

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$	
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total			
1	06					X-RAY END STATION SYSTEMS						76,778	6,236,236	7,220,332	6,850,891	14,071,223		3,707,527	
1	06	01				System Management & Integration						3,604	61,258	339,695	76,342	416,037		90,842	
1	06	01	01			Management						3,604	61,258	339,695	76,342	416,037		90,842	
1	06	01	01			Management & Oversight - Jul-Sep06	3-Jul-06	29-Sep-06	C	SL_EE1	Hrs	127		11,550		11,550	20%	2,310	
1	06	01	01			Management & Oversight - FY07	2-Oct-06	28-Sep-07	C	SL_EE1	Hrs	1,699		158,382		158,382	20%	31,676	
1	06	01	01			Management & Oversight - FY08	1-Oct-07	30-Sep-08	C	SL_EE1	Hrs	1,712		163,744		163,744	20%	32,749	
1	06	01	01			Travel - Jul-Sep06	3-Jul-06	29-Sep-06	C	SL_MST	\$\$		1,258		1,509		30%	453	
1	06	01	01			Travel - FY07	2-Oct-06	28-Sep-07	C	SL_MST	\$\$		30,000		36,936		30%	11,081	
1	06	01	01			Travel - FY08	1-Oct-07	30-Sep-08	C	SL_MST	\$\$		30,000		37,896		30%	11,369	
1	06	01	01			Commission Coordinator - Jul-Sep06	3-Jul-06	29-Sep-06	C	SL_EE1	Hrs	66		6,020		6,020	20%	1,204	
1	06	01	02			SSRL Physics													
1	06	02				XES Controls						29,825	2,840,726	2,630,788	3,107,961	5,738,749		1,470,973	
1	06	03				Mechanical/Vacuum Subsystem													
1	06	03	01			Chamber Support Tables - Mech/Vac													
1	06	03	02			Vacuum Components - Mech/Vac													
1	06	03	02	01		Valves - Vacuum													
1	06	03	02	02		Hardware - Vacuum													
1	06	03	02	03		Ion Pump - Vacuum													
1	06	03	02	04		Turbo Pump - Vacuum													
1	06	03	02	05		Gauges - Vacuum													
1	06	03	03			Experimental Chambers													
1	06	03	03	01		AP Chamber 1													
1	06	03	03	02		AP Chamber 2													
1	06	04				Laser Subsystem						8,791	961,700	942,853	1,058,324	2,001,177		500,294	
1	06	04	01			XES Laser						1,328	641,100	124,124	704,988	829,112		207,278	
1	06	04	01			Specification - XES Laser	4-Jan-07	2-Mar-07	C	SL_PHS	Hrs	120		8,777		8,777	25%	2,194	
1	06	04	01			Specification - XES Laser	4-Jan-07	2-Mar-07	C	SL_OE1	Hrs	120		13,564		13,564	25%	3,391	
1	06	04	01			Design - XES Laser	5-Mar-07	25-Jun-07	C	SL_PHS	Hrs	320		23,404		23,404	25%	5,851	
1	06	04	01			Design - XES Laser	5-Mar-07	25-Jun-07	C	SL_OE1	Hrs	320		36,170		36,170	25%	9,043	
1	06	04	01			Design Review - XES Laser	26-Jun-07	10-Jul-07	C	SL_PHS	Hrs	32		2,340		2,340	25%	585	
1	06	04	01			Design Review - XES Laser	26-Jun-07	10-Jul-07	C	SL_OE1	Hrs	32		3,617		3,617	25%	904	
1	06	04	01			Prep Bid Pkg - XES Laser	11-Jul-07	24-Jul-07	C	SL_PHS	Hrs	32		2,340		2,340	25%	585	
1	06	04	01			Prep Bid Pkg - XES Laser	11-Jul-07	24-Jul-07	C	SL_OE1	Hrs	32		3,617		3,617	25%	904	
1	06	04	01			Evaluation of Proposals - XES Laser	22-Aug-07	5-Sep-07	C	SL_PHS	Hrs	40		2,926		2,926	25%	731	
1	06	04	01			Evaluation of Proposals - XES Laser	22-Aug-07	5-Sep-07	C	SL_OE1	Hrs	40		4,521		4,521	25%	1,130	
1	06	04	01			Vendor Fab/Ship - XES Laser	7-Sep-07	14-Mar-08	C	SL_PHS	Hrs	120		8,976		8,976	25%	2,244	
1	06	04	01			Vendor Fab/Ship - XES Laser	7-Sep-07	14-Mar-08	C	SL_OE1	Hrs	120		13,872		13,872	25%	3,468	
1	06	04	01			Vendor Fab/Ship - XES Laser	7-Sep-07	14-Mar-08	C	SA_MSE	\$\$		641,100		704,988		704,988	25%	176,247
1	06	04	02			Laser Diagnostics						4,407	127,600	526,164	140,769	666,933		166,733	
1	06	04	02			Engineering - Laser Diagnostics	3-Jul-06	28-Oct-08	C	SL_PHP	Hrs	3,727		463,559		463,559	25%	115,890	
1	06	04	02			Specification - Laser Diagnostics	4-Jan-07	30-Mar-07	C	SL_PHS	Hrs	40		2,926		2,926	25%	731	
1	06	04	02			Specification - Laser Diagnostics	4-Jan-07	30-Mar-07	C	SL_OE1	Hrs	40		4,521		4,521	25%	1,130	
1	06	04	02			Design - Laser Diagnostics	1-Aug-07	26-Sep-07	C	SL_PHS	Hrs	240		17,553		17,553	25%	4,388	
1	06	04	02			Design - Laser Diagnostics	1-Aug-07	26-Sep-07	C	SL_PCE	Hrs	40		4,521		4,521	25%	1,130	
1	06	04	02			Design - Laser Diagnostics	1-Aug-07	26-Sep-07	C	SL_OE1	Hrs	240		27,128		27,128	25%	6,782	
1	06	04	02			Prep Bid Pkg Energy Sensors - Laser Diagnostics	27-Sep-07	10-Oct-07	C	SL_PHS	Hrs	16		1,191		1,191	25%	298	
1	06	04	02			Fab/Ship Energy Sensors - Laser Diagnostics	11-Dec-07	22-Feb-08	C	SA_MSE	\$\$		8,600		9,488		9,488	25%	2,372
1	06	04	02			Prep Bid Pkg IR FROG - Laser Diagnostics	27-Sep-07	10-Oct-07	C	SL_PHS	Hrs	16		1,191		1,191	25%	298	
1	06	04	02			Vendor Ship IR FROG- Laser Diagnostics	11-Dec-07	22-Feb-08	C	SA_MSE	\$\$		25,000		27,580		27,580	25%	6,895
1	06	04	02			Prepare Bid Pkg Fast Diodes - Laser Diagnostics	27-Sep-07	10-Oct-07	C	SL_PHS	Hrs	16		1,191		1,191	25%	298	
1	06	04	02			Vendor Fab/Ship Fast Diodes - Laser Diagnostics	11-Dec-07	22-Feb-08	C	SA_MSE	\$\$		2,000		2,206		2,206	25%	552
1	06	04	02			Prep Bid Pkg Oscilloscope - Laser Diagnostics	27-Sep-07	10-Oct-07	C	SL_PHS	Hrs	16		1,191		1,191	25%	298	

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1	2	3	4	5	6							Hours	\$	Labor	M&S	Total		
1	06	04	02			Vendor Fab/Ship Oscilloscope - Laser Diagnostics	11-Dec-07	22-Feb-08	C	SA_MSE	\$\$		80,000		88,256	88,256	25%	22,064
1	06	04	02			Prep Bid Pkg Autocorrelators - Laser Diagnostic	27-Sep-07	10-Oct-07	C	SL_PHS	Hrs	16		1,191		1,191	25%	298
1	06	04	02			Fab/Ship Autocorrelators - Laser Diagnostics	11-Dec-07	22-Feb-08	C	SA_MSE	\$\$		12,000		13,238	13,238	25%	3,310
1	06	04	03			Laser Optical Transport						2,696	184,000	259,272	202,637	461,910		115,477
1	06	04	03			Specification - Laser Optic Transport	4-Jan-07	2-Mar-07	C	SL_PHS	Hrs	40		2,926		2,926	25%	731
1	06	04	03			Specification - Laser Optic Transport	4-Jan-07	2-Mar-07	C	SL_OE1	Hrs	40		4,521		4,521	25%	1,130
1	06	04	03			Specification - Laser Optic Transport	4-Jan-07	2-Mar-07	C	SL_ME1	Hrs	40		3,995		3,995	25%	999
1	06	04	03			Conceptual Design - Laser Optic Transport	1-Aug-07	5-Sep-07	C	SL_PHS	Hrs	120		8,777		8,777	25%	2,194
1	06	04	03			Conceptual Design - Laser Optic Transport	1-Aug-07	5-Sep-07	C	SL_OE1	Hrs	120		13,564		13,564	25%	3,391
1	06	04	03			Conceptual Design - Laser Optic Transport	1-Aug-07	5-Sep-07	C	SL_ME1	Hrs	240		23,969		23,969	25%	5,992
1	06	04	03			Preliminary Design - Laser Optic Transport	6-Sep-07	10-Oct-07	C	SL_PHS	Hrs	120		8,837		8,837	25%	2,209
1	06	04	03			Preliminary Design - Laser Optic Transport	6-Sep-07	10-Oct-07	C	SL_OE1	Hrs	120		13,657		13,657	25%	3,414
1	06	04	03			Preliminary Design - Laser Optic Transport	6-Sep-07	10-Oct-07	C	SL_ME1	Hrs	240		24,134		24,134	25%	6,033
1	06	04	03			Final Design - Laser Optic Transport	11-Oct-07	21-Nov-07	C	SL_PHS	Hrs	120		9,005		9,005	25%	2,251
1	06	04	03			Final Design - Laser Optic Transport	11-Oct-07	21-Nov-07	C	SL_OE1	Hrs	120		13,916		13,916	25%	3,479
1	06	04	03			Final Design - Laser Optic Transport	11-Oct-07	21-Nov-07	C	SL_ME1	Hrs	240		24,592		24,592	25%	6,148
1	06	04	03			Design Earthquake restraints for Optical Tables	26-Jun-07	7-Aug-07	C	SL_PHS	Hrs	120		8,777		8,777	25%	2,194
1	06	04	03			Design Earthquake restraints for Optical Tables	26-Jun-07	7-Aug-07	C	SL_OE1	Hrs	120		13,564		13,564	25%	3,391
1	06	04	03			Design Earthquake restraints for Optical Tables	26-Jun-07	7-Aug-07	C	SL_ME1	Hrs	240		23,969		23,969	25%	5,992
1	06	04	03			Design Enclosures for Optical Tables	26-Jun-07	7-Aug-07	C	SL_PHS	Hrs	120		8,777		8,777	25%	2,194
1	06	04	03			Design Enclosures for Optical Tables	26-Jun-07	7-Aug-07	C	SL_OE1	Hrs	120		13,564		13,564	25%	3,391
1	06	04	03			Design Enclosures for Optical Tables	26-Jun-07	7-Aug-07	C	SL_ME1	Hrs	240		23,969		23,969	25%	5,992
1	06	04	03			Prep Bid Pkg Lenses & Mirrors - Laser Optic Tran	26-Nov-07	7-Dec-07	C	SL_PHS	Hrs	40		3,002		3,002	25%	750
1	06	04	03			Vendor Fab/Ship Lenses & Mirrors -Laser Optic Tr	25-Jan-08	18-Apr-08	C	SA_MSE	\$\$		64,000		70,605	70,605	25%	17,651
1	06	04	03			Prep Bid Pkg Shielding/Contain - Laser Optic Tra	26-Nov-07	8-Jan-08	C	SL_PHS	Hrs	40		3,002		3,002	25%	750
1	06	04	03			Prep Bid Pkg Shielding/Contain - Laser Optic Tra	26-Nov-07	8-Jan-08	C	SL_ME1	Hrs	40		4,099		4,099	25%	1,025
1	06	04	03			Vendor Fab/Ship Shielding/Conta-Laser Optic Tra	8-Feb-08	2-May-08	C	SA_MSE	\$\$		14,000		15,445	15,445	25%	3,861
1	06	04	03			Prep Bid Pkg Optic Tables (4) - Laser Optic Tran	8-Aug-07	21-Aug-07	C	SL_PHS	Hrs	20		1,463		1,463	25%	366
1	06	04	03			Prep Bid Pkg Optic Tables (4) - Laser Optic Tran	8-Aug-07	21-Aug-07	C	SL_ME1	Hrs	20		1,997		1,997	25%	499
1	06	04	03			Vendor Fab/Ship Optic Tables (4) -Laser Optic Tr	21-Sep-07	2-Jan-08	C	SA_MSE	\$\$		100,000		110,049	110,049	25%	27,512
1	06	04	03			Prep Bid Pkg Cabinets - Laser Optic Transport	26-Nov-07	7-Dec-07	C	SL_PHS	Hrs	16		1,201		1,201	25%	300
1	06	04	03			Vendor Fab/Ship Cabinets -Laser Optic Transport	25-Jan-08	21-Mar-08	C	SA_MSE	\$\$		3,000		3,310	3,310	25%	827
1	06	04	03			Procure Enclosures for Optical Tables	8-Aug-07	3-Oct-07	C	SA_MSE	\$\$		3,000		3,229	3,229	25%	807
1	06	04	04			Laser Safety						360	9,000	33,293	9,929	43,222		10,806
1	06	04	04			Write SOP - Laser Safety	4-Jan-07	2-Mar-07	C	SL_PHS	Hrs	40		2,926		2,926	25%	731
1	06	04	04			Prepare for Laser Safety PDR	1-Jun-07	24-Sep-07	C	SL_PHS	Hrs	40		2,926		2,926	25%	731
1	06	04	04			Prepare for Laser Safety PDR	1-Jun-07	24-Sep-07	C	SL_OE1	Hrs	40		4,521		4,521	25%	1,130
1	06	04	04			Prepare for Laser Safety Oversight Comm. Review	9-Oct-07	19-Feb-08	C	SL_PHS	Hrs	40		3,002		3,002	25%	750
1	06	04	04			Prepare for Laser Safety Oversight Comm. Review	9-Oct-07	19-Feb-08	C	SL_OE1	Hrs	40		4,639		4,639	25%	1,160
1	06	04	04			Prepare for Laser Safety FDR	9-Oct-07	5-Dec-07	C	SL_PHS	Hrs	40		3,002		3,002	25%	750
1	06	04	04			Prepare for Laser Safety FDR	9-Oct-07	5-Dec-07	C	SL_OE1	Hrs	40		4,639		4,639	25%	1,160
1	06	04	04			Prepare for Laser Safety Committee Review	5-Mar-08	28-May-08	C	SL_PHS	Hrs	40		3,002		3,002	25%	750
1	06	04	04			Prepare for Laser Safety Committee Review	5-Mar-08	28-May-08	C	SL_OE1	Hrs	40		4,639		4,639	25%	1,160
1	06	04	04			Procure Laser PPS	12-Jun-08	25-Jun-08	C	SA_MSE	\$\$		9,000		9,929	9,929	25%	2,482
1	06	05				X-Ray Detectors						3,820	-	281,844	-	281,844		56,369
1	06	05	01			Beam Imaging												
1	06	05	02			Not Used												
1	06	05	03			Beam Intensity												
1	06	05	04			Detector & Streak Camera						3,820	-	281,844	-	281,844		56,369
1	06	05	04	01		Detector Management						3,820	-	281,844	-	281,844		56,369
1	06	05	04	01		Detector Engineering	3-Jul-06	30-Sep-08	C	SL_PHS	Hrs	3,820		281,844		281,844	20%	56,369
1	06	05	04	02		Streak Camera - LBL												

