NLC - The Next Linear Collider Project

NLC Conventional Facilities

Introduction and Overview

Jon Ives
May 25, 1999
Schedule for Conventional Facilities Breakout Sessions
Tuesday Morning Sessions

- 8:30  Introduction and Overview - Jon Ives (60 minutes)
- 9:30  Break (15 minutes)
- 9:45  Plans for Conceptual Phase - Ives/Corvin/Sevilla (90 minutes)
- 11:15 Discussion/Q&A (30 minutes)
- 12:00 DOE Full Committee Working Lunch - Orange Room (60 min.)
Schedule for Conventional Facilities Breakout Sessions
Tuesday Afternoon Sessions

• 1:00 Status of Facilities Requirements/Costs - Corvin/Sevilla (90 min.)
• 2:30 Break (15 minutes)
• 2:45 Conventional Facilities Schedule - Jon Ives (60 minutes)
• 3:45 Wrap-up and Planning for Wednesday (15 minutes)
• 4:00 Subcommittee Executive Session - (60 minutes)
• 5:00 DOE Full Committee Executive Session (Orange Room)
Schedule for Conventional Facilities Breakout Sessions
Wednesday Morning Sessions

• 8:30    Subcommittee Executive Session
• 9:00    Discussion/Q&A (30 minutes)
• 9:30    Risk Analysis - Jon Ives (30 minutes)
• 10:00   Break (15 minutes)
• 10:15   Site Selection Process - Ives (60 minutes)
• 11:15   Options:
    Presentations as requested by Subcommittee
    Demonstrations: Facilities Web Site/Success/Access Software
    Discussions/Q&A or Subcommittee Working Session
• 12:00   DOE Full Committee Working Lunch - Orange Rm. (60 min.)
Schedule for Conventional Facilities Breakout Sessions
Wednesday Afternoon Sessions

• 1:00 Continue Options as Described for the Morning
• 4:00 Subcommittee Executive Session - (60 minutes)
• 5:00 DOE Full Committee Executive Session (Orange Room)

May 25, 1999
Building the Project Tools

Scope

Cost → Schedule

Cost → Schedule

Schedule → Cost
NLC Work Breakdown Structure

- 1  NLC Project TEC
- 14 Conventional Facilities
- 2  NLC Project OPC
- 21 Pre-Construction OPC (CD-1 to CD-3)
- 215 Conventional Facilities (WBS 14 after CD-2)
- 216 Site Selection and NEPA Documentation
Conventional Facilities
Introduction and Overview - Scope

Conventional Facilities OPC WBS - Level 4

21
Pre-Construction OPC (CD-1 to CD-3)

215
Conventional Facilities
- 2151 Conceptual Design
- 2152 R & D
- 2153 A-E Contract

216
Site Selection & NEPA Documentation
- 2161 DOE Site Selection
- 2162 DOE NEPA Documentation

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WBS Dictionary for Conventional Facilities

- Database Records 1165
- Definitions Completed 1165
- Percent Complete 100%

May 25, 1999
Defining Interfaces

• WBS Definitions
  – What Conventional Facilities Provides
  – What Conventional Facilities Does Not Provide

• Interface Diagrams, Sketches & Drawings
  – Electrical
  – Mechanical
NLC Conventional Facilities

Introduction and Overview - Scope

Interface Diagrams

Figure 2. Cooling Water System Interface Diagram

Cooling System
(See handout for a full-size version)
Interface Diagrams

![Interface Diagram](image)

**Electrical System**

(See handout for a full-size version)
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Conventional Facilities
Introduction and Overview - Scope

NLC WBS Dictionary

<table>
<thead>
<tr>
<th>WBS ID</th>
<th>1417242</th>
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</thead>
<tbody>
<tr>
<td>Element Name</td>
<td>Site Main Linac Mechanical Systems</td>
</tr>
<tr>
<td>Person Responsible</td>
<td>Ives</td>
</tr>
<tr>
<td>Date</td>
<td>9/1/021</td>
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Definition

WBS 1417242 includes the mechanical systems, outside the five-foot-line, for the positron and electron main linac beam-line housings.

These mechanical systems include:

- Heat extraction, using water and air systems.
- Thermostatic systems will handle cooling tower makeup water, cooling tower water, low conductive water, electronic rack cooling water, and chilled water.
- Waste water collection, storage and disposal, including potentially radioactive water.
- Water for domestic uses.
- Fire suppression systems.

