



Management of SB2009

Project Management:

Nick Walker

Akira Yamamoto

Marc Ross

2nd ILC GDE Accelerator Advisory Panel Review,
Oxford, 6-8 Jan, 2010



1st AAP Review - TILC'09:

• Review Report:

- http://ilc-edmsdirect.desy.de/ilc-edmsdirect/file.jsp?edmsid=*879165
 - Released May 26, 2009
 - 33 Recommendations (encouragements and comments):
 - CFS 4
 - AS/MM 10
 - Management 3
 - (R & D 16 → for subsequent AAP review)
- <http://ilcagenda.linearcollider.org/materialDisplay.py?contribId=3&materialId=paper&confId=4253>

• Project Responses to AAP (4 each selected) →



Report on the AAP Review at TILC'09

April 17-21, 2009, Tsukuba, Japan
Overview

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CFS – see talk by Vic

CFS

1. *The AAP encourages the CFS groups to continue their efforts to explore the various tunnel configurations with a uniform approach and common methodology.*
2. *Technical designs of configurations such as RF power distribution and the treatment of operational reliability (downtime for klystron replacement etc.), safety and radiation aspects should be handled in a consistent and transparent manner. Each configuration should be subject to an in-depth risk analysis that includes consideration of the operation and maintenance aspects.*
3. *The AAP encourages further exchange between the various area groups. In many cases, guidance from the project managers is necessary for systematic application across the project. For these CFS efforts to be most useful, it is important to define clearly the main assumptions and technical choices.*
4. *The AAP is impressed by the progress of the 3d tool integration. The tools are recognized as an important aid in understanding critical aspects of a chosen layout, where the benefits from the resource-intensive implementation efforts may be justified.*

This talk

This talk



Minimum Machine

Minimum Machine



To be presented in the review

- 1. The AAP suggests developing sufficient simulation and modeling capability to understand such dependences quantitatively. The cost of ameliorating any degradations should be assessed to allow informed decisions on which aspects of the MM design to include in the new baseline.*
- 2. The AAP encourages the Project Management to form and vigorously engage the planned task force to assess the re-baselining effort. The decision making on the emerging new definition should involve representatives of the MDI group and must be collectively propagated throughout all subgroups.*
- 3. The redesign should only be considered for those components and aspects where the benefits are high. During the transition time the RDR solution must be preserved to maintain readiness for construction of the ILC.*



To be presented in the review

This talk

This talk



AS

Accelerator System

Thanks!

1. Overall, the AAP is impressed by the progress in all accelerator systems. The work package goals and milestones are laid out in the technical design phase report.

Electron source

Within TDP2
timeframe – R&D

2. The AAP encourages the technical group to perform such a system test.

source

Within TDP2
timeframe – R&D

3. The positron flux margins for the current layout are tight. The AAP suggests carrying out the detailed simulation studies to fully understand the requirements and possibly adapt the layout or choice of components.

Within TDP2
timeframe – R&D

4. The AAP suggests studying or, if applicable, compiling the existing documentation on, the effect of the 150 m undulator on beam emittance, stability, and possibly implied constraints on, and requirements for, linac tuning.

RTML

To be presented in the
review (agreed)

5. The AAP notes a reduction in operating margins in the range of IP bunch lengths and of damping ring instabilities. The AAP notes that resources in the RTML area are very limited.

Within TDP2
timeframe – R&D

6. The AAP encourages the field studies at FNAL for noise measurements.

BDS & Management

333
Within TDP2
timeframe –
R&D
management

The AAP recommends that these open issues should be addressed and more strongly supported by additional resources.

This talk

- 2. The AAP suggests that the following linked strategies would be helpful in sharpening the focus of the GDE effort: a) reserve, and protect, more time for the GDE Director and the troika to formulate and agree upon project objectives b) actively and visibly (to the GDE team at large) rebalance the objectives so that they are more focused on the milestone-related goals and less emphasize an ever broadening R&D program c) take active steps to create, and support broad and coherent ownership of the core goals.*

This talk

Agreed – to
be started

Part of the 2012 report will be a new cost estimate. Unless the project simply wants to use the XFEL cryomodule costs it is necessary to start preparing this estimate.

