LUSI PROJECT
JULY 2007 LEHMAN REVIEW (CD-1) RECOMMENDATIONS AND RESPONSES

SECTION	AREA		RECOMMENDATION	RESPONSE
2.1	XPP WBS 1.2	1	Consider hiring a deputy beamline leader	If and when funding permits this will receive consideration.
		2	Work with a broad range of potential users to develop more thoroughly the specifications for the pump laser.	XPP will be sharing the AMO laser
		3	Work with industry on laser development and work toward procuring this system as a complete system from a laser vendor.	XPP will be sharing the AMO laser
		4	Develop a detailed plan for the offset monochromator to deal with the possibility that the thin Si crystal technology does not develop fast enough.	The offset monochromator for XPP is not currently in the project scope. Provisions have been made to add the monochromator at a later date.
2.2	CXI WBS 1.3	1	Ensure the particle injector MOU with LLNL is managed carefully since it is the key component of the CXI instrument.	Due to the restricted funding profile, the CXI injector effort will be performed by SLAC instead of at LLNL.
		2	Evaluate the use of refractive lens for focusing as an alternative to mirrors.	The use of refractive lenses has been evaluated. It was decided that mirrors offer much better performance.
2.3	XCS WBS 1.4	1	Develop a strategy to deal with pulse-to-pulse stability.	The X-ray beam should be collimated all along the beam path, in order to turn beam fluctuations into intensity fluctuations. These incident intensity calculation have to be monitored and enter in the evaluation of the data. The beam needs in any case be delivered to the sample with a reduced size, thus providing sufficiently large observable speckle sizes.
		2	Plan an early test of the 2 micrometer thick silicon beam-splitting monochromator, before firming up the optical layout of the beamline.	Early test of a thin Si crystal is expected whenever such crystal is available. The design of the optical layout of the XCS instrument is, for now, independent of the availibility of the Si thin crystals.
		3	Address the issue of beam-stability after a 200 m long monochromator arm, and consider developing a feed -forward system to anticipate the position change and correct for it before the beam comes to the second monochroator crystal.	The issue of beam stability will be addressed and appropriate systems will be included to provide a viable system. LUSI is also investigating a scheme to reduce the distance from the monochromator to the sample with a corresponding reduction in the complexity of the corrections required.
		4	Make provisions to develop "split-and-delay line" system in-house.	There is no funding available for any in-house development within LUSI. External/other fundings should be requested to do so.
		5	Make provisions for sample chamber environment, perhaps through MOUs with the Design Team Leaders.	Funding is not allowing any provision for chamber environment in the current scope. It may be incorporated in the scope at a later date.
2.4	DIAGNOSTICS WBS 1.5		None	
2.5	CONTROLS WBS 1.6	1	Increase R&D effort to improve the position stability of the photon beam at the point of the experiment: a) solidify beam position feedback and/or feed forward control for beam slow drifting control; b) optimize the beamline optics design to reduce the system sensitivity to the beam position jitter on a pulse-by-pulse basis.	LUSI will not be able to fund this R&D, but it is likely that LCLS operations will consider funding the necessary R&D related to these recommendations.
		2	Optimize the system design and procurement schedule to take advantage of the fast moving technological advances in data acquisition and management.	The system design and procurement schedule are designed to buy especially computing and storage items as late as possible.
2.6	INSTALLATION	1	Utilize the LCLS photon beam System Manager and his team to also coordinate the rest of the installation for LUSI.	See Management (5.0)
3.0	ES &H		None	
4.0	COST & SCHEDULE	1	Evaluate CD-4b date of March 2012 to confirm it allows sufficient time for completion of the planned FY 2012 procurements.	The Critical Decision dates have changed from CD-1. The current CD-4B date is September, 2011.
		2	Add activities and dates for the LLNL injector work to the project schedule.	See CXI (2.2)
		3	Link all contract awards in the project schedule (except "first article" procurements) to the CD-3a or CD-3b milestones.	Contract awards are linked appropriately in the schedule.
5.0	MANAGEMENT	1	Develop a plan for instrument installation that fully integrates with LCLS by CD-2a. (It would be advisable to manage LCLS installation and LUSI instalation in one team under a single installation manager).	LUSI is currently working with LCLS Photon Systems to plan for installation coordination. LCLS Photon systems will be starting installation sooner than LUSI. We plan to develop an installation coordination system tha will seemlessly transition to LUSI installation

		2	Approve CD-1	CD-1 Approved September, 27, 2007