Note: The cooling systems for the main linac klystrons and modulators are not included under this WBS element. (See WBS 1417241.)

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Tech Data Sheets for Conventional Facilities

- Database Records: 1165
- Data Sheets “Completed”: 109
- Percent Complete: 9%
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Conventional Facilities
Introduction and Overview - Scope

May 25, 1999
Development of Cost Estimates

- Cost Estimating Software - “Success” by US Cost
- Data Source - R. S. Means Cost Data
- Baseline Cost Model
- Risk Assessment
Introduction and Overview - Cost
WBS 142 Housing Costs - Positron Main Linac

- **Costs:** R.S. Means

- **Include:**
  - Material
  - Labor
  - Equipment
  - Overhead
  - Profit
  - Cost Index

May 25, 1999
Development of the Project Schedule

- Software - Primavera P3/SureTrak
- Conventional Facilities Schedule
- Integrated Project Schedule
Conventional Facilities
Introduction and Overview - Schedule

Act ID | Description                          | Orig Dur | Rem Dur | Early Start |
-------|--------------------------------------|----------|---------|-------------|
CD1000 | CD-1 APPROVE MISSION NEED/PROJECT    | 0        | 0       |             |
CD1030 | HEPAP Review                         | 0        | 0       |             |
CD2000 | CD-2 APPROVE CDR/BASELINE (DOE)      | 0        | 0       |             |
CD2010 | DOE FY04 Budget Input to OMB         | 0        | 0       |             |
CD2020 | OMB Passback                         | 0        | 0       |             |
CD2030 | Secretary's Record of Decision (NEPA)| 0        | 0       |             |
CD2050 | President's FY04 Budget to Congress  | 0        | 0       |             |
CD2060 | FY04 Appropriations Available        | 0        | 0       |             |
CD3000 | CD-3 APPROVE START OF CONSTRUCTION   | 0        | 0       |             |
CD4000 | CD-4 APPROVE PROJECT CMPLT/ACCEPT    | 0        | 0       |             |
CD4010 | NLC CD-1 Lehman Review               | 0        | 0       |             |
CD4020 | CDR 0.4 Progress Review              | 0        | 0       |             |
CD4030 | CDR 0.4 Design Review                | 0        | 0       |             |
CD4040 | CDR 0.8 Progress Review              | 0        | 0       |             |
CD4050 | CDR 0.8 Design Review                | 0        | 0       |             |
CD4060 | CDR 1.0 Progress Review              | 0        | 0       |             |
CD4070 | CDR 1.0 Design Review                | 0        | 0       |             |
CD4080 | CDR Complete                         | 0        | 0       |             |

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Dealing with Uncertainties

• Site Not Known
  – Land cost not included in current cost estimate
  – Geology/topography/geohydrology - assumptions
  – Connections to regional infrastructure - not included
  – Water/waste treatment - on-site plants not included
Dealing with Uncertainties

- **Campus Facilities**
  - Self-contained, independent NLC assumed
  - Some “Placeholder” requirements defined for costing
  - NLC-specific requirements being defined

- **Beam-Line Housings**
  - Dumps and dump lines - placeholders
  - Interaction Halls - placeholders
Intra-NLC Communications

- Weekly Facilities Working Meeting
- Weekly NLC Executive Committee Meeting
- Weekly Area Managers/System Managers Meeting
- Weekly Schedule Task Force Meeting
- Conventional Facilities Web Site
- Project Planning Database

May 25, 1999
Conventional Facilities

TEC Scope and Cost

- Work Breakdown Structure (Preliminary Level 6)
- WBS Definitions + Utility WBS Interface Diagrams
- Description of the Baseline Cost Model
- Cost Model Roll-Up (Preliminary Level 6) NEW
- Scope & Cost (Next)

Schedule

- Preliminary Schedules: 3Q01 - 4Q09

Graphics

- Machine Area Schematic + Graphics & Data

Site Selection Process

- Site Selection Criteria - Revision 2 + Site View
- Candidate Site Comparisons Seismic: CA, IL, JP, US

Conventional Facilities Group Organization and Staffing

- Contact Information EMAIL Mail to: Contact Us

May 25, 1999
Handouts

- Sample WBS definitions
- Sample WBS Technical Data Sheets
- Electrical Interface Diagram
- Mechanical Interface Diagram
- Main Linac Mechanical Systems Drawing
Summary

- Project tools are in place
- Pre-conceptual work provides solid foundation upon which to build the CDR
- Details to follow in today’s presentations!