LCLS Risk Registry
april 2007

No.	Risk Title	Date Submitted	Submitted By	Date Last Revised	Owner	If / Then	Risk Timeframe Which phase could this event occur?	Probability of Event (percentage)	Cost Impact (AYK$))	Risk Severity Level	Risk Contingency (1000s) Total Risk Contingency	Risk Contingency (1000s) High Risk Items	Risk Handling Approach	Steps for Handling the Risk (Punch List)	Risk Retired - Mark "X" for Yes and date
1.1	**Management**														
R1.1-020	Contingency Analysis	10/2/2006	Mark Reichanadter	10/2/2006	Mark Reichanadter	The project does not have a clear understanding of its contingency needs for the remainder of the project … then there is the potential for committing to too much (or not enough) scope.	Design, Construction	**10%**	**$5,000**	**2**	**$500**		Mitigate	1. Perform a semi-annual bottoms-up risk-based contingency analysis on remaining work (T. Mast) 2. Perform a Monte-Carlo assessment annually to validate the bottoms-up contingency analysis (T. Mast). 3. Perform monthly assessment of Estimate at Complete (M. Reichanadter). 4. Perform monthly assessment of contingency on 'commitments to go' after reserving adequate contingency for scope under contract.	
R1.1-021	Control Account Mischarges leading to Variances	10/2/2006	Mark Reichanadter	2/22/2007	System Managers (Schultz; Reichanadter; Saenz; Arthur)	The project control acounts are not regularly monitored … then there is the potential for mischarges which lead to erroneous variances.	Desig, Construction, commissioning	**20%**	**$5,000**	**2**	**$1,000**		Mitigate	• Establish procedures to close control accounts - January 2007. • Establish Hammer Tool to track budget vs actuals – January 2007.	
R1.1-022	Installation Schedule	10/19/2006	R.M. Boyce	5/18/2007	R.M Boyce	If the major installation period beginning November 2007, is not well-doumented and integrated throughout the project … then there is a risk of not meeting the start of commissioning milestones	Construction, Installation	**20%**	**$5,000**	**2**	**$1,000**		Mitigate	1. Establish high level management meetings to review installation schedule and milestones - April 2, 2007 2. Determine scheduling and reporting methods to be used for downtime - April 2, 2007 3. Integrate LCLS installation planning with other SLAC Operating programs to lessen impacts - April 15, 2007 4. Establish planning meetings to develop and integrate installation & checkout tasks at systems levels - April 15, 2007 5. Create, distribute and review the installation schedule to ensure total project wide agreement - April 15, 2007" 6. Establish Blanket Ordering Agreements (BOA) for installation - May 15, 2007	
R-1.1-023	Deputy Controls Manager	4/9/2007	Dave Schultz	4/9/2007	Dave Schultz	If LCLS Controls manpower needs cannot be filled in a timely manner … then personnel overload will lead to poor documentation and delays.	Design, Construction	**50%**	**$100**	**3**	**$50**	**$50**	Mitigate	• Offer to qualified person (Mar. 07) - turned down • Make offer(s) to others (Apr. 07)• Review risk (May 07)	
1.2	**Injector System**														
1.3	**Linac System**														
1.4	**Undulator System**														
R1.4-025	Vacuum Chamber Development Schedule	3/8/2006	S. Milton	5/18/2007	David Schultz	IF the undulator vacuum chamber does not meet specification … then an alternate, back-up, chamber will have to be developed with a subsequent delay the turn on for the beam through the complete undulator system.	Design, Commissioning	**10%**	**$900**	**2**	**$90**		Mitigate	• Downselect vacuum chamber design 2-15-07 -done, FDR & SOW (Apr. 07), evaluate first articles (June 07)	
R1.4-026	RF BPM Schedule	3/8/2006	S. Milton	5/18/2007	David Schultz	If the schedule for the rf bpms cannot be improved … then the rf bpms will delay the assembly in the MMF and subsequently delay the turn on for the beam through the complete undulator system.	Design, Commissioining	**20%**	**$400**	**2**	**$80**		Mitigate	• 3-BPM test (May 2007) • Review risk again in detail (June 2007)	

