

ANL LCLS Quality Level Grading Matrix

The purpose of this document is to provide LCLS Technical Leads with a uniform method for determining the Quality Levels for LCLS WBS activities under their purview. Quality Levels are required by section 4(a)(1) of DOE Quality Assurance Order 414.1C, by the ANL QA Plan, and by the ANL P.A.R.I.S. Procurement system. The LCLS QA Coordinator is available to assist LCLS Cost Account Managers in establishing Quality Levels.

LCLS Prima Vera Data



LCLS QA Database

Step 1: Select the Highest Consequence Level for each LCLS QA consequence category in the absence of any Quality Controls.

LCLS QA Consequence Categories	High QA Consequence Level	Moderate QA Consequence Level	Low QA Consequence Level
Radiation Exposure	<input type="checkbox"/> ≥ 25 rem whole-body	<input type="checkbox"/> ≥ 1 rem and < 25 rem	<input type="checkbox"/> < 1 rem
Other Impact on Safety and Health	<input type="checkbox"/> Life threatening injury to a member of the public or a worker at the LCLS.	<input type="checkbox"/> Serious injury to a member of the public or a worker at the LCLS.	<input type="checkbox"/> Minimal impact on the health and safety of the public or a worker at the LCLS.
Environmental Impact	<input type="checkbox"/> Off-site environmental or radioactive material releases.	<input type="checkbox"/> On-site environmental or radioactive material releases.	<input type="checkbox"/> Negligible impact on the environment.
Component Classification	<input type="checkbox"/> Safety class system, component or software as identified in facility safety documents such as the LCLS Safety Analysis Document. <input type="checkbox"/> Costly or Complex First Article hardware or software specially made or modified to LCLS specifications.	<input type="checkbox"/> Safety significant system, component or software as identified in facility safety documents such as the LCLS Safety Analysis Document. <input type="checkbox"/> Hardware, software or service specially made or modified to LCLS specifications.	<input type="checkbox"/> Off the shelf commercial grade hardware, software or service. <input type="checkbox"/> Hardware or software for Prototype or R+D.
Long Lead Procurement	<input type="checkbox"/> Lead time greater than 180 Calendar days	<input type="checkbox"/> Lead Time greater than 90 calendar days, but less than 180	<input type="checkbox"/> Lead Time less than 90 calendar days
Cost	<input type="checkbox"/> Financial loss of greater than \$2.5M	<input type="checkbox"/> Financial loss of greater than \$1M	<input type="checkbox"/> Financial loss not a major issue
Mission Impact	<input type="checkbox"/> Potential for impact on an LCLS Level 3 Project Milestone of greater than 1 month.	<input type="checkbox"/> Potential for impact on an LCLS Level 3 Project Milestone of less than 1 month.	<input type="checkbox"/> No potential impact on a LCLS Level 3 Project Milestone
Security or Proprietary Impact	<input type="checkbox"/> Significant impact on work-for-other or national or ANL security or proprietary programs.	<input type="checkbox"/> Moderate impact on work-for-other or national or ANL security or proprietary programs	<input type="checkbox"/> No security or proprietary issue.
Scientific Reputation	<input type="checkbox"/> DOE, national or international impact.	<input type="checkbox"/> ANL or Local impact	<input type="checkbox"/> Little or no impact

(Consequence categories based upon the ANL and APS QA Plans, and the ANL Project Management Manual)

