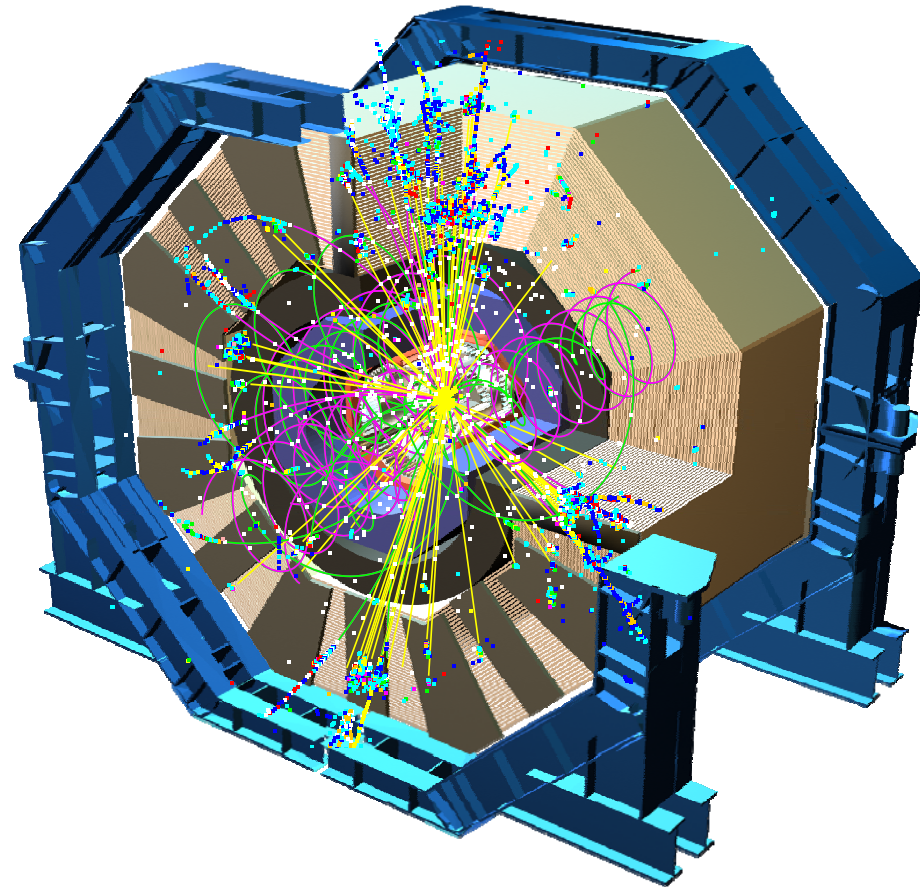




SiD Cost Status



Intentions And Reality

- Generate a "collaboration consensus" on the cost of the SiD baseline as a "Point Design"
 - Start from WBS structure and Parametric Detector Study
 - Form new estimate from subsystem work entirely in WBS file to form "the document" for the Point Design.

Preliminary input from VXD, Tracker, and HCal

- Interact (in advance of Valencia) to understand these costs and cost issues.

Minimal - more later

- At Valencia, generate "Average Detector Cost"

We shall see...

Accounting Methodology (Roughly)

- Generate estimates for M&S
 - In local currency and defined era.
 - In a WBS structure
 - With a WBS Dictionary
 - With (some) Basis of Estimate (BOE)
- Generate estimates for Labor
 - Account by hours and type (e.g. 300 MY or Mechanical Engineering)
- Add adjustments for confidence (perhaps different than contingency, but I don't understand the difference)
- This is (I think) the ITER Style Value
- Then:
 - Provide labor table to convert time to (e.g.) \$
 - Provide scheme for estimating indirects
 - Provide scheme for estimating escalation
- This is (I think) the DOE Value (and rapidly becoming more popular with other funding agencies).

