



**LCLS-II Review Committee Charge for:
CT.00 CRYOPLANT PLC CODE Production Review**

13-14 November 2018 at JLAB

Committee: Joseph DELONG (SLAC Deputy Head of Controls), Tom PETERSON (LCLS-II Technical Director), Ginger DECONTRERAS (LCLS-II System Engineer), Michal Kadlec (ITER), Matt Howell (SNS)

Introduction: JLAB is responsible for the design and delivery to SLAC of the LCLS-II CRYOPLANT Equipment, including numerous sub-systems from various vendors. The Sub-Systems are connected to 23 PLCs across the plants. The PLC and Control Hardware are defined and procured by JLAB; a final design review was held on September 2017([HR-2017-09-001](#)).

JLAB is also responsible for development of the PLC software, including Configuration, Definition, Coding and Testing. The Controls will be essential to commissioning, and will play a key role to ensure safe equipment operation and to achieve the CRYOPLANT KPP.

SLAC is responsible for the Network and for the EPICS based Human Machine Interface (HMI) Layer.

Charge: The Review Committee is charged to assess the plan to Define, Code and Test the CRYOPLANT PLC, EPICS HMI Layer and shall provide answers to the following questions:

1. GENERAL

- a Is the documentation and coding maturity consistent with the schedule?
- b Is the schedule compatible with the overall plan including Installation and Commissioning?
- c Is the Control Team organized and staffed to successfully complete the project?

2. EQUIPMENT PROTECTION

- a Are all equipment protection functions (in particular responses to abnormal conditions such as trips, alarms and interlocks) comprehensive, clearly identified, documented, implemented and traceable to the PLC code?

3. DEFINITION AND DOCUMENTATION

- a Are all automated functions (Alarms, Trips, Interlocks / Permissive, Cause and Effects, Control Loops, and Automated Sequences) sufficiently documented for Coding, Testing, Commissioning, Operation and Troubleshooting?
- b Is there traceability between documentation and the PLC code?

4. CODING

- a Are coding rules adequately defined and implemented?
- b Is the PLC code clearly developed, and consistent with documentation and coding rules?

5. BENCH TESTING

- a Has JLAB developed an appropriate plan for testing the CRYOPLANT control systems?
- b Is the EPICS HMI testing integrated with the PLC tests?

6. COMMISSIONING

- a Has JLAB developed a plan to perform commissioning?
- b Have the required resources been identified?
- c Does JLAB's plan for commissioning and testing of the coldboxes appropriately address commissioning and checkout of the PLC controls prior to testing the coldboxes?