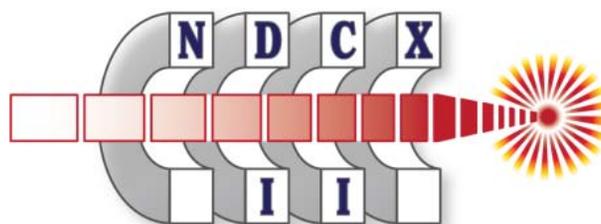


NDCX-II Plans for Commissioning



J.W. Kwan

HIF VNL Program Advisory Committee Meeting

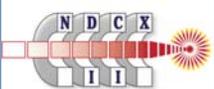
Dec 8, 2010

The Official Statement in NDCX-II Project Execution Plan

The specific project acceptance criteria (CD-4) can be stated as:

“The NDCX-II accelerator and pulsed power systems will be installed, aligned, vacuum tested, and energized with high voltage pulses. An ion beam will be accelerated and transported to a beam diagnostic station along the beam line. The beam current will be measured with a Faraday cup, and the beam profile will be recorded with 2-D scintillator images.”

Commissioning of NDCX-II is not part of the project scope. When the above criteria are met, the project will be completed.



NDCX-II project schedule highlights

- Assume complete construction and start running beam test by about July 2011.
- Estimate to take at least 2 months of “Integration Test” to meet CD-4 deliverable criteria (most optimistic date is early Sept, 2011).
- Allow a 6-month schedule contingency until the end of March 2012 which is the official end-date of the project.
- Follow with a 12-month Commissioning period supported by VNL program fund.



Integration Test (part of project)

- **Checking things out – voltage holding (acceleration & magnets), vacuum, beam diagnostic equipment, controls, data acquisition, mostly done by June 2011**
- **Trouble shooting will take several weeks**
- **Injector Test including ion source heating, beam extraction and characterization of injected beam to be done in July 2011**
- **Beam Transport & Acceleration (Integration) Test including alignment, pulser timings, waveform tuning, etc. to be done in August 2011.**
- **Beam diagnostics include imaging, position, energy, and beam loss.**
- **Plan on running with the ion source not at full current**



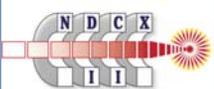
Commissioning (phase 1: Oct 2011 – Mar 2012)

- **System Improvements (Oct – Dec 2011):**
 - Injector to reach full current
 - Ion source life time
 - Add/improve beam diagnostics
 - Review safety procedures and documentations
 - Design beam dynamics experiments (simulations)
- **Install final focus magnet and target chamber (Jan 2012)**
- **Beam transport & acceleration (Jan 2012 – Mar 2012)**
 - Run beam to the end of the beam line.
 - Do beam-based alignment, pulser timings, waveform tuning, beam energy analyzer, emittance diagnostics, beam loss, etc. in order to fully characterize beam pulse at the target
- **Reach a certain milestone of beam pulse on target that enables meaningful WDM experiments**



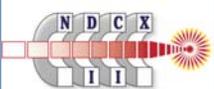
Commissioning (phase 2: Apr 2012– Sep 2012)

- **Improve system reliability and availability**
- **Continue to improve beam quality and target diagnostics**
- **Time-share Beam Dynamics experiments with WDM experiments.**
- **See Alex and Frank's talks for research experiments on NDCX-II.**



Summary

- Phase 1 commissioning period—allows 6 months to run beams and to reach target
- Phase 2 commissioning period—another 6 months to improve performance and starts doing WDM target experiments.
- A new target chamber will allow introduction of new diagnostics, and more space for auxiliary equipment such as neutralizing plasma sources. The total cost of the new target chamber with appropriate diagnostics is estimated to be around \$2 – 3M.
- A \$1M in FY11 can provide support for mechanical design of the target chamber and expedite its construction schedule.



The NDCX-II Project for HEDLP/HIF Studies

Budget = \$11M, Schedule = Jul 2009 to Mar 2012

