

PM report for the June 2008

With this issue of the Technical Design Phase Monthly Report, you will find summary notes for the Group's monthly meetings (Main Linac Technology – Superconducting RF, Conventional Facilities and Siting, and Accelerator Systems), and a report from the Cost and Schedule Group (Peter Garbincius). These meeting notes show progress made and plans for upcoming meetings and work.

Our goal is to publish this report monthly. It complements the weekly ILC Newsline, especially the 'Director's Corner'. Please see the 'Director's Corner' for important planning and policy communication.

The Project Managers' attention is turning toward two important review meetings that will be held in the next ~year. These are our first reviews since the completion of the RDR and reflect the new, more formal, Technical Design Phase organization. Both reviews and the associated panels have been described in the ILC Newsline 'Director's Corner'. The Project Advisory Committee (PAC), who report to the ILCSC, will review us in late October, and the Accelerator Advisory Panel (AAP), who report to the Project Director Barry Barish, will review our work in spring of 2009. We expect the latter review to serve as the 'interim TDP 1' review and its basis will include the goals and plans described in the R & D Plan, published in early June 2008.

Marc Ross, for Project Managers Nick Walker and Akira Yamamoto

June 2008.

Draft: Minutes of ML-SCRF Technology Meeting (080611)

Date & Time:

13:00-14:15 GMT, June 11, 2008, using WebEx.

Participants:

L. Lilje, H. Hayano, N. Ohuchi, H. Cater, T. Peterson, S. Fukuda, A. Yamamoto, M. Ross, J. Carwardine, W. Bialowons, J. Kerby, C. Pagani, R. Larsen, H. Padamsee, Bob Kephart, M. Champion, B. Chase, S. Michizono, S. Simrock, J. Branlard, G. Cancelo, W. Funk, S. Prat, T. Shidara

Agenda:

1) Status report from PM (A. Yamamoto and M. Ross)

See the attached file "SCRF-PMreports-080611"

During the Dubna meeting, technical design report was released (release 2).

It is necessary to re-evaluate and fix the base-line field gradient within TDP-1 for other systems (CF&S and AS) to enable to progress further systematic work in TDP-2.

2) Report from each group leader

- Cavity (by L. Lilje)

S0 WebEx meeting was initiated and regional statuses were presented. Meeting slides at

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=2772>

Next S0 WebEx meeting is scheduled on Tuesday, 17 June, from 12:00- GMT. Agenda at

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=2782>

And discussions how to handle tight loop will be included.

- Cavity Integration (by H. Hayano)

4 TESLA-like cavities are under cool-down test at STF without connecting warm couplers.

Cool-down/high power tests are scheduled from July 1 till 25.

Orsay-KEK collaboration for Orsay coupler test at STF was discussed.

(It shall be reconsidered since the power source at Orsay has recovered: S. Prat)

STF started the evaluation and material test to clear HP regulation for phase-2 He vessel.

INFN-KEK collaboration of cryomodule production for S1 Global is starting.

DESY stated to supply two cavity packages with Chechia Test in the middle of 2009.

Chechia Test of US cavities at DESY might be technically possible, if it is requested.

- Cryomodule (by N. Ohuchi)

Cryomodule design for S1 global was presented.

- Cryogenics (by T. Peterson)

Comparison between shallow versus deep tunnel in terms of Cryogenic System:

Shallow site allows most cryogenic plant hardware to remain on the surface and just distribution needs to be in the tunnel. There might not be a big cost difference in terms just of cryogenic hardware. A shallow tunnel with no access to the surface except for the same very widely spaced locations as a deep tunnel "looks" much like a deep tunnel in terms of cryogenic system constraints except for the "lower cold box" requirement at refrigerators for the deep tunnel.

- HLRF (by S. Fukuda)

During the Dubna GDE meeting, delta T issues of cooling water for klystron collector and power distribution system (PDS) were discussed. Delta T for PDS (esp. for circulator) is important since its performance will be affected largely by the temperature rise.

