

LUSI Risk Registry
June 2009

Risk ID	Risk Title	If / Then	POC Owner	Date Last Revised	Risk Values Before Handling				Risk Control Actions			Risk Values After Handling					Risk Retired - Mark "X" for Yes and date	
					Risk Consequence	Risk Probability	Risk Severity Level	Worst Case Cost Impact (AYK\$)	Risk Handling Approach Avoid, Mitigation, Transfer, Accept	Estimated Cost to Implement Handling (AYK\$)	Steps for Handling the Risk (Punch List)	Risk Consequence	Risk Probability	Risk Severity Level	Cost Impact (AYK\$)			
															Best Case	Most Likely		Worst Case
1.1	Management																	
R1.1-001	Design Phase Project Scope Creep	IF the post CD-2 cost estimate for the project during the design phase increases because of scope creep, THEN the contingency available for the later instruments is reduced.	T. Fornek	2/12/2009	Marginal	Unlikely	Low	50	Mitigate	0	Change control is in use. Technical Configuration Control Committee in place. Using established LCLS CCB.	Negligible	Unlikely	Low	0	25	50	
R1.1-003	Loss of Key Personnel	IF Lead management, scientific and engineering staff leave the project, THEN there would be significant schedule and cost impacts.	T. Fornek	2/12/2009	Significant schedule risk Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Likely	High	200	Mitigate	100	Provide for succession of key personnel. Where possible add second scientists to provide for some transition of information. Utilize LCLS Directorate resources where possible. These resources have their own succession strategy. Review compensation.	Marginal schedule risk >\$100K but <\$1M Schedule: Potential delay to L3 milestone is <3 months or L2 milestone is <1 month	Unlikely	Low	0	25	50	
R1.1-004	Burden and Overhead	IF SLAC burdens and overheads increase substantially, THEN contingency is reduced.	T. Fornek	3/22/2009	Marginal	Likely	Medium	600	Mitigate	0	Work with LCLS Directorate and SLAC management to control and manage burdens and overheads.	Negligible	Unlikely	Low	0	50	100	
R1.1-006	Schedule Errors	IF the project schedule is inaccurate due to incomplete planning or logic errors/omissions, THEN the integrated project schedule may be inaccurate.	T. Fornek	3/22/2009	Critical schedule risk >\$100K but <\$1M L2M delay >3mo, L1M delay <1mo	Unlikely	Low	300	Mitigate	50	Schedule is based on similar activities performed on the LCLS Construction project and at other light sources. Experience is proving schedules accurate. Most likely impact is on added scope activities. Review schedule performance monthly	Marginal	Unlikely	Low	0	50	100	
R1.1-008	Lack of engineering resources	IF the engineering staffing is insufficient, THEN schedule delays will occur.	T. Fornek	3/22/2009	Critical schedule risk >\$100K but <\$1M L2M delay >3mo, L1M delay <1mo	Likely	High	500	Mitigate	150	Provide engineering and design staffing levels at approximately 1/2 person-year greater than that planned in the schedule. This could lead to unallocated hours, but the more likely scenario is that the contingency turns in to real work and the cost impact is \$0.	Marginal schedule risk >\$50K but <\$500K L3M delay <3mo, L2M delay <1mo	Unlikely	Low	0	100	250	
R1.1-009	Currency fluctuations	IF the US dollar falls THEN the foreign procurements for the LUSI will be more expensive.	T. Fornek	7/9/2008	No tech impact Significant Cost impact (>500K) Negligible schedule impact	Likely	High	500	Accept and Mitigate	150	Agree to price in US dollars early since this is a long lead procurement.	No tech impact Low Cost impact (<50K) Negligible schedule impact	Likely	Low	0	25	50	
R1.1-010	Longer procurement durations for ARRA funded procurements	If the ARRA funded procurements take longer than procurements using standard funds/ Then LUSI schedules may be delayed	T. Fornek	5/11/2009	Marginal Scope/Technical: May require minor facility redesign or modification. Cost: impact consequence is >\$50K but <\$500K Schedule: Potential delay to L3 milestone is <3 months or L2 milestone is <1 month	Likely	Low	300	Accept and Mitigate	75	Provide sufficient procurement duration in the schedule. Utilize an additional support person to help move procurements along. Continue the weekly LUSI/procurement meetings with emphasis on expediting all procurements - Not just-in-time delivery	Negligible	Unlikely	Low	0	0	25	
