RDR Management Board Overview

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KEK

What is RDR Management Board?

- Formed just after Bangalore to centralize the responsibilities for producing the RDR.
- Responsible for organizing and giving direction to the RDR efforts within the AS, TS and GS.
- Finish its role at RDR completion (and its reviews)
- Members
  - **Barry Barish**
  - **3 Regional Directors (Dugan, Foster, Nozaki)**
  - **3 Accelerator Design Leaders (Raubenheimer, Walker (chair), Yokoya)**
  - **3 Cost Experts (Garbincius, Bialowons, Shidara)**
  - **Integration Scientist (Paterson)**

Global Design Effort

1. Organize (weekly) RDR meetings, setting agendas and goals in advance
2. Act as a forum for general technical discussions on the machine design.
3. Understand performance overheads and cost-tradeoffs in the design of the machine
4. Monitor the progress of the required information flow between AS and TS. Identify (or take note) of bottlenecks to resolved.
5. Identify 'global' conflicts or design problems, resolve them if possible (straightforward) or escalate them to the EC
6. Begin to formulate a plan (possible design modifications) to reduce the costs for post-Vancouver.

Board Meetings

- Weekly telephone conference
- Face-to-face meetings
  - **Vancouver** **July**
  - **KEK** **Aug.31-Sep.1**
  - **KEK** **Sep.22-23**
  - **CALTECH** **Oct.10-12**
  - **Valencia** **Nov**
  - **SLAC** **Dec.14-16**
  - **Daresbury** **Jan.10-12, 2007**
  - **Beijing** **Feb. 2007**

Cost Reduction Target

- Vancouver cost is just too high
- Reduction target set at KEK mtg
  - **Total reduction ~ 30% from Vancouver**
    - Accelerator (design, components) ~ 20%
    - Physics scope ~ 10%
- Major reduction items proposed by KEK meeting
- Contact persons to AS/TS/GS defined for further reduction
- CFS cost savings ~14% at Caltech meeting

Design Changes Since Vancouver(1)

Approved

- 2IPs with 14mrad crossing angle
- Single DR for positron
- 5m Muon wall
- Surface assembly of detectors
- Central injector complex (Nov.2)
  - **1e-DR, 1e+DR in the same tunnel**
  - **DRs, KAS, e-injectors, all near the IP**

Design Changes Since Vancouver(2)

CCB pending

- Linac unit specification (CR#20)
  - **9 + 8(with Q) + 9 cavities**
    - Larger waveguide (WR770)
    - RF power system for 33.5MW/m
    - Reduction of number of klystron 1/13
  - **Eliminate overhead of number of units (3.5%)**
  - **Reduce overhead for cryogenic static loss**
- RTML for central injector complex

Design Changes Since Vancouver(3)

Under preparation of Change Request
(positive among Management Board)

- Electron source
  - **Laser rooms to surface**
  - **Remove backup (except gun+buncher)**
- Positron source
  - **Half the number pf BPM+correctors**
  - **Remove 2nd target**
  - **Minimize underground target hall**
- Damping Rings
  - **9mm bunch length to reduce RF power (with same momentum compaction)**
  - **Lattice modification to eliminate 2 shatfs**

Design Changes Since Vancouver(4)

- CFS
  Many items discussed at CALTECH meeting by CFS Group
  - **Linac tunnel diameter 5m → 4.5m**
  - **Reduce number of shafts**
  - **Reduce the sizes of caverns**
  - **Reduce power and cooling equipments**

Design Changes Since Vancouver(5)

Those related to physics scope
(Management Board is positive for change, waiting for physicists responce)

- Reduce number of bunches (and luminosity) to half
  - **Same beam train length (2x bunch distance)**
  - **Reduce linac RF system (lower beam current)**
  - **Still upgradeable to the full luminosity**
- 1 IP with push-pull detectors

Design Changes Since Vancouver(6)

Examples of items which Management Board did not agree with, at least for RDR

- Souces
  - **Conventional positron source**
  - **Remove KAS (keep-alive source)**
- Damping Rings
  - **Reduce momentum compaction**
  - **Use higher harmonic cavities**
  - **Reduce circumference to half (half luminosity)**
- RTML
  - **Single stage bunch compressor**
  - **Remove spare klystron in bunch compressor #1**
- Main Linacs
  - **Separate cryostat for quads in main linacs**
  - **Sheet-beam klystron**
  - **Eliminate circulators**
  - **Marx modulator (pending in Mgmt Board)**

Design Changes Since Vancouver(7)

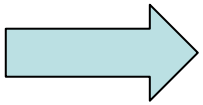
Items waiting for discussion

- 2K RF cavities in DR
  (6mm bunch without reducing momentum compaction)
- Share shafts between BDS and DR
- Share service tunnel between BDS and injectors

