



Global System Kick-off Meeting

CFS – AS

10 Sept 2007

KEK

Marc Ross

Global Design Effort



Engineering Design Activity:

- Builds on the:
- BCD – the baseline description (12.2005)
- RDR – contains the backbone of our design and the ‘value’ estimate (08.2007)

- The EDR:
- will have the next update for these, based on ‘value engineering’ and more in-depth understanding, and
- Will include a plan for project execution
 - **Including how to build the tunnels and high technology components**
- 08.2010



Scope of ED Activity

- Resources provided (almost all) by participating institutions and their funding agencies
 - (small ‘common fund’)
 - Limitations known for the coming 3 years
 - Project control over resources may increase during EDA
- Duration is known,
- Resources known,
- Scope is ?
 - **Decreased ED resources → increased risk**
- Design and R & D prioritization based on ‘return for investment’
 - **Also schedule “criticality”**



RDR Completion:

- Success of the GDE – a ‘grass-roots’ organization without a strong institutional center
 - (opposite of CERN)
 - Capitalize on this and
 - Lay groundwork for a stronger – yet still de-centralized - ‘ILC Engineering Design Project’
 - Critical Mass
- Our community ‘votes with its feet’...
 - given the structure and the
 - opportunity to contribute to their labs future and the future of the science.



Near-ness of ILC

- Is the ILC infinitely far off?
 - How do we attract the technology/scientific community?
 - What about Orbach's Feb 2007 statement?
-

- By completing R & D and Design milestones
 - **Some formality needed to confront political process**
- and bringing in strong new faces
 - **Akira Yamamoto, KEK; Jim Kerby, Fermilab; etc**
- organizing and *aligning* intellectual, engineering resources in labs
 - *enabled through regional financing.*
- Exciting technology → SRF-based accelerator projects
 - **XFEL; Fermilab Proton linac; ERL**

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Path to Get Started on the EDR

- *Plan:*
 - ***ED Activity is a 'Project' subject to accountability/transparency***
 - ***Deliverable is a documented strategy and plan***
- *Resources*
 - ***Common Fund***
 - ***Negotiation with regional/institutional managers***
- *Staffing*
 - ***Need engineering management***
- *Schedule*
 - ***Planning Milestones due: Fermilab 22.10.07 and Tohoku 03.03.08***



Top Priority: Push the Technology AND Control the COST

- fundamental → containment of the current RDR Value estimate.
- potential cost-reduction via good engineering practices
 - **clearly identified in the RDR.**
- Together with the risk-mitigating prioritized R&D program
- the focus of the EDR work.



Industrialization

- Second focus: → increasing direct involvement of industries
 - **Engineering development / cost saving through industrial partnerships**
- Preparation for mass production
 - **is a critical issue for key technologies,**
 - **understanding how individual countries can contribute in-kind**
- This must be achieved on a truly worldwide basis,
 - **Intend to follow free-market**
 - **including seeking out and developing potential (new) industrial bases**



Our Community – global basis:

- The GDE is committed to these goals
 - as a **global project**, ← *this is a major ILC strength*
 - **building on the success of the RDR.**
- We must also:
 - **ensure that internal momentum is maintained and**
 - **foster continued growth in the enthusiasm and commitment of the international ILC community.**
 - **grow the resources: funding; new institutions; universities**
- Challenge →
 - **maintain effective communication paths between co-workers separated by great distances.**
 - **ensure strong overlap between GDE/ED activities and priorities of the major institutions/stake-holders.**
- Strength →
 - **diverse technical expertise**
 - **wide ranging laboratory infrastructure**
 - **(result of years of hard work and preparation.)**