R1.1-011	Mis-interpretation of the ARRA guidelines	If the ARRA guidelines for committing, spending or reporting are mis-interpreted/ Then loss of ARRA funds could occur	T. Fornek	5/14/2009	CRISIS Scope/Technical: Project cannot be completed. Technical goals cannot be met. Cost: Estimated cost of impact consequence is >\$3M Schedule: Potential delay to L3 milestone is >3 months	Very Unlikely	High	33000	Mitigate	75	SLAC has a working group to monitor ARRA projects. This group closely monitors ARRA requirements and maintains close contact with DOE. Additional management support will be secured to ensure close cooperation with the working group.	Negligible	Unlikely	Low	0	0	0	

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															Best Case	Most Likely		Worst Case
1.2	X-ray Pump Probe Instrument (XPP)																	
R1.2-002	Sample goniometer-schedule delay due to late vendor engineer-design review approval	IF the vendor is late finalizing the design, or the design is unacceptable to SLAC THEN the fabrication schedule could be delayed while design revisions are completed.	Langton	8/1/2008	Marginal Scope/Technical: May require minor facility redesign or modification. Cost: impact consequence is >\$50K but <\$500K Schedule: Potential delay to L3 milestone is <3 months or L2 milestone is <1 month	Unlikely 10-40%	Low	40	Mitigate	5	<ul style="list-style-type: none"> Ensure initial vendor buy in of timeline Closely track vendor progress during design stage. Establish contact with sub-vendors to insure timely deliveries. Complete periodic spot review of designs to ensure suitability. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Unlikely 10-40%	Low	0	10	25	
R1.2-003	Sample goniometer-schedule delay due to late hardware fabrication-assembly	IF the vendor is late due to fabrication delays or assembly integration issues THEN the test and acceptance schedule could be delayed.	Langton	8/1/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	10	<ul style="list-style-type: none"> Request periodic status updates. Start partial acceptance testing as soon as suitable sub-assemblies are completed. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Unlikely 10-40%	Low	0	25	50	
R1.2-004	Sample goniometer-schedule delay due to hardware technical requirements not met during vendor site acceptance testing	IF the vendor site testing and acceptance criteria are not met THEN there could be a schedule delay while the vendor redesigns and / or reworks the hardware.	Langton	8/1/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Very Unlikely <10%	Low	25	Mitigate	10	<ul style="list-style-type: none"> Replace individually deficient element Temporarily immobilize deficient element Deploy interim hardware with reduced capability 	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Very Unlikely <10%	Low	0	5	10	
R1.2-005	Sample goniometer-technical requirements not met	IF the hardware does not meet technical requirements THEN mitigation alternatives will have to be implemented.	Langton	8/1/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Very Unlikely <10%	Low	25	Mitigate	0	<ul style="list-style-type: none"> Ensure complete design-engineer-built test process closely followed. Ensure vendor qualified by prior experience. Ensure all testing completed relevant environment / conditions. Investigate availability of alternative hardware. 	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Very Unlikely <10%	Low	0	5	10	
R1.2-006	Sample goniometer-schedule delay due to changes to vendor requirements for support structure	IF the vendor revises requirements for this SLAC fabricated item THEN rework could delay testing schedule.	Langton	6/24/2008	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	10	Mitigate	0	<ul style="list-style-type: none"> Ensure requirements are reasonable and agreed prior to start fab. Over specify requirements prior to fab. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	5	10	

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															Best Case	Most Likely		Worst Case
R1.2-009	Detector mover-schedule delay due to late hardware fabrication-assembly	IF the vendor is late due to fabrication delays or assembly integration issues THEN the test and acceptance schedule could be delayed.	Langton	8/1/2008	Marginal Scope/Technical: May require minor facility redesign or modification. Cost: impact consequence is >\$50K but <\$500K Schedule: Potential delay to L3 milestone is <3 months or L2 milestone is <1 month	Unlikely 10-40%	Low	10	Mitigate	10	<ul style="list-style-type: none"> Request periodic status updates. Start partial acceptance testing as soon as suitable sub-assemblies are completed. 	Marginal Scope/Technical: May require minor facility redesign or modification. Cost: impact consequence is >\$50K but <\$500K Schedule: Potential delay to L3 milestone is <3 months or L2 milestone is <1 month	Unlikely 10-40%	Low	0	5	10	Retire
