

***Conventional Facilities and Siting  
Global Group (CFS)  
SLAC Update  
November 5, 2007***

Acknowledgment:

Jerry Aarons, Clay Corvin, and Esther Kweon

# Activities Update Since August 20, 07

- Overview
  - *Participation in EDR Kick-Off, IRENG07 and ALCPG07 Meetings*
  - *CFS Scope of Work*
  - *CFS Work Package Descriptions*
  - *SLAC CFS Work Package for FY08*

# Activities Update Since August 20, 07

- **EDR Kick-Off Meetings**
  - ***Three Separate CFS Kick-Off Meetings Were Held (One in Each Region)***
    - ***Jerry and I attended the American Region***
  - ***At Each Meeting, Information was Presented that Described Each Region's Efforts for the Overall ILC CFS Design Work***
  - ***In Addition, Information also Presented that Described the Process for Large Project Approval in Each Respective Region***
  - ***While the Regional Methods Vary in Both Structure and Timeframe, the Actual Engineering Work Required is Very Similar***

# Activities Update Since August 20, 07

- *EDR Kick-Off Meetings Cont.*
  - *Participated in Three Area Systems Kick-Off Meetings; RTML, e- Source, and BDS*
  - *At Each Meeting, Information was Presented that Described the Scope and Maturity of Efforts for the Overall ILC CFS Design Work in the RDR*
  - *Information also Presented that Described the Process as well as the plan for the Overall ILC CFS Design Work in the EDR*
  - *In Addition, Identified a few inconsistencies, Discrepancies, Omission as well as Double counting in the RDR CFS*

## Excerpts from the CF&S Group Parallel Sessions (at ALCPG07) Review of the RDR Cost Estimate Findings:

- 3) 1.7.1.2.1 Shaft in BDS
  - (Europe), one 9m shaft 95m depth,
  - (America), one shaft 1 m 130m depth, one shaft at 9m, Four 0.8m shaft for the dumps,
  - (Asia), one 9m, four small shaft boring pipe
- 4) Tunnel for BDS
  - (America) 2.226 km each, one for electron and one for positron only for beam tunnel, only 1.1km for service tunnel, [1.6km to electron source]
  - (Europe) 2.221km ....service tunnel is included in both BDS, and e- or e+ source
  - (Asia) 2.226 km each, one for electron and one for positron only for beam tunnel, only 1.1km for service tunnel, [1.6km to electron source]
- 5) 17124 Cavern for BDS, Service cavern
  - (America) 6000 cu m
  - (Europe) 10,000 cu m, different geological/shaft situation
  - (Asia) same as America
- Beam dump cavern
  - (America) total 21,488 cu.m
  - (Europe) 34,800 cu.m
  - (Asia) 34,800 cu.m
- Muon Wall
  - (America) 4 alcoves, two on each side, 9m (630 cu.m), 18m (1,050 cu m) x 2
  - (Europe) 24m, and 15m
  - (Asia) same as Europe
- 7) 1.7.1.4.5 Miscellaneous for BDS
  - (America) four personal crossover access,
  - (Europe) sixteen personal crossover, also included in sources
  - (Asia) two total (20 m length of each passageway)=40m
  - (America) 44 utility penetrations
  - (Europe) 120 (include the sources penetrations)
  - (Asia)
- Laser shaft
  - (America) should have 4 laser room on the surface with shaft (or boring)1.5m going down w small cavern, but we don't have it...
  - (Europe) no surface bldg
  - (Asia) have 1.5m shaft, no laser bldg

