process so non-conformances can be identified and corrected as they occur.	Attempt local repair; if unsuccessful, rebuild coil 1301-0060	**May-2013**	FY13	**Chrzanowski**	open	U	Negligible	Low	manager's estimate	50	0	repeat existing tasks	**$ 50**	**$ 13**	
17	06/15/10	1305f	**1305**		OH bundle - poor VPI impregnation	Engineering of the fill locations and vents will be performed as part of developing the fabrication procedure.	Evaluate condition of coil Local dry areas could be repaired, but larger failure would require cutting OH coil from TF and rebuilding OH 1305-8800	**Sep-2013**	FY13	**Chrzanowski**	open	U	Significant	Moderate		500			**$ 500**	**$ 125**	
18	06/15/10	1305g	**1305**		OH coil fails electrical tests	Include tests (meggar, hydro and hi-pot) at several points in the fabrication process so non-conformances can be identified and corrected as they occur.	If fault can not be repaired, Coil must be cut off and rebuilt 1305-8800	**Sep-2013**	FY13	**Chrzanowski**	open	U	Significant	Moderate		500			**$ 500**	**$ 125**	
19	06/15/10	1305h	**1305**		Unable to completely remove temporary spacer between OH and TF after completion of fabrication	Administrative controls during operation requiring OH and TF to be powered together	1305-8700	**Sep-2013**		**Chrzanowski**	open	U	Marginal	Low		0			**$ -**	**$ -**	
20	12/08/09	1302a	**1302**	Centerstack Assembly	Components do not arrive when required	If schedule is critical, OT or second shift would be required to regain schedule	1302-1500	**Sep-2013**		**Chrzanowski**	open	U	Negligible	Low		0			**$ -**	**$ -**	

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21	12/08/09	1304a	**1304**	Inner TF Bundle Design and Fabrication	Poor VPI of TF bundle ***x duplicate of 1305b***	Engineering of the fill locations and vents will be performed as part of developing the fabrication procedure.	If repairs cannot be made, rebuild coil 1304-1870	**n/a**	FY13	**Chrzanowski**	Retired	U	Marginal	Low	manager's estimate	165	0	repeat fabrication tasks	**$ 165**	**$ -**	
22	12/08/09	1304b	**1304**		TF coil fails electrical tests ****x duplicate of 1305c****	Include tests (meggar, hydro and hi-pot) at several points in the fabrication process so non-conformances can be identified and corrected as they occur.	If fault area cannot be repaired, rebuild coil 1304-1890	**n/a**	FY13	**Chrzanowski**	Retired	U	Marginal	Low	manager's estimate	165	0	repeat fabrication tasks	**$ 165**	**$ -**	
23	12/08/09	1305a	**1305**	OH Coil Design and Fabrication	No vendor bids for OH/TF fabrication	Fabricate coil in-house [Suggest having bid process include both domestic and international] PPPL to fab		**OH coil fabrication**		**Chrzanowski**	Retired	U							0	**0**	
24	08/02/11	7100rs	**7100**	Project Schedule	Opportrunity to accelerate the schedule by emplying 2 shift operation in the CS fab and by applying cost underruns to acxcelerate scope	Jim chrzanowski to consider two shift ops Strykowsky to identifying schedule accel tasks	none	**Sep-2013**	fy14	**Chrzanowski/Strykowsky**	open	L	Significant		Based on schedule analysis of critical path and at least 3 months savings x standing army cost (strykowsky)	-750	-3 mo.		**$ (750)**	**$ (450)**	
25	02/16/10	2440a	**2440**	Beamline Refurbishment	Further inspections may require additional parts and labor	Inspect all parts promptly so damaged ones can be identified early - all parts and labor now in job estimate		**2/2/2011**		**Denault**	Retired	U			project manager's estimate	50			0	**0**	
26	02/17/10	2450b	**2450**		Heat load may be too high	Remake He lines - not a concern		**2/2/2011**		**Denault**	Retired	U			project manager's estimate	50	0		0	**0**	