- 4. The AAP suggests asking ILCSC to consider displaying and arbitrating the use of laboratory resources more formally. Proper orchestration of the in-kind contributions is mandatory to advance the likelihood of implementation of the ILC. Sudden changes in commitment should be avoided and, if necessary, should be communicated in the ILCSC.*

For the
Project
Director



Updating the *Reference Design*:

- Was the focus of 2009 ILC design activity
- Compare SB2009 activity to 2006 RDR

AAP:

(Report page 8)

“With only little time left before the re-baseline decisions are to be made, management needs a focused process to make these decisions relatively soon and indeed the Project Managers are about to launch this process. **The process should be driven and managed by the GDE Director and the Project Managers together. (color added)**

The AAP encourages the Project Management to form and vigorously engage the planned task force to assess the re-baselining effort. The decision making on the emerging new definition should involve representatives of the MDI group and must be collectively propagated throughout all subgroups.”



Focus for Design Optimization: Reduce CFS cost and 'risk'

- (CFS 'risk' \equiv unknowns inherent in underground construction)
- consolidate and reduce underground construction
 - Reference Design focused on technical / R & D 'risk'
 - RDR technical design is fundamentally sound and technically conservative
 - 2009 \rightarrow Offset Civil construction through innovative accelerator / technical design \rightarrow
 - Necessarily an 'integration' effort...
 - Because multiple 'top-level' groups are critically involved



At a glance: ILC CFS 2009

- Comparison: RDR vs SB2009 →

	RDR	SB2009	RDR-SB		% change
Tunnel length	72.3	38.4	33.9	km	47%
Drill & Blast volume	264.7	233.1	31.6	*1000 m ³	12%
Total (TBM + D&B) volume	1,415.0	843.8	571.2	*1000 m ³	40%
(D&B % of total)	19%	28%	6%		

- Tunnel (TBM) length approaching minimum
≈ set by beamline enclosure length
- To do for TDP-2: Analyze and consolidate
Drill and Blast volume



Integration: Accelerator ↔ CFS

AAP:

(Report page 3)

- *“The AAP encourages further **exchange between the various area groups**. In many cases, guidance from the project managers is necessary for systematic application (**integration**) across the project. For these CFS efforts to be most useful, it is important to clearly define the main assumptions and technical choices.”*

(See also Vic’s talk)

- **Team:**

- 38 members – (largely ‘Technical Area Group Leaders’)
- Top CFS: Kuchler, Enomoto, Lackowski, Osborne
- 18 Americas, 9 Asia, 11 Europe

Since April 2009:

- Met 3 times face to face; 7 times via telecon (~monthly).
- <http://ilcagenda.linearcollider.org/categoryDisplay.py?categId=126>



AD&I Group

Chris	Adolphsen	SLAC	Vic	Kuchler	FNAL
Deepa	Angal-Kalinin	CI	Tom	Lackowski	FNAL
Ian	Bailey	CI	Andrea	Latina	FNAL
Wilhelm	Bialowons	DESY	Frank	Lehner	DESY
Axel	Brachmann	SLAC	Lutz	Lilje	DESY
Karsten	Buesser*	DESY	Chris	Nantista	SLAC
Phil	Burrows*	JAI/OXU	Tsunehiko	Omori	KEK
John	Carwardine	ANL	John	Osborne	CERN
Jim	Clarke	CI	Mark	Palmer	Cornell
Norbert	Collomb	CI	Ewan	Paterson	SLAC
Eckhard	Elsen	DESY	Mauro	Pivi	SLAC
Atsushi	Enomoto	KEK	Marc	Ross	FNAL
Shigeki	Fukuda	KEK	Andrei	Seryi	SLAC
Peter	Garbincius	FNAL	Tetsuo	Shidara	KEK
Rongli	Geng	JLab	Nikolay	Solyak	FNAL
Camille	Ginsberg	FNAL	Nobu	Toge	KEK
Susanna	Guiducci	INFN	Junji	Urakawa	KEK
Hitoshi	Hayano	KEK	Nicholas	Walker	DESY
Tom	Himel	SLAC	Akira	Yamamoto	KEK
Jim	Kerby	FNAL	Kaoru	Yokoya	KEK

*) Physics & Detector (MDI) representatives



Engineering Modeling

- Key to TDP-2 Accelerator / CFS Integration

AAP:

(Report page 3)

- *“The AAP is impressed by the progress of the 3d tool integration. The tools are recognized as an important aid in understanding critical aspects of a chosen layout, where the benefits from the resource-intensive implementation efforts may be justified.”*

(See also Vic’s talk)

- CFS – based resources applied to offset increase equipment density in beamline enclosure tunnel

- All three regions growing 3d effort
- Integrated through DESY / CERN

} 2009 progress



Balancing Objectives:

AAP:

(Report page 11)