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1	2	3	4	5	6							Hours	\$	Labor	M&S	Total		
1	06	06				System Installation & Alignment						12,192	-	1,113,109	-	1,113,109		304,164
1	06	06	01			Front End Install						692	-	63,236	-	63,236		16,422
1	06	06	01			Install SXR stoppers (2)	23-Jun-08	25-Jun-08	C	SL_MFA	Hrs	48		4,244		4,244	25%	1,061
1	06	06	01			Install SXR stoppers (2)	23-Jun-08	25-Jun-08	C	SL_ME1	Hrs	24		2,459		2,459	25%	615
1	06	06	01			Align SXR stoppers (2)	26-Jun-08	26-Jun-08	C	SL_MES	Hrs	16		1,318		1,318	25%	330
1	06	06	01			Align SXR stoppers (2)	26-Jun-08	26-Jun-08	C	SL_ME1	Hrs	4		410		410	25%	102
1	06	06	01			Install SXR stopper collimation	27-Jun-08	27-Jun-08	C	SL_MFA	Hrs	16		1,415		1,415	25%	354
1	06	06	01			Install HXR stoppers	30-Jun-08	2-Jul-08	C	SL_MFA	Hrs	48		4,244		4,244	25%	1,061
1	06	06	01			Install HXR stoppers	30-Jun-08	2-Jul-08	C	SL_ME1	Hrs	24		2,459		2,459	25%	615
1	06	06	01			Align HXR stoppers	3-Jul-08	3-Jul-08	C	SL_MES	Hrs	16		1,318		1,318	25%	330
1	06	06	01			Align HXR stoppers	3-Jul-08	3-Jul-08	C	SL_ME1	Hrs	4		410		410	25%	102
1	06	06	01			Install HXR stopper collimation	7-Jul-08	7-Jul-08	C	SL_MFA	Hrs	16		1,415		1,415	25%	354
1	06	06	01			Test SXR/HXR Stoppers	11-Jul-08	14-Jul-08	C	SL_MVE	Hrs	16		1,743		1,743	25%	436
1	06	06	01			Install FEE PPS cable, signs, audio, keybank	30-Nov-07	11-Dec-07	C	SL_CT1	Hrs	16		1,016		1,016	25%	254
1	06	06	01			Install FEE PPS cable, signs, audio, keybank	30-Nov-07	11-Dec-07	C	SL_CP1	Hrs	32		2,706		2,706	25%	676
1	06	06	01			Install FEE PPS cable, signs, audio, keybank	30-Nov-07	11-Dec-07	C	SL_CE1	Hrs	16		1,856		1,856	25%	464
1	06	06	01			Install FEE BCS BSOIC's, cables, AC	30-Nov-07	5-Dec-07	C	SL_MFA	Hrs	64		5,659		5,659	25%	1,415
1	06	06	01			Install doors	27-Nov-07	3-Dec-07	C	SL_MFA	Hrs	80		7,074		7,074	25%	1,768
1	06	06	01			Install doors	27-Nov-07	3-Dec-07	C	SL_ME1	Hrs	20		2,049		2,049	25%	512
1	06	06	01			Test Kirk lock, emergency egress	4-Dec-07	4-Dec-07	C	SL_MFA	Hrs	8		707		707	25%	177
1	06	06	01			Wire PPS for doors	5-Dec-07	6-Dec-07	C	SL_CT1	Hrs	4		254		254	25%	63
1	06	06	01			Wire PPS for doors	5-Dec-07	6-Dec-07	C	SL_CP1	Hrs	8		676		676	25%	169
1	06	06	01			Wire PPS for doors	5-Dec-07	6-Dec-07	C	SL_CE1	Hrs	4		464		464	25%	116
1	06	06	01			Test/Certify FEE HPS	20-Feb-08	26-Feb-08	C	SL_CP1	Hrs	40		3,382		3,382	30%	1,015
1	06	06	01			Test/Certify FEE HPS	20-Feb-08	26-Feb-08	C	SL_CE1	Hrs	40		4,639		4,639	30%	1,392
1	06	06	01			Wire SXR and HXR stoppers	3-Jul-08	8-Jul-08	C	SL_MFA	Hrs	48		4,244		4,244	25%	1,061
1	06	06	01			Shield penetration tubes (3)	16-Jul-08	18-Jul-08	C	SL_MFA	Hrs	48		4,244		4,244	30%	1,273
1	06	06	01			Plumb (air and water) stoppers	9-Jul-08	10-Jul-08	C	SL_MFA	Hrs	32		2,830		2,830	25%	707
1	06	06	02			Near Hall Install						8,888	-	815,358	-	815,358		213,267
1	06	06	02	01		Near Hall Install Global Controls						1,032	-	91,492	-	91,492		31,404
1	06	06	02	01		Install NEH racks	11-Dec-07	17-Dec-07	C	SL_TMU	Hrs	48		4,529		4,529	25%	1,132
1	06	06	02	01		Install NEH MPS, cables	14-Dec-07	2-Jan-08	C	SL_CT1	Hrs	30		1,905		1,905	25%	476
1	06	06	02	01		Install NEH MPS, cables	14-Dec-07	2-Jan-08	C	SL_CP1	Hrs	60		5,073		5,073	25%	1,268
1	06	06	02	01		Install NEH MPS, cables	14-Dec-07	2-Jan-08	C	SL_CE1	Hrs	30		3,479		3,479	25%	870
1	06	06	02	01		Test/Certify MPS	31-Jul-08	6-Aug-08	C	SL_CP1	Hrs	40		3,382		3,382	30%	1,015
1	06	06	02	01		Test/Certify MPS	31-Jul-08	6-Aug-08	C	SL_CE1	Hrs	40		4,639		4,639	30%	1,392
1	06	06	02	01		Install/test NEH controls timing system	7-Jan-08	11-Feb-08	C	SL_CT1	Hrs	50		3,175		3,175	40%	1,270
1	06	06	02	01		Install/test NEH controls timing system	7-Jan-08	11-Feb-08	C	SL_CP1	Hrs	100		8,455		8,455	40%	3,382
1	06	06	02	01		Install/test NEH controls timing system	7-Jan-08	11-Feb-08	C	SL_CE1	Hrs	50		5,799		5,799	40%	2,319
1	06	06	02	01		Install/test global timing system (LBL)	1-May-08	5-Jun-08	C	SL_CT1	Hrs	100		6,349		6,349	40%	2,540
1	06	06	02	01		Install/test global timing system (LBL)	1-May-08	5-Jun-08	C	SL_CP1	Hrs	200		16,911		16,911	40%	6,764
1	06	06	02	01		Install/test global timing system (LBL)	1-May-08	5-Jun-08	C	SL_CE1	Hrs	100		11,597		11,597	40%	4,639
1	06	06	02	01		Install/test ethernet network	11-Dec-07	4-Jan-08	C	SL_CT1	Hrs	30		1,905		1,905	25%	476
1	06	06	02	01		Install/test ethernet network	11-Dec-07	4-Jan-08	C	SL_CP1	Hrs	60		5,073		5,073	25%	1,268
1	06	06	02	01		Install/test ethernet network	11-Dec-07	4-Jan-08	C	SL_CE1	Hrs	30		3,479		3,479	25%	870
1	06	06	02	01		Install/Test NEH Occupancy Safeguards	2-Nov-07	7-Nov-07	C	SL_CT1	Hrs	32		2,032		2,032	30%	610
1	06	06	02	01		Install/Test NEH Occupancy Safeguards	2-Nov-07	7-Nov-07	C	SL_CE1	Hrs	32		3,711		3,711	30%	1,113
1	06	06	02	02		Near Hall Install Mech/Vac						288	-	26,421	-	26,421		6,605
1	06	06	02	02		Install NEH cable tray stubs	11-Dec-07	13-Dec-07	C	SL_TMU	Hrs	48		4,529		4,529	25%	1,132
1	06	06	02	02		Install NEH N2 purge lines	11-Dec-07	17-Dec-07	C	SL_MFA	Hrs	80		7,074		7,074	25%	1,768
1	06	06	02	02		Install AMO house air stubs	11-Dec-07	12-Dec-07	C	SL_MFA	Hrs	32		2,830		2,830	25%	707
1	06	06	02	02		Install NEH cooling water stubs	11-Dec-07	13-Dec-07	C	SL_MFA	Hrs	48		4,244		4,244	25%	1,061