# Activities Update Since August 20, 07

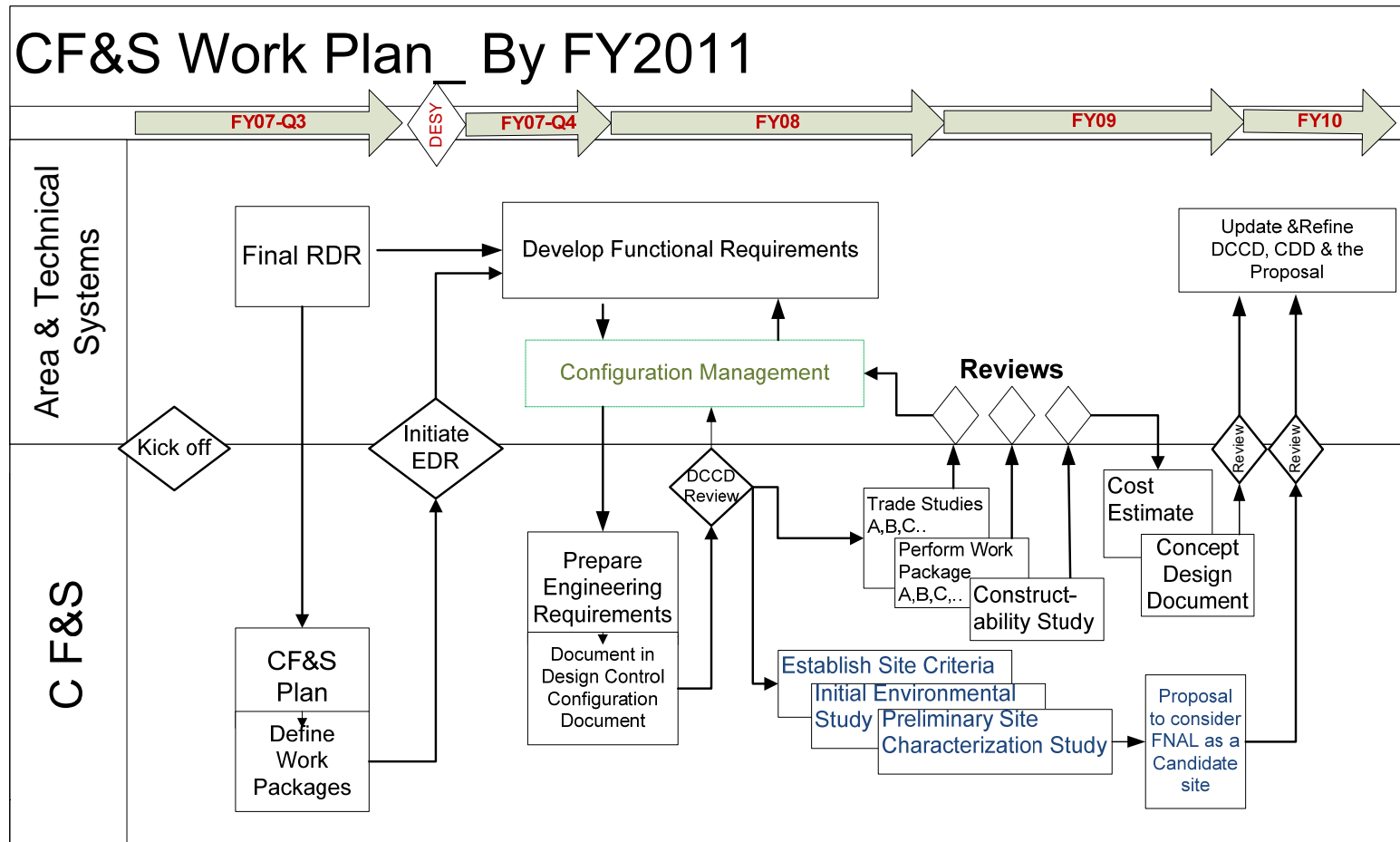
- **Current CFS Status**

- *Current Efforts are focused on the Development of what is to be Included in the Next Phase, Engineering Design Report (EDR)*
- *Continue to Work Together with FNAL, Asian and European colleagues to Provide the Americas Region CFS ILC Support*
- *Work Packages are Currently Being Developed Based on Input received from the GDE Project Management Group and from Participation in a Series of EDR Planning Meetings for CFS and the Other Major Area and Technical Systems*
- *Comparison of Work Packages with Available Resources will Identify Priorities for Completion*
- *The CFS Effort is at a Branching Point that will begin to Identify the Distinctions Between Generic GDE/EDR Support and Specific Site Design Development Toward an Expression of Regional Interest*

