



Project Managers' Report

June 2009

ILC Global Design Effort

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. This monthly report complements the weekly ILC Newslines. Please see the 'Director's Corner' for important planning and policy communication.

The Project Managers: Marc Ross, Nick Walker and Akira Yamamoto
June 2009

**Global Design Effort
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GDE Monthly Project Management Report for June 2009

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Project Managers' Report

Work on the new ILC Baseline design began in earnest in June 2009 following the face-to-face Accelerator Design and Integration (ADI) meeting held at Desy. The meeting produced a 'Strawman Baseline', dubbed SB2009, which is described in the meeting report, authored by Nick Walker. We intend to submit a proposal based on SB2009, with supporting documentation, to Project Director Barry Barish before the end of the year for review and evaluation. The Accelerator Advisory Panel will convene to study and comment on the proposal in early January 2010.

If adopted, the proposed baseline would be our first major change to the 2007 ILC Reference Design. SB2009 includes a suggestion for a single-tunnel main linac. The removal of the roughly 25 km long main linac support tunnel, almost 40% of the total Reference Design tunnel length, will result in a substantially reduced value cost estimate. To justify a design change of this magnitude much work remains to be done. Three topics stand out: 1) development of a cost effective, reliable high level RF system suited for a single tunnel configuration (two viable schemes are under development), 2) an assessment of single tunnel fire safety, cryogenics, and general safety such as earth quake and others, and 3) an evaluation of system availability. For the latter, an 'Availability Task Force' has been formed, chaired by Marc Ross.

The Availability Task Force deserves special mention here because of its pivotal role in the validation of the single tunnel main linac design choice. The task force has three sub-groups, charged to: 1) apply the reliability-operations-maintenance simulation 'Availsim' to compare one vs two tunnel ILC main linac schemes, 2) understand the implications that subsystem component mean-time to failure and mean-time to repair estimate have on overall linac performance (and what might be done to improve it!), and 3) to apply traditional, spreadsheet techniques to estimate one and two tunnel linac uptime. The task force will report at our fall GDE meeting.

The next major milestone for SB2009 will be marked at the GDE workshop in Albuquerque in late September.

Last month also marked the first anniversary of the Clic / ILC collaboration and we met with Clic and Cern management to review collaboration activities and plan its development. This meeting, the first of its kind, proved quite useful and we believe it will lead to increased ILC-related activities at Cern, especially in three key areas where Cern has unique expertise: 1) mass production of cryomodule components, 2) large scale cryogenic systems and 3) extensive deep

rock civil engineering. Our meetings have been widely reported including a column by Jean-Pierre Delahaye. His column mentions the discussion of a 'joint venture to promote ... preparations for the future linear collider...' which was a very important part of the meeting. His column also lists cost and maturity of the Clic and ILC accelerator technologies and hints at possible comparisons to take place in a few years time.

The 'TESLA Technology Collaboration' (TTC) meeting hosted by LAL Orsay (Paris) June 16-19 provided a strong counterpoint to the R & D discussion at Cern and the ILC rebaselining (ADI) meeting. The focus of the meeting was the preparation for the industrial production of over 800 superconducting cavities for the EU XFEL project. All 100+ cryomodules (~6% of ILC) will be assembled at CEA-Saclay. The ILC and XFEL teams are working closely together, through connections provided in part by TTC, and their experience will provide us with the knowledge to accurately plan and estimate ILC main linac construction. By 2012, we will have demonstrated a 'mature' linac technology.

Finally, at the end of June, we met at Desy with a delegation from the Dubna - based Joint Institute for Nuclear Research (JINR) and their Moscow - based civil engineering contractor 'State Special Projects Institute' (GSPI). The focus of the meeting was the exploratory geotechnical work done late last year by GSPI in order to provide the basis for a shallow ILC sample site. Civil engineering design and planning work for underground structures is based on accurate, detailed, geotechnical information and we were very impressed by the study. The team will jointly publish a report at the next GDE meeting, this fall.

Marc Ross

Minutes of ML-SCRF Technology Meeting (090624)

Date & Time:

13:00-14:15 GMT, June 24, 2009, via WebEx.