Shallow site scheme will affect the ACD, especially speaking the location of Marx generator should be carefully considered, and related cost difference should be examined.

PDS for S1 global is under consideration and its preliminary designs were presented.

- MLI (prepared by C. Adolphsen)

Progress and test results of the superconducting quadrupole model magnet will be presented at the next meeting.

3) Special topics and discussions

- HLRF-LLRF cooperative contribution to FLASH-9mA test: (J. Carwardine)
Contribution from ILC-GDE collaboration to FLASH-9mA test is expected.
See the attached file "Carwardine_HLRF_LLRF_9mA_Studies_11June08".
S. Choroba will be asked to act as one of contact persons for HLRF.
S. Fukuda will be the contact person for KEK to participate the test program.
HLRF/LLRF Combined WebEx meeting will be organized for this test.

4) Meeting schedule

- SCRF WebEx Meeting: July 9, no meeting in August.
High gradient R&D and its direction (including guideline for the S0 process, and re-organization of the "tight-loop program") will be reported/discussed by L. Lilje
Functional parameters and plug-compatible conditions will be discussed. H. Hayano and N. Ohuchi will prepare compatibility tables for cavity package and cryomodule.
- Post-TTC SCRF meeting, October 24, in Delhi.
- LCWS-08, GDE meeting, November 17-20, in Chicago.

CFS & Global Systems Webex Meeting (June 18th, 2008)

PM Report (Marc Ross)

Marc Ross reported on the GDE R&D Plan v2 that was released at Dubna. He discussed R&D priorities, schedule, and the resource tables.

The ILC GDE R&D Plan Version 2 has been released and is available from the ILC home page. The document will be revised every 6 months, with the next release due in December 2008. Several comments and corrections have been received already, and these will be taking into account in the December 08 release.

The global resource tables have been presented to US Congressional 'Staffers' in Washington.

It was noted that an apparently large number of FTE-years under 'Controls' is dominated by Low Level RF and related activities (included in the scope of Controls).

An important facet of the R&D Plan will be the definition of a 'Minimum Machine' configuration.

An interim TDP report will be delivered at the end of TDP Phase-1 (meeting will be in Paris in July 2010).

Part of the deliverables for TDP Phase-II will be a Project Implementation Plan (PIP) that will include models for contributions in kind that would address issues such as the division of conventional facilities and siting costs. The PIP is anticipated to be ratified (if not formally signed) by ILCSC.

CFS is working on the definition of a uniform site. The current focus appears to be leaning towards two existing sites (DESY and JINR/Dubna) as reference 'uniform' sites.

There will be a high-level visit from EU/BNDF to JINR during the week of June 23rd to discuss support for JINR contributions to the GDE conventional facilities program.

CFS Report (Dubna)

Vic Kuchler reported on CFS activities from the Dubna GDE meeting.

The group has begun to establish prioritized CFS plan.

The group intends to fully take advantage of opportunities presented by CLIC/ILC collaboration

Lee/Emil have come up with an all-chilled water solution, also all-process water solution available too

There was much discussion on the definition and priorities surrounding development of uniform site models. The discussion continued after the conclusion of the main CGS&G meeting.

CFS Report (ILC/CLiC)

John Osborne reported on two recent meetings of the CLIC and ILC teams. Future meetings are also planned, with the next meeting scheduled to discuss air handling. A subsequent meeting on cooling water for later in the year

Marc asked John to follow up on adding the ILC/CLIC Cost & Schedule Group to the CIC/ILC meeting agenda in October

Controls Report

Margaret Votava's report covered the international activities on Controls. She noted that the US effort had essentially come to a halt in 2008 because of funding reductions from the US Congress 'omnibus' funding bill. Controls infrastructure design/development activities for controls overall was in the US, so with that effort zero'd, people are focusing on their largely R&D, such as ATCA.

