

Monthly Report of the ILC Controls Project  
February, 2007  
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March 2, 2007

**Project Definition:**

The ILC Controls effort is on multiple fronts:

- 1) Providing a controls system for the SCRF R&D program at Fermilab. This includes NML, Horizontal Test Stand(s), Vertical Test Stand(s) at 1B1. It also includes the controls system for 3.9GHz cavity testing as many of the components being developed at used at A0 as many of these will be moved/deployed at NML.
- 2) Global ILC effort. We will help write the RDR including cost estimates. We will help write the EDR and participate in controls R&D necessary for its completion. We will help participate in instrumentation R&D working on HOM BPM measurements and ATCA digitizers.
- 3) Cavity Data Management System.

**Project Manager's Summary:**

In order to provide stakeholders with feedback regarding controls related activities, we began monthly status reports (first one in February) and have started a Microsoft Project Plan file (not even skeletal yet) to track the controls related tasks and progress. This is meant to be a two way communication in order to receive input on task priorities and schedules.

A significant effort was spent in preparing for and participating in the SCRF DOE review in mid-February. A controls talk was separated out from LLRF as a separate talk in the breakout session. No particular action items for controls were spelled out in the closeout summary. The written report has not yet been made available.

Limited manpower resources continue to be a problem especially as Dennis and Ron were away at KEK for 2 weeks on an HOM instrumentation trip. We're making some progress in alleviating the problems:

- Progress has been made in finding a possible UofI undergraduate to work on A0 related controls displayed. Once we are able to work out the funding details, this may take place in mid-May.
- We are also aggressively trying to push another CP personnel requisition for ILC controls development. Luciano will be on vacation most of March.
- The CD admin support group has agreed to help with system administration of the ILCTA test area machines at A0, MDB, and NML. The particular individuals are Connie Sieh and Troy Dawson. Test stand support is a new role for the CD admins so there will be a learning curve for all involved.

- Two additional AD/Controls people are taking on responsibility for specific ILCTA tasks. Jerry Firebaugh is looking into the DOOCS/EPICS interface code from DESY. Jimmy Wu is evaluating the IRMIS database.

We have a task spreadsheet with contacts from Sergei and will be contacting the people listed to determine their controls requirements.

### **ILC:**

We completed last minute preparations for the Beijing meeting. Weekly global controls meetings have continued with summaries from the Beijing meeting and DOE reviews.

### **Data Management:**

During the past month, the data management committee continued to refine its requirements document. The committee also met with UGS representatives to discuss the requirements document so that they could produce a proposal for an evaluation of their Tecnomatix MES software. Their initial proposal did not meet our needs and was rather costly. We explained our concerns and are currently evaluating a revised proposal. Finally we have asked for a review of our requirements document with ILC management. This review would ensure that the committee's understanding of the requirements is consistent with that of the ILC project. We believe this to be a prudent step before investing the time and money necessary to developing the solution that meets those needs.

### **NML:**

Final estimates are in progress for replacement of the ceiling tiles and carpeting of the control room floor. Requisitions are expected shortly. The control room console layout was presented at the Monday installation meeting. The layout will be incorporated in a 3D model of the control room for further review.

The layout for "phase 1" installation, which includes Capture Cavity 2, and cryomodule 1 has been determined. Discussion about rack space, equipment placement, grounding, and cable routing is proceeding

Cryogenics:

EPICS templates were developed for NML cryogenics. A new server node, nml-cryo2 is up and running the new database. Checkout has begun.

### **A0:**

Firewire DOOCs camera server was installed and is available from the main display panel. Installation of DOOCs on a Linux x86 VME board has begun. Minor

improvements to the controls user interface were made. Integration of motor controls into DOOCs continues.

Incremental updates were made to the coupler conditioning software.

There appeared to be a problem in the WOOSTER DSP code. Spent a few hours here looking into it, but it's likely to be a configuration problem. Better diagnostics here would help (See section on infrastructure).

Effort is continuing for support of power supplies, actuators, and stepping motor control in the double dogleg beamline addition.

### **HTS:**

Cable installation for the test stand should start next week. Rack layout changes are being made to accommodate interlocks and necessary equipment in support of both CC2 and HTS.

Operation of the test stand is planned to be automated, using the sequencer for processing. It is also desired to divorce the HTS high level RF from Acnet.

The above requires additional epics support for data acquisition, displays, and archiving.

Minor EPICS database additions and bug fixes for cryogenics controls have been completed.

### **VTS:**

Design of the cryogenic controls is proceeding. Approximately 50% of the programmable logic controller code is complete. Layout and drawing of the field wiring and purchasing of cable has begun.

Design and documentation of the cryogenic process control including automation has been initiated.

### **Infrastructure:**

Investigation of Hytec hardware (VME modules) as possible EPICS-ready replacement for the internet rack monitors was initiated. The IRMs are older technology and newer commercial solutions that come EPICS ready are available.

An EPICs naming convention that will be compatible with DOOCs naming conventions was formulated. Documentation has begun.

Work has begun on a vxWorks EPICS IOC application for general use which is more streamlined and has more monitoring and diagnostics built-in. A potential use is for the Photocathode Prep System.

We are working to replace the Sparc boards with x86 boards running Linux. The sparc boards are used in conjunction with the SIMCON LLRF controllers and in WOOSTER. They are older and slower, and the diagnostic suite is not as rich (eg, no TRACE), so it's more difficult to track down problems when they occur. Much progress was made on this front. The Linux port to x86 is now believed to be complete including VME DMA transfers and interrupts. We are still waiting from DESY for the source code for the MATLAB libraries that run on the front end boards. This is used by the CD engineers while doing board testing.

**Instrumentation R&D:**

Software support for upgrading the KEK ATF BPMs continued culminating in a trip to KEK to install a VME crate with four Echotek V1 digitizer boards. Controls people participating in this effort were Ron Rechenmacher, Dennis Nicklaus, Sharon Lackey and Charlie Briegel. There was a great deal of preparation work done ahead of time in terms of getting development environments up on portable laptops. The team also worked very hard while they were there and experienced the usual computer security issues, cabling problems, etc. It was a very successful and worthwhile trip. The system was installed and successfully connected to the ATF control system.

**ATCA:**

**Resources Used in February 2007:**

	<b>AD</b>	<b>CD</b>	<b>TD</b>	<b>PPD</b>	<b>Total Effort</b>
<b>ILCTA</b>	<b><u>0.62</u></b>	<b><u>1.58</u></b>		<b><u>0.39</u></b>	<b><u>2.2</u></b>
<b>ILC</b>	<b><u>0.06</u></b>	<b><u>0.81</u></b>			<b><u>0.87</u></b>
<b>DM</b>					<b><u>0.86</u></b>

The effort listed here is time worked and does not include vacation, sick leave, holidays, etc.

**Purchase requisitions/procard during February, 2007:**

**Milestones:**

**Meetings held, Reports Given:**

Rob Kutschke presented a tutorial on linear accelerators, how they work and the controls requirements of their components.

Weekly status meetings were held on February 5, 12 and 19.

**Documents:**

The following documents were written/updated and added to the ILC Document Database during February 2007.

DOE SCRF Controls talk:

<https://docdb.fnal.gov/ILC-private/DocDB/ShowDocument?docid=398>

NML Layout

<https://docdb.fnal.gov/ILC-private/DocDB/ShowDocument?docid=382>

A cartoon description of Linear Colliders

<https://docdb.fnal.gov/ILC-private/DocDB/ShowDocument?docid=392>

Controls project plan

<https://docdb.fnal.gov/ILC-private/DocDB/ShowDocument?docid=393>

