

NSTX UPGRADE CONCEPTUAL DESIGN COST ESTIMATE															Recommended			CONCEPTUAL DESIGN					
UNCONSTRAINED CASE															Risk		Contingency		ESTIMATE RANGE				
DESCRIPTION	RLM	Job Manager	Base Estimate	FY 2009 Actual Cost	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	Uncertainty %		\$			Gross risk \$ (4)	Likelihood	Weighted Risk (5) \$	Lower = (2)+(5)	Upper = (3)+(4)	LOWER	UPPER	
											Low	High	Low (1)	Average (2)	High (3)								
Job: 1000 - CSU Analytical Support		Pete Titus	\$421		150.1	133.1	68.3	69.4				-20%	40%	-\$84	\$42	\$168			\$0	\$42	\$168	\$463	\$589
Job: 1001 - CS Plasma Facing Components		Kelsey Tresemer	\$1,776	64.6	246.3	626.2	838.5					-20%	40%	-\$342	\$171	\$684	40	L	\$24	\$195	\$724	\$1,971	\$2,500
Job: 1002 -Passive Plate Analysis & Upgrade Act		Pete Titus	\$180		120.5	59						-20%	40%	-\$36	\$18	\$72	-		\$0	\$18	\$72	\$197	\$251
Job: 1200 - Vacuum Vessel & Structural Support		Danny Mangra	\$779	571.7	192.9	14.6						-20%	40%	-\$42	\$21	\$83	60	U	\$15	\$36	\$143	\$815	\$922
Job: 1201 - Outer TF Structures		Danny Mangra	\$701		183.4	268.2	248.9					-20%	40%	-\$140	\$70	\$280	-		\$0	\$70	\$280	\$771	\$981
Job: 1202 - Outer PF Coil Structures		Danny Mangra	\$1,128		321.7	173	633.6					-20%	40%	-\$226	\$113	\$451	-		\$0	\$113	\$451	\$1,241	\$1,580
Job: 1203 - Umbrella Structural Reinforcement		Danny Mangra	\$289		146.7	58.1	83.7					-20%	40%	-\$58	\$29	\$115	-		\$0	\$29	\$115	\$317	\$404
Job: 1204 - CS Support Pedestal		Danny Mangra	\$203		92.3	33.9	41.2	35.1				-20%	40%	-\$41	\$20	\$81	-		\$0	\$20	\$81	\$223	\$284
Job: 1205 - Misc VV Structural Support		Danny Mangra	\$256		80	44	132					-20%	40%	-\$51	\$26	\$102	-		\$0	\$26	\$102	\$282	\$358
Job: 1301 - Outer Toroidal Field Coils (incl 1300 CAD sprt)		Jim Chrzanowski	\$726		53	426.2	247.1					-10%	15%	-\$73	\$18	\$109	240	U	\$60	\$78	\$349	\$804	\$1,075
Job: 1303 - TF Joint Test Stand & Perform Test		Tom Kozub	\$338		311.3	26.7						-15%	25%	-\$51	\$17	\$85	15	VU	\$1	\$18	\$100	\$356	\$438
Job: 1304 - Inner TF Bundle (Dsgn/Fab)		Jim Chrzanowski	\$1,935		1071.5	863.3						-20%	40%	-\$387	\$193	\$774	165	U	\$41	\$235	\$939	\$2,170	\$2,874
Job: 1305 - OHMIC Heating Coil (OH) DSGN/FAB		Jim Chrzanowski	\$4,004	1055.6	277.1	1364.7	1306.4					-20%	40%	-\$590	\$295	\$1,179	550	U	\$138	\$432	\$1,729	\$4,436	\$5,733
Job: 1306 - Inner Poloidal Field Coils (Shaping)		Jim Chrzanowski	\$536		93	188.2	254.6					-20%	40%	-\$107	\$54	\$214	125	U	\$31	\$85	\$339	\$621	\$875
Job: 1307 - CS Casing Assembly (DSGN/FAB)		Jim Chrzanowski	\$892		119.1	639.7	133.4					-20%	40%	-\$178	\$89	\$357	-		\$0	\$89	\$357	\$981	\$1,249
Job: 1302 - Center Stack Assembly		Jim Chrzanowski	\$833			57.3	528	247.9				-20%	40%	-\$167	\$83	\$333	-		\$0	\$83	\$333	\$917	\$1,166