Participants:

C. Ginsburg, S. Aderhold, Y. Yamamoto, H. Hayano, C. Pagani, N. Ohuchi, T. Peterson, S. Fukuda, C. Adolphsen, N. Walker, M. Ross, J. Carwardine, W. Bialowons, N. Toge, E. Elsen, R. Kephart, R. Rimmer, A. Yamamoto, J. Kerby, T. Shidara

Presentation files are available at the following Indico site;

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=3682>

1) Report from Project Mangers (A. Yamamoto, N. Walker, M. Ross)

- Nick reported on the AD&I meeting, the summary report of which is available in the ILC EDMS as D*879845. Everyone is strongly encouraged to read this if you have not already. The overall goal is of course to update the baseline design, and create the TDR. For that purpose the meeting focused on the description of SB2009 that had been distributed in advance, and then in particular on the interfaces of the technical description / potential modifications to the CFS effort and setting up the mechanisms to get the technical information needed to the CFS crew. Many of the inputs will be realized through appointed contact people (in the report) and a rolling program of webex meetings that have already started. In addition there will be a central region integration face to face meeting at SLAC at the end of July. The important aspect from the CFS effort is to make estimates on how changes in design change the cost of the machine.
- From the cavity side, the long and short of it is that a task force has been formed with representatives from each lab to gather cavity performance data, and present it in a more consistent manner than is currently done in preparation for determining the production yield & gradient. (Discussion under 'Topics', below).
- Marc and Nick mentioned a hot topic at the moment is the availability of the machine, particularly for a single tunnel solution. There is a newly formed task force that has met twice now. Also, the risk register must be updated as part of this exercise. In response to a question from Bob Kephart, Marc and Nick reminded us that the risk register is a list of issues requiring R&D; for instance, gradient or electron cloud. These risks are then broken out, and used by the GDE to guide the R&D program.
- The 2nd AD&I meeting is proposed at the end of November, to be confirmed. The 2nd AAP review is January 6-8, 2010.
- Akira showed the PM SB2009 Proposal slide from the Executive Committee. Today's meeting will focus on the cavity discussion. The RF discussion may come up in the group leaders report, but will be the focus of the next month's ML webex meeting. Akira then introduced the cavity database task force, and the approved personnel to do the work at each lab. The industrialization plans across regions were noted, including the proposal of Bob Kephart for alternative industrialization plans. Bob clarified that his proposal was not the baseline for the US effort, which has to be the standard process on the 2012 timescale, but that we do want to start working on hydro-forming and alternative processes should the timescale go longer due to the potential cost savings. Given the need to develop a new cost estimate in 3 years, the PM view is that we must advance on the baseline process, however R&D in alternatives is possible.
- Akira briefly noted the TTC summary of Hans Weise, from the recent meeting at Orsay. The last bullet noted the cavity database effort. The previous bullet noted possible field emission studies, but was not discussed at any length.

2) Report from Group Leaders

- Rongli—no report (on vacation)
- Hayano—no new report on cavity integration. The high pressure safety application for 9 cell cavity assemblies for cryomodules at KEK is in the final stages of approval, and may occur in the next month or so.
- Norihito—S1 Global cryomodule C construction is on schedule; the gas return pipe construction at Zanon is almost complete. In the last week of July Norihito and KEK colleagues will assemble the sensors. During July the modifications to cryomodule A will start. Also, KEK has started the heat load

measurement of the cryomodule with the 5K shield, and later in the year the cryomodule will be cooled down without the 5K shield for comparison.