Regarding ATCA, Margaret reported:

- IHEP has a Chinese ATCA crate up and running
- KEK will be porting EPICS redundant IOC to ATCA
- ATF flight simulation...?

An ATCA/uTCA two-day workshop is being organized by Ray Larsen, Margaret, and Patric Le Dieu at the upcoming NSS/MIC conference in Dresden in October. Funding difficulties may mean that Margaret and Claude Saunders (Argonne) may not be able to attend.

America's ILC (ART) resources on Controls for US fiscal year 2009 likely to be quite low, and there is discussion about concentrating efforts on Low-Level RF rather than continuing both Controls and LLRF activities.

Planning for RF integration tests as part of the ILC/FLASH "9mA" tests

John Carwardine reported on planning status for the RF integration tests at FLASH.

Goals are to include RF integration tests, including characterization of HLRF overhead

vs RF regulation. The intention is to involve the international ILC RF community in planning and potentially with executing the plan. Those groups reside mainly at KEK, SLAC, and Fermilab. Leadership for the studies will continue to come from DESY.

A website for the 9mA studies (including RF integration) has been set up at:
<http://www.desy.de/~njwalker/TTF9MA>

Follow-up note:

Planning meetings for the FLASH 9mA studies are anticipated to be held bi-monthly, with alternate meetings focusing on RF studies and the main accelerator program respectively. The next meeting, focused on RF, is slated for Tuesday July 15th. [Contact Nick Walker or John Carwardine]

Other items

Peter Garbincius reported that an interim contract has been set up with Triad.

Next meeting: July 16th

8. Accelerator Systems WebEx Conference 27 June 2008, 13:00 GMT

Minutes (v1.0)

Attending: W. Bialowons, J. Carwardine, P. Garbincius, K. Kubo, M. Kuriki, F. Lehner (minutes), O. Napoly, E. Paterson, A. Seryi, T. Shidara, J. Urakawa, N. Walker, A. Yamamoto

Excused: A. Brachmann, J. Clarke, N. Solyak, A. Wolski

1. General Announcements - Nick Walker

Nick welcomed the attendees and presented the agenda of the meeting. Due to EPAC several TAG Leaders are excused and can not attend. **Written summary status reports should be sent to Frank no later than Thursday 3.07.**

The next WebEx meeting is set for **Friday, July 18 at 13:00 GMT.**

2. Short status report by TAGs

2.1 Beam Delivery Systems – A. Seryi

Andrei reported on the status of the BDS. A workshop on ATF2 software requirements and developments was recently held at LAL Orsay.

Integration and installation activity at ATF2 is progressing to put the new beamline together, which will be ready by October.

Colleagues from India are working on the beam dump system, mainly on optimization studies of the geometry and on overall design parameters. They run simulations with FLUKA and use hydrodynamic calculations to model heat dissipation in water vessel.

As regards the interface from the machine to the detectors, a document was prepared and discussed at the recent ECFA meeting in Warsaw and also presented at EPAC. Andrei pointed out that there is good progress with this document to finalise it for LCWS '08. The document will specify the minimal functional requirements and technical solutions for the machine-detector interface.

2.2 Simulations – K. Kubo (Slides available)

Kiyoshi gave a status report on simulations. The group meeting via webex is once or twice a month with ~5 participants.

A standard survey/alignment model exists by now but help/input from “conventional” survey/alignment experts is needed. Two almost independent simulations using the standard survey model have been performed for the Main Linac with basically consistent results. Simulation works including RF Coupler kicks are on-going. Preliminary results show no significant effect on the Main

Linac and an acceptable emittance growth in the bunch compressors. Kiyoshi pointed out that he needs to know the accuracy of the RF field calculations. The coupler wake fields were not yet included in the simulations. Nick mentioned that Dirk Krücker has results on the effects of the coupler wake fields and a paper was submitted to EPAC. In a further discussion the simulation of the shorter bunch from the damping ring (6mm) and single-stage bunch compressor was addressed.