R1.2-010	Detector mover-schedule delay due to hardware technical requirements not met during vendor site acceptance testing	IF the vendor site testing and acceptance criteria are not met THEN there could be a schedule delay while the vendor redesigns and / or reworks the hardware.	Langton	8/1/2008	Marginal Scope/Technical: May require minor facility redesign or modification. Cost: impact consequence is >\$50K but <\$500K Schedule: Potential delay to L3 milestone is <3 months or L2 milestone is <1 month	Unlikely 10-40%	Low	10	Mitigate	10	<ul style="list-style-type: none"> Complete varification tests of relavent hardware. Replace individually deficient element, reduce payload mass as possible. Deploy interim hardware with reduced capability. 	Marginal Scope/Technical: May require minor facility redesign or modification. Cost: impact consequence is >\$50K but <\$500K Schedule: Potential delay to L3 milestone is <3 months or L2 milestone is <1 month	Unlikely 10-40%	Low	0	5	10	
R1.2-011	Detector mover-technical requirements not met	IF the hardware does not meet technical requirements THEN mitigation alternatives will have to be implemented.	Langton	8/1/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	500	Mitigate	150	<ul style="list-style-type: none"> Ensure complete design-engineer-built test process closely followed. Ensure vendor qualified by prior experience. Ensure all testing completed relevant environment / conditions. Investigate availability of alternative Hardware. 	Marginal Scope/Technical: May require minor facility redesign or modification. Cost: impact consequence is >\$50K but <\$500K Schedule: Potential delay to L3 milestone is <3 months or L2 milestone is <1 month	Unlikely 10-40%	Low	0	100	200	
R1.2-012	Detector (BNL) - schedule delay due to late SLAC approval of BNL design	IF BNL is late finalizing the design, or the design is unacceptable to SLAC THEN the fabrication schedule could be delayed while design revisions are completed.	van Bakel	8/1/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	0	<ul style="list-style-type: none"> Ensure initial stakeholder buy in of timeline. Closely track BNL progress during design stage, conduct frequent reviews. Complete periodic spot review of designs to ensure suitability. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50	
R1.2-013	Detector (BNL) - schedule delay due to late hardware fabrication-assembly	IF BNL is late due to fabrication delays or assembly integration issues THEN the test and acceptance schedule could be delayed.	van Bakel	8/1/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	0	<ul style="list-style-type: none"> Request periodic status updates Start partial acceptance testing as soon as suitable sub-assemblies are completed. Establish contact with sub-vendors to ensure timely deliveries. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50	

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															Best Case	Most Likely		Worst Case
R1.2-014	Detector (BNL) - schedule delay due to hardware technical requirements not met during BNL site acceptance testing	IF BNL site testing and acceptance criteria are not met THEN there could be a schedule delay while the vendor redesigns and / or reworks the hardware.	van Bakel	8/1/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	0	<ul style="list-style-type: none"> Complete varification tests of relavent hardware. Replace individually deficient elements. Test smaller sub-assemblies to advance test schedule - find issues early. Deploy interim hardware with reduced capability. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50	
R1.2-015	Detector (BNL) - technical requirements not met	IF the hardware does not meet technical requirements THEN mitigation alternatives will have to be implemented.	van Bakel	8/1/2008	Critical Scope/Technical: Considerable impact on project. Technical goals of project cannot be fully achieved. Cost: Estimated cost of impact consequence is >\$1M but <\$3M Schedule: Potential delay to L2 milestone is >3 months or L1 milestone is <3 mon	Unlikely 10-40%	Medium	2000	Mitigate	0	<ul style="list-style-type: none"> Rigorously review design at each design review. Redesign / rebuild individually deficient elements. Implement advanced measurement / control hardware. Deploy interim hardware with reduced capability. Alternate hardware available from Cornell. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	2000	
1.3	Coherent X-ray Imaging Instrument (CXI)																	