- Tom Peterson—Tom showed one slide, from Jefferson Lab, on cryogenic plant efficiency. What the plots show are the improvements that Jefferson Lab has made in the performance of existing plants, and how those improvements approach the nominal lines. In the ILC RDR the plants assumed were on the nominal lines already at 4K, but at 2K we were actually realistic, maybe slightly optimistic (based on LHC experience). Tom wants to emphasize that in the RDR we have already assumed state of the art in the cryogenic plants, on the nominal lines.
- Shigeki—though there has not been a webex meeting recently, a short comment on HLRF status. For KEK, the 2nd supplementary budget of JFY2008 was approved. The 3rd modulator and a multi beam klystron for STF-2 were ordered. As for the modulator contraction, a new company has participated. We are preparing for the bidding to buy parts of the waveguide (power distribution) system for STF-2 since we have the supplementary budget of JFY2009 additionally. Last week Shigeki visited China and he was shown a Marx generator with 1 cell unit under testing. IHEP would like to continue R&D for new methods and look for collaboration. Chris Adolphsen notes that the Marx modulator with the Toshiba multi beam klystron was tested and 10 MW was achieved. Marc applauded this success. SLAC are in discussion w/ Fermilab to loan magnet cryostat to test prototype linac quadrupole.
- Marc notes that Shigeki and Chris have to provide input to Tom Himel for the simulation work on the availability.

3) Topics

- **Cavity Gradient and Yield re-evaluation**

Camille presented her slides, posted on the website. She noted the question of where the database resides... it should be possible for Fermilab to upload to DESY, but we need to check w/ DESY on the level of support needed and possible...can JLab and Cornell do this as well? She also thanked Zach Conway for providing the Cornell data through her Excel sheet very quickly, and the efforts to enter KEK data in the DESY database recently.

Akira has a comment on pg 7. He notes we start with a 3 year time frame, as before this it was not so standard...but later we may look at subsets of time period to show progress. Also, previously Rongli has correctly noted that as opposed to only the 'first process' result, we would like to have a 2nd test result to be consistent with the actual current definition of 'production yield'. There is agreement on this, but we propose this discussion occur after FALC.

Marc notes that the timing of the 'plot' proposed by Camille is associated w/ FALC, in reality it is because the FALC meeting is used to generate a new version of the R&D plan, and what is important is having the new plots for the R&D plan. W/ respect to the R&D plan, both Marc and Akira note we will need to review the cavity production numbers, and the definitions used in the R&D plan. This will be important work in the next month. The practical deadline for the FALC slides, and the R&D plan revision, is July 10. Bob Kephart asked if there is a worry that 4 years later there is only 1 qualified vendor...it was noted that the plot shown to FALC would include data from 2 vendors, and maybe one of those vendors would have cavities processed in both Europe and the US. The remainder of the vendors is a work in progress. Jim Kerby confirmed that the input to FALC would be 2 slides...one showing a preliminary plot, from an incomplete data set, as an example of the type of plots to be generated; the second will show the plan from the cavity database group leading up to ALCPG, where a more complete discussion will occur.

Bob Rimmer says that past JLab experience showed real difficulties to get the data into the DESY database from JLab due to differences in the way data is taken and stored; the spreadsheet may be achievable however. Eckhard Elsen thinks it would be nice to use the DESY database and is supportive in general and notes the synergy, but notes that Dieter Gall is retiring soon and cannot comment on future DESY support at this time.

- **Update of TDP R&D Plan (release 4)**

Release 4 will be issued in mid-July. As Marc mentioned earlier w/ Marc we need to review the Process and Production Yield definitions given in release 3 on page 9.

- **Status of S1 Global preparation**

Module C construction is on schedule, completion is Oct 15, 2009, at which point it will be shipped to KEK. Module A modifications will be completed by the end of this year. DESY cavities are hoped to arrive at the end of October. Fermilab cavities will be discussed in mid-July during Akira's visit. The

cavities are expected to arrive by the end of this year.

4) Further Plans and Meetings

The upcoming ML-SCRF webex meetings are scheduled for July 22, Aug 19, Sept 16, Oct 14, Nov 11, Dec 9.

SRF09: Sept 21-25 in Berlin

ALCPG09: Sept 29 – Oct 2/3 in Albuquerque

AD&I 2: tentatively scheduled for late November

AAP Review #2: Jan. 6-8, 2010 (Oxford?)