# A Tentative CF&S Work Plan Approach for EDR

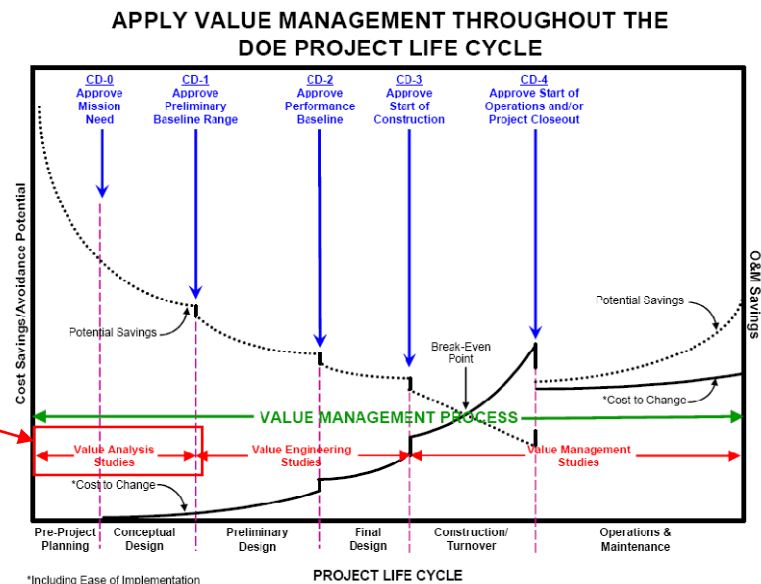
## Concept Design Must Be Based on Validated Requirements

- Requirements should have a range;  
Acceptable, Preferable, Desirable



# Activities Update Since August 20, 07

- Goal: To apply the first iteration cycle of the Work-Plan, focusing on e- Sources, Beam Delivery and Interaction Region
- Approach: Will be based on Systems Engineering Management
  - **Define physics functional requirements**
    - Identify the range; Acceptable, Preferable, Desirable
  - **Define boundaries, interfaces, utility needs and functional environment**
  - **Define physics requirement to an engineering requirements**
  - **Initiate a CFS Design Configuration Control Document**
  - **Put under Interface Control**
  - **Identify Optimization Studies**
    - Design Alternatives Trade-Offs
    - Trade Studies
    - Constructability Studies
    - **Value Analysis Studies**





# Activities Update Since August 20, 07

- CFS Scope Of Work

- *The CFS Contribution to the EDR is Somewhat Different than that of the Technical Aspects of the ILC Project*
  - *Continued Development and Refinement of Criteria and Pre-Concept or Concept level Design*
  - *Schedule Development from Now Until the Start of Construction*
  - *Cost Optimization of Baseline Criteria*
  - *Alternative Evaluation*
- *CFS Scope of Work will also Include the Process for Site Selection*

# Activities Update Since August 20, 07

- **CFS Work Package Organization**
  - **Work Packages are Divided Under Two General Categories and Six Sub-Categories**
    - **2.1 Civil Engineering and Services**
      - **2.1.1 Criteria Development and Design EDR I**
      - **2.1.2 Final Site Specific Design EDR II**
    - **2.2 Conventional Facilities Process Management**
      - **2.2.1 CFS Scope of Work**
      - **2.2.2 Cost and Time Management**
      - **2.2.3 Site Selection**
      - **2.2.4 Scope of Work for Bidders to Host the Project (For Information Only)**