27	02/17/10	2440b	**2440**		Existing copper parts may be reusable (except for the dump)	Negative risk - reduce scope of job - job estimate now includes reduced scope		**FY10 PDR**		**Denault**	Retired	L			project manager's estimate	-234			0	**0**	
28	12/08/09	7200a	**7200**	Centerstack Management	Additional reviews	Increase scope as required		**Sep-2013**	FY11,12	**Dudek**	open	U	Marginal	Low	Manager's estimate	107		additional review every other year	**$ 107**	**$ 27**	
29	03/24/10	7200b	**7200**		Availability of key personnel: Chrzanowski, Mangra, Titus	Chrzanowski by Heitzenroeder and Kalish; Mangra by Smith: Titus by Brooks and Heitzenroeder - back-up persons identified for key personnel		**FY10 PDR**		**Dudek**	Retired								0	**0**	
30	12/08/09	CD0-a			Uncertain of ability to find a cost effective TF joint that works at higher fields	Perform extensive analysis (all operating scenarios) for new joint designs				**Dudek**	Retired										
31	12/08/09	CD0-b			Little room to re-enforce outer TF legs and umbrella structure to handle higher loads	Perform detailed design				**Dudek**	Retired										
32	12/08/09	CD0-c			The vacuum vessel may need to be reinforced to accommodate higher loads					**Dudek**	Retired										
33	06/15/10	2490c	**2490**		MPTS Beam Dump Window re-design and re-installation may require more effort than estimated due to the physical constraints in the area of bay L	Preliminary design work started to layout MPTS and included VV modifdactions and interfaces.- Job 4500 estimate included to provide larger Bay L port and MPTS interfaces.		**FY11 FDR**		**Jones**	Retired	U			Engineering estimate	included in NSTXU cost		Past experience designing and installing this diagnostic on NSTX		0	**0**	
34	12/02/10	1303a	**1303**	TF Joint Test Stand and Testing	Significant change in TF design concept	Perform additional work		**2/1/2011**	FY11	**Kozub**	Retired	U	Negligible	Low	manager's estimate	10 to 50		past experience	50	**12.5**	
35	12/02/10	1303b	**1303**		Increased number of redesign/retest cycles	Perform additional work		**2/1/2011**	FY11	**Kozub**	Retired	U	Negligible	Low	manager's estimate	10 to 50		past experience	50	**12.5**	
36	12/02/10	1303c	**1303**		Unexpected technical challenges in implementing testing apparatus and procedures	Perform additional work		**2/1/2011**	FY11	**Kozub**	Retired	VU	Negligible	Low	manager's estimate	0 to 30		past experience	30	**1.5**	
37	12/08/09	1200a	**1200**	Centerstack Structural Supports	All interferences with existing equipment have not been identified	Field audit of interferences is included in estimate. audit included in base estimate		**2/2/2011**	FY11	**Mangra**	Retired	U			manager's experience	60	0	6 weeks of engineer and designer	60	**15**	
38	06/15/10	1200b	**1200**		Engineering total man-hours >1 engineer	obtain requested resources		**Sep-2011**		**Mangra**	open	VL	Negligible	Low		0			**$ -**	**$ -**	
39	06/15/10	1200c	**1200**		Schedule is front end loaded	obtain requested resources		**Sep-2011**		**Mangra**	open	VL	Negligible	Low		0			**$ -**	**$ -**	
40	06/15/10	2490a	**2490**	Relocations to Support NB2 Installation	SPRED re-design and re-installation may require more effort than estimated due to the physical constraints in the area of bay L	Start design work immediately so potential schedule impact can be accomodated if necessary.		**Apr-2013**	FY13	**Perry**	open	U	Marginal	Low	manager's estimate	98 to 147		Past experience designing and installing this diagnostic on NSTX	**$ 147**	**$ 37**	
