Conventional Facilities and Siting Overview

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GDE

CFS Overview

Where Are We ?

- Preliminary CFS Cost Estimates Were Submitted to the DCB on June 30th
  - **1.7.1 Civil Engineering - Regionally Developed**
  - **1.7.2 Electrical - Developed by European and Asian Regions with the Exception that High Voltage Costs were Regionally Developed**
  - **1.7.3 Air Treatment Equipment - Developed by Americas Region**
  - **1.7.4 Piped Utilities - Developed by Americas Region**
  - **1.7.5 Process (Cooling) Water - Developed by Americas Region**
  - **1.7.6 Handling Equipment - Developed by European Region**
  - **1.7.7 Safety Equipment - Developed by Asian Region**
  - **1.7.8 Survey and Alignment - Developed by European Region**
- Preliminary Costs for a Russian Site at Dubna are Also Being Prepared will use the Same WBS Format

CFS Overview

Drawings and Criteria

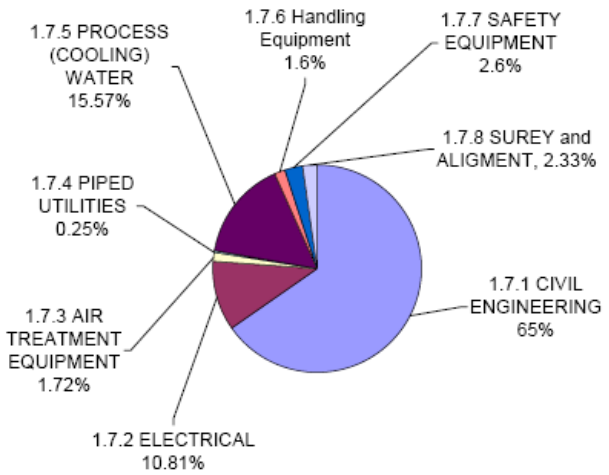
- A Basic Set of BCD Drawings has been Developed that Represent Generic Design Solutions
- Drawings have also been Prepared to Define Regionally Specific Design Conditions
  - **Configuration of Access Tunnels**
  - **Configuration of BDS and IR Regions**
  - **DESY Solution is Based on BCD Design and Needs to be Adjusted to Reflect a Shallow Design Solution**
  - **Dubna also Proposes a Shallow Design Solution**
- Specific Detailed Criteria has been Generated for All Area Systems
- All Current Information is Posted on the CFS Wiki Page

CFS Cost Breakdown by WBS

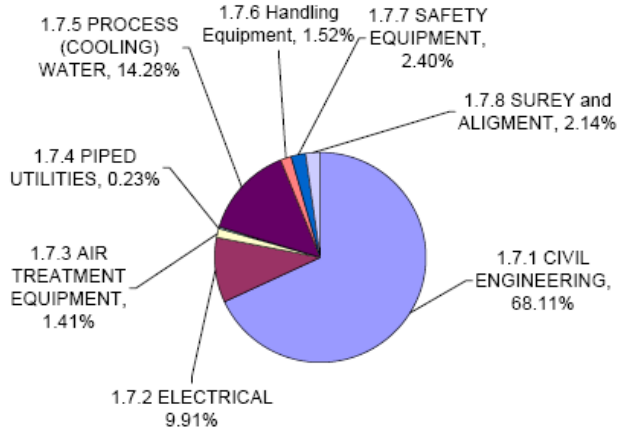
	Asia	Europe Cern	Europe Desy	America
1.7.1 CIVIL ENGINEERING	61.28%	65%	68%	66%
1.7.2 ELECTRICAL	11.79%	11%	10%	10%
1.7.3 AIR TREATMENT EQUIPMENT	1.72%	2%	1%	2%
1.7.4 PIPED UTILITIES	0.29%	0.3%	0.2%	0.2%
1.7.5 PROCESS (COOLING) WATER	17.50%	16%	14%	15%
1.7.6 Handling Equipment	1.86%	1.7%	1.5%	1.6%
1.7.7 SAFETY EQUIPMENT	2.94%	2.6%	2.4%	2.6%
1.7.8 SURVEY and ALIGMENT	2.62%	2.3%	2.1%	2.3%