R1.3-003	Vendor delivers KB0.1 mirrors that do not meet the specifications	IF the mirror vendor delivers mirrors for the KB0.1 system and the metrology reveals they do not meet the specifications THEN there can be a significant loss of functionality or additional costs.	P. Montanez	3/25/2009	Marginal tech impact Marginal Cost impact (>50K) Marginal schedule impact L3M < 3 months	Likely	Medium	100	Accept and Mitigate	20	<ul style="list-style-type: none"> Travel to vendor sites during fabrication Have a quality control person supervise their final fabrication process and final surface characterization. Build sufficient float in the schedule to allow extra vendor effort. (DONE) Identify vendors with proven capabilities. 	Marginal tech impact Marginal Cost impact (>50K) Negligible schedule impact	Unlikely	Low	0	0	100	
R1.3-009	Vendor delivers KB1 mirrors that do not meet the specifications	IF the mirror vendor delivers mirrors for the KB1 system and the metrology reveals they do not meet the specifications THEN there can be a significant loss of functionality or additional costs and time.	P. Montanez	3/25/2009	Marginal tech impact Marginal Cost impact (>50K) Significant schedule impact L2M < 3 months	Likely	High	100	Accept and Mitigate	20	<ul style="list-style-type: none"> Travel to vendor sites during fabrication Have a quality control person supervise their final fabrication process and final surface characterization. Build sufficient float in the schedule to allow extra vendor effort. (DONE) Identify vendors with proven capabilities. 	Marginal tech impact Marginal Cost impact (>50K) Marginal schedule impact	Likely	Medium	0	0	100	
R1.3-010	Remote operation of commercial devices associated with the injector	IF it proves more difficult and time consuming than expected to modify commerial devices so they can be remotely controlled from outside the hutch THEN extra time and effort will be required.	P. Montanez	3/25/2009	Significant tech impact Marginal Cost impact (>50K) Significant schedule impact L2M < 3months	Very Likely	High	200	Accept and Mitigate	0	<ul style="list-style-type: none"> Leverage PULSE efforts to solve this problem Move injector to a CD-4C deliverable (DONE) 	Marginal tech impact Marginal Cost impact (>50K) Negligible schedule impact	Unlikely	Low	0	100	200	
R1.3-012	Injector does not meet the specs	IF injector design does not meet the particle beam focus and the throughput specs THEN there can be a significant loss of functionality.	P. Montanez	3/25/2009	Significant tech impact Low Cost impact (<50K) Negligible schedule impact	Unlikely	Medium	0	Accept and Mitigate	200	<ul style="list-style-type: none"> Hire an injector scientist with many years experience to oversee the design. (DONE) Leverage PULSE efforts to develop injector. 	Significant tech impact Low Cost impact (<50K) Negligible schedule impact	Unlikely	Medium	0	0	0	
R1.3-017	Delays due to undefined interfaces with other beamlines	IF the design criteria of the other beamlines (XCS and HED) change THEN some redesign may be required to fix possible problems.	P. Montanez	3/25/2009	Marginal tech impact Loss of functionality Low Cost impact (<50K) Negligible schedule impact	Likely	Medium	50	Accept and Mitigate	0	<ul style="list-style-type: none"> Write an ICD fixing the relevant design parameters at an early stage. Delay the design of the vacuum stands until key parameters have been set. 	Marginal tech impact Loss of functionality Low Cost impact (<50K) Negligible schedule impact	Unlikely	Low	0	10	50	

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															Best Case	Most Likely		Worst Case
1.4	X-ray Correlation Spectroscopy Instrument (XCS)																	
R1.4-001	Diffractometer-schedule delay due to late placement of PO to vendor	IF there is a delay in placing a PO with the vendor(s) for the design build contract THEN the eng-design schedule could be delayed.	Bong	4/2/2009	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	0	<ul style="list-style-type: none"> Write Engineering Specification, Advanced Procurement Plan and Statement of Work early. Schedule procurement cycle time with enough time for foreign procurement process. Integrate procurement cycle times into P3 schedule. Set milestones in P3 schedule to track progress of procurement process. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50	