41	06/15/10	2490b	**2490**		LOWEUS re-design and re-installation may require more effort than estimated due to the physical constraints in the area of bay L	Start design work immediately so potential schedule impact can be accomodated if necessary.		**Jun-2013**	FY13	**Perry**	open	U	Marginal	Low	manager's estimate	98 to 147		Past experience designing and installing this diagnostic on NSTX	**$ 147**	**$ 37**	
42	08/02/11	8200rs	**8200**	Construction	Opportunity to factor in efficiencies into the construction plan	Erik to do bottom-s up estimate factoring in input from viola, raftopolous, and jos winston	none	**Oct-2011**	fy12	**Perry/Strykowsky**	open	L	Significant		Based on at least 10% savings (strykowsky)	-950			**$ (950)**	**$ (570)**	
43	12/08/09	2460a	**2460**	NB Armor	CFC tiles needed for thermal/structural reasons	Add requirement for redundant plasma control to eliminate need for CFC tiles - Now in job		**FY10 PDR**		**Priniski**	Retired	L							0	**0**	
44	03/17/10	2480a	**2480**	NB2 Duct and VV Mods	Beam too close to bellows/duct	Include molybdenum shielding in estimate - Bay K port plug provides larger free apeture than BL. Some Moly shield for bellows included in job.		**FY10 PDR**		**Priniski**	Retired	L			project manager's estimate	30 to 60	0	Past experience on NSTX	0	**0**	

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45	03/17/10	2480d	**2480**		Previous fabricators of rectangular bellows not available	Locate alternate vendors - RFQ with multiple vendors to access vendor and cost for PDR.		**Issue requisition for bellows fabrication**		**Priniski**	Retired	U			Project Manager's estimate	10 to 100			0	**0**	
46	03/17/10	2480b	**2480**		Difficulty machining vessel	Double estimate for this portion of the job - several methods exist for cutting and job estimate was increased for least efficient process.		**Vessel machining**		**Priniski**	Retired	L			project manager's estimate	10 to 70	1 to 8	Past experience on NSTX	0	**0**	
47	12/08/09	2480c	**2480**		J-K cap may not be able to be installed in one piece	Include removal of one TF outer leg (to facilitate access) in the baseline estimate - now in job				**Priniski**	Retired	U							0	**0**	
48	02/17/10	2470b	**2470**		Old 100 micron fiber cables that are proposed to be used may not be in good condition	Test a prototype with a 62.5 micron cable fused to 100 micron cable - sufficient 100 micron cable located on-site		**FY11 FDR**		**Ramakrishnan**	Retired	U			project manager's estimate	50		Past experience in installing the NB1 line up for NSTX	0	**0**	
49	12/08/09	2470a	**2470**	NB Power System	Old RCA tubes are being used and may need a tune-up	Use the 8 additional tubes from TFTR - replacements available				**Ramakrishnan**	Retired	U						Budgetary quotes received for Tiax and other cables and used in estimates	0	**0**	
50	12/08/09	6100c	**6100**	Data Acquisition rate	Data acquisition takes too long	Upgrade additional data acq systems and/or networks, revise software		**Sep-2011**	FY11	**Sichta**	open	VU	Marginal	Low	Manager's estimate	5 to 25	0 to 2		**$ 25**	**$ 1**	
51	07/25/10	6100d	**6100**	Loss of key personnel	Loss of key personnel	Assure project schedule has free float to absorb potential schedule impact. hire replacement and assess schedule impact		**Sep-2014**	FY14	**Sichta**	open	U	Marginal	Low	Estimated impact is < 1 months on the critical path. Impact on cost because untrained personnel will be less effective.	10 to 50	0 to 4		**$ 50**	**$ 13**	
52	07/25/10	6100e	**6100**	Additional work scope	NSTX operations does not fund work scope as listed in WBS6100 PDR	Continued diligence to assure the program office funds req'd infrastructure improvements. Additional work scope for upgrade		**Sep-2014**	FY14	**Sichta**	open	U	Marginal	Low	Estimated impact is < 1 months on the critical path. Impact on cost due to additional workscope.	50 to 300	o to 4		**$ 300**	**$ 75**	