LCLS Risk Registry
april 2007

No.	Risk Title	Date Submitted	Submitted By	Date Last Revised	Owner	If / Then	Risk Timeframe Which phase could this event occur?	Probability of Event (percentage)	Cost Impact (AYK$))	Risk Severity Level	Risk Contingency (1000s) Total Risk Contingency	Risk Contingency (1000s) High Risk Items	Risk Handling Approach	Steps for Handling the Risk (Punch List)	Risk Retired - Mark "X" for Yes and date
1.5	**X-Ray, Transport, Optics & Diagnostics System**														
R-1.5-006	Late changes to design due to evolving user requirements	1/6/2005	Richard Bionta	3/15/2007	John Arthur	If there are major changes in the scope, performance, existence or placement of XTOD instrumentation due to evolving user requirements…Then, it will be difficult to meet the schedule and budget as specified in P3.	Design, Construction, Commissioning	**10%**	**$100**	**2**	**$10**		Mitigate	1) Adhere to BCR process. 2) Participate in Experimental Area design process 3) Formalize XTOD-LUSI interfaces with ICD by July 2007 4) Develop computer beam and instrumentation tools to allow accurate assessment of proposed changes.	
R-1.5-013	Mirror procurement delay	10/10/2006	John Arthur	3/15/2007	J. Arthur	IF there are major delays or difficulties with procuring x-ray mirrors that meet technical requirements … THEN mirror installation may be delayed and/or mirror cost may rise.	Construction	**10%**	**$250**	**2**	**$25**		Mitigate	1) Develop mirror specs, begin discussions with vendors early. 2) Evaluate specs at SCR's Spring 2007 3) Procure mirrors with sufficient schedule float to activate backup plan if necessary.	
R-1.5-014	Mirror mounting design immaturity	10/10/2006	John Arthur	3/15/2007	J. Arthur	IF it proves difficult to meet technical specs for mirror mounting ... THEN the mirror mounting schedule and/or cost plans may be exceeded.	Design, construction	**10%**	**$200**	**2**	**$20**		Mitigate	1) Develop mirror mount specs early (SCR's Spring 2007). 2) Consider both procurement from outside vendors and internal fabrication. 3) Consider building small prototype to prove design. 4) Allow schedule for evaluation of prototype.	
1.6	**X-Ray Endstations System**														
R-1.6-008	Pricing fluctuations for procurement items	4/1/2005	S. Moeller	3/15/2007	J. Arthur	IF the prices for procurement items or the exchange rate for foreign procurements increases rapidly in the next years … THEN the actual cost for procurements will be higher than our current cost estimates	Construction	**25%**	**$100**	**2**	**$25**		Accept	Monitor prices of items that will be procured in the later years and especially from vendors that are the only suppliers of the items. Allow for sufficient contingency.	
R-1.6-009	Scope uncertainties due to evolving requirements early in the design phase of the Atomic Physics Instrument	3/16/2006	S. Moeller	3/15/2007	John Arthur	IF there are major scope changes for the atomic physics instrument … THEN the actual cost for this instrument may be higher than our current cost estimates, and the schedule may be delayed.	Construction	**10%**	**$100**	**2**	**$10**		Mitigate	1. Adhere to the Requirements Documents (PRD, ESD, ICD, RDS). 2. Finalize scope at time of PDR (Summer 2007).	