R1.4-002	Diffractometer-schedule delay due to late vendor engineer-design review approval	IF the vendor is late finalizing the design, or the design is unacceptable to SLAC THEN the fabrication schedule could be delayed while design revisions are completed.	Bong	6/26/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	48	<ul style="list-style-type: none"> Ensure initial vendor buy in of timeline. Closely track vendor progress during design stage. Establish contact with sub-vendors to ensure timely deliveries. Complete periodic spot review of designs to ensure suitability. Provide cost incentives in contract for timely delivery 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50	
R1.4-003	Diffractometer-schedule delay due to late hardware fabrication-assembly	IF the vendor is late due to fabrication delays or assembly integration issues THEN the test and acceptance schedule could be delayed.	Bong	6/26/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	0	<ul style="list-style-type: none"> Require periodic status updates from vendor. Start partial acceptance testing as soon as suitable sub-assemblies are completed. Provide cost incentives in contract for timely delivery 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50	
R1.4-004	Diffractometer-schedule delay due to hardware technical requirements not met during vendor site acceptance testing	IF the vendor site testing and acceptance criteria are not met THEN there could be a schedule delay while the vendor redesigns and / or reworks the hardware.	Bong	6/26/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Very Unlikely <10%	Low	50	Mitigate	0	<ul style="list-style-type: none"> Replace individually deficient element. Temporarily immobilize deficient element. Deploy interim hardware with reduced capability. Provide cost incentives in contract for timely delivery 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50	
R1.4-005	Diffractometer-technical requirements not met	IF the hardware does not meet technical requirements THEN mitigation alternatives will have to be implemented.	Bong	6/26/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Very Unlikely <10%	Low	1000	Mitigate	0	<ul style="list-style-type: none"> Rigorously review design at each design review. Redesign / rebuild individually deficient element. Temporarily immobilize deficient element. Deploy interim hardware with reduced capability. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	0	1,000	

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															Best Case	Most Likely		Worst Case
R1.4-006	Large Angle Detector Mover-schedule delay due to late placement of PO to vendor	IF there is a delay in placing a PO with the vendor(s) for the design build contract THEN the eng-design schedule could be delayed.	Bong	4/2/2009	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	0	<ul style="list-style-type: none"> Write Engineering Specification, Advanced Procurement Plan and Statement of Work in year prior to CD3. Investigate splitting effort to multiple vendors. Schedule procurement cycle time with enough time for foreign procurement process. Integrate procurement cycle times into P3 schedule. Set milestones in P3 schedule to track progress of procurement process. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50	
R1.4-007	Large Angle Detector Mover-schedule delay due to late vendor engineer-design review approval	IF the vendor is late finalizing the design, or the design is unacceptable to SLAC THEN the fabrication schedule could be delayed while design revisions are completed.	Bong	6/26/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	0	<ul style="list-style-type: none"> Ensure initial vendor buy in of timeline. Closely track vendor progress during design stage. Require preliminary and final design reviews. Establish contact with sub-vendors to ensure timely deliveries. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50	
R1.4-008	Large Angle Detector Mover-schedule delay due to late hardware fabrication assembly	IF the vendor is late due to fabrication delays or assembly integration issues THEN the test and acceptance schedule could be delayed.	Bong	6/26/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	0	<ul style="list-style-type: none"> Require periodic status updates from vendor. Start partial acceptance testing as soon as suitable sub-assemblies are completed. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50	
R1.4-009	Large Angle Detector Mover-schedule delay due to hardware technical requirements not met during vendor site acceptance testing	IF the vendor site testing and acceptance criteria are not met THEN there could be a schedule delay while the vendor redesigns and / or reworks the hardware.	Bong	6/26/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	0	<ul style="list-style-type: none"> Require rigorous review of design prior to fabrication. Complete verification tests of relevant hardware at vendor site prior to delivery. Replace individually deficient element. Reduce payload mass as possible. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50	