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total		
1	06	06	02	02		Install vacuum cable plant	24-Nov-08	2-Dec-08	C	SL_TMU	Hrs	80		7,744		7,744	25%	1,936
1	06	06	02	03		Near Hall Install Laser						2,080	-	202,075	-	202,075		50,519
1	06	06	02	03		Install Laser Tables & Enclosures	3-Jan-08	31-Jan-08	C	SL_PHS	Hrs	80		6,003		6,003	25%	1,501
1	06	06	02	03		Install Laser Tables & Enclosures	3-Jan-08	31-Jan-08	C	SL_OE1	Hrs	80		9,278		9,278	25%	2,319
1	06	06	02	03		Install Laser	17-Mar-08	11-Apr-08	C	SL_PHS	Hrs	160		12,006		12,006	25%	3,002
1	06	06	02	03		Install Laser	17-Mar-08	11-Apr-08	C	SL_OE1	Hrs	320		37,111		37,111	25%	9,278
1	06	06	02	03		Install Laser	17-Mar-08	11-Apr-08	C	SL_ME1	Hrs	160		16,395		16,395	25%	4,099
1	06	06	02	03		Install Laser Diagnostics & Optic Transport	5-May-08	2-Jun-08	C	SL_PHS	Hrs	160		12,006		12,006	25%	3,002
1	06	06	02	03		Install Laser Diagnostics & Optic Transport	5-May-08	2-Jun-08	C	SL_OE1	Hrs	320		37,111		37,111	25%	9,278
1	06	06	02	03		Install Laser Diagnostics & Optic Transport	5-May-08	2-Jun-08	C	SL_ME1	Hrs	160		16,395		16,395	25%	4,099
1	06	06	02	03		Install/Test Laser Controls	19-May-08	15-Jul-08	C	SL_CT1	Hrs	160		10,158		10,158	25%	2,540
1	06	06	02	03		Install/Test Laser Controls	19-May-08	15-Jul-08	C	SL_CP1	Hrs	320		27,057		27,057	25%	6,764
1	06	06	02	03		Install/Test Laser Controls	19-May-08	15-Jul-08	C	SL_CE1	Hrs	160		18,555		18,555	25%	4,639
1	06	06	02	04		Near Hall Install Detectors						3,600	-	322,414	-	322,414		80,604
1	06	06	02	05		Near Hall Install Atomic Physics												
1	06	06	02	05		Install High Field Physics Experiment	28-Jul-08	22-Aug-08	C	SL_PHS	Hrs	80		6,003		6,003	25%	1,501
1	06	06	02	05		Install High Field Physics Experiment	28-Jul-08	22-Aug-08	C	SL_MFA	Hrs	320		28,296		28,296	25%	7,074
1	06	06	02	05		Install High Field Physics Experiment	28-Jul-08	22-Aug-08	C	SL_ME1	Hrs	160		16,395		16,395	25%	4,099
1	06	06	02	05		Install High Field Physics Experiment	28-Jul-08	22-Aug-08	C	SL_CT1	Hrs	160		10,158		10,158	25%	2,540
1	06	06	02	05		Install High Field Physics Experiment	28-Jul-08	22-Aug-08	C	SL_CP1	Hrs	320		27,057		27,057	25%	6,764
1	06	06	02	05		Install High Field Physics Experiment	28-Jul-08	22-Aug-08	C	SL_CE1	Hrs	160		18,555		18,555	25%	4,639
1	06	06	02	05		Install Refocus Optics	1-May-08	14-May-08	C	SL_PHS	Hrs	40		3,002		3,002	25%	750
1	06	06	02	05		Install Refocus Optics	1-May-08	14-May-08	C	SL_MFA	Hrs	160		14,148		14,148	25%	3,537
1	06	06	02	05		Install Refocus Optics	1-May-08	14-May-08	C	SL_ME1	Hrs	80		8,197		8,197	25%	2,049
1	06	06	02	05		Install Refocus Optics	1-May-08	14-May-08	C	SL_CT1	Hrs	80		5,079		5,079	25%	1,270
1	06	06	02	05		Install Refocus Optics	1-May-08	14-May-08	C	SL_CP1	Hrs	160		13,529		13,529	25%	3,382
1	06	06	02	05		Install Refocus Optics	1-May-08	14-May-08	C	SL_CE1	Hrs	80		9,278		9,278	25%	2,319
1	06	06	02	05		Install AMO Diagnostic Equipment	22-Sep-08	3-Oct-08	C	SL_PHS	Hrs	40		3,016		3,016	25%	754
1	06	06	02	05		Install AMO Diagnostic Equipment	22-Sep-08	3-Oct-08	C	SL_MFA	Hrs	160		14,215		14,215	25%	3,554
1	06	06	02	05		Install AMO Diagnostic Equipment	22-Sep-08	3-Oct-08	C	SL_ME1	Hrs	80		8,236		8,236	25%	2,059
1	06	06	02	05		Install AMO Diagnostic Equipment	22-Sep-08	3-Oct-08	C	SL_CT1	Hrs	80		5,103		5,103	25%	1,276
1	06	06	02	05		Install AMO Diagnostic Equipment	22-Sep-08	3-Oct-08	C	SL_CP1	Hrs	160		13,593		13,593	25%	3,398
1	06	06	02	05		Install AMO Diagnostic Equipment	22-Sep-08	3-Oct-08	C	SL_CE1	Hrs	80		9,321		9,321	25%	2,330
1	06	06	02	05		Install Particle Imaging Experiment	27-Oct-08	21-Nov-08	C	SL_PHS	Hrs	80		6,159		6,159	25%	1,540
1	06	06	02	05		Install Particle Imaging Experiment	27-Oct-08	21-Nov-08	C	SL_MFA	Hrs	320		29,032		29,032	25%	7,258
1	06	06	02	05		Install Particle Imaging Experiment	27-Oct-08	21-Nov-08	C	SL_ME1	Hrs	160		16,821		16,821	25%	4,205
1	06	06	02	05		Install Particle Imaging Experiment	27-Oct-08	21-Nov-08	C	SL_CT1	Hrs	160		10,423		10,423	25%	2,606
1	06	06	02	05		Install Particle Imaging Experiment	27-Oct-08	21-Nov-08	C	SL_CP1	Hrs	320		27,761		27,761	25%	6,940
1	06	06	02	05		Install Particle Imaging Experiment	27-Oct-08	21-Nov-08	C	SL_CE1	Hrs	160		19,038		19,038	25%	4,759
1	06	06	02	06		Near Hall Install PPS System						928	-	85,101	-	85,101		22,171
1	06	06	02	06		Shield hutch penetrations	23-Apr-08	25-Apr-08	C	SL_MFA	Hrs	48		4,244		4,244	30%	1,273
1	06	06	02	06		Install NEH PPS cables, chassis, lights	14-Dec-07	2-Jan-08	C	SL_CT1	Hrs	15		952		952	25%	238
1	06	06	02	06		Install NEH PPS cables, chassis, lights	14-Dec-07	2-Jan-08	C	SL_CP1	Hrs	40		3,382		3,382	25%	846
1	06	06	02	06		Install NEH PPS cables, chassis, lights	14-Dec-07	2-Jan-08	C	SL_CE1	Hrs	15		1,740		1,740	25%	435
1	06	06	02	06		Install NEH BCS BSOIC's, cables, AC	14-Dec-07	19-Dec-07	C	SL_MFA	Hrs	64		5,659		5,659	25%	1,415
1	06	06	02	06		Mount sliding doors	11-Dec-07	11-Jan-08	C	SL_MFA	Hrs	320		28,296		28,296	25%	7,074
1	06	06	02	06		Mount sliding doors	11-Dec-07	11-Jan-08	C	SL_ME1	Hrs	160		16,395		16,395	25%	4,099
1	06	06	02	06		Test Kirk lock, emergency egress	14-Jan-08	18-Jan-08	C	SL_MFA	Hrs	40		3,537		3,537	25%	884
1	06	06	02	06		Wire hutch doors	14-Jan-08	18-Jan-08	C	SL_CT1	Hrs	5		317		317	25%	79
1	06	06	02	06		Wire hutch doors	14-Jan-08	18-Jan-08	C	SL_CE1	Hrs	5		580		580	25%	145
1	06	06	02	06		Shield beam pipe	23-Apr-08	25-Apr-08	C	SL_MFA	Hrs	48		4,244		4,244	30%	1,273
1	06	06	02	06		Test/Certify hutch HPS	11-Jul-08	17-Jul-08	C	SL_CP1	Hrs	40		3,382		3,382	30%	1,015

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total		
1	06	06	02	06		Test/Certify hutch HPS	11-Jul-08	17-Jul-08	C	SL_CE1	Hrs	40		4,639		4,639	30%	1,392
1	06	06	02	06		Install/wire/plumb Tunnel Stoppers	4-Feb-08	7-Feb-08	C	SL_MFA	Hrs	64		5,659		5,659	25%	1,415
1	06	06	02	06		Align Tunnel Stoppers/Collimator	8-Feb-08	8-Feb-08	C	SL_MES	Hrs	8		659		659	25%	165
1	06	06	02	06		Shield penetration tube (NEH-TUN)	12-Feb-08	12-Feb-08	C	SL_MFA	Hrs	16		1,415		1,415	30%	424
1	06	06	02	07		Near Hall Install Laser PPS						960	-	87,855	-	87,855		21,964
1	06	06	02	07		Install Laser PPS Finish	26-Jun-08	24-Jul-08	C	SL_CT1	Hrs	80		5,079		5,079	25%	1,270
1	06	06	02	07		Install Laser PPS Finish	26-Jun-08	24-Jul-08	C	SL_CP1	Hrs	160		13,529		13,529	25%	3,382
1	06	06	02	07		Install Laser PPS Finish	26-Jun-08	24-Jul-08	C	SL_CE1	Hrs	80		9,278		9,278	25%	2,319
1	06	06	02	07		Install Laser PPS Preparation	3-Jan-08	31-Jan-08	C	SL_CT1	Hrs	80		5,079		5,079	25%	1,270
1	06	06	02	07		Install Laser PPS Preparation	3-Jan-08	31-Jan-08	C	SL_CP1	Hrs	160		13,529		13,529	25%	3,382
1	06	06	02	07		Install Laser PPS Preparation	3-Jan-08	31-Jan-08	C	SL_CE1	Hrs	80		9,278		9,278	25%	2,319
1	06	06	02	07		Test/Certify Laser PPS	25-Jul-08	21-Aug-08	C	SL_CP1	Hrs	160		13,529		13,529	25%	3,382
1	06	06	02	07		Test/Certify Laser PPS	25-Jul-08	21-Aug-08	C	SL_CE1	Hrs	160		18,555		18,555	25%	4,639
1	06	06	03			Tunnel Install						428	-	39,221	-	39,221		10,348
1	06	06	03			Install stopper tank	28-Mar-08	1-Apr-08	C	SL_TMU	Hrs	48		4,529		4,529	25%	1,132
1	06	06	03			Install stopper tank	28-Mar-08	1-Apr-08	C	SL_MVE	Hrs	12		1,307		1,307	25%	327
1	06	06	03			Install Tunnel PPS cables, chassis, keybank	2-Jan-08	11-Jan-08	C	SL_CT1	Hrs	16		1,016		1,016	25%	254
1	06	06	03			Install Tunnel PPS cables, chassis, keybank	2-Jan-08	11-Jan-08	C	SL_CP1	Hrs	32		2,706		2,706	25%	676
1	06	06	03			Install Tunnel PPS cables, chassis, keybank	2-Jan-08	11-Jan-08	C	SL_CE1	Hrs	16		1,856		1,856	25%	464
1	06	06	03			Install Tunnel BCS BSOIC's, cables, AC	2-Jan-08	4-Jan-08	C	SL_MFA	Hrs	48		4,244		4,244	25%	1,061
1	06	06	03			Mount doors (CF?)	2-Jan-08	8-Jan-08	C	SL_MFA	Hrs	80		7,074		7,074	25%	1,768
1	06	06	03			Test Kirk lock, emergency egress	9-Jan-08	9-Jan-08	C	SL_MFA	Hrs	8		707		707	25%	177
1	06	06	03			Wire Tunnel doors	9-Jan-08	10-Jan-08	C	SL_CT1	Hrs	4		254		254	25%	63
1	06	06	03			Wire Tunnel doors	9-Jan-08	10-Jan-08	C	SL_CP1	Hrs	8		676		676	25%	169
1	06	06	03			Wire Tunnel doors	9-Jan-08	10-Jan-08	C	SL_CE1	Hrs	4		464		464	25%	116
1	06	06	03			Test/Certify Tunnel HPS	22-Apr-08	28-Apr-08	C	SL_CP1	Hrs	40		3,382		3,382	30%	1,015
1	06	06	03			Test/Certify Tunnel HPS	22-Apr-08	28-Apr-08	C	SL_CE1	Hrs	40		4,639		4,639	30%	1,392
1	06	06	03			Wire Tunnel stoppers	2-Apr-08	2-Apr-08	C	SL_MFA	Hrs	8		707		707	25%	177
1	06	06	03			Plumb (air & water) stoppers	3-Apr-08	4-Apr-08	C	SL_MFA	Hrs	32		2,830		2,830	25%	707
1	06	06	03			Install penetration shielding	18-Apr-08	21-Apr-08	C	SL_MFA	Hrs	32		2,830		2,830	30%	849
1	06	06	04			Far Hall Install						1,960	-	174,737	-	174,737		58,988
1	06	06	04	01		Far Hall Install Global Controls						920	-	81,221	-	81,221		30,920
1	06	06	04	01		Install FEH MPS, cables	17-Jan-08	31-Jan-08	C	SL_CT1	Hrs	30		1,905		1,905	40%	762
1	06	06	04	01		Install FEH MPS, cables	17-Jan-08	31-Jan-08	C	SL_CP1	Hrs	60		5,073		5,073	40%	2,029
1	06	06	04	01		Install FEH MPS, cables	17-Jan-08	31-Jan-08	C	SL_CE1	Hrs	30		3,479		3,479	40%	1,392
1	06	06	04	01		Test/Certify MPS	1-Aug-08	7-Aug-08	C	SL_CP1	Hrs	40		3,382		3,382	40%	1,353
1	06	06	04	01		Test/Certify MPS	1-Aug-08	7-Aug-08	C	SL_CE1	Hrs	40		4,639		4,639	40%	1,856
1	06	06	04	01		Install/test FEH controls timing system	7-Feb-08	28-Feb-08	C	SL_CT1	Hrs	50		3,175		3,175	40%	1,270
1	06	06	04	01		Install/test FEH controls timing system	7-Feb-08	28-Feb-08	C	SL_CP1	Hrs	100		8,455		8,455	40%	3,382
1	06	06	04	01		Install/test FEH controls timing system	7-Feb-08	28-Feb-08	C	SL_CE1	Hrs	50		5,799		5,799	40%	2,319
1	06	06	04	01		Install/test global timing system (LBL)	7-Feb-08	13-Mar-08	C	SL_CT1	Hrs	100		6,349		6,349	40%	2,540
1	06	06	04	01		Install/test global timing system (LBL)	7-Feb-08	13-Mar-08	C	SL_CP1	Hrs	200		16,911		16,911	40%	6,764
1	06	06	04	01		Install/test global timing system (LBL)	7-Feb-08	13-Mar-08	C	SL_CE1	Hrs	100		11,597		11,597	40%	4,639
1	06	06	04	01		Install/test ethernet network	16-Jan-08	6-Feb-08	C	SL_CT1	Hrs	30		1,905		1,905	25%	476
1	06	06	04	01		Install/test ethernet network	16-Jan-08	6-Feb-08	C	SL_CP1	Hrs	60		5,073		5,073	25%	1,268
1	06	06	04	01		Install/test ethernet network	16-Jan-08	6-Feb-08	C	SL_CE1	Hrs	30		3,479		3,479	25%	870
1	06	06	04	02		Far Hall Install Mech/Vac												
1	06	06	04	04		Far Hall Install Detectors						720	-	64,293	-	64,293		19,288
1	06	06	04	04		Install final Detector at SLAC	14-Jul-08	22-Aug-08	C	SL_MFA	Hrs	240		21,222		21,222	30%	6,367
1	06	06	04	04		Install final Detector at SLAC	14-Jul-08	22-Aug-08	C	SL_CT1	Hrs	240		15,238		15,238	30%	4,571
1	06	06	04	04		Install final Detector at SLAC	14-Jul-08	22-Aug-08	C	SL_CE1	Hrs	240		27,833		27,833	30%	8,350
1	06	06	04	05		Far Hall Install PPS System						320	-	29,224	-	29,224		8,781