53	12/08/09	6100a	**6100**	Central Instrumentation and Control	Volume of data from diagnostic camera systems exceed capability of network, storage, and backup systems	Install 10 Gb networks and enhance storage and backup systems		**FY10 PDR**	FY13	**Sichta**	RETIRED	U	Marginal	Low	Engineering estimate	30 to 200		Similar work at PPPL	0	**0**	
54	12/08/09	6100b	**6100**		EPICS data acquisition takes too long	Include in the base job the upgrade of some data acquisition systems (CAMAC)		**FY10 PDR**	FY13	**Sichta**	RETIRED	VL	Marginal	Moderate	Engineering estimate	10 to 100		Similar work at PPPL	0	**0**	
55	03/17/10	7300a	**7300**	NB2 Management	Additional reviews	Increase scope as required		**2/2/2011**	FY11,12	**Stevenson**	Retired	U	Negligible	Low	Manager's estimate	75		additional review every other year	75	**18.75**	
56	03/17/10	7400a	**7400**	Health Physics Support	Unplanned overtime	Increase scope as required included in job		**2/2/2011**	FY12,13,14	**Stevenson**	Retired	L			Project Manager's estimate	35		additional 10%	35	**21**	
57	03/17/10	CD0-d			Uncertain of level of effort required to decontaminate TFTR NB					**Stevenson**	Retired										
58	12/08/09	CD0-e			Uncertain of the commercial availability of high voltage switch-tubes					**Stevenson**	Retired										
59	12/08/09	CD0-f			Uncertain of the commercial availability of cabling and terminations for the 100kV accelerator system					**Stevenson**	Retired										
60	03/17/10	7100a	**7100**	Project Management and Integration	EVMS implementation requires more project controls, supporrt for training, etc than expected	Assign experienced engineers as CAMs. Minimize the number of CAMs. New PM office.		**Dec-2011**	FY12	**Strykowsky**	open	U	Marginal	Low	Project Manager's estimate	150		1/2 FTE for one year	**$ 150**	**$ 38**	
61	12/08/09	7710a	**7710**	Direct Allocations	Volatility of head rates	Increase as required		**Sep-2013**	FY11,12,13,14	**Strykowsky**	open	L	Negligible	Low	Project Manager's estimate	65		100%	**$ 43**	**$ 26**	
62	12/08/09	7710b	**7710**		Volatility of base estimates for the allocated cost centers	Increase as required		**Sep-2013**	FY11,12,13,14	**Strykowsky**	open	L	Negligible	Low	Project Manager's estimate	65		100%	**$ 43**	**$ 26**	
63	12/08/09	7700a	**7700**	HP Allocations	Volatility of overhead rates	Increase as required		**Sep-2013**	FY13	**Strykowsky**	open	L	Negligible	Low	Project Manager's estimate	65		3% variation	**$ 65**	**$ 39**	
64	12/08/09	7700b	**7700**		Volatility of base estimates for the allocated cost centers	Increase as required		**Sep-2013**	FY13	**Strykowsky**	open	L	Negligible	Low	Project Manager's estimate	65		3% variation	**$ 65**	**$ 39**	

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65	12/08/09	7100b	**7100**		PPPL overhead rates	Continue to ensure that outyear rates are conservative		**Sep-2013**		**Strykowsky**	open	L			Project Manager's estimate	682 (+/-)		Rates are typically conservative when set, but fluctuate as a function of the total lab funding. Pressure from indirect department may result in increased staff thus higher rates. -1% to +1%	**$ -**	**$ -**	
66	12/02/10	2300b	**2300**		Diagnostic/waveguide hqas a present weakness that hasn't been seen in operation	Reinforce		**2/2/2011**		**Titus**	Retired		Negligible	Low		0			0	**0**	
67	12/02/10	2300c	**2300**		Diagnostic/waveguide requires more analysis to qualify	Expand analysis models beyond those used in the scoping study		**2/2/2011**	FY11	**Titus**	Retired		Negligible	Low		25			25	**22.5**	