CFS Overview

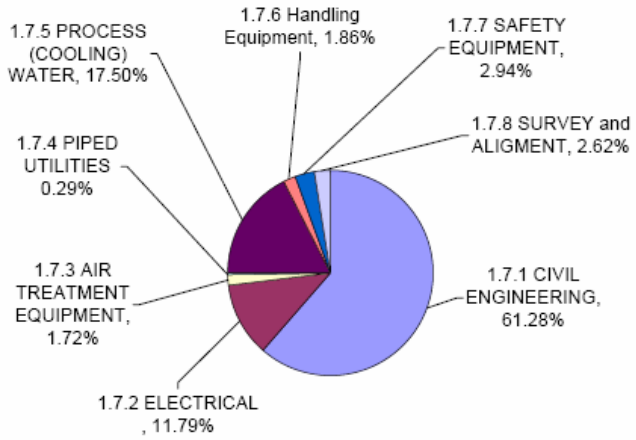
CFS Cost Breakdown by WBS



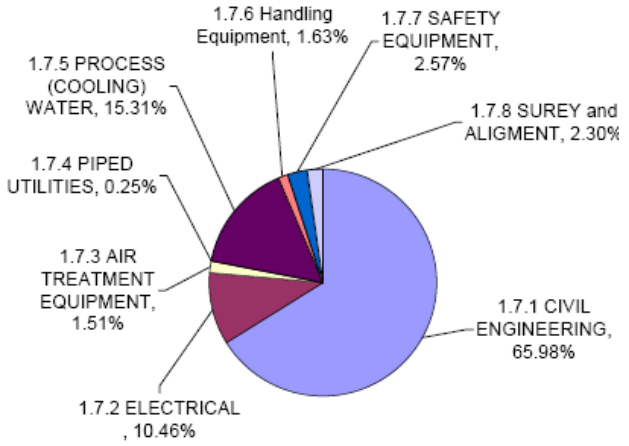
CERN Cost Distribution by WBS



DESY Cost Distribution by WBS

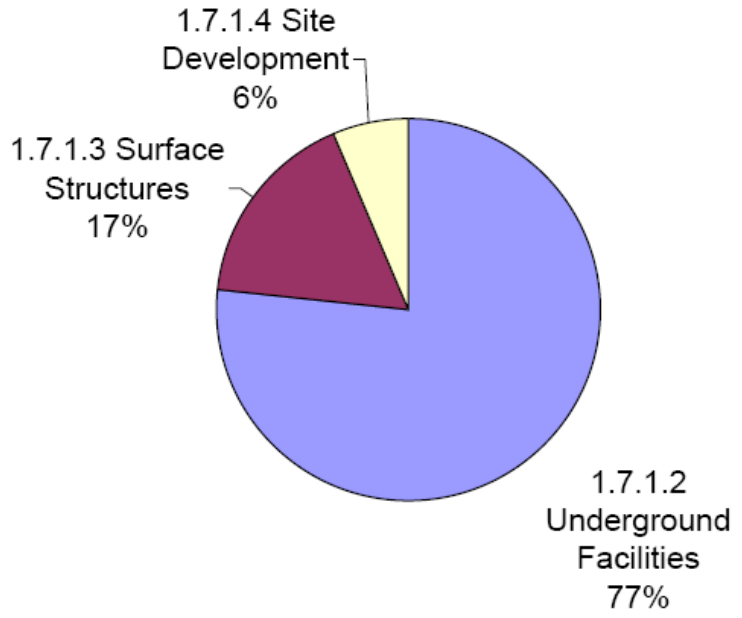


ASIA Cost Distribution by WBS



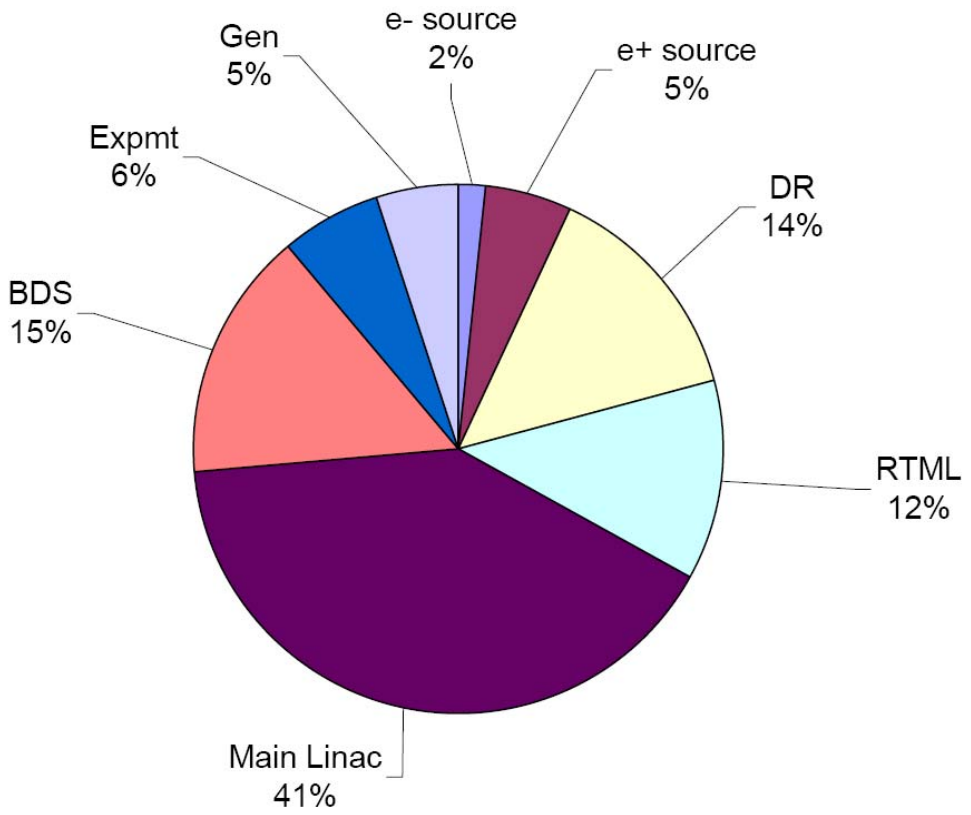
Americas Cost Distribution by WBS

CFS Civil Engineering (1.7.1) Cost Breakdown



Distribution Of 1.7.1 Civil Engineering Costs

CFS Cost Breakdown by Area System



CFS Cost Distribution by Area System

Preliminary Observations

- All CFS Cost Estimates are Generated from Unit Costs Derived from Actual Constructed Project Costs
- The Entire CFS Cost Process is a Work In Progress
- Initial Cost Variance is ~16% from Low to High Costs
- There are Several Regional Details that Need to be Resolved Within the CFS Group
- Increased Understanding of Regional Details is Expected to Further Reduce the Regional Cost Variance
- Additional CFS Interaction with the Various Area and Technical Systems is Needed
- Continuing Review of Criteria and Design Parameters is Needed to Refine the CFS Solutions that will be Reflected in Revised Cost Estimates

Primary Areas of Interest

- 1.7.1 Civil Engineering (65%)
  - **Size and Number of Shafts**
  - **Diameter of Tunnels Needs to be Reviewed for Each Area System**
  - **Costs for Surface Buildings is Only a Placeholder at this Time**
  - **Complexity of the BDS**
  - **Scope is Still the Biggest Cost Driver for the Civil Engineering**

Primary Areas of Interest Continued

- 1.7.2 Electrical (10%)
  - **More Than 340 MW of Connected Power Required**
  - **Electrical Power Required Directly Influences Required Mechanical Capacity (~300 MW)**
  - **Initial CFS Placeholder Criteria for BDS Magnet Requirements were Very Low Compared to Recently Received Criteria. Further Data from Other Area Systems is Likely to have a Similar Impact**

Primary Areas of Interest Continued