GDE meeting (China): probably in March, 2010

TTC (FNAL): probably in April, 2010

IPAC (Kyoto): 24 – 28 May, 2010

--Given the proximity of the SRF09 and ALCPG meetings, and at least from Fermilab (and assumed from DESY) the attendance of technical personnel would be at SRF09. Jim Kerby proposed that the main technical meeting would be SRF09, with a summary talk and a database talk given at ALCPG09. The rest of the ALCPG09 ML meeting then would focus on cryomodules, RF, and related efforts. People are of course welcome to attend both, but for those who have to make a choice this may help focus the meetings in each place. An evening or side meeting at SRF09 could be used to discuss the database and review the cavity summary slides in advance. Comments welcome.

5) Next SCRF Meeting Schedule

- Next ML-SCRF WebEx meeting: July 22, 13:00- GMT, focusing on HLRF Issues. (Chris & Shigeki agreed)

CFS & Global Systems Monthly Webex Meeting

June 3rd, 2009

AGENDA

1. PM Report (M. Ross)
2. CFS follow-up to the May Accelerator Design & Integration meeting
3. ILC Cost Estimate, options for dealing with escalation rates

MEETING NOTES

PM Report (Marc)

We are awaiting final reports from the various reviews held in April and May:

- The AAP Committee report was distributed in May. We will generate written responses to several items raised in the report, specifically relating to CFS.
- The PAC Committee final report is due in mid June. The PMs expects the committee to show strong support for the gradient R&D, CFS, and positron source activities.
- The US Americas Region Team (ART) annual review was also held in May, and the final report is expected in June.

Upcoming GDE meetings

- Three meetings will be held at CERN during the week of June 8th: CILC/ILC collaboration steering committee; quarterly face-to-face meeting of the GDE Executive Committee: the ILC Executive Committee will meet with the CERN Directorate.
- The next Tesla Technology Collaboration meeting will be held in mid June at Orsay.
- The meeting between GDE and JINR-GSPI is now schedule for June 25/26 at DESY. The main agenda item is the GSPI report from the geotechnical survey of the Dubna site. Also on the agenda is the GDE/ILC-HiGrade/JINR collaboration, and increasing the integration of the GSPI-JINR integration with the ILC CFS group.
- The next FALC meeting is on July 12-13 in Quebec. The PMs are in the process of updating the GDE R&D Plan, to be presented to FALC at the meeting. (See next section).
- The ALCPG 2009 meeting will be held Sept 29 - Oct 3 in Albuquerque. This is an important meeting for TDP-I, because a major theme of the meeting with the Strawman Baseline design for the TDP (SB2009) that will be presented by the PMs at the next Accelerator Advisory Committee in January 2010 as the proposed baseline design going into the second phase of the Technical Design Phase (TDP-II) that begins in 2010.
- The next CLIC workshop (CLIC-09) will be held October 12-16 at CERN.
- The next AAP review will be in early January in England. This is an important review, since it will mark the end of the first phase of the Technical Design Phase (TDP-I).

GDE R&D Plan update

- Release-4 of the R&D Plan will be distributed to the FALC Resource Group prior to the FALC meeting in July.
- A primary effort for this revision is to update the resource tables for the three regions. It is anticipated that the sections on resources for generic R&D and ILC-related projects will be expanded from the previous release.
- Technical Group Leaders are requested to review the text in their relevant sections of Release-3 of the R&D Plan Appendix and to update as appropriate. Resources must support the baseline design development.

DESY Accelerator Design & Integration Meeting

- The PM summary of the meeting is now in draft [was subsequently released].
- Key points relating to the Strawman Baseline 2009 design (SB2009) are:
 - The Klystron 'cluster' analysis (late 2008) will be used as a model for cost comparison with respect to the RDR.
 - The low-power option should be taken as given
 - Both HLRF options (Klystron Cluster and Distributed RF System) is to be studied for each of the three sample sites
 - Utility costs are also to be evaluated for each sample site
 - The 2010 baseline design will include alternatives to allow flexibility while maintaining sold cost bases, for example the two HLRF options.
 - We will adopt a single tunnel for the main linac.
- Adoption of the single tunnel linac requires review of the safety analysis for each region, considering appropriate solutions to meet local safety requirements. There are documents under development by the joint CFS collaboration. While it will be difficult to develop a joint definitive document that covers all three regions, there will be sections relevant to each region: CERN will produce an LHC chapter, KEK have already produced a draft for the Asian region, and Fermilab will develop a draft based on the US national fire protection regulation NFPA-520. This safety document will be used to support the decision to go to a single tunnel.