68	12/08/09	1000a	**1000**	Centerstack Analytical Support	Analysis indicates a significant component needs upgrade that previously hasn't been identified	Maintain upgrades of the model and keep ahead of the scenario changes		**Sep-2011**	FY11	**Titus**	open	VU	Negligible	Low	manager's experience	10 to 40		manager's estimate	**$ 40**	**$ 2**	
69	12/08/09	1000b	**1000**	Centerstack Analytical Support	Analysis indicates a minor component needs upgrade that previously hasn't been identified - weld details, details that are inconsistent with the Pro-E model	Identify these areas early with site surveys and as-builts		**Sep-2011**	FY11	**Titus**	open	L	Negligible	Low	manager's experience	10 to 40		manager's estimate	**$ 40**	**$ 24**	
70	06/15/10	1002a	**1002**	Passive Plate Analysis	Halo and New/other disruption loads are beyond the capacity of the present hardware	Size modifications based on calculations and implement		**Sep-2011**	FY11	**Titus**	open	L	Negligible	Low	Project Manager's estimate	5 to 20	0	1 to 4 weeks of designer	**$ 20**	**$ 12**	
71	03/17/10	2300a	**2300**	Miscellaneous small appendage reinforcements on vessel	Upgrade may increase EM loads to small items on vessel that may need reinforcement, e.g. shutters, ECH, brackets,diagnostic supports.	Design reinforcements as problem areas are identified.		**Sep-2011**	FY11	**Titus**	open	U	Marginal	Low	project manager's estimate	100			**$ 100**	**$ 25**	
72	08/02/11	1001d	**1001**	Centerstack Plasma Facing Components	Passive Plate Tiles/hardware need upgrading: Possibly ~2050 tiles	Design and fab 2D CFC		**6/22/2011**	FY13	**Tresemer**	Retired	U	Significant	Moderate		436			436	**109**	
73	08/02/11	1001e	**1001**	Centerstack Plasma Facing Components	May be able to use ATJ on CS VS instead of 2D CFC. Depends on fastening needs			**6/22/2011**	FY11	**Tresemer**	Retired	U			Possible outcome of thermal analysis. Is unlikely.	-75			-75	**-18.75**	
74	08/02/11	8200e	**8200**		Passive Plate Tiles/hardware need upgrading: Possibly ~3500 tiles, 70000 in^3, replacing with 2D CFC	Finalize disruprtion and thermal load analysis by FDR.	Should replcement be necessary option to defer until later in ops by limiting machine paramters (no cost/schedule impact but tech perf impact) or replace all affetced PP and tiles during the planned outage (sign cost impact little schedule impact)	**8/1/2011**	FY13	**Tresemer**	Retired	**U**	Significant	Moderate		1000		field removal of PP upgrade attachments and re-installPP	1000	**750**	
75	12/08/09	1001a	**1001**	Centerstack Plasma Facing Components	Tiles not delivered on time	If schedule critical, install tiles in vessel.	1001-0066	**Sep-2012**		**Tresemer**	open	U			prior experience on NSTX	0				**$ -**	
76	12/08/09	1001b	**1001**	Centerstack Plasma Facing Components	Special diagnostics for tiles not received on time	If schedule critical, install tiles in vessel.	4100-0056	**Jun-2013**		**Tresemer**	open	U			prior experience on NSTX	0				**$ -**	
77	06/15/10	1001c	**1001**	Centerstack Plasma Facing Components	Tiles require unforseen machining	If schedule critical, and in-house machinining will not suffice, seek external machining sources. Additional machining time added to WAF	1302-1500	**Mar-2014**	FY13	**Tresemer**	open	L	Negligible	Low	prior experience on NSTX	15 to 60	1 to 4	3 machinists for 1 to 4 weeks	**$ 60**	**$ 36**	
78	**08/02/11**	1001d	**1001**	Centerstack Plasma Facing Components	Outboard Divertor tile and hardware replacement may be required for extreme operating scenarios	Should replacement be necessary, defer until later in ops by limiting machine paramters (no cost/schedule impact)		**8/2/2011**		**Tresemer**	retired	**VU**			Retired. Existing OBD tiles will be used inplace of the LLD.						
