GDE ACCELERATOR ADVISORY PANEL REVIEW

CONVENTIONAL FACILITIES AND SITING GROUP

TECHNICAL DESIGN PHASE I OVERVIEW

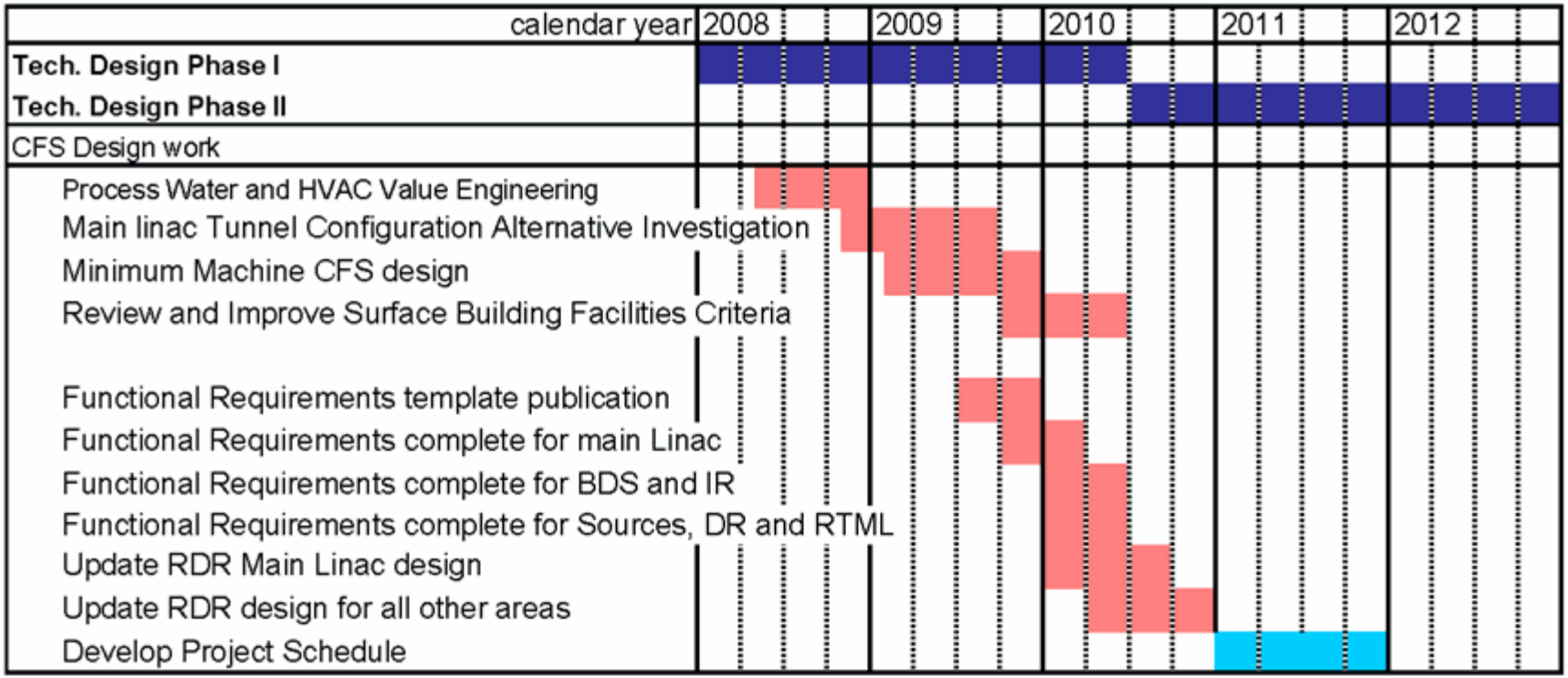
V. KUCHLER

CFS TDP Effort

- The ILC Research and Development Plan Details the CFS Efforts Through TDP I & II
- Identify Cost Drivers from the RDR
- Use Value Engineering to Identify and Evaluate Alternative Design Options and Costs
- Provide Factual Information to the PM's to Assist in the Development of a New Baseline Design Solution
- Collect New Criteria from Area and Technical Systems
- Develop a New CFS TDP Design Solution, Cost Estimate and Project Schedule
- Prepare Text for Inclusion into the Technical Design Report