3. Towards a Minimum Machine Definition – E. Paterson

Ewan explained the scope of the ~20 page document that will specify the concept of a minimum machine as one of the primary deliverables in TDP-I for 2008 (at LCWS '08) and that will form the basis of the minimum machine studies for 2009. A brief working document that outlines a possible plan of action to establish this specification document was recently drafted by Ewan and Nick and will be circulated to all the TAG leaders at the beginning of next week.

Loosely defined, the minimum machine is the design that fulfils the basic physics requirements as outlined in the WWS parameter document, but where overhead, margin, and possible design conservatism has been pushed back to an absolute minimum (reduced cost).

Ewan introduced the skeleton proposal for the minimum machine with the goal to reduce underground volume by more integrated use of the tunnels and shafts. The core layout of the integrated centralized campus proposal is described in the working document and includes:

- Two 6.4 km DR's rotated by 90° in the same horizontal plane as the BDS but displaced transversally by 200m
- A common beam-tunnel to house the upstream part of the BDS and the e+ and e- sources
- A single-stage bunch compressor
- A minimum 500 GeV BDS

Ewan emphasised that the primary concern is if the equipment fits into one tunnel, and how to answer this question as simply as possible. He suggested collecting tunnel cross section sketches and equipment sketches together in one easily accessible site to address it.

Ewan pointed out that feedback from TAG leaders is crucial. He wants to solicit constructive comments and suggestions from the TAG leaders on the ideas proposed. Everybody should read this working document carefully and all comments should be sent to him and Nick Walker, but should be cc'd to all the TAG leaders (pmedr@fnal.gov). The goal is to converge on a first draft of the minimum machine specification by Friday 22 August, where we will discuss the conclusions at the Accelerator Systems TAG leaders WebEx meeting.

4. Action items for 2008 (slides available) – Nick

Nick presented the major action items for 2008:

R&D plan:

Nick went over the R&D plan v2.0 emphasizing that it encapsulates the PM's strategy and vision for the next four years. The top-level milestones are defined and TAG leaders have to read carefully the schedule since several milestone dates need review. An interim revision of the R&D planning document with minor changes will be released (version 2.1) by end of August. Feedback for v2.1 has to be given by 18 July 2008. In addition there is the full review and a new release due in December 2008.

Nick explained that each TAG leader should define interim milestones for next 6-12 months which must fit into R&D top-level milestones. The PMs will attempt to set-up one-to-one discussions with each TAG leader in the near future to discuss the plans. Nick also noted that an important milestone will be the proposed AAP review tentatively scheduled for the end of April 09 at KEK. Nick emphasised that it is important to think of deliverables that can be reported at this review.

Minimum Machine:

Referring to Ewan's presentation Nick mentioned that the big task is to submit the complete minimum machine specification document by ILC/LCWS '08. The work on this minimum machine will be the focus of upcoming AS-TAGL meetings and general AS machine design activities up to October '08. A consensus on the definition of the core layout is necessary until 22 August 2008.

As regards RDR costs Nick mentioned that consolidating RDR data and information is still a priority and structuring ourselves properly for a TDP cost update is critical. This is mainly the responsibility of the cost management group (CMG) but naturally touches many points where TAG leaders need to get involved. Nick pointed out that the migration of lattice files into ILC-EDMS has started. All existing lattices should be sent to him with some explanation of status. He expects to finalise migration by 19 September 2008.

Nick showed the future schedules of the upcoming AS-TAGL meetings:

- Friday, 18 July 2008
 - Interim milestones and R&D plan feedback
 - Discussion on resources for minimum machine
- Friday, 22 August 2008
 - Agreement on scope of minimum machine definition
 - Report outline
 - Writing and related action items
- Friday, 19 September 2008
 - Lattice files migrated into EDMS

Nick noted that he hoped to increase the technical content of the monthly WebEx meetings, and requested suggestions for focus topics for future meetings be sent to Frank.