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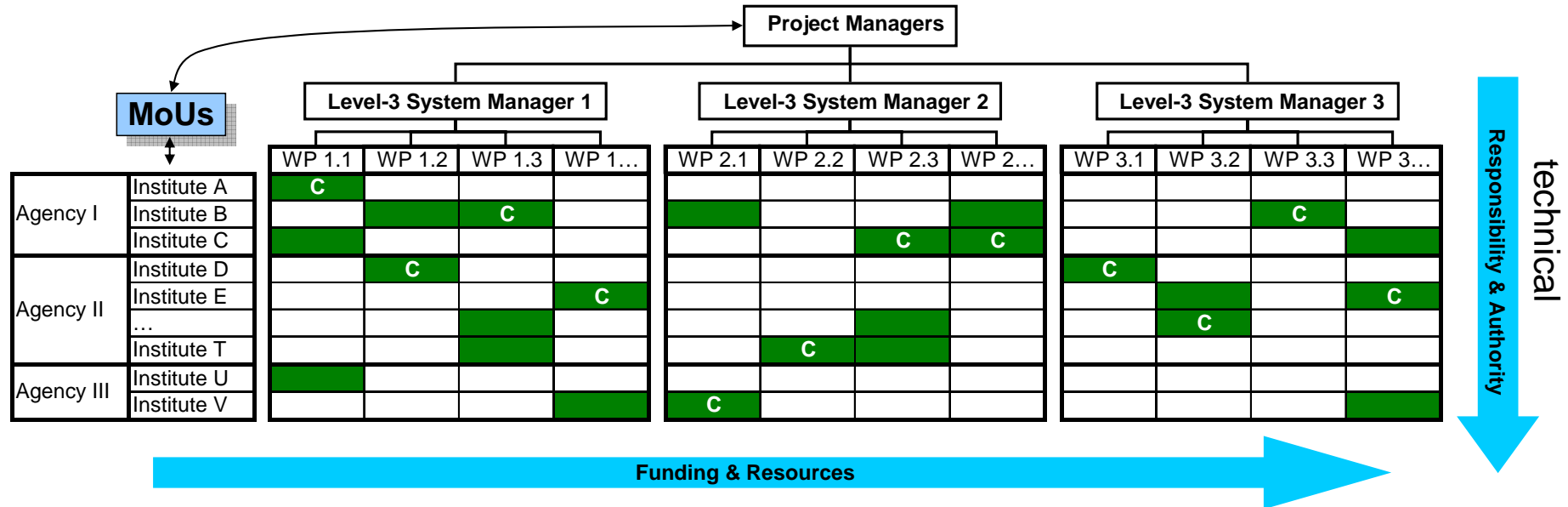


Access to Resources

- Common Fund Support
 - **Administrative Staff for Director and PM**
 - **Cost & Schedule**
- Regional Support
 - **Technical Management Staffing**
 - **R & D Financial Resources**
 - **The Regional Directors have an important role**
 - Authorize the plan
 - They connect the ILC EDR Project to technical expertise



Managing a non-centrally funded project:



- green indicates a commitment:
 - **institute will deliver**
- MoUs facilitate connection: (see Shekar)
 - **Project Management (authority and responsibility) and institutions (funding and resources).**
- The 'C' → coordinating role in a WP
 - **Each WP has only one coordinator.**

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Example Work Package Coordination →

Area: Main Linac Technology (draft)

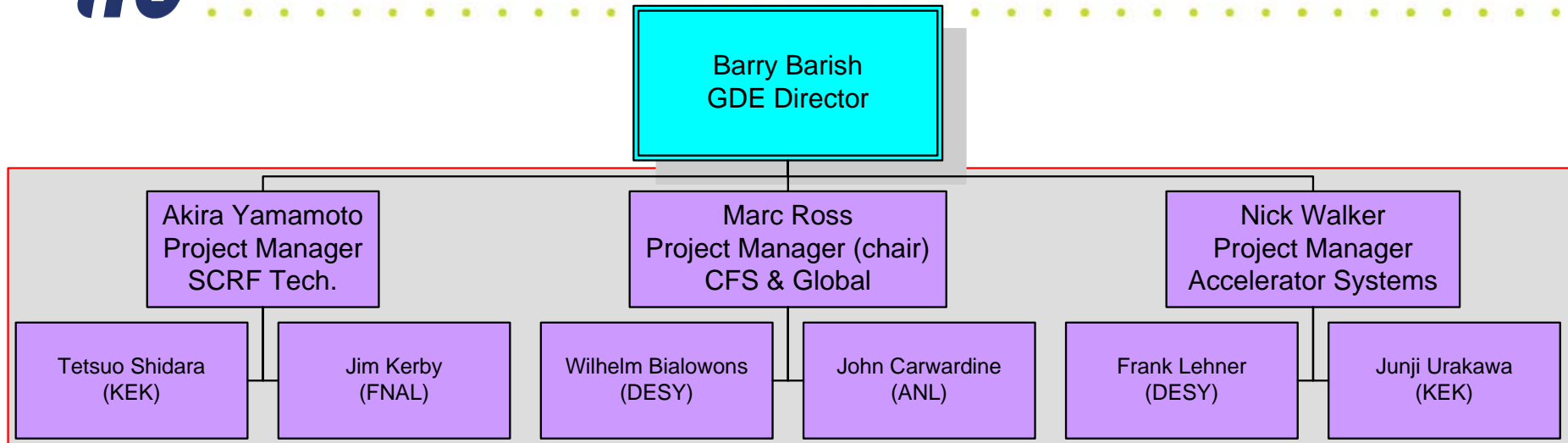
Regional/Intsitutional Effort:			Technical Effort (MLT):					
- Director-US: Mike Harrison - Director-EU: B. Foster - Director-AS: M. Nozaki			- Project Manager: A. Yamamoto - Associate Managers: T. Shidara , J. Kerby, * Group leader, ** Co-leader					
Regions	Institutes	Institute Leaders	Cavity (Process) - L. Lilje*	Cavity (Prod./Int.) -H. Hayano*	Cryomodule -N. Ohuchi* -H. Carter(tbc)**	Cryogenics - T. Peterson*	HLRF -S. Fukuda*	ML Integr. - C. Adolphsen*
US	Cornell Fermilab SLAC ANL TJNL	H.Padamsee R. Kephart T. Raubenheimer	H.Padamsee	C.Adolphsen	H.Carter	T.Peterson	R.Larsen	Adolphsen
EU	DESY CERN Saclay Orsay INFN Spain	R.Brinkman J. Delahaye O. Napoly A.Variola C. Pagani			Parma	Tavian		
AS	KEK Korea Inst. IHEP India Inst.	K.Yokoya	Noguchi Saito	Hayano	Ohuchi	Ohuchi	Fukuda	

