Progress Report - February

Date of report: 5 February 2017 **Author:** Karl W. Smolenski

Identification of the project:

500kV DC Photoelectron Gun for BNL

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Description:

Cornell is to supply a DC photoelectron gun for Brookhaven National Lab (BNL), for RHIC electron cooling.

Objective:

The objective of the Progress Report is to keep the collaboration abreast of the project status as centered at Cornell University's CLASSE and to communicate future activities and milestones. Any risks to the project will be highlighted in the Progress Report. Any dependent activities: e.g. the timing of free-issued equipment and machined parts from BNL will also be noted in the Progress Report.

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Project Status

We are working on a detailed Gantt chart for the whole project, including everything, not just the manufacturing phase.

A physical traveler binder has been started with all inspection reports for the electrodes, materials data, etc. Numerous orders have been coming in. All work has been submitted to the Cornell Shops, and they are progressing through the work on a prioritized list. We'll be able to track progress and completion dates. The three electrode pieces (the most critical parts) are complete and have advanced to the polishing phase. All materials for the shop are now all in hand. Supplies have also been ordered, various vacuum items, hardware, etc.

Milestone Dates

Description	Baseline Date	Anticipated Date
Contract Award	4/1/2015	4/9/2015
Manufacturing Plan / Schedule	4/29/2015	6/5/2015
Component Fabrication Commences at Cornell	5/13/2015	4/9/2015
DC Gun Assembled and Leak Checked at Cornell	1/6/2016	1/6/2016
DC Gun Conditioned at Cornell	5/25/2016	5/25/2016
DC Gun Delivered to BNL	8/3/2016	8/3/2016

Contractual dates are specified in the SOW. These may change during the project and every attempt will be made to accelerate the project to provide an earlier delivery date.

Traffic Light, *applies only to the anticipated dates:*

Amber =	Controlled risk to the project
Red =	Uncontrolled risk to the project
Grey =	Complete

Current Project Gantt

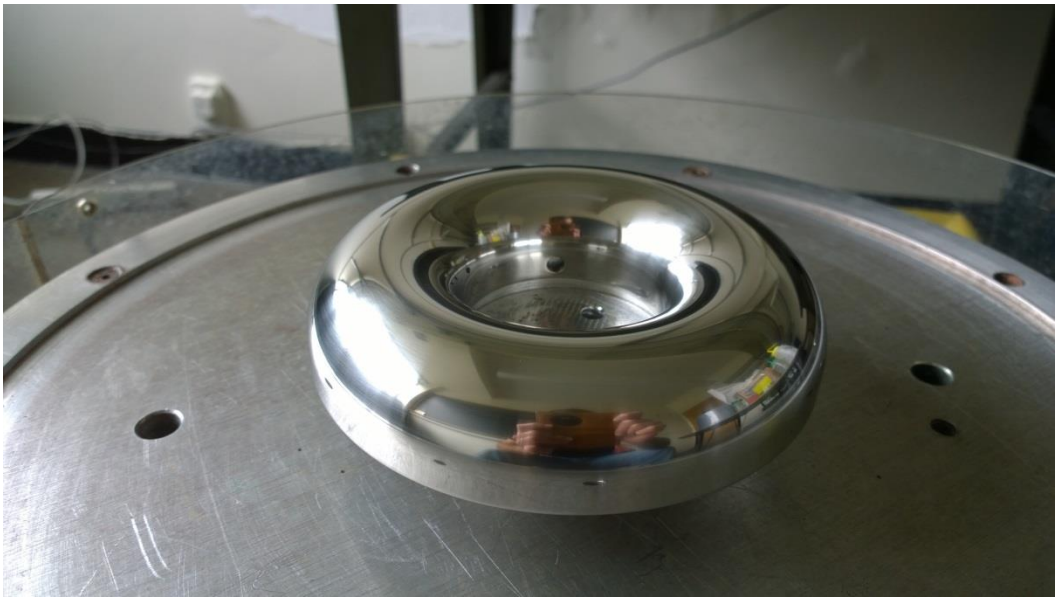
The project Gantt chart will be forwarded. As the project is at the beginning stages it show all tasks on schedule, future reports will show more realistically where the project lies.

Current Phase

Cornell / BNL reviewed the modified vacuum vessel design and it has been approved for manufacture. (Cornell would appreciate a copy of the final drawings for future projects). Order for two replacement gun insulator

ceramics has started and is proceeding. Cornell found the leak check chamber and dome (there is an SRS RGA currently mounted suitable for leak checking.

The front and rear electrodes have been coarse hand polished, we are progressing through the finer grits and will be packaging them for shipment to the electropolishing vendor (we will wait until the center electrode is also ready). The center electrode is complete and will be welded before it proceeds to polishing this week. This electrode (with large area) will probably take most of June to finish.



Training starts Monday for a temporary employee who has been hired for the summer for clean room / chemical cleaning tasks. Most vacuum components (gaskets, flanges, hardware) have arrived and are ready for cleaning. An additional machinist started June 1st to alleviate delays in the machine shop.

Modifications to the Anode Assy – rotatable 4.5" CF replaced with fixed 4.5" CF to avoid shifting during shipping (7101-259), likewise done to the Prep System Adapter (7101-260), revisions issued. Further modifications to the anode were required to accommodate a bucking solenoid. In order to slide the solenoid into place, the very long (SHV) 10kV feedthrough had to be replaced with an (MHV) 5kV feedthrough. BNL will need to review and integrate their design of the bucking coil. Bucking coil will be designed and provided by BNL. Cornell will need the bucking coil in advance of the assembly since it is trapped. Design work on the cooling rod continues and its interface to outside of vacuum continues.

Future Phases

Much work is waiting on the machine shop to complete. In order to keep technicians busy, the stalk, which requires extensive polishing, is the next high priority now that the electrodes are complete.

The two ceramic insulators for this project (currently in storage) need to be recovered and carefully measured and then cleaned for assembly.

Open Issues

Many open issues at this point. Highlighting here only the most critical to ensure rapid progress on the project. We should hold our first phone conference this week to discuss the following:

1. SF6 pressure vessel design and interface to the vacuum vessel
2. Ordering VAT gate valves should happen soon, they should be ordered cleanroom-clean
3. Cornell needs to complete a master assembly model
4. Cornell needs to provide designs for many "less critical" items quickly such as the stands for the gun and its girder