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total		
1	06	06	04	05		Install FEH PPS cables, chassis, lights	17-Jan-08	31-Jan-08	C	SL_CT1	Hrs	15		952		952	25%	238
1	06	06	04	05		Install FEH PPS cables, chassis, lights	17-Jan-08	31-Jan-08	C	SL_CP1	Hrs	40		3,382		3,382	25%	846
1	06	06	04	05		Install FEH PPS cables, chassis, lights	17-Jan-08	31-Jan-08	C	SL_CE1	Hrs	15		1,740		1,740	25%	435
1	06	06	04	05		Wire hutch doors	19-Aug-08	25-Aug-08	C	SL_CT1	Hrs	5		317		317	25%	79
1	06	06	04	05		Wire hutch doors	19-Aug-08	25-Aug-08	C	SL_CE1	Hrs	5		580		580	25%	145
1	06	06	04	05		Install FEH BCS BSOIC's, cables, AC	16-Jan-08	18-Jan-08	C	SL_MFA	Hrs	48		4,244		4,244	25%	1,061
1	06	06	04	05		Shield Vacuum Spools	21-Apr-08	23-Apr-08	C	SL_MFA	Hrs	48		4,244		4,244	30%	1,273
1	06	06	04	05		Test/Certify FEH hutch HPS	26-Aug-08	2-Sep-08	C	SL_CP1	Hrs	40		3,382		3,382	30%	1,015
1	06	06	04	05		Test/Certify FEH hutch HPS	26-Aug-08	2-Sep-08	C	SL_CE1	Hrs	40		4,639		4,639	30%	1,392
1	06	06	04	05		Install/Test FEH Occupancy Safeguards	7-Jul-08	10-Jul-08	C	SL_CT1	Hrs	32		2,032		2,032	40%	813
1	06	06	04	05		Install/Test FEH Occupancy Safeguards	7-Jul-08	10-Jul-08	C	SL_CE1	Hrs	32		3,711		3,711	40%	1,484
1	06	06	05			Electron Dump Enclosure Install						224	-	20,557	-	20,557		5,139
1	06	06	05			Mark floor for drilling	7-Nov-07	7-Nov-07	C	SL_MES	Hrs	24		1,977		1,977	25%	494
1	06	06	05			Install EDE cable tray stubs	8-Nov-07	8-Nov-07	C	SL_MFA	Hrs	16		1,415		1,415	25%	354
1	06	06	05			Install PPS cable	8-Nov-07	14-Nov-07	C	SL_TMU	Hrs	32		3,019		3,019	25%	755
1	06	06	05			Install floor anchors	8-Nov-07	8-Nov-07	C	SL_TMU	Hrs	16		1,510		1,510	25%	377
1	06	06	05			Install support stands	9-Nov-07	9-Nov-07	C	SL_TMU	Hrs	16		1,510		1,510	25%	377
1	06	06	05			Install stopper tank/collimator/fast valve	4-Feb-08	5-Feb-08	C	SL_TMU	Hrs	32		3,019		3,019	25%	755
1	06	06	05			Align stopper tank/collimator/fast valve	7-Feb-08	7-Feb-08	C	SL_MES	Hrs	16		1,318		1,318	25%	330
1	06	06	05			Grout support stands	8-Feb-08	8-Feb-08	C	SL_TMU	Hrs	16		1,510		1,510	25%	377
1	06	06	05			Plumb (air & water) EDE stoppers/fast valve	11-Feb-08	12-Feb-08	C	SL_MFA	Hrs	32		2,830		2,830	25%	707
1	06	06	05			Wire EDE stoppers	13-Feb-08	14-Feb-08	C	SL_MFA	Hrs	8		707		707	25%	177
1	06	06	05			Test EDE stoppers	15-Feb-08	19-Feb-08	C	SL_MVE	Hrs	16		1,743		1,743	25%	436
1	06	07				AMOS Experiment						14,168	2,022,552	1,498,831	2,231,447	3,730,278		1,087,378
1	06	07	01			AP Management & Design						7,376	-	802,134	-	802,134		199,859
1	06	07	01	01		Management						660	-	76,481	-	76,481		15,296
1	06	07	01	01		PRD draft	3-Jul-06	13-Oct-06	C	SL_PHP	Hrs	10		1,204		1,204	20%	241
1	06	07	01	01		PRD reviews and finalization	16-Oct-06	3-Nov-06	C	SL_PHP	Hrs	40		4,925		4,925	20%	985
1	06	07	01	01		ICD to conventional facilities	1-Jun-07	7-Jun-07	C	SL_PHP	Hrs	40		4,925		4,925	20%	985
1	06	07	01	01		ICD between components	5-Jan-07	11-Jan-07	C	SL_PHP	Hrs	40		4,925		4,925	20%	985
1	06	07	01	01		ICD to controls	5-Jan-07	19-Jan-07	C	SL_PHP	Hrs	80		9,850		9,850	20%	1,970
1	06	07	01	01		ICD to LCLS	1-Jun-07	7-Jun-07	C	SL_PHP	Hrs	40		4,925		4,925	20%	985
1	06	07	01	01		Plan assembly/installation X1-high field physics	20-Feb-08	18-Mar-08	C	SL_PHP	Hrs	40		5,053		5,053	20%	1,011
1	06	07	01	01		Plan assembly/installation X1-high field physics	20-Feb-08	18-Mar-08	C	SL_MFA	Hrs	40		3,537		3,537	20%	707
1	06	07	01	01		Plan assembly/installation of refocus optics	20-Feb-08	18-Mar-08	C	SL_PHP	Hrs	30		3,790		3,790	20%	758
1	06	07	01	01		Plan assembly/installation of refocus optics	20-Feb-08	18-Mar-08	C	SL_MFA	Hrs	40		3,537		3,537	20%	707
1	06	07	01	01		Plan assembly/installation of diagnostics	20-Feb-08	18-Mar-08	C	SL_PHP	Hrs	30		3,790		3,790	20%	758
1	06	07	01	01		Plan assembly/installation of diagnostics	20-Feb-08	18-Mar-08	C	SL_MFA	Hrs	40		3,537		3,537	20%	707
1	06	07	01	01		Plan assembly/installation X2 - particle imaging	20-Feb-08	18-Mar-08	C	SL_PHP	Hrs	30		3,790		3,790	20%	758
1	06	07	01	01		Plan assembly/installation X2 - particle imaging	20-Feb-08	18-Mar-08	C	SL_MFA	Hrs	40		3,537		3,537	20%	707
1	06	07	01	01		Plan commissioning	20-Feb-08	18-Mar-08	C	SL_PHP	Hrs	120		15,159		15,159	20%	3,032
1	06	07	01	02		Conceptual Design						1,156	-	127,328	-	127,328		31,284
1	06	07	01	02		Conceptual Engr. - X1 High Field Physics	7-Jul-06	3-Nov-06	C	SL_PHP	Hrs	128		15,471		15,471	25%	3,868
1	06	07	01	02		Conceptual Engr. - X1 High Field Physics	7-Jul-06	3-Nov-06	C	SL_ME1	Hrs	128		12,549		12,549	25%	3,137
1	06	07	01	02		Conceptual Engr. - Refocus Optics	11-Sep-06	3-Nov-06	C	SL_PHP	Hrs	40		4,878		4,878	35%	1,707
1	06	07	01	02		Conceptual Engr. - Refocus Optics	11-Sep-06	3-Nov-06	C	SL_ME1	Hrs	40		3,957		3,957	35%	1,385
1	06	07	01	02		Conceptual Engr. - Diagnostics	11-Sep-06	3-Nov-06	C	SL_PHP	Hrs	40		4,878		4,878	25%	1,219
1	06	07	01	02		Conceptual Engr. - Diagnostics	11-Sep-06	3-Nov-06	C	SL_ME1	Hrs	40		3,957		3,957	25%	989
1	06	07	01	02		Conceptual Engr. - X2 Particle Imaging	11-Sep-06	3-Nov-06	C	SL_PHP	Hrs	80		9,756		9,756	35%	3,414
1	06	07	01	02		Conceptual Engr. - X2 Particle Imaging	11-Sep-06	3-Nov-06	C	SL_ME1	Hrs	80		7,913		7,913	35%	2,770
1	06	07	01	02		SCR Safety Review	6-Nov-06	17-Nov-06	C	SL_PHP	Hrs	60		7,387		7,387	20%	1,477
1	06	07	01	02		SCR Safety Review	6-Nov-06	17-Nov-06	C	SL_ME1	Hrs	80		7,990		7,990	20%	1,598

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$	
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total			
1	06	07	01	02		Prepare/Hold SCR	20-Nov-06	5-Dec-06	C	SL_PHP	Hrs	80		9,850		9,850	20%	1,970	
1	06	07	01	02		Prepare/Hold SCR	20-Nov-06	5-Dec-06	C	SL_ME1	Hrs	80		7,990		7,990	20%	1,598	
1	06	07	01	02		System concept review (SCR)	6-Dec-06	4-Jan-07	C	SL_PHP	Hrs	120		14,775		14,775	20%	2,955	
1	06	07	01	02		System concept review (SCR)	6-Dec-06	4-Jan-07	C	SL_ME1	Hrs	160		15,979		15,979	20%	3,196	
1	06	07	01	03		Preliminary Design						1,980	-	214,483	-	214,483		53,228	
1	06	07	01	03		Preliminary design - X1 High Field Physics	22-Jan-07	2-Apr-07	C	SL_PHP	Hrs	200		24,624		24,624	25%	6,156	
1	06	07	01	03		Preliminary design - X1 High Field Physics	22-Jan-07	2-Apr-07	C	SL_ME1	Hrs	400		39,948		39,948	25%	9,987	
1	06	07	01	03		Preliminary design - Refocus optics	5-Jan-07	19-Mar-07	C	SL_PHP	Hrs	40		4,925		4,925	35%	1,724	
1	06	07	01	03		Preliminary design - Refocus optics	5-Jan-07	19-Mar-07	C	SL_ME1	Hrs	80		7,990		7,990	35%	2,796	
1	06	07	01	03		Contract development - Refocus optics	20-Mar-07	16-Apr-07	C	SL_PHP	Hrs	30		3,694		3,694	20%	739	
1	06	07	01	03		Preliminary design - Diagnostics	5-Jan-07	19-Mar-07	C	SL_PHP	Hrs	80		9,850		9,850	25%	2,462	
1	06	07	01	03		Preliminary design - Diagnostics	5-Jan-07	19-Mar-07	C	SL_ME1	Hrs	160		15,979		15,979	25%	3,995	
1	06	07	01	03		Preliminary design - X2 Particle Imaging	5-Jan-07	19-Mar-07	C	SL_PHP	Hrs	80		9,850		9,850	35%	3,447	
1	06	07	01	03		Preliminary design - X2 Particle Imaging	5-Jan-07	19-Mar-07	C	SL_ME1	Hrs	160		15,979		15,979	35%	5,593	
1	06	07	01	03		PDR Safety Review	3-Apr-07	23-Apr-07	C	SL_PHP	Hrs	90		11,081		11,081	20%	2,216	
1	06	07	01	03		PDR Safety Review	3-Apr-07	23-Apr-07	C	SL_ME1	Hrs	60		5,992		5,992	20%	1,198	
1	06	07	01	03		Prepare/Hold PDR	24-Apr-07	7-May-07	C	SL_PHP	Hrs	80		9,850		9,850	20%	1,970	
1	06	07	01	03		Prepare/Hold PDR	24-Apr-07	7-May-07	C	SL_ME1	Hrs	80		7,990		7,990	20%	1,598	
1	06	07	01	03		Preliminary design review (PDR)	15-May-07	12-Jun-07	C	SL_PHP	Hrs	120		14,775		14,775	20%	2,955	
1	06	07	01	03		Preliminary design review (PDR)	15-May-07	12-Jun-07	C	SL_ME1	Hrs	320		31,958		31,958	20%	6,392	
1	06	07	01	04		Final Design						3,580	-	383,842	-	383,842		100,051	
1	06	07	01	04		Specify components - X1 High Field Physics	3-Apr-07	7-May-07	C	SL_PHP	Hrs	200		24,624		24,624	25%	6,156	
1	06	07	01	04		Specify components - X1 High Field Physics	3-Apr-07	7-May-07	C	SL_ME1	Hrs	100		9,987		9,987	25%	2,497	
1	06	07	01	04		Final design - X1 High Field Physics	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	640		63,961		63,961	25%	15,990	
1	06	07	01	04		Specify components - Refocus optics	17-Apr-07	30-Apr-07	C	SL_PHP	Hrs	80		9,850		9,850	35%	3,447	
1	06	07	01	04		Specify components - Refocus optics	17-Apr-07	30-Apr-07	C	SL_ME1	Hrs	80		7,990		7,990	35%	2,796	
1	06	07	01	04		Final design - Refocus optics	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	160		15,990		15,990	35%	5,597	
1	06	07	01	04		Specify components - Diagnostics	20-Mar-07	2-Apr-07	C	SL_PHP	Hrs	80		9,850		9,850	25%	2,462	
1	06	07	01	04		Specify components - Diagnostics	20-Mar-07	2-Apr-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	07	01	04		Final design - Diagnostics	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	240		23,985		23,985	25%	5,996	
1	06	07	01	04		Specify components - X2 Particle Imaging	20-Mar-07	23-Apr-07	C	SL_PHP	Hrs	200		24,624		24,624	35%	8,619	
1	06	07	01	04		Specify components - X2 Particle Imaging	20-Mar-07	23-Apr-07	C	SL_ME1	Hrs	100		9,987		9,987	35%	3,495	
1	06	07	01	04		Final design - X2 Particle Imaging	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	400		39,975		39,975	35%	13,991	
1	06	07	01	04		FDR Safety Review	5-Oct-07	1-Nov-07	C	SL_PHP	Hrs	120		15,159		15,159	20%	3,032	
1	06	07	01	04		FDR Safety Review	5-Oct-07	1-Nov-07	C	SL_ME1	Hrs	160		16,395		16,395	20%	3,279	
1	06	07	01	04		Prepare/Hold FDR	2-Nov-07	15-Nov-07	C	SL_PHP	Hrs	60		7,579		7,579	20%	1,516	
1	06	07	01	04		Prepare/Hold FDR	2-Nov-07	15-Nov-07	C	SL_ME1	Hrs	160		16,395		16,395	20%	3,279	
1	06	07	01	04		Final design review (FDR)	16-Nov-07	19-Feb-08	C	SL_PHP	Hrs	240		30,317		30,317	20%	6,063	
1	06	07	01	04		Final design review (FDR)	16-Nov-07	19-Feb-08	C	SL_ME1	Hrs	480		49,184		49,184	20%	9,837	
1	06	07	02			AP X1 High Field Physics Exp.						3,540	1,248,661	365,981	1,377,206	1,743,187		492,071	
1	06	07	02			Assemble - X1 High Field Physics	28-Jul-08	22-Sep-08	C	SL_PHP	Hrs	150		18,948		18,948	25%	4,737	
1	06	07	02			Assemble - X1 High Field Physics	28-Jul-08	22-Sep-08	C	SL_PCT	Hrs	40		2,540		2,540	25%	635	
1	06	07	02			Assemble - X1 High Field Physics	28-Jul-08	22-Sep-08	C	SL_MFA	Hrs	200		17,685		17,685	25%	4,421	
1	06	07	02			Assemble - X1 High Field Physics	28-Jul-08	22-Sep-08	C	SL_ME1	Hrs	100		10,247		10,247	25%	2,562	
1	06	07	02			Readiness/Safety Review - X1 High Field Physics	23-Sep-08	6-Oct-08	C	SL_PHP	Hrs	80		10,207		10,207	25%	2,552	
1	06	07	02			Readiness/Safety Review - X1 High Field Physics	23-Sep-08	6-Oct-08	C	SL_MFA	Hrs	80		7,145		7,145	25%	1,786	
1	06	07	02			Testing - X1 High Field Physics	7-Oct-08	3-Nov-08	C	SL_PHP	Hrs	80		10,369		10,369	35%	3,629	
1	06	07	02			Testing - X1 High Field Physics	7-Oct-08	3-Nov-08	C	SL_MFA	Hrs	80		7,258		7,258	35%	2,540	
1	06	07	02	01		X-Ray Fluorescence Detectors						550	600,000	55,017	661,600	716,617		191,917	
1	06	07	02	01		Bid/Evaluate/RFP - X-Ray Fluor. Detector	13-Jun-07	25-Jul-07	C	SL_PHP	Hrs	40		4,925		4,925	25%	1,231	
1	06	07	02	01		Bid/Evaluate/RFP - X-Ray Fluor. Detector	13-Jun-07	25-Jul-07	C	SL_ME1	Hrs	40		3,995		3,995	25%	999	
1	06	07	02	01		Fab/Deliver - X-Ray Fluor. Detector	24-Sep-07	22-Sep-08	C	SA_MSE	\$\$		600,000		661,600		661,600	27%	178,632