M&S, Labor Base , MB numbers (2005 M\$)

WBS	Decription	M&S	M&S Cont	Labor	Labor Cont	Total
1.1.1	VXD	4.3	2.8	2.0	0.7	9.8
1.1.2	Tracker	11.5	4.2	8.0	3.2	26.9
1.1.3.1	EMCal	50.2	18.2	19.9	7.4	95.7
1.1.3.2	Hcal	11.5	6.3	14.9	5.7	38.4
1.1.3.3	BeamCal	1.6	0.5	0.0	0.0	2.1
1.1.4	Muon Sys	16.3	5.9	3.5	1.3	27.0
1.1.5	Electronics	3.9	1.3	12.0	3.7	20.9
1.1.6	Magnet	114.2	39.1	5.6	1.9	160.9
1.1.7	Installation	2.6	0.5	4.7	1.7	9.6
1.1.8	Management	0.9	0.2	6.8	1.5	9.4
Totals		217	79	77	27	401

Subsystem Feedback

WBS	Description	M&S	M&S Cont	Labor	Labor Cont	Total
1.1.1	VXD	4.6	3.2	2.2	0.8	10.8
1.1.2	Tracker	9.6	4.7	6.6	2.3	23.2
1.1.3.1	EMCal					
1.1.3.2	Hcal					
1.1.3.3	BeamCal					
1.1.4	Muon Sys					
1.1.5	Electronics					
1.1.6	Magnet					
1.1.7	Installation					
1.1.8	Management					
Totals						

Comparison, M\$ and Fractional Difference

WBS	Description	Δ	$\Delta/\text{average}$	
1.1.1	VXD	-1.0	-10%	Cooper et al
1.1.2	Tracker	3.7	15%	Cooper et al
1.1.3.1	EMCal			
1.1.3.2	Hcal			
1.1.3.3	BeamCal			
1.1.4	Muon Sys			
1.1.5	Electronics			
1.1.6	Magnet			
1.1.7	Installation			
1.1.8	Management			
Totals				

Indirects

	M&S	Labor	Totals
Base	\$217	\$77	\$295
Contingency	\$79	\$27	\$106
Total	\$296	\$105	\$401
Indirect rates	0.06	0.20	
Indirects	\$18	\$21	\$39
Totals w indirects	\$314	\$126	\$439

Indirects are unlikely to be avoided, but rational large project indirect rates can probably be negotiated.

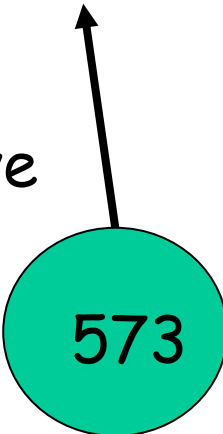
Escalation

Total in FYXXXX M\$	2005	439.4
Start Year	2011	
Construction Duration	6 years	
Inflation	1.03 per year.	
Factor	1.305	
Total Escalation		133.9
Total, TYM\$		573.3