LCLS Risk Registry
april 2007

No.	Risk Title	Date Submitted	Submitted By	Date Last Revised	Owner	If / Then	Risk Timeframe Which phase could this event occur?	Probability of Event (percentage)	Cost Impact (AYK$))	Risk Severity Level	Risk Contingency (1000s) Total Risk Contingency	Risk Contingency (1000s) High Risk Items	Risk Handling Approach	Steps for Handling the Risk (Punch List)	Risk Retired - Mark "X" for Yes and date
1.9	**Conventional Facilities**														
R-1.9-004	Tunnel Schedule	5/7/2004	David Saenz	4/11/2007	David Saenz	If the average tunneling rate, using road header boring, is not maintained … Then the minimal tunneling advances will experience a schedule delay and impact the overall schedule of beneficial occupancy milestones	Construction	**10%**	**$2,000**	**2**	**200**		Mitigate	1. Review const. secquince based on field conditions 2 - Increase working hours(days). 3 shifts 8hrs, 6/7 days week, maint. on weekends 3 - Add additional equipment. Additional muckers, robotic shotcrete machine, rockbolt jumbo 4 - Work multiple headings. Excavate/concrete UH/X-ray tunnels from both portals	
R-1.9-024	UH Tunnel Geology	8/9/2005	Dick McDonald	4/11/2007	David Saenz	IF insufficient ground cover at E. End UH tunnel for normal excavation … THEN, additional ground support will be installed to facilitate tunnel excavation	Construction	**10%**	**$250**	**2**	**25**		Mitigate	1 - Additional support has been designed by Jacobs. 2.- Install grouted canopy tubes or self drilling grouted pipe at the portal. 3 - Install shotcrete ring to incase tubes or pipe at portal. 4 - Install spiling as excavation approaches portal. 5 - Decress spacing on girders. 6 - Apply additional shotcrete	
R-1.9-025	Linac Legacy Issues	1/5/2005	Dick McDonald	4/11/2007	David Saenz	IF the condition of the existing SLAC Linac infrastructure does not support LCLS requirements … THEN the LCLS will not be able to operate the new beamlie components required to meet electron beam delivery parameters	Design, Construction	**25%**	**$750**	**2**	**187.5**		Mitigate	1. Specified utilities requirements provided to Conventional Facilities. Additional needs are continually being brought foreward and implemented. 2. Generate plan to upgrade utilities to requirements 3. Perform upgrades during 2007 shutdown 4. Eval. effective mitgating measures	
R-1.9-028	In place Utility Protection	1/23/2006	Dick McDonald	4/11/2007	David Saenz	IF SLAC operational utilities are disrupted during construction … THEN, SLAC Operations will be impacted and construction schedule will be delayed for repairs and costs will increase	Construction	**50%**	**$500**	**3**	**250**	**$250**	Mitigate	1 - Potholing 2 - Gound Penetrating radar 3 - Excavation permits 4 - Relocate utilities 5 - Put inplace contingency plan.	
R-1.9-032	CF Staff Support	2/24/2005	Dick McDonald	4/11/2007	David Saenz	IF sufficent staff are not hired in a timley manner … THEN delays will be incurred in administration of contract	Construction	**75%**	**$500**	**3**	**375**	**$375**	Mitigate	1. Identify and validate needs - Complete 2. Post position with HR. 5/14/07 will be complete 3. Contact headhunter shops. 5/29/07 will be complete 4. Search through personal contacts. - Complete	
R-1.9-033	UTR Support (CEF)	3/13/2006	Dick McDonald	4/11/2007	David Saenz	IF UTR staff are not available a timley manner … THEN UTR staff will not be suficient to support project needs.	Construction	**25%**	**$250**	**3**	**62.5**	**$63**	Mitigate	Monitor support to insure needs are being met. - Complete Discussions have been held with CEF and plans have been put in place to support LCLS needs. 7/1/07	
R1-9-036	Turner Claim on bonds, insurance and profit	4/11/2007	Dick McDonald	5/22/2007	David Saenz	If TCCo prevails in arbitrition/litigation then LCLS is subject to additional costs	Construction	**20%**	**$4,500**	**2**	**900**		Mitigate	Review claim - On going Validate through 9/08 Process any settlement 12/08	
R1-9-037	InsituForm lets Affholder defalt on contract	5/22/2007	Dick McDonald	5/22/2007	David Saenz	If Affholder defalts then bonding company finishes contract with new contractor. Delays will be incurred until new contractor over comes learning curve and safety requirements.	Construction	**10%**	**$3,000**	**2**	**300**		Accept	Work with bonding company to minimize impact.	
R1-9-037	InsituForm sells Affholder	5/22/2007	Dick McDonald	5/22/2007	David Saenz	When Affholder is sold then there could be delays and work stopages.	Construction	**75%**	**$500**	**3**	**375**	**$375**	Mitigate	Instructr Turner to work with new owner (or remaining Affolder staff) to insure our project is given attention we need.	
											$7,360	**$1,113**			