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$	
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total			
1	06	07	02	01		Assemble - X-Ray Fluor. Detector	23-Sep-08	13-Oct-08	C	SL_PHP	Hrs	45		5,773		5,773	25%	1,443	
1	06	07	02	01		Assemble - X-Ray Fluor. Detector	23-Sep-08	13-Oct-08	C	SL_MFA	Hrs	120		10,777		10,777	25%	2,694	
1	06	07	02	01		Readiness/Safety Review - X-Ray Fluor. Detector	14-Oct-08	20-Oct-08	C	SL_PHP	Hrs	40		5,184		5,184	20%	1,037	
1	06	07	02	01		Readiness/Safety Review - X-Ray Fluor. Detector	14-Oct-08	20-Oct-08	C	SL_ME1	Hrs	40		4,205		4,205	20%	841	
1	06	07	02	01		Testing - X-Ray Fluor. Detector	21-Oct-08	10-Nov-08	C	SL_PHP	Hrs	45		5,832		5,832	25%	1,458	
1	06	07	02	01		Testing - X-Ray Fluor. Detector	21-Oct-08	10-Nov-08	C	SL_PHP	Hrs	120		8,883		8,883	25%	2,221	
1	06	07	02	01		Testing - X-Ray Fluor. Detector	21-Oct-08	10-Nov-08	C	SL_MFA	Hrs	60		5,443		5,443	25%	1,361	
1	06	07	02	02		Ion Imaging & Electron TOF Detectors						1,340	260,378	135,291	287,250	422,541		115,799	
1	06	07	02	02		Bid/Evaluate/RFP - Elect. TOF Detector	13-Jun-07	4-Oct-07	C	SL_PHP	Hrs	80		9,857		9,857	25%	2,464	
1	06	07	02	02		Bid/Evaluate/RFP - Elect. TOF Detector	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	40		3,998		3,998	25%	999	
1	06	07	02	02		Fab/Deliver - Elect. TOF Detector	5-Nov-07	5-Mar-08	C	SA_MSE	\$\$		169,565		187,065		187,065	33%	61,731
1	06	07	02	02		Bid/Evaluate/RFP - Ion Imaging Detector	13-Jun-07	4-Oct-07	C	SL_PHP	Hrs	80		9,857		9,857	35%	3,450	
1	06	07	02	02		Bid/Evaluate/RFP - Ion Imaging Detector	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	40		3,998		3,998	35%	1,399	
1	06	07	02	02		Fab/Deliver - Ion Imaging Detector	5-Nov-07	30-Apr-08	C	SA_MSE	\$\$		90,813		100,185		100,185	22%	22,041
1	06	07	02	02		Assemble - TOF Detector	16-Apr-08	11-Jun-08	C	SL_PHP	Hrs	105		13,264		13,264	25%	3,316	
1	06	07	02	02		Assemble - TOF Detector	16-Apr-08	11-Jun-08	C	SL_MFA	Hrs	120		10,611		10,611	25%	2,653	
1	06	07	02	02		Readiness/Safety Review - TOF Detector	12-Jun-08	18-Jun-08	C	SL_PHP	Hrs	40		5,053		5,053	20%	1,011	
1	06	07	02	02		Readiness/Safety Review - TOF Detector	12-Jun-08	18-Jun-08	C	SL_ME1	Hrs	40		4,099		4,099	20%	820	
1	06	07	02	02		Testing - TOF Detector	19-Jun-08	17-Jul-08	C	SL_PHP	Hrs	60		7,579		7,579	20%	1,516	
1	06	07	02	02		Testing - TOF Detector	19-Jun-08	17-Jul-08	C	SL_PHP	Hrs	160		11,544		11,544	20%	2,309	
1	06	07	02	02		Testing - TOF Detector	19-Jun-08	17-Jul-08	C	SL_MFA	Hrs	40		3,537		3,537	20%	707	
1	06	07	02	02		Assemble - Ion Imaging Detector	30-May-08	25-Jul-08	C	SL_PHP	Hrs	75		9,474		9,474	25%	2,369	
1	06	07	02	02		Assemble - Ion Imaging Detector	30-May-08	25-Jul-08	C	SL_MFA	Hrs	120		10,611		10,611	25%	2,653	
1	06	07	02	02		Readiness/Safety Review - Ion Imaging Detector	28-Jul-08	1-Aug-08	C	SL_PHP	Hrs	40		5,053		5,053	20%	1,011	
1	06	07	02	02		Readiness/Safety Review - Ion Imaging Detector	28-Jul-08	1-Aug-08	C	SL_ME1	Hrs	40		4,099		4,099	20%	820	
1	06	07	02	02		Testing - Ion Imaging Detector	4-Aug-08	29-Aug-08	C	SL_PHP	Hrs	60		7,579		7,579	20%	1,516	
1	06	07	02	02		Testing - Ion Imaging Detector	4-Aug-08	29-Aug-08	C	SL_PHP	Hrs	160		11,544		11,544	20%	2,309	
1	06	07	02	02		Testing - Ion Imaging Detector	4-Aug-08	29-Aug-08	C	SL_MFA	Hrs	40		3,537		3,537	20%	707	
1	06	07	02	03		Sample Source						600	129,246	63,566	142,585	206,151		52,463	
1	06	07	02	03		Bid/Evaluate/RFP - X1 Sample Source	13-Jun-07	4-Oct-07	C	SL_PHP	Hrs	40		4,928		4,928	25%	1,232	
1	06	07	02	03		Bid/Evaluate/RFP - X1 Sample Source	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	40		3,998		3,998	25%	999	
1	06	07	02	03		Fab/Deliver - X1 Sample Source	5-Nov-07	5-Mar-08	C	SA_MSE	\$\$		129,246		142,585		142,585	26%	37,072
1	06	07	02	03		Assemble - X1 Sample Source	16-Apr-08	11-Jun-08	C	SL_PHP	Hrs	120		15,159		15,159	20%	3,032	
1	06	07	02	03		Assemble - X1 Sample Source	16-Apr-08	11-Jun-08	C	SL_PCT	Hrs	40		2,540		2,540	20%	508	
1	06	07	02	03		Assemble - X1 Sample Source	16-Apr-08	11-Jun-08	C	SL_MFA	Hrs	120		10,611		10,611	20%	2,122	
1	06	07	02	03		Readiness/Safety Review - X1 Sample Source	12-Jun-08	18-Jun-08	C	SL_PHP	Hrs	40		5,053		5,053	35%	1,769	
1	06	07	02	03		Readiness/Safety Review - X1 Sample Source	12-Jun-08	18-Jun-08	C	SL_ME1	Hrs	40		4,099		4,099	35%	1,435	
1	06	07	02	03		Testing - X1 Sample Source	19-Jun-08	17-Jul-08	C	SL_PHP	Hrs	80		10,106		10,106	25%	2,526	
1	06	07	02	03		Testing - X1 Sample Source	19-Jun-08	17-Jul-08	C	SL_MFA	Hrs	80		7,074		7,074	25%	1,768	
1	06	07	02	04		Vacuum System						120	195,837	13,854	216,048	229,902		79,080	
1	06	07	02	04		Bid/Evaluate/RFP - X1 Vacuum System	13-Jun-07	4-Oct-07	C	SL_PHP	Hrs	80		9,857		9,857	25%	2,464	
1	06	07	02	04		Bid/Evaluate/RFP - X1 Vacuum System	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	40		3,998		3,998	25%	999	
1	06	07	02	04		Fab/Deliver - X1 Vacuum System	5-Nov-07	5-Mar-08	C	SA_MSE	\$\$		195,837		216,048		216,048	35%	75,617
1	06	07	02	05		Other X1 Items						120	63,200	13,854	69,723	83,577		29,949	
1	06	07	02	05		Bid/Evaluate/RFP - Differential Pumping	13-Jun-07	4-Oct-07	C	SL_PHP	Hrs	80		9,857		9,857	35%	3,450	
1	06	07	02	05		Bid/Evaluate/RFP - Differential Pumping	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	40		3,998		3,998	35%	1,399	
1	06	07	02	05		Fab/Deliver - Differential Pumping	5-Nov-07	5-Mar-08	C	SA_MSE	\$\$		63,200		69,723		69,723	36%	25,100
1	06	07	03			AP Refocus Optics						820	256,881	89,169	283,874	373,042		131,423	
1	06	07	03			Bid/Evaluate/RFP - Optics Assembly	13-Jun-07	6-Sep-07	C	SL_PHP	Hrs	120		14,775		14,775	35%	5,171	
1	06	07	03			Bid/Evaluate/RFP - Optics Assembly	13-Jun-07	6-Sep-07	C	SL_ME1	Hrs	100		9,987		9,987	35%	3,495	
1	06	07	03			Fab/Deliver - Optics Assembly	8-Oct-07	22-Aug-08	C	SA_MSE	\$\$		65,000		71,708		71,708	45%	32,269
1	06	07	03			Optics Metrology	25-Aug-08	17-Nov-08	C	SL_MSS	\$\$		30,000		33,578		33,578	35%	11,752

