



LCLS-II Lessons Learned (so far)

Rich Stanek

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Lessons Learned – Organization/Management

- Communication and sound decision making are keys to success
 - Sharing information/data amongst regions will provide large benefits
- Need a technically knowledgeable management team
 - Decisions will need to be made and they must incorporate the technical consequences/tradeoffs that can only be evaluated by management that understands the technology
- Project success depends on
 - Trained and motivated staff
 - Utilizing as much automation as possible
 - Adequate number of technical supervisors - not stretched too thin
 - Supply chain management
 - Assuring arrival of qualified parts
 - Working to a logically linked and reasonable schedule
 - Includes the need for pre-series production

Lessons Learned - Design

- Assuming CM come from at least three regions.
- Build to Spec (Plug Compatible) or Build to Print
 - Plug compatible seems like a good choice but it can lead to complications related to
 - Stability of requirements
 - Design choices and optimization
 - Unique QC requirements
 - Safety considerations – different failure mode scenarios
 - Build to Print might be easier
- Design finalized well in advance of production to allow for
 - Multiple prototypes
 - Prequalification of component vendors
 - Infrastructure tuned to specific design

Lessons Learned - Quality

- Quality Assurance must be consistent across the project
- Quality Control
 - Starts with the design
 - Is active with the raw material supplier
 - Continues at the component vendor facilities
 - Follows along through the fabrication and testing phases
 - Completes with installation and commissioning
- Throughout this process the project needs
 - Data traceability and record management
 - Independent QC verification

Lessons Learned - Industrialization

- LCLS-II is not large enough project to warrant industrialization
 - For LCLS-II, components will be built in industry but cavities tested and CM assembled at Labs (1 CM/month/Lab) – not changing the model
 - Still can learn from the LCLS-II and XFEL experiences
 - Lab-based model struggles in some areas (labor, cost control/reduction...)
- If industrialization is required – how to share liability?
- ILC (in U.S.) might require a different model
 - More industrial scale – let industry do what they do best
 - Optimize for large scale production, procurements, labor allocation...
 - Design for manufacturability
 - Labs should provide higher level control/supervision
 - Expertise, non-conformance resolution, final signoff/approvals...