79	07/16/10	8200d	**8200**		Realign Coils - This is in case the coils spring or change shape after releasing them from their existing clamps. This could afect the algnment of all any coil mounted to the vessel wall/ribs.	Metrology - new clamps		**Sep-2013**	FY14	**Viola**	open	U	Negligible	Low	Manager's estimate	40			**$ 40**	**$ 10**	
80	07/16/10	8200c	**8200**		Realign vacuum vessel - This is in case the vessel springs or changes shape after cutting the new port opening. This could affect the algnment of all the vessel internals mounted to the vessel wall.	Metrology	2480-0083	**Nov-2013**	FY14	**Viola**	open	L	Negligible	Low	Manager's estimate	40			**$ 40**	**$ 24**	38.8
81	07/16/10	8200b	**8200**		Damage to coil insulation during removal - This is in case we accidentally nick or gouge the outer insulation.	repair coil	8250-129	**Apr-2014**	FY13	**Viola**	open	VU	Negligible	Low	Coil engineer (Chrzanowski) estimate	40			**$ 40**	**$ 2**	
82	12/08/09	8250a	**8250**	Centerstack Removal and Re-installation / Pumpdown / Bakeout	Vacuum seals don't pass leakcheck	Lift centerstack out, rework seals, re-install centerstack		**Sep-2014**	FY14	**Viola**	open	VU	Negligible	Low	Construction Manager's estimate	28 to 56	1 to 2	Same work previous done on NSTX	**$ 56**	**$ 3**	

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	8/2/2011	**NSTX Upgrade Project Risk& Opportunity Registry, rev 19 draft**					**Revisions shown in blue.**				VL=	90%			L=	60%	U=	25%	VU=	5%	
83	12/08/09	8250b	**8250**		Flex bus require more than two fit-ups / reworks prior to final installation	Repeat "remove, rework, re-install"		**Sep-2014**	FY14	**Viola**	open	U	Marginal	Low	Construction Manager's estimate	63 to 189	2 to 6	Same work previous done on NSTX	**$ 189**	**$ 47**	
84	12/08/09	8250c	**8250**		Umbrella lids require more than two fit-ups / reworks prior to final installation	Repeat "remove, rework, re-install"		**Sep-2014**	FY14	**Viola**	open	U	Negligible	Low	Construction Manager's estimate	14 to 42	1 to 2	Same work previous done on NSTX	**$ 42**	**$ 11**	
85	12/08/09	8200a	**8200**	Centerstack and Coil Structure Installation	Longer time to remove diagnostics for access	- incorporated into base plan				**Viola**	Retired	L							0	**0**	
86	07/16/10	8200c	**8200**		remove LLD and replace with existing OD tiles	Perform disruption analysis on LLD or program decision on limiting operation.INCLUDE IN BASELINE				**Viola**	Retired	L			Manager's estimate	0			0	**0**	
87	12/08/09	2450a	**2450**	NB2 Services	Availability of V. Garzotto	Desandro / Denault could do this work- replacements available					Retired								0	**0**	
88																					
89																					
90	12/08/09																				
91		**NCSX Lessons Learned**																			
92																					
93		NCSX-1	Complete requisite R&D and designs prior to establishing a baseline.					**PDR**		**Strykowsky**	open										
94		NCSX-2	Implement rigorous, disciplined, and realistic cost estimating techniques early on.					**CD-1**		**Strykowsky**	Retired - implemented										
95		NCSX-3	Conduct regular bottom-up estimates to complete (ETC) to identify and address cost and schedule issues.					**CD-4**		**Strykowsky**	open										
96		NCSX-4	Develop and execute an effective risk management plan early on.					**PDR**		**Strykowsky**	Retired - implemented										
97		NCSX-5	Develop, maintain, and execute a staffing plan.					**PDR**		**Strykowsky**	Retired - implemented										
98		NCSX-6	Recognize the cost and schedule implications of using high technology tools at or near their capability limits.					**PDR**		**Strykowsky**	open										
99		NCSX-7	Develop strong ties with external resources in key technology areas, including those outside of your area of expertise.					**PDR**		**Strykowsky**	open, but note that CDR was performed by an independent committee of external experts										
100		NCSX-8	Build a strong, effective project managemnet organization early.					**PDR**		**Strykowsky**	Retired - implemented										
101		NCSX-9	Communicate and act.					**CD-4**		**Strykowsky**	open										