- 1.7.5 Process Cooling (15%)
  - **Electrical Power Required Directly Influences Required Mechanical Capacity (~300 MW)**
  - **∆T (11ºC or 20ºF) for Process Water Can be Reviewed for Opportunities to Decrease Piping Size and Pump Capacity**
  - **Several Placeholders are Still in Place for the Cooling Requirements at the e- and e+ Sources**
  - **There May Well be Other Water Cooled Components with Unidentified Criteria that will Need to be Added to the Overall Process Cooling Loads**
  - **A Separate Chilled Water Cooling System is Currently Provided for Electronic Control Racks which Could be Replaced by an All Air System**

CFS Proposal for Cost Comparison Studies

- The CFS Group will Provide a System to Document Cost Comparison Study Requests
- We will Continue to Utilize the Area and Technical System POC's to Verify Requests and Exchange Information
- Requests will be Numbered and Initially Completed in Order of Receipt, Although Prioritization will be Needed in Some Cases
- While Posting on the Web Would be Preferred by the CFS Group, Sensitive Cost Data May Preclude this Option
- Cost Study Requests May Affect Multiple Area or Technical Systems (and Perhaps the CCB) and as such, Coordination Between all Affected Groups will be Essential to Provide a Correct and Complete Response

Summary

- CFS Would Like to Thank **ALL** Parts of the ILC Collaboration that have Worked with the CFS Group to Provide Us with the Information that we have Accumulated To Date
- CFS Will Continue the On-Going Effort to Refine Criteria at all Levels and in all Area and Technical Systems Using the Established Points of Contact
- We Propose to Provide Updated CFS Cost Data to the DCB on a Monthly Basis
- We Will Continue to Provide Cost Data to the Area and Technical Systems Following the Direction of the DCB
- CFS will Work as Needed to Develop an Understanding of the Content and Contribution Needed for the RDR Document