- The AAP suggests that the following linked strategies would be helpful in sharpening the focus of the GDE effort: **a)** reserve, and protect, more time for the GDE Director and the troika to formulate and agree upon project objectives **b)** actively and visibly (to the GDE team at large) **rebalance the objectives** so that they are more **focused on the milestone-related goals** and less emphasize an ever broadening R&D program **c)** take active steps to create, and support broad and coherent ownership of the core goals.*
- Advice acknowledged and we agree; **Focus toward TDP-2**

Specific Steps → Examples:

- Creation of a ‘global database for ILC cavity test results’
 - A Task Force with a global perspective (led by Camille Ginsburg, FNAL/TD)
- Creation of a Task Force to provide viable Availability models for the proposed baseline



Gradient Task Force

- R&D Goals set in RDR
 - 9-cell cavity: to reach 35 MV/m at $Q_0 = 8E-9$ at the vertical test, with the production yield at $> 90\%$
 - Cryomodule: to reach $<31.5\text{ MV/m}>$ at $Q_0 = 1\text{ E}10$,
- Project Goal/Parameter set in RDR
 - ILC operational gradient set at $<31.5\text{ MV/m}>$ including cavity operational margin to the quench/field-emission limit and also accelerator control/operational margin for HLRF/LLRF
- Seek a reasonable balance between ‘R&D goals’ and the ‘Project Parameters’ in TDP
 - Understanding the status with the global data base
 - Re-optimization of the parameters in system design



Creation of a Global Database for Better Understanding of “Production Yield” in TDP-2

- Global Data Base Team formed:

- Camille Ginsburg (Fermilab)
 - Team Leader & Data Coordination
- Rongli Geng (JLab)
 - GDE-SCRF Cavity TA Group Leader
- Zack Conway (Cornell University)
- Sebastian Aderhold (DESY)
- Yasuchika Yamamoto (KEK)

- Activity: progress/plan:

- July- Sept. 2009:
 - DESY-DB determined to be viable option,
 - Dataset, web-based, supported by FNAL-TD or DESY
 - First, well-defined and qualified data-base and ‘production yield plots’ reported at ALCPG/GDE meeting
- Dec., 2009:
 - The yield plot updated including a newly qualified vender
- 2010 ~
 - The data-base is to be updated periodically, and the R&D progress to be monitored.

ILC NewsLine

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Around the World

News from China on ILC collaboration

Vacuum vessel fabrication in factory

The effort towards realizing the International Linear Collider is being carried out by global collaboration. Such efforts focus mainly on the technology development, but other aspects such as training the younger generation, are also important to ILC community. From 7 to 18 September China hosted the Fourth International Accelerator School for Linear Colliders in Beijing at Huairou. Among 69 students from 21 countries, there were 29 students from Asia, including 15 Chinese students. Since 2005, Chinese PhD students majoring in ILC-related topics are increasing

Feature Story

One sheet to plot them all
DESY database becomes standard tool for cavity research

The new worldwide ILC cavity database features only nine-cell, no single-cell cavities like the one held by Camille Ginsburg in this picture.
Image: Fermilab.



Availability Task Force

- '2 tunnel' Snowmass 'Decision 6' BCD recommendation primarily on the basis of Availability
- Task Force created to find a reasonable way to make sure that SB2009 meets availability requirements
 - First Step: show SB2009 not substantially reduced from RDR
 - (see talk by John Carwardine)
 - Simulation, HLRF and PM integrated team
- Three-fold approach:
 - Refined the design of the RF systems to provide the goal availability.
 - Updated information on component reliability
 - Integrated into AVAILSIM



Conclusion

- We agree with Comments and have responded:
 1. Reducing CFS Cost and Risk
 - Necessarily driven ‘top-down’
 2. Integrating the effort across the GDE team
 - Multi-dimensional challenge
 3. 3d Modeling – a key tool
 4. Rebalancing objectives - design v/v R & D
 - A focus toward TDP2

This Review →



2nd AAP Review

- Agenda is based on SB2009 themes
 - (next talk by Nick Walker)
- Guidelines for presenters:
 - Leave 1/3 of your assigned time for discussion
 - Provide 'pros and cons'. consistent with SB2009 Proposal
 - Peter Garbincius will answer cost related questions, generally.
 - Show R & D details and technical status only as it applies directly to the Proposal. The AAP will review R & D later.

(presentations prepared during year-end holiday)



Thanks to AD & I Team and Staff

- For developing 'Working Assumptions'
- For integration effort
- For the creation of the Proposal
- For participating in this Review

- Special tribute and thanks to Nobu Toge, KEK, for assembling and editing the *'SB2009 Proposal Document'*