Monthly Report (1-30june08) for Peter H. Garbinicus
– rev. none

monthly_report_30june08.doc

Most of June was spent working with Tom Himel and John Carwardine in understanding the requirements of our costing tool, to be developed by our project management consulting firm Triad, developing a standard estimating EXCEL template, and trying to understand the interaction with EDMS.

We got Triad Project Management on board, first for a \$ 34 K interim 60 day contract. At the very end of June, the purchase order for the full \$ 178 K contract through January 19, 2009 was sent to Triad for their signature. Mid-June, I had sent to Triad the ILC Costing Tool Functional Requirements document and an updated Statement of Work for this period. Since Triad is busy preparing to work for ITER, we have received little attention so far. Hopefully, this will change when the Triad CEO returns from ITER and assigns a consultant, as promised for mid-July.

I participated at the ILC-GDE Meeting on Conventional Facilities and Siting at the Joint Institute of Nuclear Physics in Dubna, Russia, in early June. In addition to CF&S activities, John Carwardine and I also interacted with the CERN members of the CLIC-ILC Cost & Schedule team (Sylvain Weisz, Katy Foraz, and Jean-Pierre Delahaye). Tetsuo Shidara (KEK) and Hans Braun (CERN) did not participate. We have to remember to include Tetsuo and Hans in our distributions. The main discussion was to try to settle on a common cost estimating template. This will be somewhat problematic since the CLIC template wants to show four estimates for each part: final 500 GeV, 500 GeV interim, 1,000 GeV interim, and 3,000 GeV final. We gave the CLIC people the ILC Costing Tool Functional Requirements document and examples of draft ILC estimating templates.

Personally, I started temporarily working for the Fermilab Directorate on guidance of the experimental high energy physics and experimental astrophysics projects. This work is intended not to exceed 25% of my time through the end of December 2008, or until a new Associate Director of Research is brought on board to replace Hugh Montgomery, who has become Director of Jefferson Lab.

I was not able to make much progress on my first four assignments from the Cost Management Team Meeting at DESY in early May:

1. develop up a grading system to assess the availability and traceability of the background information for the cost estimate including basis of estimate, completeness, correctness, accessibility of data or the estimators themselves, namely to find how far we can ultimately trace back, distribute this to the other CMG members so they can apply – working on a template, will be later than the assigned date of end of May08
2. apply this grading methodology to drill-down into the Conventional Facilities estimate – again, will be later than the assigned end of May 2008
3. review the grading information supplied by the other CMG members on their assigned parts of the estimate – sometime in early June 2008 – will probably be not earlier than end of June.

4. place the cost estimating data in the EDMS, which will need organization and file structure and templates – much longer term – this will depend on the manpower added to this task.

To do over the next month(s):

Get Triad involved using ILC Costing Tools Functional Requirements document and draft estimating templates as starting points for discussion. Introduce EDMS.

Decide what parametric aspects are needed for the cost estimate and how to implement them in a database format.

Document Magnetic Field, Current, and Voltage information for all magnets from the MagSys TS Group.

I've gotten the e- Source, e+ Source, and RTML technical/cost sheets from Vladimir Kashikhin.

Have cost spreadsheet from Jim Clarke on Undulator – technical description from RDR text

Have authorization (from Apollinari and Holmes) to have Tompkins provide any cost and technical backup sheets that he has for magnets for BDS (conventional & SC), SC for ML, kickers and pulsed magnets (from Mattison), and DR (from Mark Palmer e-mails – may have to ask Wolski/Guiducci for DR – Palmer hasn't responded)

After determining the appropriate format, start porting the estimate files from my personal web-page to EDMS in a confidential-secure manner. This was done only to the Project Management group area in EDMS for non-cost-confidential files. Will need decision on how confidentiality will be accomplished in EDMS.