CFS Follow-up to the DESY AD&I meeting (Vic)

- The CFS group has proposed re-instigating points of contact between the area systems groups and the CFS group. Individual meetings have been scheduled between CFS and each accelerator area system group in order to review specific CFS needs of the respective accelerator areas. These meetings are scheduled for early June through mid July. The CFS group's regular weekly Tuesday video meeting timeslot will be used.
- The Americas CFS team will develop a revised WBS Costing Spreadsheet for the analysis of identified SB2009 alternatives. There will be separate columns for each of the three regional costs. Specific criteria for integration of the Electron Source, Positron Source, Damping Ring and RTML will be verified first with 2D drawings and followed up later with 3D drawings.

- Fermilab resources for the 3-D integration study are no longer available because of the injection of funds by the US Stimulus Package, so an outside consulting firm is being hired in order to provide that associated expertise to and to join the existing collaboration with DESY, CERN, and KEK.
- CFS is planning a meeting At SLAC in Late July to develop the combined criteria for the new arrangement of the Central Region w/E. Paterson

Cost Management for the Technical Design Phase (Peter)

- There will be a revised cost estimate released at the end of TDP-II along with the TDP baseline design. Since the TDP is targeting specific areas and topics of the ILC design, not all cost estimates will (or need to be) re-done for the TDP, so in many cases, the cost estimates from the RDR will be re-used directly or used as bases of estimates for TDP cost elements.
- In order to compare cost estimates between those made in 2006 and those made in 2011, we need to be able to escalate/de-escalate the cost estimates to equivalent bases. How do we do this?
- Cost estimates from 2011 can be de-escalated to 2006 or cost estimates from 2006 can be escalated forwards to 2011. The two approaches are unfortunately not equivalent because of various factors, including inflation rates and currency exchange rates and real changes in unit costs such as raw materials and labor rates. The US Department of Energy uses “market basket” indices for DOE projects and could be used for US-based estimates but are not suitable for estimates made in other regions.
- This agenda item stimulated a lengthy discussion. The general consensus was that RDR costs should be projected forward to 2011, but more work will be needed before we have a clear model of how to make those protections.

Next Meeting: July 1st, 2009

19. Accelerator Systems WebEx Conference

12 June 2009, 13:00 GMT

Minutes (v1.0)

Attending: W. Bialowons, P. Garbincius, S. Guiducci, K. Kube, F. Lehner, T. Omori, E. Paterson, M. Palmer, N. Solyak, N. Toge, N. Walker

Apologies received from: A. Brachmann, A. Seryi, J. Clarke

All slides are available on the indico site

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=3636>

1. Opening (N. Walker)

N. Walker welcomed the attendees and opened the meeting by apologizing for shifting the meeting to a Friday. There were high level management meetings at CERN. The GDE EC met with the CLIC steering committee to discuss future collaboration plans. The EC met also with the CERN DG. At the end of 2010 there will be an ECFA Linear Collider Workshop at CERN.

2. Short status report by TAGLs

DRs (S. Guiducci, slides available):

There will be a webex meeting on DR issues scheduled for 22 June with the aim to update the DR R&D plan for the process of selecting the new baseline at the end of 2009. As highlighted by the AAP review at TILC 09, how the results from the e-cloud R&D will be applied to the DR design has to be better laid out. The objective is to have a preliminary plan at ALCPG09. Susanna reported from a meeting with the CFS group last Tuesday (09.06.09). The new lattice file for a 6.4km ring with injection and extraction in the same straight section was given to CFS contact Tom Lackowski. Updates on heat loads and layout and rough location of the heat loads are necessary. The design information for this lattice will be appropriately scaled to estimate the requirements for the proposed 3.2km ring, as part of the SB2009 studies.