Not all slots assigned – *WP/ WP coordinators under consideration*

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EDR Project



- and Technical Area Group Leaders
 - Total 25 (!)
 - Responsible for:
 - Work Package definition & draft allocation
 - Area baseline
 - Organizing / drafting decision process

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CFS & Global Systems

- CFS has been identified as an RDR cost driver; and is expected to yield significant cost reduction through “value” engineering.
- It is complicated via site/regional dependencies, requiring delineation into global/generic engineering and site/region-specific engineering.
- Both categories of CFS work must be clearly identified in the final Work Breakdown Structure (WBS).



Goals

- iteration of CFS requirements with accelerator designers/engineers (value engineering);
- Detailed evaluation of alternative solutions (e.g. shallow site);
- Preparation of critical information for specific site selection / development;



Milestones

CFS milestones support the development of sample sites in each region allowing a site selection directly following the completion of the ED Phase. Global Systems milestones support the development of cost / risk optimized designs. These milestones include:

- specific sample -site cost benefit and value - engineering analysis leading to an Accelerator System and CFS cost / risk optimum design
- development of an inter-regional schedule for sample -site preparation
- alternate site format design development
- preparation for the site selection process

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Value Engineering

- Value Engineering is the process whereby the total estimated cost of achieving an objective is compared with the lowest possible cost of achieving that objective.
- All affected and contributing technical subsystems will be represented in a multilateral discussion whereby each cost component must be justified by its impact on the objective.
- Requirements for commodities such as underground space, electrical power and water cooling capacity must be measured against technical system requirements such as vibration, temperature and thermal stability in terms of cost, cost risk and technical risk.
- System Engineering, whereby representatives from several Technical Area Groups are involved in optimizing the design of a given subsystem, is to be coordinated through the System Integration group of the Project Management Office.
- This group will participate in the Project Review Meetings where the group will develop a prioritized approach to optimize high-interference regions which go across defined system area boundaries or have complex interfaces.



Planning Phase (July 07 - March 08)

- Milestones
 - **Project Management Team releases all necessary project guidance, tools, and organizational information to Technical Area Group Leaders**
 - **Technical Area Group Leaders provide WBS dictionary, preliminary list of work packages, and preliminary list of issues, decision points, and resource requirements.**
- Interim Deliverables (Oct 07)
 - **Engineering Design Project Management Plan version 1**
 - **WBS template and guidance document for Technical Area Group Leaders**
 - **Change control template and guidance document for Technical Area Group Leaders**
- Deliverable (March 08)
 - **ED Project WBS dictionary for Levels 1-3**
 - **Preliminary outline of Engineering Design Report**
 - **Preliminary list of final deliverables for the Engineering Design phase**
 - **Preliminary resource plan**
 - **Prioritized list of issues and decision points to be addressed during ED Phase**



CFS – AS Kick-off Meeting

- 3 CFS EDR Kick Off meetings.
- Each one has a focus on
 - regional issues,
 - issues special to the group - special experience or institutional expertise, and
 - carry over from previous meetings or discussions.
- At the Fermilab GDE meeting there will be a 1 hour CFS closing plenary presentation.
 - summaries of the kick off meetings
 - and a plan for the EDR.
 - an outline of needed criteria and who is responsible for providing it by when.



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- The presentation should also include plans for (the) key CFS deliverables:
 - **1) an integrated inter-regional plan - with schedules for regional and global activities,**
 - **2) plans for specific value engineering exercises –**
 - to be highlighted in the PM presentation,
 - **3) strategic discussion of a model site selection process and**
 - **4) a plan for the development and publication of a alternate site format design.**



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- “an integrated inter-regional plan - with schedules for regional and global activities”
 - This is a specific *KEK deliverable* for the Asian regional sample site (*proposal*)
- Carry-over topic:
 - Water cooling system for klystron
 - (special appointment)



Goal

- Global L3 Managers are requested to help develop these documents.
 - Statement of Work
 - Institutional MOU
- Our goal is to have the Statement of work defined for major WP defined by the Fermilab meeting of the GDE.
- Our goal is to have a few institutional MOUs in place by end of the CY08.
- Shekhar Mishra working with PMs will develop a global WP Matrix of ILC work by mid Nov 07.
- We are expected to share this top level Global Work Packages matrix with the FLAC Resource Group in late Nov. 07.

Global design effort



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