ILC R&D Plan CFS Milestones

Table 4.1: Functional Requirements and Value Engineering Milestones (stages 1 & 2)



Specific Value Engineering Areas

- **Process Water and HVAC**
  - ~17% of RDR Cost
  - Alternatives to RDR Configuration and Criteria
  - Klystron Cluster Alternative
  - Distributed Klystron Alternative
- **Main Linac Tunnel Configuration Alternatives**
  - ~25% of RDR Cost
  - A Comprehensive Review of Alternatives
  - Evaluation of Associated Life Safety and Egress Issues
- **Minimum Machine Evaluation**
  - Develop New Central Area Tunnel Configuration
  - Develop New Area System Technical Criteria
  - Develop CFS 3D Drawings for Design Modeling
- **Review and Improve Surface Facilities Criteria**
  - ~8% of RDR Cost

Other RDR CFS Cost Drivers

- Conventional Electrical Distribution
  - ~13% of RDR Cost
  - Based on RDR Criteria, Electrical Distribution Costs Reasonably Scale with the Technical Power Requirements
  - Alternatives to RDR Criteria Can Result in Cost Adjustments
    - Klystron Cluster Alternative
    - Distributed Klystron Alternative
    - Alternative Tunnel Configurations

Minimum Machine Evaluation

- Current Focus Centered on the Development of the 3D Drawing Model
- DESY is Coordinating the 3D Effort
- Webex Meetings are Held Twice Monthly
- Guidelines, Coordinate Systems and Common Orientation Conventions are Being Developed
- CFS Support is Primarily Provided by CERN
- A Consultant Contract is Currently in Place at FNAL to Further Support Both the Minimum Machine 3D Drawing and Eventual Design Evaluation Efforts
- A 100m Main Linac/BDS Tunnel Section is the Test Example for Software Compatibility and Model Manipulation
- Development of Area Systems Criteria will Follow and Formalize the 3D Model and Evaluation Process

Surface Facilities Criteria

- Least Defined Area in Terms of Actual Criteria
- Initial Criteria Were Developed Modeling the Old SSC Design in Terms of Gross Square Footage Required
- A Later Model was Developed by CERN and Their Experience with the LHC
- Both Models were Based on Essentially a New Laboratory with Full Support Facilities
- A Later CFS Review Held at CALTECH in late 2006, Prompted a Reduction in Gross Square Footage Which Eliminated all Facilities Deemed to be Over the Minimum Required for Machine Operation
- Since Then, Only Cursory Reviews of this Data have been Conducted
- More Formal Criteria Needs to be Established

Resource and Effort Profile

- The CFS Group Maintains a Strong and Focused International Effort
- The CFS Group has Developed a Strong Collaboration with the CLIC and XFEL Projects with Project X to Follow
- Base Resources Remain Fairly Dependable at Present Levels
- Additional Asian Resources are Currently Being Considered
- Current Resources will Support the Level of Effort for CFS Activities Indicated in the ILC R&D Plan
- The Value Engineering Effort will Provide Increased Credibility for the Revised TDR Baseline Design and Cost Estimate
- The CFS TDP Effort is Intended to Produce the Technical Information Needed for the International Approval and Site Selection Process to Proceed

Summary

- Following Presentations will Provide a More Detailed Status of Current CFS Efforts in Specific Areas
  - Process Water and HVAC VE
  - Distributed RF System Studies
  - Main Linac Tunnel Configuration Studies
  - CFS Collaboration Efforts
- The Final Presentation will Describe Longer Term Issues Including
  - Site Characterization
  - Site Selection Issues
  - Other Issues that Affect the CFS Effort in the Near and Long Term