# Activities Update Since August 20, 07

## Work Package Descriptions

- **2.1.1 Criteria Development and Design EDR I**
  - 2.1.1.1 Civil Works Specific to the Americas Region Sample Site
  - 2.1.1.2 Civil Works Specific to the Asian Region Sample Site
  - 2.1.1.3 Civil Works Specific to the European Region Sample Site
  - 2.1.1.4 Electrical Engineering (all three sample sites)
  - 2.1.1.5 Air Treatment Equipment (all three sample sites)
  - 2.1.1.6 Process Cooling Water and Piped Utilities (all three sample sites)
  - 2.1.1.7 Vertical handling Equipment (all three sample sites)
  - 2.1.1.8 Safety Equipment (all three sample sites)
  - 2.1.1.9 Survey and Alignment (all three sample sites)
  - 2.1.1.10 EDR I Cost Estimate
  - 2.1.1.11 EDR I Time Schedule
  - 2.1.1.12 EDR I Writing
- **This WP Group Provides Preliminary Design Up to Final Site Selection**

# SLAC CFS Group Work Package Plan for FY08

## WBS 2.11 Conventional Facility Design

- **2.11 - Conventional Facility Design** – This Work Package provides general conventional facility design and planning support and the development of cost estimates for the ILC EDR.

**2.11.1 – SLAC In-house FTE support to the general design effort described above. Focus of this effort will be on design solutions for the e-Source, Beam Delivery System and the Interaction Region of the ILC. This is to be augmented by contracts with specialty firms on the cost effective design recommendations and costing efforts.**

	April Budget Plan		Reduced Budget Model	
WBS Level	FTEs	M&S	FTEs	M&S
WBS 2.11 Conventional Facility Design	3.0	100	2.2	0

- **If the budget is reduced, the maturity of the design solutions will be limited to the extent of in-house knowledge not the best value and know-how available in industry.**
- **This contract effort is ranked as priority “1”**

# SLAC CFS Group Work Package Plan for FY08

## WBS 2.2.3.1 Installation

- For the EDR/FY08 effort, to set up a logistics management database for ILC to accomplish and optimize installation process management
  1. **Set-up a Data Base software to**
    - Define scope of on site deliverable for each subsystem
    - Define the subsystem installation requirements
    - Establish subsystem interfaces/Boundaries
  2. **Set-up and launch a 4D computer software program (CATIA) to integrate 3D geometry with time motion simulation**
    - Check for space time conflict management
    - Maximize efficiency, labor loading, and material delivery sequencing

	April Budget Plan		Reduced Budget Model	
WBS Level	FTEs	M&S	FTEs	M&S
WBS 2.2.3.1 Installation	2.0	120	1.75	0

- **Task described under item 2 will not be accomplished, if the budget is reduced**
- **This effort is ranked as priority “2”**

# SLAC CFS Group Work Package Plan for FY08

## WBS 7.11 Regional Interest

- **7.11.3 - Conventional Facilities** – This Work Package provides conventional facilities design and planning efforts for the ILC Regional Interest for the ILC EDR effort.

**7.11.3.2-Vibration Characterization of IR**– This work package will provide actual vibration measurements by performing cross-hole, down-hole (up-hole) testing of the Interaction Region, as well as 3D computer modeling and vibration propagation analysis of the IR using SASSI.

➤ **This contract effort (200\$K) is ranked as priority “4”**

- **7.11.3.3 – Constructability Studies** – This work package will provide independent expert consultant review and recommendation on the construction methods for underground. This review will help to identify alternatives and options for cost reduction and scheduling efficiencies of the underground work.

WBS Level	April Budget Plan		Reduced Budget Model	
	FTEs	M&S	FTEs	M&S
WBS 7.11 Regional Interest	0.5	300	0.2	0

- **If the budget is reduced, none of the above mentioned tasks will be accomplished.**
- **This contract effort (100\$K) is ranked as priority “3”**