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total		
1	06	07	03			Bid/Evaluate/RFP - Optics Chamber	13-Jun-07	4-Oct-07	C	SL_PHP	Hrs	80		9,857		9,857	20%	1,971
1	06	07	03			Bid/Evaluate/RFP - Optics Chamber	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	60		5,996		5,996	20%	1,199
1	06	07	03			Fab/Deliver - Optics Chamber	5-Nov-07	30-Apr-08	C	SA_MSE	\$\$		27,881		30,758	30,758	29%	8,920
1	06	07	03			Bid/Evaluate/RFP - Focus Verification	13-Jun-07	4-Oct-07	C	SL_PHP	Hrs	40		4,928		4,928	35%	1,725
1	06	07	03			Bid/Evaluate/RFP - Focus Verification	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	40		3,998		3,998	35%	1,399
1	06	07	03			Fab/Deliver - Focus Verification	5-Nov-07	5-Mar-08	C	SA_MSE	\$\$		34,000		37,509	37,509	33%	12,378
1	06	07	03			Bid/Evaluate/RFP - RO Stand	13-Jun-07	4-Oct-07	C	SL_PHP	Hrs	40		4,928		4,928	20%	986
1	06	07	03			Bid/Evaluate/RFP - RO Stand	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	40		3,998		3,998	20%	800
1	06	07	03			Fab/Deliver - RO Stand	5-Nov-07	5-Mar-08	C	SA_MSE	\$\$		100,000		110,320	110,320	35%	38,612
1	06	07	03			Assemble - Refocus Optics	18-Nov-08	17-Dec-08	C	SL_PHP	Hrs	60		7,776		7,776	35%	2,722
1	06	07	03			Assemble - Refocus Optics	18-Nov-08	17-Dec-08	C	SL_MFA	Hrs	160		14,516		14,516	35%	5,081
1	06	07	03			Assemble - Refocus Optics	18-Nov-08	17-Dec-08	C	SL_ME1	Hrs	80		8,410		8,410	35%	2,944
1	06	07	04			AP Diagnostics						1,131	282,605	108,627	311,771	420,398		130,263
1	06	07	04			Bid/Evaluate/RFP - Diagnostic Equipment	13-Jun-07	4-Oct-07	C	SL_PHP	Hrs	80		9,857		9,857	35%	3,450
1	06	07	04			Bid/Evaluate/RFP - Diagnostic Equipment	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	40		3,998		3,998	35%	1,399
1	06	07	04			Fab/Deliver - Diagnostic Equipment	5-Nov-07	5-Mar-08	C	SA_MSE	\$\$		282,605		311,771	311,771	34%	106,002
1	06	07	04			Assemble - Diagnostic Equipment	16-Apr-08	20-May-08	C	SL_PHP	Hrs	75		9,474		9,474	20%	1,895
1	06	07	04			Assemble - Diagnostic Equipment	16-Apr-08	20-May-08	C	SL_PCT	Hrs	16		1,016		1,016	20%	203
1	06	07	04			Assemble - Diagnostic Equipment	16-Apr-08	20-May-08	C	SL_MFA	Hrs	200		17,685		17,685	20%	3,537
1	06	07	04			Readiness/Safety Review - Diagnostic Equipment	21-May-08	28-May-08	C	SL_PHP	Hrs	40		5,053		5,053	25%	1,263
1	06	07	04			Readiness/Safety Review - Diagnostic Equipment	21-May-08	28-May-08	C	SL_ME1	Hrs	40		4,099		4,099	25%	1,025
1	06	07	04			Testing - Diagnostic Equipment	29-May-08	19-Sep-08	C	SL_PHP	Hrs	160		20,212		20,212	20%	4,042
1	06	07	04			Testing - Diagnostic Equipment	29-May-08	19-Sep-08	C	SL_PHP	Hrs	320		23,087		23,087	20%	4,617
1	06	07	04			Testing - Diagnostic Equipment	29-May-08	19-Sep-08	C	SL_MFA	Hrs	160		14,148		14,148	20%	2,830
1	06	07	05			AP Particle Imaging Experiment						1,301	234,405	132,920	258,597	391,517		133,761
1	06	07	05			Bid/Evaluate/RFP - X2 Large Area Detector Support	13-Jun-07	4-Oct-07	C	SL_PHP	Hrs	120		14,785		14,785	35%	5,175
1	06	07	05			Bid/Evaluate/RFP - X2 Large Area Detector Support	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	80		7,995		7,995	35%	2,798
1	06	07	05			Fab/Deliver - X2 Large Area Detector Support	5-Nov-07	30-Apr-08	C	SA_MSE	\$\$		50,000		55,160	55,160	45%	24,822
1	06	07	05			Bid/Evaluate/RFP - X2 Vacuum Equipment Support	13-Jun-07	4-Oct-07	C	SL_PHP	Hrs	120		14,785		14,785	35%	5,175
1	06	07	05			Bid/Evaluate/RFP - X2 Vacuum Equipment Support	13-Jun-07	4-Oct-07	C	SL_ME1	Hrs	60		5,996		5,996	35%	2,099
1	06	07	05			Fab/Deliver - X2 Vacuum Equipment	5-Nov-07	30-Apr-08	C	SA_MSE	\$\$		184,405		203,436	203,436	32%	65,100
1	06	07	05			Assemble - X2 Particle Imaging	1-Aug-08	19-Sep-08	C	SL_PHP	Hrs	105		13,264		13,264	35%	4,642
1	06	07	05			Assemble - X2 Particle Imaging	1-Aug-08	19-Sep-08	C	SL_PCT	Hrs	16		1,016		1,016	35%	356
1	06	07	05			Assemble - X2 Particle Imaging	1-Aug-08	19-Sep-08	C	SL_MFA	Hrs	280		24,759		24,759	35%	8,666
1	06	07	05			Assemble - X2 Particle Imaging	1-Aug-08	19-Sep-08	C	SL_ME1	Hrs	140		14,345		14,345	35%	5,021
1	06	07	05			Readiness/Safety Review - X2 Particle Imaging	22-Sep-08	26-Sep-08	C	SL_PHP	Hrs	40		5,053		5,053	35%	1,769
1	06	07	05			Readiness/Safety Review - X2 Particle Imaging	22-Sep-08	26-Sep-08	C	SL_ME1	Hrs	40		4,099		4,099	35%	1,435
1	06	07	05			Testing - X2 Particle Imaging	29-Sep-08	24-Oct-08	C	SL_PHP	Hrs	60		7,761		7,761	25%	1,940
1	06	07	05			Testing - X2 Particle Imaging	29-Sep-08	24-Oct-08	C	SL_PHP	Hrs	160		11,820		11,820	25%	2,955
1	06	07	05			Testing - X2 Particle Imaging	29-Sep-08	24-Oct-08	C	SL_MFA	Hrs	80		7,243		7,243	25%	1,811
1	06	08				Crystals and Gratings						112	20,000	13,660	21,985	35,645		8,911
1	06	08	01			K Measurement Spectrometer						112	20,000	13,660	21,985	35,645		8,911
1	06	08	01			Prepare PRD - K Meas.	21-Aug-06	31-Oct-06	C	SL_PHP	Hrs	72		8,735		8,735	25%	2,184
1	06	08	01			Prepare Bid Docs - Si Crystal (2)	23-Jul-07	3-Aug-07	C	SL_PHP	Hrs	10		1,231		1,231	25%	308
1	06	08	01			Bid and Award - Si Crystal (2)	6-Aug-07	17-Sep-07	C	SL_PHP	Hrs	30		3,694		3,694	25%	923
1	06	08	01			Fab and Deliver - Si Crystal (2)	19-Sep-07	13-Dec-07	C	SA_MSE	\$\$		20,000		21,985	21,985	25%	5,496
1	06	09				Mechanical Systems						4,266	330,000	399,552	354,832	754,384		188,596
1	06	09	01			PPS Stoppers						2,408	300,000	226,640	322,574	549,214		137,304
1	06	09	01			Prepare PRD - PPS Beam Stop Hardware	2-Oct-06	13-Oct-06	C	SL_PHS	Hrs	80		5,851		5,851	25%	1,463
1	06	09	01			PRD Review - PPS Beam Stop Hardware	16-Oct-06	27-Oct-06	C	SL_PHS	Hrs	80		5,851		5,851	25%	1,463
1	06	09	01			Prepare Final Design - PPS Beam Stop Hardware	30-Oct-06	28-Nov-06	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997
1	06	09	01			Prepare Final Design - PPS Beam Stop Hardware	30-Oct-06	28-Nov-06	C	SL_MDD	Hrs	160		13,397		13,397	25%	3,349

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$	
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total			
1	06	09	01			Final Design Review - PPS Beam Stop Hardware	29-Nov-06	12-Dec-06	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	01			Final Design Review - PPS Beam Stop Hardware	29-Nov-06	12-Dec-06	C	SL_MDD	Hrs	80		6,699		6,699	25%	1,675	
1	06	09	01			Prepare for Safety Review - PPS Beam Stop Hardwa	30-Oct-06	28-Nov-06	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	01			Prep Bid Pkg - PPS Beam Stop Hardware	13-Dec-06	25-Jan-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	01			Bid Process - PPS Beam Stop Hardware	26-Jan-07	23-Feb-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	01			Vendor Fab/Ship - PPS Stoppers	27-Feb-07	19-Jun-07	C	SL_ME1	Hrs	8		799		799	25%	200	
1	06	09	01			Vendor Fab/Ship - PPS Stoppers	27-Feb-07	19-Jun-07	C	SA_MSE	\$\$		300,000		322,574		322,574	25%	80,644
1	06	09	01			Assemble FEE - PPS Beam Stop Hardware (2)	20-Jun-07	11-Oct-07	C	SL_MFM	Hrs	160		17,689		17,689	25%	4,422	
1	06	09	01			Assemble FEE - PPS Beam Stop Hardware (2)	20-Jun-07	11-Oct-07	C	SL_MFA	Hrs	320		27,642		27,642	25%	6,911	
1	06	09	01			Assemble FEE - PPS Beam Stop Hardware (2)	20-Jun-07	11-Oct-07	C	SL_ME1	Hrs	160		16,016		16,016	25%	4,004	
1	06	09	01			Assemble NH - PPS Beam Stop Hardware	16-Aug-07	11-Oct-07	C	SL_MFM	Hrs	80		8,865		8,865	25%	2,216	
1	06	09	01			Assemble NH - PPS Beam Stop Hardware	16-Aug-07	11-Oct-07	C	SL_MFA	Hrs	160		13,853		13,853	25%	3,463	
1	06	09	01			Assemble NH - PPS Beam Stop Hardware	16-Aug-07	11-Oct-07	C	SL_ME1	Hrs	80		8,027		8,027	25%	2,007	
1	06	09	01			Assemble Tunnel - PPS Beam Stop Hardware	12-Oct-07	10-Dec-07	C	SL_MFM	Hrs	80		9,054		9,054	25%	2,263	
1	06	09	01			Assemble Tunnel - PPS Beam Stop Hardware	12-Oct-07	10-Dec-07	C	SL_MFA	Hrs	160		14,148		14,148	25%	3,537	
1	06	09	01			Assemble Tunnel - PPS Beam Stop Hardware	12-Oct-07	10-Dec-07	C	SL_ME1	Hrs	80		8,197		8,197	25%	2,049	
1	06	09	01			Assemble EDE - PPS Beam Stop Hardware	20-Jun-07	15-Aug-07	C	SL_MFM	Hrs	80		8,824		8,824	25%	2,206	
1	06	09	01			Assemble EDE - PPS Beam Stop Hardware	20-Jun-07	15-Aug-07	C	SL_MFA	Hrs	160		13,789		13,789	25%	3,447	
1	06	09	01			Assemble EDE - PPS Beam Stop Hardware	20-Jun-07	15-Aug-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	02			PPS Shielding						1,858	30,000	172,912	32,257	205,169		51,292	
1	06	09	02			Prepare Specification - PPS Shielding & Supports	24-Jan-07	6-Feb-07	C	SL_PHS	Hrs	40		2,926		2,926	25%	731	
1	06	09	02			Develop RP Reqmnts - PPS Shielding & Supports	2-Jan-07	30-Jan-07	C	SL_PHS	Hrs	40		2,926		2,926	25%	731	
1	06	09	02			Prepare Conceptual Design - PPS Shielding & Supp	7-Feb-07	21-Feb-07	C	SL_PHS	Hrs	8		585		585	25%	146	
1	06	09	02			Prepare Conceptual Design - PPS Shielding & Supp	7-Feb-07	21-Feb-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	02			Prepare Conceptual Design - PPS Shielding & Supp	7-Feb-07	21-Feb-07	C	SL_MDD	Hrs	40		3,349		3,349	25%	837	
1	06	09	02			Conceptual Design Review - PPS Shielding & Supp	22-Feb-07	7-Mar-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	02			Conceptual Design Review - PPS Shielding & Supp	22-Feb-07	7-Mar-07	C	SL_MDD	Hrs	80		6,699		6,699	25%	1,675	
1	06	09	02			Prepare Preliminary Design - PPS Shielding/Supp	8-Mar-07	4-Apr-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	02			Prepare Preliminary Design - PPS Shielding/Supp	8-Mar-07	4-Apr-07	C	SL_MDD	Hrs	160		13,397		13,397	25%	3,349	
1	06	09	02			Preliminary Design Review - PPS Shielding/Supp	5-Apr-07	18-Apr-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	02			Preliminary Design Review - PPS Shielding/Supp	5-Apr-07	18-Apr-07	C	SL_MDD	Hrs	80		6,699		6,699	25%	1,675	
1	06	09	02			Prepare Final Design - PPS Shielding & Supports	19-Apr-07	16-May-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	02			Prepare Final Design - PPS Shielding & Supports	19-Apr-07	16-May-07	C	SL_MDD	Hrs	160		13,397		13,397	25%	3,349	
1	06	09	02			Prepare for Safety/RP Review - Shielding & Suppt	19-Apr-07	16-May-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	02			Final Design Review - PPS Shielding & Supports	17-May-07	31-May-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	02			Final Design Review - PPS Shielding & Supports	17-May-07	31-May-07	C	SL_MDD	Hrs	80		6,699		6,699	25%	1,675	
1	06	09	02			Prep Bid Pkg - PPS Shielding & Supports	1-Jun-07	28-Jun-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	02			Bid Process - PPS Shielding & Supports	29-Jun-07	27-Jul-07	C	SL_ME1	Hrs	80		7,990		7,990	25%	1,997	
1	06	09	02			Deliver/Ship - PPS Shielding & Supports	31-Jul-07	27-Aug-07	C	SL_MSE	\$\$		30,000		32,257		32,257	25%	8,064
1	06	09	02			Fab/Assemble EDE - PPS Shielding & Supports	28-Aug-07	4-Sep-07	C	SL_MFM	Hrs	40		4,412		4,412	25%	1,103	
1	06	09	02			Fab/Assemble EDE - PPS Shielding & Supports	28-Aug-07	4-Sep-07	C	SL_MFA	Hrs	40		3,447		3,447	25%	862	
1	06	09	02			Fab/Assemble EDE - PPS Shielding & Supports	28-Aug-07	4-Sep-07	C	SL_ME1	Hrs	10		999		999	25%	250	
1	06	09	02			Fab/Assemble FEE - PPS Shielding & Supports	5-Sep-07	11-Sep-07	C	SL_MFM	Hrs	40		4,412		4,412	25%	1,103	
1	06	09	02			Fab/Assemble FEE - PPS Shielding & Supports	5-Sep-07	11-Sep-07	C	SL_MFA	Hrs	40		3,447		3,447	25%	862	
1	06	09	02			Fab/Assemble FEE - PPS Shielding & Supports	5-Sep-07	11-Sep-07	C	SL_ME1	Hrs	10		999		999	25%	250	
1	06	09	02			Fab/Assemble NH - PPS Shielding & Supports	12-Sep-07	18-Sep-07	C	SL_MFM	Hrs	40		4,412		4,412	25%	1,103	
1	06	09	02			Fab/Assemble NH - PPS Shielding & Supports	12-Sep-07	18-Sep-07	C	SL_MFA	Hrs	40		3,447		3,447	25%	862	
1	06	09	02			Fab/Assemble NH - PPS Shielding & Supports	12-Sep-07	18-Sep-07	C	SL_ME1	Hrs	10		999		999	25%	250	
1	06	09	02			Fab/Assemble Tunnel - PPS Shielding & Supports	19-Sep-07	25-Sep-07	C	SL_MFM	Hrs	40		4,412		4,412	25%	1,103	
1	06	09	02			Fab/Assemble Tunnel - PPS Shielding & Supports	19-Sep-07	25-Sep-07	C	SL_MFA	Hrs	40		3,447		3,447	25%	862	
1	06	09	02			Fab/Assemble Tunnel - PPS Shielding & Supports	19-Sep-07	25-Sep-07	C	SL_ME1	Hrs	10		999		999	25%	250	
1	06	09	02			Fab/Assemble FH - PPS Shielding & Supports	26-Sep-07	2-Oct-07	C	SL_MFM	Hrs	40		4,431		4,431	25%	1,108	

