

“Cost Containment” for the TDR

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RDR Design & “Value” Costs

The reference design was “frozen” as of 1-Dec-06 for the purpose of producing the RDR, including costs.

It is important to recognize this is a snapshot and the design will continue to evolve, due to results of the R&D, accelerator studies and value engineering

The value costs have already been reviewed three time

- 3 day “internal review” in Dec
- ILCSC MAC review in Jan
- International Cost Review (May)

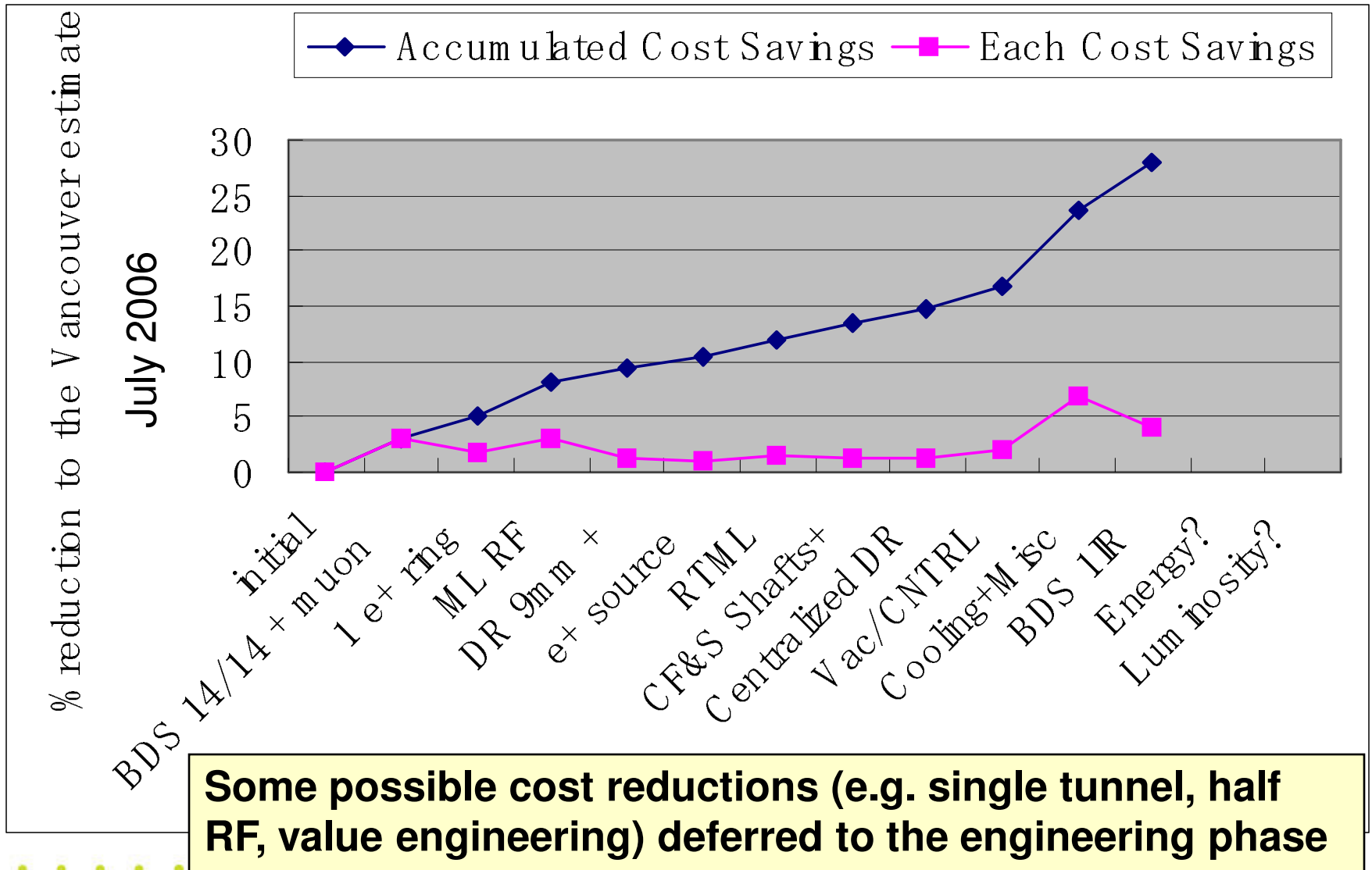
Σ Value = 6.62 B ILC Units