CesrTA (M. Palmer):

CesrTA is in the last week of taking experimental data before the next shutdown. A lot of work has been done on the X-ray beam size monitor (XBSM). Good progress was reported by Mark in many areas. More details and updates will be given next week. A mini-workshop to refine plans for the CesrTA experimental program will be held at Cornell on 25 June. Mark commented that Cornell will help in preparing the power-supply layout and requirements for the ILC DR.

Positron Source (T. Omori):

There was no report by the TAG leader. Instead, T. Omori reported on preparations for the ILC/CLIC common positron source meeting next week (18.06.09)

RTML (N. Solyak, written report):

Major R&D studies were focused on design and performances of the single-stage bunch compressor. The accomplishments are:

1. Design, based on optimized PT2005 lattice is completed (BC1S).
2. Diagnostic section was moved from BC2 to the end of single-stage BC and slightly re-designed to lower energy.
3. Main linac has been extended down to ~5 GeV, using lattice for a regular Main Linac
4. Emittance preservation studies are completed for both baseline two-stage BC and single-stage BC. Nominal misalignments and RF coupler kick and wake were assumed. Emittance growth results are similar: ~5nm for BC1S and ~7nm for two stage BC = (BC1+BC2). In both cases DFS and bump optimization was used. Optimization of CM tilts (3 CM in BC1S and 3 CM in low-energy Main Linac) allows further reduction of emittance growth by factor of 2-3. Final results: 2.6nm for BC1S and 2nm for baseline 2-stage BC.
5. Beam extraction line after BC1S was re-designed to accommodate larger energy spread in BC1S vs. BC1 in baseline (3.6% instead of 2.5%). Few possible designs were analyzed.
6. We generate list of the components in single-stage design as a basis for incremental cost estimation.
7. Results were presented and discussed at ILC AD&I meeting, DESY May 28-29, 2009

After DESY AD&I meeting the following work was accomplished:

1. BC1S lattice was modified. Two major changes:
 - a. Type-3 cryomodules were replaced with cryomodule Type-4
 - b. 6-cell wiggler was replaced with modified 6-cell wiggler, used in BC1 stage. New wiggler is more advanced and provides more flexibility and tuning knobs. Lattice is being optimized and matched to diagnostic section.
2. New sets of stray magnetic field measurements are completed. We are studying on effect of magnetic shielding (μ -metal) to reduce stray field inside the vacuum tube. It was found that significant reduction can be achieved.

BDS (written notes by A. Seryi):

ATF2 Winter-Spring 09 runs concluded with good results on emittance measured in the extraction line -- 11pm has already been measured (design for ATF2 is 12pm). Tuning of ATF2 proceeded in highly systematic manner. Optics and

tuning tools are being used to verify and tune the optics. The horizontal beam size is measured by BSM working in laser wire mode and is in good agreement with the predicted value. The measurement of the vertical beam size by interferometer mode of the BSM hasn't yet been achieved and this is a priority for the Fall 09 run. The 8th ATF2 project meeting (June 4-8) reviewed the commissioning progress and identified where the efforts need to be focused and in particular where hardware and software upgrades will be needed. These include multi-OTR system, upgrade of extraction line BPM electronics, establishing of a laser transport line from LW laser to BSM (amongst others). These upgrade will allow:

- better reproducibility of emittance and extraction conditions;
- reliable and fast emittance measurement and corrections and optics verification, correction to the IP;
- interferometer mode of BSM.

MDI work at SLAC, on IR and a practical push-pull solution which combines the ILD and SiD detector approaches. Alain Herve (CERN) is currently visiting SLAC, and is expected to be joined by DESY and FNAL experts soon.

Simulations (K. Kubo):

A ILC/CLIC beam dynamics workshop is to be held at CERN 23-25.06.09. The attendance seems to be good with ~30 registered participants. See <http://indico.cern.ch/conferenceDisplay.py?confId=56133>.