What to do here at Valencia

Entering the final phase to RDR

- Consolidate Area System Designs, Check completeness of the costs
- Review the basis and justify the cost of individual components



Wednesday: AS interview

Thursday: TS/GS interview

Absolute costs to be discussed → closed meetings

Wednesday Interviews

Nov08 Room Name	Hemiciclo	2.2	3.5	3.6	3.7	Sala Profesores	Sala Juntas
# of people	33	32	20	20	27	15	14
Telephone	X					X	
9:00	S3 open Session A. Wolski	High Availability J. Carwardine		EDMS Outreach Outreach/Training Tom M.	CF&S	main linac cost main linac cost main linac cost	Operations - T. Himel RDR Writing and plans for TDR
10:45							
10:45 - 11:15	*Coffee*					*coffee*	
11:15							
	S3 open Session A. Wolski	High Availability J. Carwardine	e+ e- A. Brachmann		CF&S w /Main Linac, Install	BDS cost BDS cost	Operations - T. Himel
12:00							
						DR cost DR cost	Cavity - K. Saito TTC Summary rpts
	(needs phone)						
13:00-14:30		*lunch*				*lunch*	
14:00	WWS Phone Conf						
15:00			e+ e- A. Brachmann	Main Linac w /controls	CF&S w /Main Linac, Install	RTML cost RTML cost	Cavity - K. Saito TTC Summary rpts
16:00-16:45		*Coffee*					
17:00			e+ e- A. Brachmann	Main Linac w /controls	CF&S	e-e+ source cost e-e+ source cost	Cavity - K. Saito TTC Summary rpts
18:00	Joint Plenary						

AS Interviews

- Is the proposed cost savings reasonable?
  - **What is the risk associated with the savings?**
- Is the cost list complete? Is anything missing?
- What is needed towards RDR?
- What is the required R&D to achieve the cost savings?
- Schedule of submitting Change Request

Thursday Interviews

Nov 09 Room Name	Hemiciclo	2.2	3.5	3.6	3.7	Sala Profesores	Sala Juntas	Sal
# of people	33	32	20	20	27	15	14	
Telephone	X					X		
9:00	Main Linac	e+ e-	BDS parallel	EDMS	CF&S	DCB Meeting	Cavity - K. Sato	
	w / Cryogenics	A. Brachmann/M. Kuriki	Andrei S.	Outreach/Training		Peter G.	Single Crystal	
10:00	Vacuum			Tom M.			Nobium rpt	
10:45-11:15	*coffee*							
11:15								
	Main Linac	e+ e-	BDS parallel	Accel Physics	CF&S	RF pow er	Cavity - K. Sato	
12:00	w / Cryogenics	A. Brachmann/M. Kuriki	Andrei S.	D. Schulte		controls	Cost Issues	
	Vacuum					instrumentation		
13:00								
1:00-2:30	*lunch*							
14:00								
15:00	Main Linac			Accel Physics	CF&S	Magnet/PS	Cryomodule/Cavity	
	w / RF	e+ e-		D. Schulte		Magnet/PS	Cryomodule/Cavity	
16:00		A. Brachmann/M. Kuriki				Dumps/Collimators	Cryomodule/Cavity	
4:30-5:00	*coffee*							
17:00					CF&S	cryogenics	metrology	
		e+ e-				cryogenics	metrology	
18:00		A. Brachmann/M. Kuriki				Vacuum	installation	
						Vacuum	installation	
19:00								

TS/GS Interviews

(From Peter's email)

- What assumptions did you use?
- How did you get these numbers?
- What reviews and cross-checks did you perform? Compared with other projects?
- What was the average cost factor for Production Quantities? Learning curve?
- Were you lacking in specifications or requirements?
- Did requirements substantially increase cost or complexity?
- How did you optimize cost vs. performance? Need to negotiate with AS leaders!

After Valencia

- Close design changes (submit Change Requests) by the end of November
- `Internal' cost review at SLAC Dec.14-16
- ILCSC-MAC 3rd meeting in Jan.10-12
- Funding Agency cost briefing ?
- RDR draft must be ready by Beijing GDE meeting Feb.5-7

RDR Schedule

ID	Task Name
1	*holidays*
2	CALTECH RDR MEETING
3	TS/AS internal reviews
4	Cost reduction reports
5	Review feedback
6	Cost & design review at Valencia
7	VALENCIA GDE WORKSHOP
8	Consolidate costs / design modifications
9	Final design & cost freeze
10	Prepare cost review
11	Final GDE cost review at SLAC
12	SLAC RDR MEETING
13	Final cost corrections and documentation
14	ILC MAC
15	Agency cost briefings
16	Public preliminary cost rollup
17	**RDR writing**
18	Edit/consolidate detailed outline
19	Detailed outlined frozen
20	Prepare drafts
21	First drafts complete
22	Final editing / review
23	Final draft complete
24	BEIJING GDE WORKSHOP