Injector to Conventional Facilities
Interface Control Document

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Project Director  
Signature  
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Change History Log

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<th>Rev Number</th>
<th>Revision Date</th>
<th>Sections Affected</th>
<th>Description of Change</th>
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<td>9-20-2005</td>
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<td>Initial Version</td>
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EXECUTIVE SUMMARY

1.1 Scope  Interface between LCLS Injector System and LCLS Conventional Facilities. Conventional Facilities provides x-ray, electron and beamline and equipment enclosures, mounting surfaces, compressed air, conventional utilities, and environmental conditions for the Linac components and controls.

1.2 Responsibilities

<table>
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<tr>
<th>WBS</th>
<th>Represented by</th>
<th>Responsible for:</th>
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<tr>
<td>1.9</td>
<td>D. Saenz</td>
<td>Supporting and approving this ICD</td>
</tr>
<tr>
<td>1.2</td>
<td>E. Bong</td>
<td>Preparing, maintaining, and approving this ICD</td>
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1.3 Interface Diagram

- Requirements for beamlines, enclosures, supports, buildings and cabling defines Room Data Sheets, Housing & Support Building Design
- Beamline Devices and Supports attached to Beamline Housing Floor
- Cable Plant to beamline Devices resides in Cable Tray
- Controls Racks and Hardware resides in Support Building & Power distribution

1.3 Linac Scope

1.9 Conventional Facilities Scope
### 1.4 Interface Description

<table>
<thead>
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<th>Heading</th>
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<tr>
<td>3.1</td>
<td>X</td>
<td>Mechanical</td>
<td>Mounting surface/footing for component support</td>
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<td>3.2</td>
<td>X</td>
<td>Fluid</td>
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<td>3.3</td>
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<td>Vacuum</td>
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<td>3.4</td>
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<td>3.5</td>
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<td>RF</td>
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<td>3.6</td>
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<td>3.11</td>
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<td>Other</td>
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2.0 Applicable Documents
- 1.1-101 LCLS Cable Specifications
- 1.2-001 LCLS InjectorLinac System Requirements
- 1.9-001 Physics Requirements For Conventional Facilities
- 1.9-100 Shielding Requirements for the LCLS Project (Title I)
- 1.9-101 Architectural/Engineering Design Guidelines
- 1.9-104 Emergency Lighting Specification

3.0 Interface Definition
The interface between the LCLS Injector and Conventional Facilities Systems occurs along the physical expanse of the LCLS Injector located in the Sector-20 Off-Axis Injector Vault and in the Linac Housing at the beginning of Sector-21. There is also an interface in the Linac Sector-20 Injector Alcove and the RF hut in Sector-20 Klystron Gallery. Conventional Facilities provides modifications to the beamline housing in which the Injector components are mounted, and a new alcove and RF hut to house and protect the Injector drive laser and controls equipment. CF also provides all cable trays, water headers, air headers, convenience outlets, lighting, power distribution to process equipment racks for Injector controls components, and HVAC as required for The RF hut and alcove. CF also upgrades utilities in existing housings and support buildings as required for the Injector beamline and controls.

The Injector System installs components and systems within the structures provided by Conventional Facilities. The interface varies with type of component. Injector installs the cable plant into cable trays installed by Conventional Facilities. Injector installs anchors into the floor to mount beamline components and equipment. Injector installs racks in equipment shelters provided by Conventional Facilities. CF provides power distribution to the process racks, Injector specifies the power requirement. Conventional Facilities provides water and compressed air headers with valves at locations specified by Injector. Injector provides specifications to Conventional Facilities on radiation shielding requirements, internal enclosure dimensions, cable tray dimensions and routing, water air and power requirements, and temperature requirements. Injector also requires a controls interface to the CF power distribution and lighting for PPS. Linac also requires review of the implementation of LOTO and Fire Protection/Life Safety design in the power distribution.

3.1 Mechanical Requirements – Mechanical interface is at the housing floor for beamline devices, equipment building floor for process equipment rack mounting, power connection at each process equipment rack for power distribution, cable tray for cable plant installation, nipples at valves for water distribution and nipples at valves for air distribution.

3.2 Fluid Requirements – Temperature controlled LCW cooling water headers provided by CF with valve locations specified by Linac. Compressed air headers provided by CF with valve locations specified by Linac.

3.3 Vacuum Requirements – None
3.4 **Thermal Requirements** – CF will provide HVAC to Laser room and RH hut to Injector System specifications.

3.5 **RF Requirements** – None

3.6 **Electrical Requirements** – Cabling providing power to process racks in RF Hut and Li-20 Alcove will be installed by CF. Cabling from process racks to beamline equipment will be installed by Injector Systems (Controls Section of WBS). All cable trays are to be installed by CF. Injector will provide cable tray dimensions and routing for tray to laser lab, RF Hut, Injector beamline components and systems.

3.7 **Power Requirements** – CF to provide power to process equipment racks. CF also to provide convenience outlets in Injector Vault, RF Hut and Li-20 Alcove and welding power outlets in Injector Vault. CF power distribution design to be reviewed by Injector for compliance to PPS, Life Safety and LOTO requirements. Injector to provide power requirements.

3.8 **Signal Requirements** – Injector will provide signals from PPS to turn off housing lights and power to hazards.

3.9 **Radiation Requirements** – None.

3.10 **Environmental Requirements** – CF to provide ventilation in the beamline housing and HVAC in RF Hut and Li-20 Alcove to Injector System specifications.

3.11 **Other Requirements** – None

4.0 **Verification** – Injector System to review CF drawings for compliance to Injector provided specifications such as HVAC, cable-way and power distribution. Verification of all requirements to be performed prior to CF contract award and again prior to beneficial occupancy. Performance goals for each system to be tested are described in the Physics Requirements Documents.

5.0 **Notes** – Construction of global controls feedback and controls infrastructure to be managed and funded from WBS 1.1 LCLS Management and Integration.