3. Summary of DESY AD&I Meeting (N. Walker; slides available)

Nick gave a summary of the "Accelerator Design and Integration Meeting" (AD&I) which was held on May 28-29 at DESY in Hamburg. The agenda information and the talks are available at

<http://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=3526>

The PMs have written a comprehensive [summary report](#) (ILC-EDMS ID #879845). The report contains a table of the straw-man baseline 2009 (SB2009) working assumptions and a list of action items for all areas.

Special CFS contact points for accelerator systems on CFS work have been re-established. To enhance the CFS-interactions a series of webex meetings for CFS requirements review are scheduled. In addition there will be a special face-to-face meeting for the central region integration at SLAC in the latter half of July (TBC).

Nick continued to talk about the AD&I goals at the upcoming ALCPG (29.09.-03.10.). The top-level details of SB2009 in terms of cost increment, parameters

etc. and risk register have to be worked out. At the same time the writing of the proposal report (outline, content, writing assignments) has to begin. A second AD&I meeting is tentatively planned for end of November (TBC). In December 2009 the proposal report will go to the EC and then to the AAP, to be reviewed early January, 2010.

The next TAGL meeting is set on 8th July, 2009 at 13:00 GMT.

Monthly Report (June 1-30, 2009) for Peter H. Garbincius

Distributed July 1 to: Marc Ross, Tetsuo Shidara, John Carwardine, Wilhelm Bialowons, Frank Lehner.

Accelerator Design and Integration (AD&I) activities:

Since it doesn't seem like a good idea to wait until the very end of the AD&I studies to start on something for which most information and decisions are readily available, I distributed notes to start discussion on the cost estimate impact for SB2009-LowP (Low Power option) which would install only one-half of the 560 Klystrons, Modulators, and related accessories as described in the ILC RDR for the Main Linac. This LowP study would only be applied to the single tunnel options for the Klystron Cluster (starting with the same 10 MW RF units as the RDR) and the Distributed RF System (DRFS). This would reduce the beam current, but the design luminosity would be preserved by employing Andrei Seryi's "moving focus". Shigeki Fukuda has scheduled a preliminary discussion of this, including design and cost impact of longer pulses for the modulators and klystrons, at the HLRF webex meeting on July 2 (July 3 in Japan).

Triad's ILC Cost Estimating Tool (ICET):

J. Carwardine, T. Himel, T. Shidara, P. Garbincius, Maura Barone, David Seigle (summer student)
Triad: S. Curtis, L. Lew, and K. Long, and
DESY-EDMS: Daniel Szepielak (plus infrequently Jens Kreutzkamp and Lars Hagge)

Triad-EDMS-ILC webex meetings were held June 2, 9, 17, 23, and 30.

The big news is that after a month of struggling with cyber security, Triad has found a solution which uses one of their existing servers with a fixed IP Address for web services access to DESY EDMS. This was demonstrated at the June 30 webex meeting which used the STAGER feature of the latest ICET V1.4b tool, released on June 26, to access Generic Parts on the ILC EDMS production environment to select and download requested selectable versions of Cost Estimating Modules (Excel files) to the local desktop ICET workspace. Wow, three additional successes in themselves! – DESY EDMS fully implemented Generic Parts for the ILC EDMS and web service access to the ILC EDMS Production Environment, and Triad's ICET V1.4b, all during June. There remains the problem of executing such web services access and download from other than one's home institution. Virtual Personal Networks pass a variable IP Address from the user's Internet Service Provider which does not meet the DESY cyber security standards. So the cost management experts would be required to perform the STAGER operation from their home institutions or to perform the STAGER download to their ICET workspace before traveling.

DESY EDMS is still working on implementing URL-like EDMSdirect call for accessing native EXCEL files and the five designated access schemes (projects) for cost estimating confidentiality. These are expected by Daniel be ready by mid-July. The five designated access schemes (projects) can readily be utilized by generic parts where individual sub-parts can be included in these designated access schemes (projects).

Summer student David Seigle has continued work directly and effectively with Triad to debug ICET both V1.4a and V1.4b and has exercised generating (partially) linked WBS trees both from top-down (generated from WBS configuration file) and from bottom-up (by linking together individual Cost Estimating Modules). These complementary approaches will be useful for building and studying costs of variant ILC configurations.