Finalize contracts for external hosting of Primavera – defer that for a while

Define and start implementing full Project Management tools, procedures, and training - also defer

With the other Cost Engineers, complete the Business Model for ILC – part of PIP for TDR – no progress since October 2007

Peter

ILC GDE Controls and LLRF PM Progress Report

March, 2008

Project Management

Most US people remained reassigned and not working on ILC related tasks.

Electronics Platform and High Availability

IHEP :

The ATCA platform of HuaWei Inc has arrived at IHEP in March, Including an ATCA crate (T8223):19 inch width, 14U high, 14 slot (12 for the processor, 2 for the switch), 300W/slot;Two processor blades (BH23):X86 series (LV Woodcrest Intel)2130MHz, 2*1 GB DDR (667MHz); 2*80GB SATA Disk; one switch (NX12+NR12):4*1GE (base) + 4*1GE (Fabric) +4FC and two ShelfManage module (SSM).Two SSM can exchange the function between each other (one works , the other is standby).Two power supply:4*220VAC, and 1*(-48)V.

We have assembled the ATCA components at our lab. Till now Enterprise Linux OS (Version 4 update 2) has been installed on the CPU board. We are reading the document of the ATCA, studying the function of SSM and the redundant research is in progress.

For the ATCA work in collaboration with Giessen: About Computer Node in the ATCA electronics frame, we have tested sucessfully with OS runing, optical high speed data transmission both with test board and Front-End electronics, and now is under testing with application software in Giessen University. Onother problem we have is the configuration of the PHY device for the gigabit ethernet connection. Some modifications for the second version is drafted.

KEK :

Will be porting a redundant EPICS IOC to ATCA.

SLAC :

The VME-ATCA Adapter module contract with SAIC is successfully completed to the halfway point (Phase I) and the decision was taken in May to proceed with Phase II which includes the deliverables of three functioning modules along with basic software drivers on a Linux platform. The new contract for layout, assembly and testing of three units is through the SLAC approval process and awaiting final DOE signoff.

The contract for additional consulting on the platform standards is also awaiting final signoff. This work will support completion of the ATCA adapter, evaluation of VME modules at SLAC, and planning of the IEEE NSS-MIC ATCA Workshop in October 2008. No further work has been done on the ATCA Profile for Physics but progress is planned by the end of FY 08 to support collaboration building at the workshop.

Work continues on the modulator-klystron interlock system for the test stand involving the Marx and the new 10 MW Toshiba tube which is being installed. Four interlock modules have been fabricated, assembled and placed under test. Initial tests showed some resistor values that had to be changed on the boards; this has been completed. Software has been developed for the test system. The FPGA code has been tested and multi-unit software tests are continuing. The plan for this unit is to morph into the ATCA platform via the VME-ATCA Adapter.

A draft proposal is nearing completion for the proposed LCLS controls upgrade of the Main Linac using a phased transition of hardware architecture to xTCA. A design review of the preliminary phase involving just node hardware and all software is planned for mid-June. ATCA and μ TCA are being investigated for use in the sector node and front end systems. New embedded shelf management 1U rack-mount μ TCA products now on the market appear to offer promising cost reductions of the infrastructure with 6-8 μ TCA (AMC) module payloads.

Architecture

Test Area Updates

- DESY
 - 4 different μ TCA crates received, one more to come next days
 - prototype of 8 channel, 100MSamples, 14 bit ADC AMC-board received:
 - Linux driver and DOOCS server ready, working with the manufactor on DMA
 - redesign of the DESY AMC module with one Virtex 5 FPGA done, production just started
 - 2 channel ADC and 2 channel DAC as a piggyback for the DESY AMC is ready and testing started
 - old FNAL/DESY timing system of FLASH on IP modules is running on μ TCA with full DOOCS support (interrupts, driver, server, ...)

Engineering

Workshops and conferences:

Work is progressing on organizing the ATCA 2 day workshop in Dresden as part of the NPSS MIC conference. Several controls people are planning on attending including Kazuro plus a student, possibly Shin, Kay, Zhen'An Lui, Ray Larsen, and Vince Pavlicek.