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$	
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total			
1	06	09	02			Fab/Assemble FH - PPS Shielding & Supports	26-Sep-07	2-Oct-07	C	SL_MFA	Hrs	40		3,462		3,462	25%	866	
1	06	09	02			Fab/Assemble FH - PPS Shielding & Supports	26-Sep-07	2-Oct-07	C	SL_ME1	Hrs	10		1,003		1,003	25%	251	
2	06					X-RAY END STATION SYSTEMS (OPC)						16,440	2,879,030	1,759,261	3,177,115	4,936,376		-	
2	06	01				XE System Mgmt & Integration						8,764	20,000	959,798	29,809	989,608		-	
2	06	01				X-Ray End Stations Pre-Operations	8-Feb-08	31-Mar-09	X	SL_PHS	Hrs	3,962		345,762		345,762			
2	06	01				X-Ray End Stations Pre-Operations	8-Feb-08	31-Mar-09	X	SL_PHP	Hrs	1,981		291,030		291,030			
2	06	01				X-Ray End Stations Pre-Operations	8-Feb-08	31-Mar-09	X	SL_ME1	Hrs	991		118,094		118,094			
2	06	01				X-Ray End Stations Pre-Operations	8-Feb-08	31-Mar-09	X	SL_EE1	Hrs	991		110,231		110,231			
2	06	01				Management & Oversight - FY09	1-Oct-08	31-Mar-09	X	SL_EE1	Hrs	839		94,682		94,682			
2	06	01				Travel FY-09	1-Oct-08	31-Mar-09	X	SL_MST	\$\$		20,000		29,809		29,809		
2	06	01	01			Management													
2	06	02				Controls Subsystem						400	-	38,573	-	38,573		-	
2	06	03				Commissioning						6,636	-	688,672	-	688,672		-	
2	06	03	01			Commissioning - Controls						3,940	-	408,744	-	408,744		-	
2	06	03	01			Test Near Hall - Cabling	22-Jan-08	4-Feb-08	X	SL_PHS	Hrs	40		3,452		3,452			
2	06	03	01			Test Near Hall - Cabling	22-Jan-08	4-Feb-08	X	SL_EE1	Hrs	40		4,400		4,400			
2	06	03	01			Test Near Hall - Network	10-Jun-08	23-Jun-08	X	SL_PHS	Hrs	40		3,452		3,452			
2	06	03	01			Test Near Hall - Network	10-Jun-08	23-Jun-08	X	SL_EE1	Hrs	40		4,400		4,400			
2	06	03	01			Test Near Hall - Network	10-Jun-08	23-Jun-08	X	SL_CT1	Hrs	40		2,921		2,921			
2	06	03	01			Test Near Hall - Network	10-Jun-08	23-Jun-08	X	SL_CE1	Hrs	40		5,335		5,335			
2	06	03	01			Test Tunnel - Network	9-Jul-08	15-Jul-08	X	SL_PHS	Hrs	40		3,452		3,452			
2	06	03	01			Test Tunnel - Network	9-Jul-08	15-Jul-08	X	SL_EE1	Hrs	40		4,400		4,400			
2	06	03	01			Test Tunnel - Network	9-Jul-08	15-Jul-08	X	SL_CT1	Hrs	40		2,921		2,921			
2	06	03	01			Test Tunnel - Network	9-Jul-08	15-Jul-08	X	SL_CE1	Hrs	40		5,335		5,335			
2	06	03	01			Test Near Hall - PC Support	15-Apr-08	28-Apr-08	X	SL_PHS	Hrs	40		3,452		3,452			
2	06	03	01			Test Near Hall - PC Support	15-Apr-08	28-Apr-08	X	SL_EE1	Hrs	40		4,400		4,400			
2	06	03	01			Test Near Hall - PC Support	15-Apr-08	28-Apr-08	X	SL_CT1	Hrs	40		2,921		2,921			
2	06	03	01			Test Near Hall - PC Support	15-Apr-08	28-Apr-08	X	SL_CE1	Hrs	40		5,335		5,335			
2	06	03	01			Test Near Hall - Beamline Control	6-Oct-08	17-Oct-08	X	SL_PHS	Hrs	40		3,542		3,542			
2	06	03	01			Test Near Hall - Beamline Control	6-Oct-08	17-Oct-08	X	SL_EE1	Hrs	40		4,514		4,514			
2	06	03	01			Test Near Hall - Beamline Control	6-Oct-08	17-Oct-08	X	SL_CP1	Hrs	40		3,991		3,991			
2	06	03	01			Test Near Hall - Beamline Control	6-Oct-08	17-Oct-08	X	SL_CE1	Hrs	40		5,473		5,473			
2	06	03	01			Test Near Hall - Laser PPS	22-Aug-08	28-Aug-08	X	SL_PHS	Hrs	40		3,452		3,452			
2	06	03	01			Test Near Hall - Laser PPS	22-Aug-08	28-Aug-08	X	SL_CE1	Hrs	40		5,335		5,335			
2	06	03	01			Integrate with Controls	1-Apr-08	28-Apr-08	X	SL_PHS	Hrs	80		6,904		6,904			
2	06	03	01			Integrate with Controls	1-Apr-08	28-Apr-08	X	SL_EE1	Hrs	80		8,799		8,799			
2	06	03	01			Integrate with Controls	1-Apr-08	28-Apr-08	X	SL_CT1	Hrs	80		5,841		5,841			
2	06	03	01			Integrate with Controls	1-Apr-08	28-Apr-08	X	SL_CE1	Hrs	80		10,669		10,669			
2	06	03	01			Test Near Hall - User Safeguards	8-Nov-07	14-Nov-07	X	SL_PHS	Hrs	40		3,452		3,452			
2	06	03	01			Test Near Hall - User Safeguards	8-Nov-07	14-Nov-07	X	SL_CE1	Hrs	40		5,335		5,335			
2	06	03	01			Commission Far Hall - Cabling	28-Jul-08	22-Aug-08	X	SL_TMU	Hrs	20		2,266		2,266			
2	06	03	01			Commission Far Hall - Cabling	28-Jul-08	22-Aug-08	X	SL_CT1	Hrs	40		2,921		2,921			
2	06	03	01			Commission Far Hall - Cabling	28-Jul-08	22-Aug-08	X	SL_CE1	Hrs	40		5,335		5,335			
2	06	03	01			Commission Tunnel - Cabling	13-May-08	10-Jun-08	X	SL_TMU	Hrs	20		2,266		2,266			
2	06	03	01			Commission Tunnel - Cabling	13-May-08	10-Jun-08	X	SL_CT1	Hrs	40		2,921		2,921			
2	06	03	01			Commission Tunnel - Cabling	13-May-08	10-Jun-08	X	SL_CE1	Hrs	40		5,335		5,335			
2	06	03	01			Commission FEE - Cabling	28-May-08	24-Jun-08	X	SL_TMU	Hrs	20		2,266		2,266			
2	06	03	01			Commission FEE - Cabling	28-May-08	24-Jun-08	X	SL_CT1	Hrs	40		2,921		2,921			
2	06	03	01			Commission FEE - Cabling	28-May-08	24-Jun-08	X	SL_CE1	Hrs	40		5,335		5,335			
2	06	03	01			Commission Near Hall - Cabling	5-Feb-08	4-Mar-08	X	SL_TMU	Hrs	20		2,266		2,266			
2	06	03	01			Commission Near Hall - Cabling	5-Feb-08	4-Mar-08	X	SL_CT1	Hrs	40		2,921		2,921			
2	06	03	01			Commission Near Hall - Cabling	5-Feb-08	4-Mar-08	X	SL_CE1	Hrs	40		5,335		5,335			