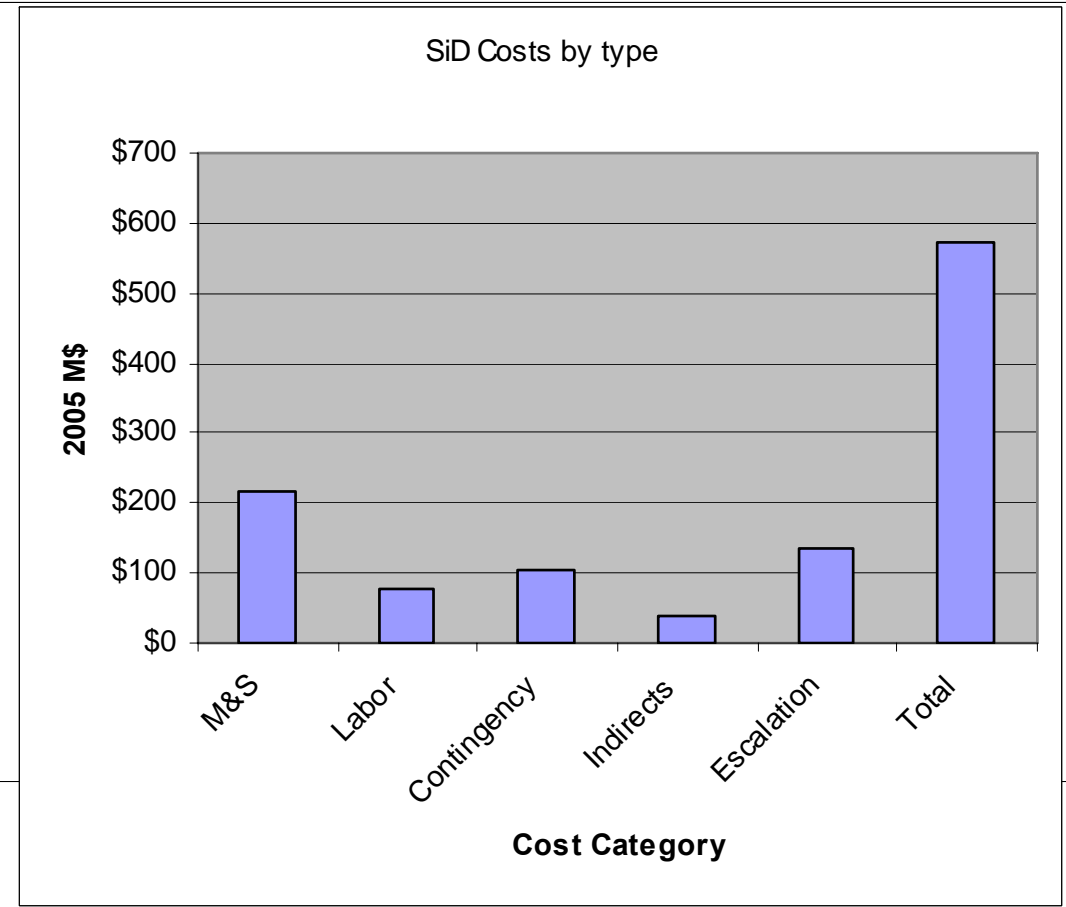
Start date is optimistic. Different regions have different rates - (perhaps)