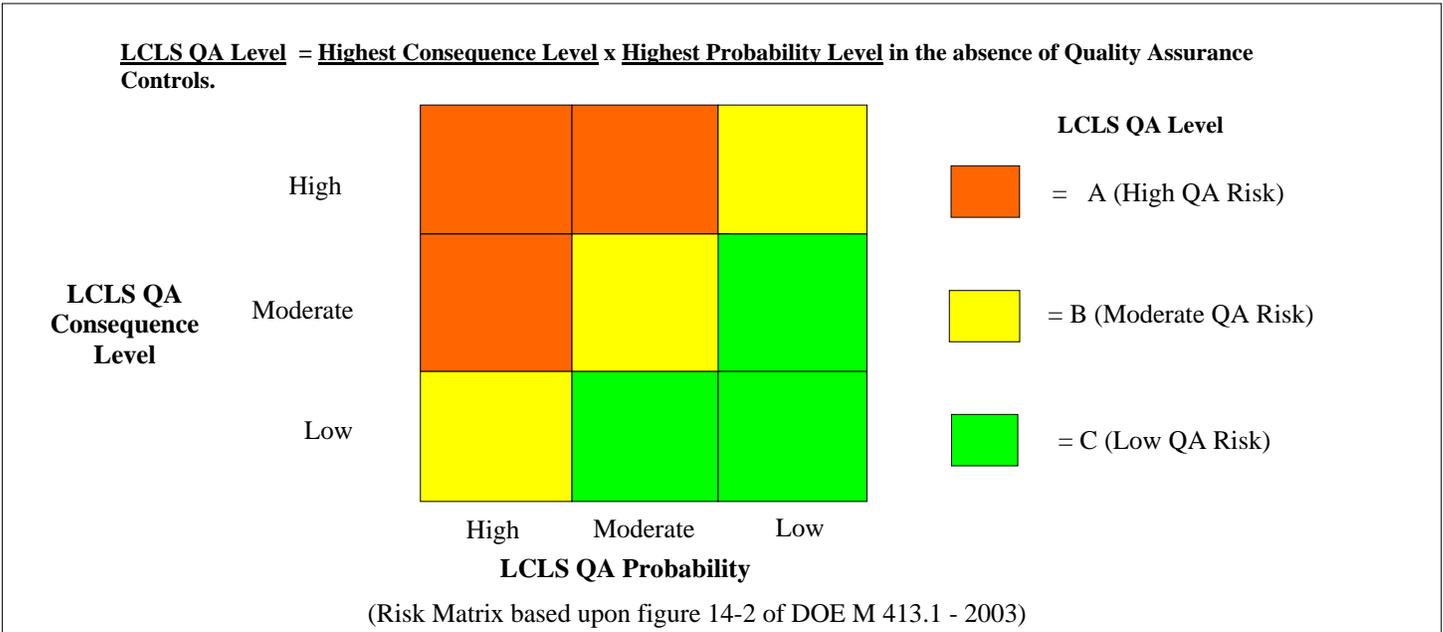
Step 2: Select the highest probability level for each LCLS QA Risk Category in the absence of any Quality Controls.

LCLS QA Risk Categories	High QA Probability Level	Moderate QA Probability Level	Low QA Probability Level
Supplier Capabilities	<input type="checkbox"/> No history of providing same or similar item or service. <input type="checkbox"/> No Quality Assurance Program <input type="checkbox"/> Recent ownership change. <input type="checkbox"/> Single foreign supplier	<input type="checkbox"/> Limited history of proving same/similar item or service. Documented Quality Assurance Program <input type="checkbox"/> Recent management change <input type="checkbox"/> Single supplier or only foreign supplier	<input type="checkbox"/> Proven history of supplying same/similar item or service. <input type="checkbox"/> Certified Quality Assurance System such as ISO9001 or MIL45802 or APS QAPP. <input type="checkbox"/> No recent management or ownership change. <input type="checkbox"/> Multiple suppliers
Design	<input type="checkbox"/> New design, and/or extensive engineering development is required. <input type="checkbox"/> Design beyond the knowledge available within the project or breakthrough in engineering is required to meet requirements	<input type="checkbox"/> Existing design that has been proven to meet the design requirements with minor design changes. <input type="checkbox"/> New design based on a similar component or subsystem that has been successfully fabricated and tested.	<input type="checkbox"/> Existing design that has been proven to meet all design and performance requirements

LCLS QA Risk Categories	High QA Probability Level	Moderate QA Probability Level	Low QA Probability Level
Hardware & Software	<input type="checkbox"/> Unproven highly engineered technology with multiple failure modes. <input type="checkbox"/> Unproven highly engineered technology requiring extensive R&D and testing required.	<input type="checkbox"/> Proven, state-of the art technology. Some engineering, modification and testing required. <input type="checkbox"/> Unproven technology required to be validated through first article acceptance, prototyping, modeling or testing in a simulated operating environment.	<input type="checkbox"/> Commercial, off-the-shelf technology, conventional manufacturing or construction. <input type="checkbox"/> Proven, state-of the art technology. No modification or testing required
Manufacturing	<input type="checkbox"/> Precision manufacturing tolerance (rework expected)	<input type="checkbox"/> Moderate tolerance (rework not expected)	<input type="checkbox"/> Ample tolerances (rework very unlikely)
No. of participating organizations	<input type="checkbox"/> LCLS + more than 3 other organizations	<input type="checkbox"/> LCLS+ up to 3 other organizations	<input type="checkbox"/> LCLS + 1 organization
Qualitative Rating	<input type="checkbox"/> Very Likely	<input type="checkbox"/> Likely	<input type="checkbox"/> Unlikely
Quantitative Rating	<input type="checkbox"/> Probability>80%	<input type="checkbox"/> 80%>Probability>20%	<input type="checkbox"/> Probability<20%

QA Probability Levels Based upon the ANL Project Management Manual

Step 3: Determine the LCLS QA Level using the consequence level and highest probability levels identified in Steps 1 and 2.



Note: There are can be situations where the probability of an event may be low, but the consequence can be high. For example a \$2.00 off-the-shelf electrical switch that will be used in a personnel safety application.

This document has been approved by LCLS Project Management