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total		
2	06	03	01			Commission - Network	8-Dec-08	15-Jan-09	X	SL_PHS	Hrs	40		3,542		3,542		
2	06	03	01			Commission - Network	8-Dec-08	15-Jan-09	X	SL_EE1	Hrs	40		4,514		4,514		
2	06	03	01			Commission - Network	8-Dec-08	15-Jan-09	X	SL_CT1	Hrs	40		2,996		2,996		
2	06	03	01			Commission - Network	8-Dec-08	15-Jan-09	X	SL_CE1	Hrs	40		5,473		5,473		
2	06	03	01			Commission - Network	8-Dec-08	15-Jan-09	X	SL_PHS	Hrs	40		3,542		3,542		
2	06	03	01			Commission - Network	8-Dec-08	15-Jan-09	X	SL_EE1	Hrs	140		15,799		15,799		
2	06	03	01			Commission - Network	8-Dec-08	15-Jan-09	X	SL_CT1	Hrs	40		2,996		2,996		
2	06	03	01			Commission - Network	8-Dec-08	15-Jan-09	X	SL_CE1	Hrs	40		5,473		5,473		
2	06	03	01			Commission - PC Support	24-Jul-08	20-Aug-08	X	SL_PHS	Hrs	40		3,452		3,452		
2	06	03	01			Commission - PC Support	24-Jul-08	20-Aug-08	X	SL_EE1	Hrs	40		4,400		4,400		
2	06	03	01			Commission - PC Support	24-Jul-08	20-Aug-08	X	SL_CP1	Hrs	40		3,889		3,889		
2	06	03	01			Commission - PC Support	24-Jul-08	20-Aug-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission - Beamline Control	14-Apr-08	9-May-08	X	SL_PHS	Hrs	80		6,904		6,904		
2	06	03	01			Commission - Beamline Control	14-Apr-08	9-May-08	X	SL_CT1	Hrs	80		5,841		5,841		
2	06	03	01			Commission - Beamline Control	14-Apr-08	9-May-08	X	SL_CP1	Hrs	80		7,779		7,779		
2	06	03	01			Commission - Beamline Control	14-Apr-08	9-May-08	X	SL_CE1	Hrs	80		10,669		10,669		
2	06	03	01			Commission FEE - X-Ray PPS	6-May-08	3-Jun-08	X	SL_ME1	Hrs	40		4,713		4,713		
2	06	03	01			Commission FEE - X-Ray PPS	6-May-08	3-Jun-08	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission FEE - X-Ray PPS	6-May-08	3-Jun-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission Near Hall - X-Ray PPS	18-Jul-08	14-Aug-08	X	SL_ME1	Hrs	40		4,713		4,713		
2	06	03	01			Commission Near Hall - X-Ray PPS	18-Jul-08	14-Aug-08	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission Near Hall - X-Ray PPS	18-Jul-08	14-Aug-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission Far Hall X-Ray PPS	3-Sep-08	30-Sep-08	X	SL_ME1	Hrs	40		4,713		4,713		
2	06	03	01			Commission Far Hall X-Ray PPS	3-Sep-08	30-Sep-08	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission Far Hall X-Ray PPS	3-Sep-08	30-Sep-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission Tunnel - X-Ray PPS	29-Apr-08	27-May-08	X	SL_ME1	Hrs	40		4,713		4,713		
2	06	03	01			Commission Tunnel - X-Ray PPS	29-Apr-08	27-May-08	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission Tunnel - X-Ray PPS	29-Apr-08	27-May-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission Near Hall - X-Ray MPS	7-Aug-08	4-Sep-08	X	SL_ME1	Hrs	40		4,713		4,713		
2	06	03	01			Commission Near Hall - X-Ray MPS	7-Aug-08	4-Sep-08	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission Near Hall - X-Ray MPS	7-Aug-08	4-Sep-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission Tunnel - X-Ray MPS	29-Apr-08	27-May-08	X	SL_ME1	Hrs	40		4,713		4,713		
2	06	03	01			Commission Tunnel - X-Ray MPS	29-Apr-08	27-May-08	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission Tunnel - X-Ray MPS	29-Apr-08	27-May-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission Far Hall - X-Ray MPS	8-Aug-08	5-Sep-08	X	SL_ME1	Hrs	40		4,713		4,713		
2	06	03	01			Commission Far Hall - X-Ray MPS	8-Aug-08	5-Sep-08	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission Far Hall - X-Ray MPS	8-Aug-08	5-Sep-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission FEE - X-Ray MPS	22-Aug-08	19-Sep-08	X	SL_ME1	Hrs	40		4,713		4,713		
2	06	03	01			Commission FEE - X-Ray MPS	22-Aug-08	19-Sep-08	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission FEE - X-Ray MPS	22-Aug-08	19-Sep-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission Near Hall - Laser PPS	29-Aug-08	26-Sep-08	X	SL_PHS	Hrs	40		3,452		3,452		
2	06	03	01			Commission Near Hall - Laser PPS	29-Aug-08	26-Sep-08	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission Near Hall - Laser PPS	29-Aug-08	26-Sep-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission Far Hall - Laser PPS	8-Jan-08	5-Feb-08	X	SL_PHS	Hrs	40		3,452		3,452		
2	06	03	01			Commission Far Hall - Laser PPS	8-Jan-08	5-Feb-08	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission Far Hall - Laser PPS	8-Jan-08	5-Feb-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission Far Hall - User Safeguards	11-Jul-08	7-Aug-08	X	SL_PHS	Hrs	40		3,452		3,452		
2	06	03	01			Commission Far Hall - User Safeguards	11-Jul-08	7-Aug-08	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission Far Hall - User Safeguards	11-Jul-08	7-Aug-08	X	SL_CE1	Hrs	40		5,335		5,335		
2	06	03	01			Commission Near Hall - User Safeguards	15-Nov-07	14-Dec-07	X	SL_PHS	Hrs	40		3,452		3,452		
2	06	03	01			Commission Near Hall - User Safeguards	15-Nov-07	14-Dec-07	X	SL_CT1	Hrs	40		2,921		2,921		
2	06	03	01			Commission Near Hall - User Safeguards	15-Nov-07	14-Dec-07	X	SL_CE1	Hrs	40		5,335		5,335		

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total		
2	06	03	02			Commissioning - XES Laser						1,976	-	207,776	-	207,776		-
2	06	03	02			Test Near Hall - Oscillator Laser/Pum	16-Oct-08	22-Oct-08	X	SL_TMU	Hrs	8		930		930		
2	06	03	02			Test Near Hall - Oscillator Laser/Pum	16-Oct-08	22-Oct-08	X	SL_PHS	Hrs	40		3,542		3,542		
2	06	03	02			Test Near Hall - Oscillator Laser/Pum	16-Oct-08	22-Oct-08	X	SL_MFA	Hrs	8		835		835		
2	06	03	02			Final Check Near Hall - Oscillator Laser/Pump	9-Oct-08	15-Oct-08	X	SL_PHS	Hrs	40		3,542		3,542		
2	06	03	02			Final Check Near Hall - Oscillator Laser/Pump	9-Oct-08	15-Oct-08	X	SL_EE1	Hrs	40		4,514		4,514		
2	06	03	02			Commission Valves - Vacuum	29-May-08	25-Jun-08	X	SL_MVE	Hrs	20		2,506		2,506		
2	06	03	02			Commission Valves - Vacuum	29-May-08	25-Jun-08	X	SL_MFA	Hrs	20		2,034		2,034		
2	06	03	02			Commission Ion Pump - Vacuum	28-May-08	24-Jun-08	X	SL_MVE	Hrs	20		2,506		2,506		
2	06	03	02			Commission Ion Pump - Vacuum	28-May-08	24-Jun-08	X	SL_MFA	Hrs	20		2,034		2,034		
2	06	03	02			Commission Turbo Pump - Vacuum	20-May-08	17-Jun-08	X	SL_MVE	Hrs	20		2,506		2,506		
2	06	03	02			Commission Turbo Pump - Vacuum	20-May-08	17-Jun-08	X	SL_MFA	Hrs	20		2,034		2,034		
2	06	03	02			Commission Gauges - Vacuum	24-Jul-08	20-Aug-08	X	SL_MVE	Hrs	20		2,506		2,506		
2	06	03	02			Commission Gauges - Vacuum	24-Jul-08	20-Aug-08	X	SL_MFA	Hrs	20		2,034		2,034		
2	06	03	02			Commission Near Hall - Oscillator Laser/Pump	23-Oct-08	19-Nov-08	X	SL_PHS	Hrs	480		42,499		42,499		
2	06	03	02			Commission Near Hall - Oscillator Laser/Pump	23-Oct-08	19-Nov-08	X	SL_CE1	Hrs	120		16,420		16,420		
2	06	03	02			Commission - Laser Diagnostics	14-Apr-08	8-Jul-08	X	SL_PHS	Hrs	60		5,178		5,178		
2	06	03	02			Commission - Optic Transport	25-Jul-08	21-Aug-08	X	SL_PHS	Hrs	20		1,726		1,726		
2	06	03	02			Commission - Optic Transport	25-Jul-08	21-Aug-08	X	SL_MFA	Hrs	20		2,034		2,034		
2	06	03	02			Commission - Optic Transport	25-Jul-08	21-Aug-08	X	SL_ME1	Hrs	20		2,357		2,357		
2	06	03	02			Commission Far Hall - Laser Timing	3-Sep-08	4-Mar-09	X	SL_PHS	Hrs	240		21,167		21,167		
2	06	03	02			Commission Far Hall - Laser Timing	3-Sep-08	4-Mar-09	X	SL_CT1	Hrs	120		8,954		8,954		
2	06	03	02			Commission Far Hall - Laser Timing	3-Sep-08	4-Mar-09	X	SL_CE1	Hrs	480		65,424		65,424		
2	06	03	02			Commission Near Hall - Laser Amplifiers	7-Jul-08	6-Jan-09	X	SL_PHS	Hrs	120		10,498		10,498		
2	06	03	03			Commissioning - AMO Experiment						240	-	27,944	-	27,944		-
2	06	03	03			Commission Far Hall Experiment Chamber - Vacuum	15-Apr-08	12-May-08	X	SL_MVE	Hrs	40		5,012		5,012		
2	06	03	03			Commission Far Hall Experiment Chamber - Vacuum	15-Apr-08	12-May-08	X	SL_MFA	Hrs	40		4,068		4,068		
2	06	03	03			Commission Far Hall Experiment Chamber - Vacuum	15-Apr-08	12-May-08	X	SL_ME1	Hrs	40		4,713		4,713		
2	06	03	03			Commission Near Hall Experiment Chamber - Vacuum	11-Nov-08	10-Dec-08	X	SL_MVE	Hrs	40		5,142		5,142		
2	06	03	03			Commission Near Hall Experiment Chamber - Vacuum	11-Nov-08	10-Dec-08	X	SL_MFA	Hrs	40		4,173		4,173		
2	06	03	03			Commission Near Hall Experiment Chamber - Vacuum	11-Nov-08	10-Dec-08	X	SL_ME1	Hrs	40		4,836		4,836		
2	06	03	05			Commissioning - 2D X-Ray Detector						480	-	44,208	-	44,208		-
2	06	03	05			Commission - 2-D X-Ray Detector	21-Oct-08	29-Oct-08	X	SL_PHS	Hrs	160		14,166		14,166		
2	06	03	05			Commission - 2-D X-Ray Detector	21-Oct-08	29-Oct-08	X	SL_EE1	Hrs	160		18,056		18,056		
2	06	03	05			Commission - 2-D X-Ray Detector	21-Oct-08	29-Oct-08	X	SL_CT1	Hrs	160		11,986		11,986		
2	06	04				Spares						640	120,000	72,218	129,916	202,134		-
2	06	04	01			Spares - PPS Stoppers						640	120,000	72,218	129,916	202,134		-
2	06	04	01			Vendor Fab/Ship - Spare PPS Stoppers	27-Feb-07	26-Mar-07	S	SA_MSE	\$\$		120,000		129,916	129,916		
2	06	04	01			Assemble - Spare PPS Beam Stop Hardware (2)	11-Dec-07	18-Apr-08	S	SL_MFM	Hrs	160		20,823		20,823		
2	06	04	01			Assemble - Spare PPS Beam Stop Hardware (2)	11-Dec-07	18-Apr-08	S	SL_MFA	Hrs	320		32,540		32,540		
2	06	04	01			Assemble - Spare PPS Beam Stop Hardware (2)	11-Dec-07	18-Apr-08	S	SL_ME1	Hrs	160		18,854		18,854		
2	06	04	02			Spares -												
2	06	04	03			Spares -												
2	06	04	04			Spares -												
2	06	04	05			Spares -												
2	06	05				X-Ray Detectors						-	2,739,030	-	3,017,389	3,017,389		-
2	06	05	01			Beam Imaging						-	2,739,030	-	3,017,389	3,017,389		-
2	06	05	02			2-D X-Ray Detector						-	2,739,030	-	3,017,389	3,017,389		-
2	06	05	02			Cornell Labor/Materials Jul-Sep2006	3-Jul-06	29-Sep-06	R	SA_MSS	\$\$		28,530		30,105	30,105		
2	06	05	02			Cornell Labor/Materials Q4 CY06	2-Oct-06	29-Dec-06	R	SA_MSS	\$\$		217,500		235,473	235,473		
2	06	05	02			Cornell Labor/Materials Q1-Q3 CY07	2-Jan-07	28-Sep-07	R	SA_MSS	\$\$		480,000		519,665	519,665		
2	06	05	02			Cornell Labor/Materials Q4 CY07	1-Oct-07	27-Dec-07	R	SA_MSS	\$\$		160,000		177,725	177,725		

Detailed Cost Estimate
X-RAY ENDSTATIONS SYSTEMS

WBS Level						LCLA DCE Aug-2006 Description	Early Start	Early Finish	Fund Type	Res Code	Units	Work Rem. Bud. Qty		Work Rem. Full Burd and Escltd Cost			Contngcy %	Contingency \$
1	2	3	4	5	6							Hours	\$	Labor	M&S	Total		
2	06	05	02			Cornell Labor/Materials Q1-Q3 CY08	2-Jan-08	30-Sep-08	R	SA_MSS	\$\$		817,500		908,066	908,066		
2	06	05	02			Cornell Labor/Materials Q4 CY08	1-Oct-08	31-Dec-08	R	SA_MSS	\$\$		272,500		310,558	310,558		
2	06	05	02	01		Proto 2 ASIC						-	-	-	-	-		-
2	06	05	02	01		Fabrication of Proto 2 ASIC	3-Jul-06	31-Jul-06	R	SA_MSS	\$\$		-		-	-		
2	06	05	02	02		Proto 3 ASIC						-	21,000	-	22,735	22,735		-
2	06	05	02	02		Fabrication of Proto 3 ASIC	5-Oct-06	5-Dec-06	R	SA_MSS	\$\$		21,000		22,735	22,735		
2	06	05	02	03		Full Lot Prototype						-	350,000	-	378,922	378,922		-
2	06	05	02	03		Fabricate Detector Diode	2-Oct-06	26-Feb-07	R	SA_MSS	\$\$		80,000		86,611	86,611		
2	06	05	02	03		Fabricate Full Lot ASIC	27-Feb-07	25-Apr-07	R	SA_MSS	\$\$		200,000		216,527	216,527		
2	06	05	02	03		Bump Bond & Assemble Prototype Detector	10-May-07	7-Jun-07	R	SA_MSS	\$\$		70,000		75,784	75,784		
2	06	05	02	04		500px Detector						-	392,000	-	434,139	434,139		-
2	06	05	02	04		Fabricate Proto 4 ASIC	6-Apr-07	1-Jun-07	R	SA_MSS	\$\$		42,000		45,471	45,471		
2	06	05	02	04		Fabricate final detector ASIC	8-Oct-07	4-Dec-07	R	SA_MSS	\$\$		200,000		222,157	222,157		
2	06	05	02	04		Fabricate final Detector Diode	24-Sep-07	20-Feb-08	R	SA_MSS	\$\$		80,000		88,757	88,757		
2	06	05	02	04		Bump Bond ASIC to final Detector	21-Feb-08	19-Mar-08	R	SA_MSS	\$\$		70,000		77,755	77,755		