R1.4-010	Large Angle Detector Mover-technical requirements not met	IF the hardware does not meet technical requirements THEN mitigation alternatives will have to be implemented.	Bong	2/12/2009	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	1000	Mitigate	100	<ul style="list-style-type: none"> Rigorously review design at each design review. Redesign / rebuild individually deficient element. Implement advanced measurement / control hardware. Deploy interim hardware with reduced capability. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	1,000	

LUSI Risk Registry
June 2009

Risk ID	Risk Title	If / Then	POC Owner	Date Last Revised	Risk Values Before Handling				Risk Control Actions			Risk Values After Handling					Risk Retired - Mark "X" for Yes and date		
					Risk Consequence	Risk Probability	Risk Severity Level	Worst Case Cost Impact (AYK\$)	Risk Handling Approach Avoid, Mitigation, Transfer, Accept	Estimated Cost to Implement Handling (AYK\$)	Steps for Handling the Risk (Punch List)	Risk Consequence	Risk Probability	Risk Severity Level	Cost Impact (AYK\$)				
															Best Case	Most Likely		Worst Case	
R1.4-011	Detector (BNL) - schedule delay due to late MOU negotiation or late funding transfer.	IF there is a delay in placing a PO with the / a vendor for the design build contract THEN the eng-design schedule could be delayed.	Bong	6/26/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	0	<ul style="list-style-type: none"> Write Engineering Specification, Advanced Procurement Plan and Statement of Work in year prior to CD3. Schedule procurement cycle time with enough time for foreign procurement process. Integrate procurement cycle times into P3 schedule. Set milestones in P3 schedule to track progress of procurement process. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50		
R1.4-012	Detector (BNL) - schedule delay due to late SLAC approval of BNL design	IF the vendor is late finalizing the design, or the design is unacceptable to SLAC THEN the fabrication schedule could be delayed while design revisions are completed.	Bong	6/26/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	0	<ul style="list-style-type: none"> Ensure initial vendor buy in of timeline Closely track vendor progress during design stage. Establish contact with sub-vendors to ensure timely deliveries. Complete periodic spot review of designs to ensure suitability. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50		
R1.4-013	Detector (BNL) - schedule delay due to late hardware fabrication-assembly	IF the vendor is late due to fabrication delays or assembly integration issues THEN the test and acceptance schedule could be delayed.	Bong	6/26/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Likely	Medium	50	Mitigate	200	<ul style="list-style-type: none"> Request periodic status updates Start partial acceptance testing as soon as suitable sub-assemblies are completed. Provide an "Early Science" detector identical to the proven XPP detector. 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	50		
R1.4-014	Detector (BNL) - schedule delay due to hardware technical requirements not met during BNL site acceptance testing	IF the vendor site testing and acceptance criteria are not met THEN there could be a schedule delay while the vendor redesigns and / or reworks the hardware.	Bong	6/26/2008	Significant Scope/Technical: Moderate impact on project technical performance. Cost: Estimated cost of impact consequence is >\$500K but <\$1M Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months	Unlikely 10-40%	Medium	50	Mitigate	320	<ul style="list-style-type: none"> Complete verification tests of relevant hardware. Replace individually deficient element. Reduce payload mass as possible. Deploy interim hardware with reduced capability (Buy Current XPP Detector). 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	15	320		