We must soon complete the Triad work in development of ICET and start to load the RDR estimate in preparation for AD&I studies.

CLIC-ILC Cost & Schedule Working Group:

G. Riddone, P. Lebrun, H. Braun, J. Carwardine, T. Shidara, and P. Garbincius

There was a CLIC-ILC Cost & Schedule Working Group face-to-face meeting at CERN, on Friday, June 12 with Peter Garbincius, Philippe Lebrun, Germana Riddone, and Katy Foraz attending, and also Frank Lehner and Tetsuo Shidara participating by webex.

Escalation into the future is a purely US feature (projections of future escalation rates are pure guesses)

Europe and Asia add actual escalation to an earlier year's estimate only up to the year in which funding is actually being allocated. There is no projection into the future, no "then-year \$". They take past escalation experience into account when distributing that particular year's funding allocation. Philippe reported that CERN only uses past escalation to update prior estimates into TODAY's estimate (based only on past history for CERN members) – not into (unknown = guess) the future.

CERN first translates estimates into Swiss Francs using exchange rates at the time the estimate is made and then escalates into XXX CHF in year 20xx when the project is approved, using CERN experiential "average over CERN member states" escalation index or an average of Swiss global arts & métiers industrie and global construction indices. In this way, they do not have to keep track of the escalation factors for all the regions from which the estimates were made. They do have to keep track of the time dependence of the international currency exchange rates.

We have been considering which is the best way to do this for the ILC.

Philippe made a presentation on the common Risk Document:

There are three risk categories for each element estimated:

1. Maturity of estimate: using a guide, like XFEL, to suggest the uncertainty range
This takes into account the possible evolution of the configuration or design.
Uncertainties for elements in this category are assumed to be completely correlated
2. the LHC experience: gives exponential distribution of probable cost for each item with an average (which equals sigma for exponential dist) $\sim 50\%/ \#$ vendors where avg # LHC vendors is ~ 4.6 (completely correlated within this category)
This involves cost scatter due to: technical execution, structure of market, and the commercial strategy of vendors (see TILC data on LHC)

3. escalation & exchange rates are fixed, direct factors, not subject to statistical analysis
These elements are tracked and compensated, and include inflation, escalation, and international procurement. Pertinent information can be found in:
 - US Office of Management & Budget (OMB) document
 - US DOE “market basket” instruction for projects – what are “baskets”
 - CERN community “average” escalation tables (Philippe to provide)There are only statistical variations on Evolution (item 1) and Scatter (item 2).
The Evolution and Scatter categories are mutually uncorrelated,
but the elements within both Evolution and Scatter are fully correlated

Do we need to update the May 2008 Draft Mandate of the CLIC-ILC Cost & Schedule Working Group?
The general feeling of the participants at this meeting was, “No”, it is sufficient!

What are deliverables of the CLIC-ILC Cost & Schedule Working Group?

We are committed to a Cost Comparison in 2010

This will depend on CLIC producing an estimate in a similar format to compare to RDR
There will be differences in kind between the CLIC and ILC estimates due to
different technologies and extra requirements on alignment/vibration for CLIC

Philippe – showed that the CLIC cost estimate template includes alignment and vibration stabilization elements for each of the estimated components

ILC suggests that a RISK register will be needed for CLIC estimates in order to compare to ILC RDR estimate. The CERN people agree this is nice, but don’t seem to put too much emphasis on it.

Assignments:

Katy has done about as much as makes sense at this time in applying the LHC experience and techniques in developing a conventional construction and installation schedule for the ILC. She should briefly (a few pages text) document what she has done, possibly including tables and assumed rates of progress.

Philippe – still wants to get started again on estimates for conventional magnets
shouldn’t be that difficult, but who is available to do it? Gather info, analyze, & write

Philippe and Peter – work on common Risk Document - can we agree on a milestone date?

Use Philippe’s presentation as a starting point or outline for document, we will
start marking it up and filling-in sections, and distribute these in ~2 weeks

The next CLIC-ILC Cost & Schedule webex meeting is tentatively scheduled for
Friday, July 10 at 1300 GMT

Peter