Job: 2300 ECH Analysis		Jim Chrzanowski	\$183		122.5	60.9						-20%	40%	-\$37	\$18	\$73	100	U	\$25	\$43	\$173	\$227	\$357
Job: 2420 - 2nd NBI Sources		Mark Cropper	\$1,398		9.1	9.2	401.6	978.2				-5%	10%	-\$70	\$35	\$140	-		\$0	\$35	\$140	\$1,433	\$1,538
Job: 2425 - BL Relocation		Martin Denault	\$1,707	15	429.8	216.2	1008.5	37.9				-15%	25%	-\$254	\$85	\$423	-		\$0	\$85	\$423	\$1,792	\$2,131
Job: 2430 - 2nd NBI Decontamination		Tim Stevenson	\$2,738	1238.5	1499.1							-20%	10%	-\$300	-\$75	\$150	-		\$0	-\$75	\$150	\$2,663	\$2,888
Job: 2440 - 2nd NBI Beamline		Martin Denault	\$2,534	28.6	90.4	538.5	1067.7	808.9				-10%	15%	-\$251	\$63	\$376	(184)	L	-\$110	-\$48	\$192	\$2,486	\$2,726
Job: 2450 - 2nd NBI Services		Martin Denault	\$3,601	76.7	321.5	603.1	2524.5	74.8				-15%	25%	-\$529	\$176	\$881	50	U	\$13	\$189	\$931	\$3,789	\$4,532
Job: 2460 - 2nd NBI Armor		Craig Priniski	\$420	35.8	130.8	28.8	224.7					-10%	15%	-\$38	\$10	\$58	-		\$0	\$10	\$58	\$430	\$478
Job: 2470 - 2nd NBI Power		Raki Ramakrishnan	\$3,033	115.2	62.1	355	2391	109.3				-15%	25%	-\$438	\$146	\$729	50	U	\$13	\$158	\$779	\$3,191	\$3,812
Job: 2475 - 2nd NBI Controls		Mark Cropper	\$1,769		302.2	88.4	873.8	504.8				-15%	25%	-\$265	\$88	\$442	-		\$0	\$88	\$442	\$1,858	\$2,212
Job: 2480 - 2nd NBI/TVPS Duct		Craig Priniski	\$2,665	183.4	240.3	60.5	1959.9	221.2				-10%	15%	-\$248	\$62	\$372	125	L	\$75	\$137	\$497	\$2,802	\$3,163
Job: 2485 - Vacuum Pumping System		Craig Priniski	\$319		79	17.6	153.7	68.7				-5%	10%	-\$16	\$8	\$32	-		\$0	\$8	\$32	\$327	\$351
Job: 2490 - NTC Equipt Relocations		Erik Perry	\$3,314	143		524.8	1543.7	1102.6				-20%	40%	-\$634	\$317	\$1,268	366	U	\$92	\$409	\$1,634	\$3,723	\$4,949
Job: 3200 - Water Cooling System Mods for CSU		Martin Denault	\$394	5.4	186.4	49.5	141.7	10.8				-15%	25%	-\$58	\$19	\$97	-		\$0	\$19	\$97	\$413	\$491
Job: 3300 - Bakeout System Mods for CSU		Raki Ramakrishnan	\$82		7.1	3	72.2					-5%	10%	-\$4	\$2	\$8	-		\$0	\$2	\$8	\$84	\$91
Job: 3400 - Gas Delivery System Mods for CSU		Bill Blanchard	\$91		48.1	13	29.6					-15%	25%	-\$14	\$5	\$23	10	VU	\$1	\$5	\$33	\$96	\$123
Job: 4100 - Center Stack Diagnostics for CSU		Bob Kaita	\$888	11.3	121.7	335.9	418.6					-5%	10%	-\$44	\$22	\$88	-		\$0	\$22	\$88	\$909	\$975
Job: 5000 - CSU Power Systems		Raki Ramakrishnan	\$8,978	385.8	1154.8	584.3	3976.6	2728.6	148.2			-15%	25%	-\$1,289	\$430	\$2,148			\$0	\$430	\$2,148	\$9,408	\$11,126
Job: 5501 - Coil Bus Runs		Jim Chrzanowski	\$725		217.5	107.3	380.7	19.6				-20%	40%	-\$145	\$73	\$290	-		\$0	\$73	\$290	\$798	\$1,015
Job: 6100 - Control Sys & Data Acquisition Sys		Paul Sichts	\$811		98.4	164.1	446.3	102.4				-15%	25%	-\$122	\$41	\$203	253	U	\$63	\$104	\$456	\$915	\$1,267
Job: 7100 - Project Mgt & Integration CSU & NBI		Ron Strykowski	\$4,536	625.8	704.1	847.4	1049.9	1309.1				-15%	25%	-\$587	\$196	\$978	150	U	\$38	\$233	\$1,128	\$4,769	\$5,664