But the Bottom Line is getting Big

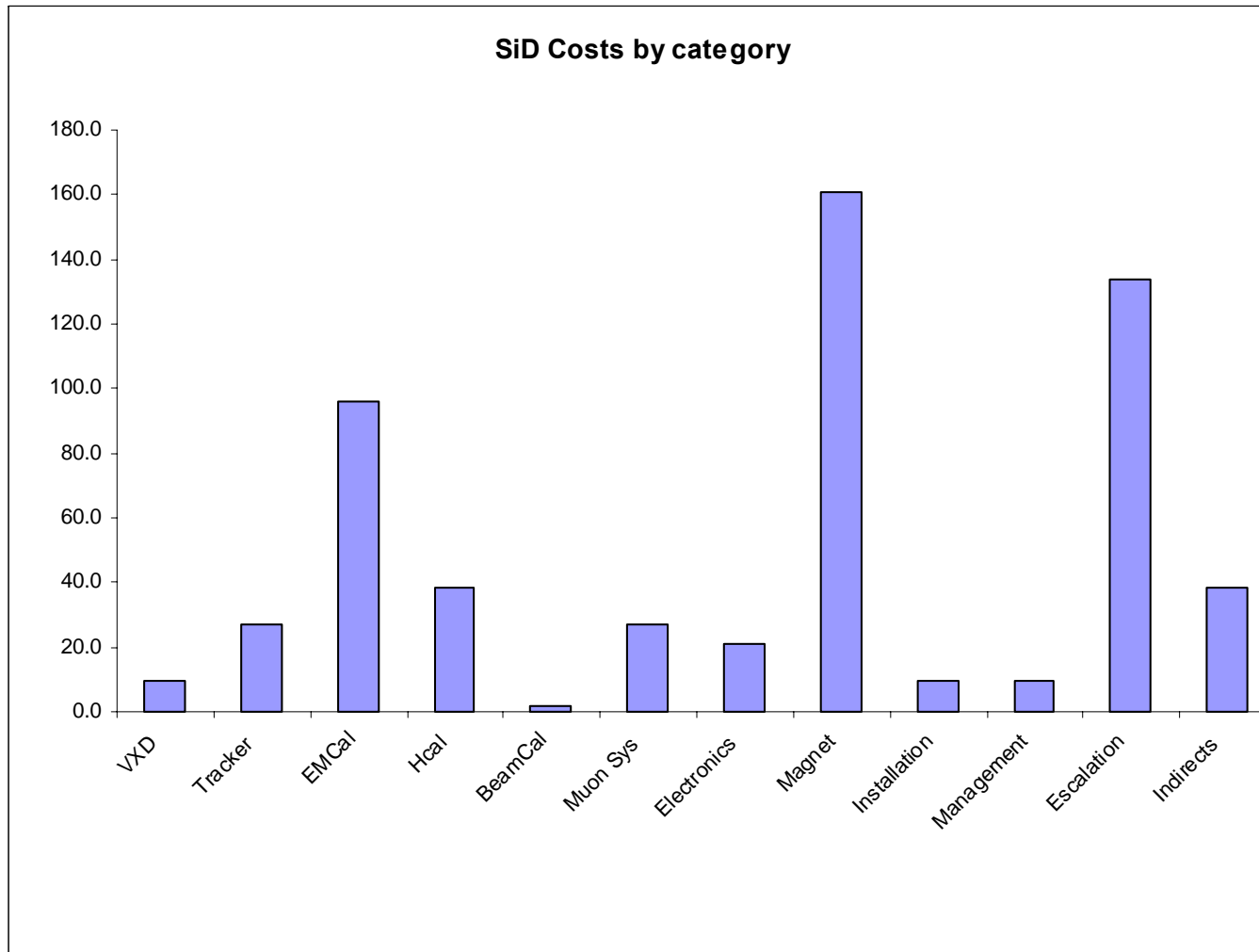
573



Costs by Type



By subsystem



Progress with Other Concepts

- Seems to be agreement on Treaty Points:
 - Assume that Final Focus quadrupoles, BPM's, etc are provided by ILC, but the inboard beamline is a detector responsibility.
 - Assume that detectors will not cost energy spectrometers or polarimeters.
 - Assume that R&D and TDR stages will produce "serious" prototypes of tooling and detectors. However, full scale tooling should be costed in the estimate.
 - Do not cost IR bridge cranes, but cost all portable Hoisting and Rigging equipment including fork lifts and man lifts (including rented crane for lowering detector parts down shaft).
 - Cost all local equipment, such as welding machines, small machine shop, etc.
 - Assume required AC power and LCW are available at the IR wall. Assume only "nominal" HVAC and lighting.
 - Include detector integration and assembly.
 - Include all staff for safety and QA.
 - Include online computing and data storage and networking.
 - Include offline computing (not including physicist desktop systems).

Other Progress

- Seem to agree that R&D through end of TDR is *not* costed.
- Unit Cost Agreements:
 - Tungsten (Kilogram) May need separate costs by thickness
Disagree ~factor 10
 - Si Detector (cm^2) May need separate costs by type
Disagree ~factor 2. SiD agreement disintegrating too!
 - Solenoid (megajoule) Is this a reasonable way to parameterize?
Making progress understanding CMS costs. Perhaps ok to 20-30%
 - Multilayer PCB (m^2) PCB for detector planes, not electronics
No progress - important for SiD HCal!
 - Machined Iron (Kg) Iron for the magnet, fabricated & assembled
Disagreement ~ factor 2

Comments

- SiD Costs now above \$500M (DOE Accounting)
 - No conclusions yet from detailed subsystem input.
 - Little agreement on unit costs, except progress on superconducting solenoid.
-
- Do we need to start thinking about trimming back SiD Costs??