R1.4-015	Detector (BNL) - technical requirements not met	IF the hardware does not meet technical requirements THEN mitigation alternatives will have to be implemented.	Bong	2/12/2009	Critical Scope/Technical: Considerable impact on project. Technical goals of project cannot be fully achieved. Cost: Estimated cost of impact consequence is >\$1M but <\$3M Schedule: Potential delay to L2 milestone is >3 months or L1 milestone is <3 mon	Unlikely 10-40%	Medium	2000	Mitigate	See R1.4-014	<ul style="list-style-type: none"> Rigorously review design at each design review. Redesign / rebuild individually deficient element. Implement advanced measurement / control hardware. Deploy interim hardware with reduced capability (Buy current XPP Detector). 	Negligible Scope/Technical: Minimal or negligible impact Cost: impact consequence is <\$50K Schedule: Slight potential schedule change, compensated by schedule float	Very Unlikely <10%	Low	0	0	0		
1.5	X-Ray, Transport, Optics & Diagnostics System																		
1.5.3	Common Optics																		

LSUI Risk Registry
June 2009

Risk ID	Risk Title	If / Then	POC Owner	Date Last Revised	Risk Values Before Handling				Risk Control Actions			Risk Values After Handling					Risk Retired - Mark "X" for Yes and date	
					Risk Consequence	Risk Probability	Risk Severity Level	Worst Case Cost Impact (AYK\$)	Risk Handling Approach Avoid, Mitigation, Transfer, Accept	Estimated Cost to Implement Handling (AYK\$)	Steps for Handling the Risk (Punch List)	Risk Consequence	Risk Probability	Risk Severity Level	Cost Impact (AYK\$)			
															Best Case	Most Likely		Worst Case
R1.5-001	Monochromator Optical Stability	If the mechanical stability requirements can not be met due to the long distance between the mono and the experimental station, Then the vendor will have to redesign and/or rework the hardware causing a schedule delay.	E. Bong	7/31/2008	<p>Significant: Scope/Technical: Moderate impact on project technical performance. Can pose threat to project mission. Can require some facility redesign or repair, or change in technical performance.</p> <p>Cost: Estimated cost of impact consequence is >\$500K but <\$1M</p> <p>Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months</p>	Likely	High	1000	Mitigate	0	<ul style="list-style-type: none"> Ensure requirements are clearly stated and agreed prior to award and fabrication. Implement a stringent vendor selection process. Implement regular visits to vendor. Implement frequent and measurable status reports. Maintain constant communication with the vendor prior to and during design and fabrication. Move mono closer to sample. 	<p>Marginal Scope/Technical: Small reduction in project technical requirements or performance. May require minor facility redesign or modification.</p> <p>Cost: Estimated cost of impact consequence is >\$50K but <\$500K</p> <p>Schedule: Potential delay to L3 milestone is <3 months or L2 milestone is <1 month</p>	Unlikely	Low	0	100	200	
R1.5-002	Monochromator Delivery	If delivery of Monochromator is delayed or prohibited due to manufacturing challenges, problems or unforeseen setbacks Then the delivery failure or delay of the Monochromator could delay the commissioning of the XCS experiment.	E. Bong	7/31/2008	<p>Significant: Scope/Technical: Moderate impact on project technical performance. Can pose threat to project mission. Can require some facility redesign or repair, or change in technical performance.</p> <p>Cost: Estimated cost of impact consequence is >\$500K but <\$1M</p> <p>Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months</p>	Likely	High	1000	Mitigate	0	<ul style="list-style-type: none"> Implement a stringent vendor selection process. Implement regular visits to vendor. Implement frequent and measurable status reports. Maintain constant communication with the vendor prior to and during design and fabrication. 	<p>Significant: Scope/Technical: Moderate impact on project technical performance. Can pose threat to project mission. Can require some facility redesign or repair, or change in technical performance.</p> <p>Cost: Estimated cost of impact consequence is >\$500K but <\$1M</p> <p>Schedule: Potential delay to L3 milestone is >3 months or L2 milestone is <3 months</p>	Unlikely	Low	0	100	1,000	
1.6	Controls and Data Acquisition																	
R-1.6-001	Late changes to design due to evolving user requirements	IF there are major changes in the scope, performance, existence or placement of CXI/XPP/XCS instrumentation due to evolving user requirements...THEN, it will be difficult to meet the schedule and budget as specified in P3.	Gunther Haller	6/3/2008	<p>Low technical risk Cost risk <\$50K</p> <p>Marginal Schedule Risk L2M delay <1 month</p>	10%	Low	50	Mitigate	0	<ul style="list-style-type: none"> Adhere to BCR process. Participate in Experimental Area design process Release Engineering Requirement documents 	<p>Low technical risk Cost risk <\$50K</p> <p>Marginal Schedule Risk L2M delay <1 month</p>	5%	Low	0	25	50	
								\$45,370		\$1,703					0	1,025	7,670	