RFQ Installation Plan

PIP-II Meeting, 14-July-2015

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RFQ Installation Plan

- Planning and documentation
- Critical Activities
- Schedule
Planning and Documentation Status

- Top-level installation drawing (F10003341, draft)
  - Covers overall installation of the RFQ in the beamline
  - References some lower-level installation drawings
    - Lower-level drawings are mostly still in work
- Installation Plan document (ED0003340, draft)
  - Outline of installation sequence
  - RFQ handling/rigging instruction
    - In technical review for rigging safety
- Schedule
RFQ Installation Plan

- Planning and documentation
- Critical Activities
  - Focus on critical path and work requiring access to the RFQ itself
  - Shown here ~chronologically
- Schedule
Shutdown Start

• We need to start a shutdown and begin to clear the cave ~2 weeks prior to RFQ arrival
• Biggest impact is on LEBT operation and RF device testing
  • Affects power test of full 50ohm kicker – need to relocate this test

• Working plan is to start the shutdown on M 8/03/15
RFQ transport by LBL

- Dedicated transport on LBL-truck
- Vibration-isolating shipping frame

RFQ Shipping Frame: Pneumatic vibration isolation

M. Hoff, LBL
Unloading at CMTF

- Forklift shipping frame off truck and set on CMTF dock
Craning off shipping frame

- A delicate operation due to high center of gravity of RFQ
- Detailed instructions and stability assessment included in the installation plan
- Crane to a staging area outside of PXIE cave
Installation of LEBT scraper

• Done outside of cave before integration with beamline
• Risks largely retired by hardware tests in the LEBT
• After this work and associated survey is done, RFQ moves into the cave

Andrews, Snee
Coupler installation

- Couplers assembled piecewise on the RFQ
- As-found survey allows spec. of coax lengths
Installation of vacuum hardware

- Assembly allows final leak check and beginning of vacuum conditioning
RFQ Cooling

- Cooling lines installed late in the process because they will restrict physical access
- Biggest single installation task
- Current status:
  - Parts mostly on hand
  - Distribution manifolds constructed
  - Skids need to be constructed and installed
RFQ Coax

- Routing has been defined
- Most pieces will be available well before need
  - Significant re-use of HINS coax
  - Order of new pieces based on design lengths in coming weeks
- Final two pieces to be ordered to a surveyed length after RFQ installation and final alignment
Coax routing and alignment scheme

X and Y adjustments allow us to co-align elbows interfacing to this straight section. Survey this length after installation and order R6 and L6 per surveyed length.

Rotation at this flange gives adjustment in \( \sim X \)

Rotation at this flange gives adjustment in \( Y \)

At final installation, last section connected in this “U”
Parallel work

There is lots of other work to do to prepare for RFQ conditioning. To a large extent, it can proceed in parallel with the steps I’ve highlighted:

- Cabling
- Instrumentation
- Interlocks
- LLRF
- Etc.
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RFQ Delivery: Assume 8/17

RFQ in cave and rough aligned 8/31

Couplers installed

RFQ under vacuum 9/11

Cooling system work complete 10/16

Last piece of coax installed 10/22

RFQ ready for conditioning
RFQ Installation Plan

Questions/Discussion?