Job: 7200 - Center Stack Management		Larry Dudek	\$1,381		384.4	339.4	333	324.3				-15%	25%	-\$207	\$69	\$345	107	U	\$27	\$96	\$452	\$1,477	\$1,833
Job: 7300 - NB2 Management		Tim Stevenson	\$1,679	63.3	275.3	362.1	438.5	449.4	90			-15%	25%	-\$242	\$81	\$404	75	U	\$19	\$100	\$479	\$1,778	\$2,157
Job: 7400 - Health Physics Support		Tim Stevenson	\$2,768		669.5	1039.9	695.9	362.2				-15%	25%	-\$415	\$138	\$692	35	L	\$21	\$159	\$727	\$2,927	\$3,494
JOB: 7700 - NSTX Upgrade HP Allocations		Ron Strykowski	\$1,755		449.4	437.6	434	434				-15%	25%	-\$263	\$88	\$439	70	L	\$42	\$130	\$509	\$1,885	\$2,264
Job: 7710 - Upgrade Allocations		Ron Strykowski	\$918	526.3	296.6	33.4	31	31				-15%	25%	-\$59	\$20	\$98	20	L	\$12	\$32	\$118	\$950	\$1,036
Job: 8200 - Centerstack & Coil Structural Instal		Mike Viola	\$5,745		108	932.3	3659.7	1045.1				-20%	40%	-\$1,149	\$575	\$2,298	370	U	\$93	\$667	\$2,668	\$6,412	\$8,413
Job: 8250 - Remove/Install Centerstack		Mike Viola	\$755				99.5	655.8				-30%	60%	-\$227	\$113	\$453	196	U	\$49	\$162	\$649	\$918	\$1,404
Job: 7900 - Integrated System		Charlie Gentile	\$71		2.1	2.3	22.2	34.3	10.5			-20%	40%	-\$14	\$7	\$29	-		\$0	\$7	\$29	\$79	\$100
schedule (months)			48	(note upper cont % not considered since OT and 2nd shift option remain)										7.2 months			15%			\$1,746	\$1,746	\$1,746	\$1,746
Base Estimate =			\$70,254	\$5,146	\$11,469	\$12,731	\$28,894	\$11,765	\$249	\$0													
etc=			\$65,108		3%	5%	8%	11%	708%														
Uncertainty Based Contingency(Lower)=			\$4,068		\$179	\$398	\$2,257	\$1,219	\$16	\$0													
Risk based Contingency(Lower)=			\$779		\$179	\$296	\$179	\$125															
Schedule Contingency(Lower)=			\$1,746					\$1,746															
Total (Lower)=			\$76,848	\$5,146	\$11,827	\$13,425	\$31,330	\$13,109	\$2,010	\$0													
Uncertainty based Contingency (Upper) =			\$76,848		13%	23%	38%	51%	731%														
Risk Based Contingency (Upper) =			\$18,625		\$820	\$1,821	\$10,332	\$5,580	\$71	\$0													
Schedule Contingency (Upper) =			\$2,988		\$687	\$1,135	\$687	\$478															
Total (Upper) =			\$93,613	\$5,146	\$12,977	\$15,687	\$39,914	\$17,824	\$2,066	\$0													
			\$93,613																				
Management /oversight (standing army) cost															\$K/mo.	Use for weighted risk							
Job: 7100 - Project Mgt & Integration CSU															\$ 109	Very Likely = >80% 90%							
Job: 7200 - Center Stack Management															\$ 27	Likely = 80-40% 60%							
Job: 7300 - NB2 Management															\$ 37								
Job: 7400 - Health Physics Support															\$ 30								
JOB: 7700 - NSTX Upgrade HP Allocation:															\$ 36	Unlikely = 40-10% 25%							
Job: 7710 - Upgrade Allocations															\$ 3	Very Unlikely = <10% 5%							
															\$ 243								