Summary RDR “Value” Costs

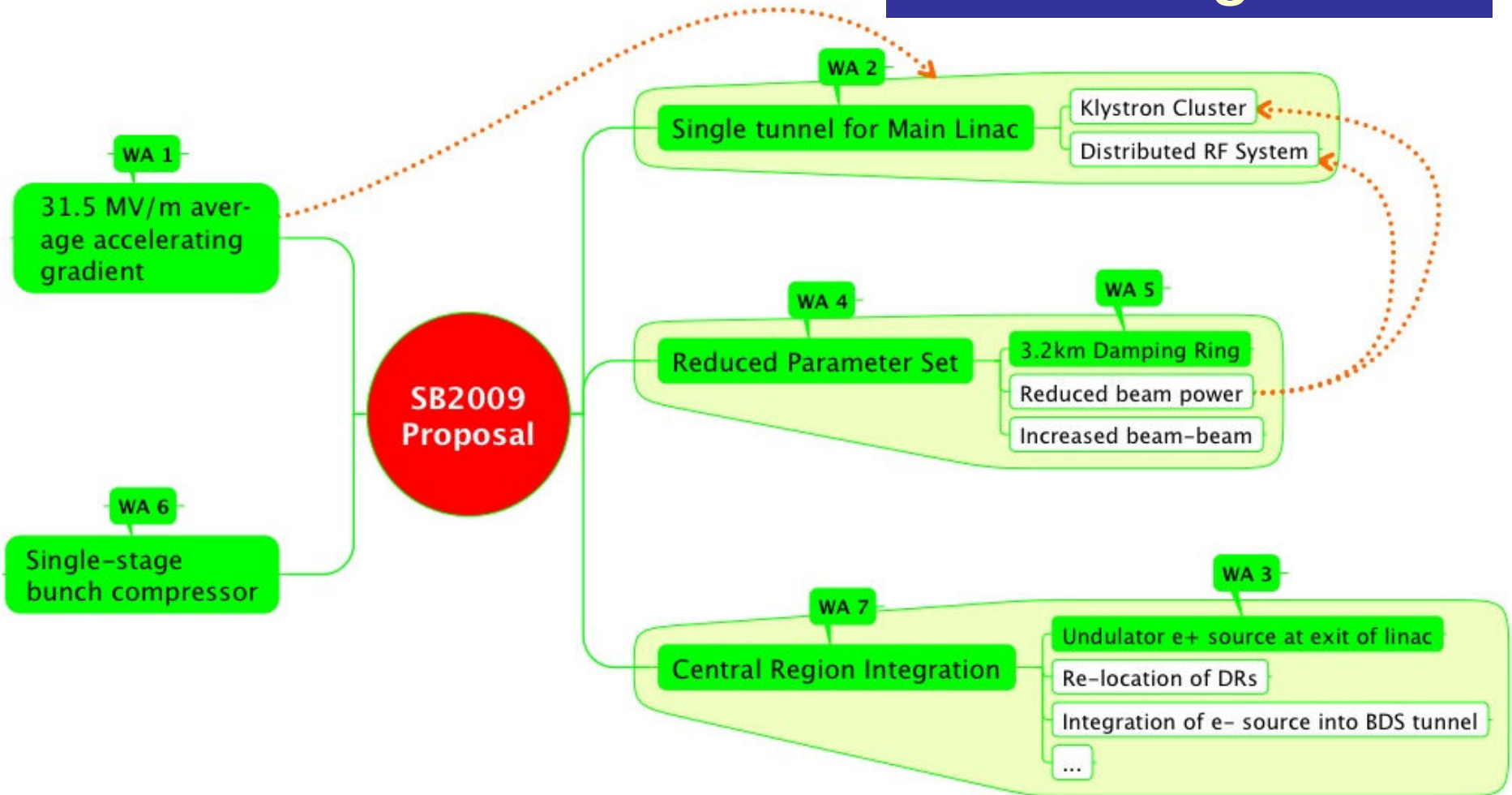
Total Value Cost (FY07)
4.80 B ILC Units Shared
+
1.82 B Units Site Specific
+
14.1 K person-years
 (“explicit” labor = 24.0 M person-
hrs
@ 1,700 hrs/yr)
1 ILC Unit = \$ 1 (2007)



Evolving Design → Cost Reductions



Cost Savings ~ 13%



N Walker

- *“The PAC supports the “Minimum Machine” activities to carefully review the RDR design, although it is not enthusiastic about the use of the term “Minimum Machine”. The Committee believes that this activity should not compromise the existing ILC physics goals, and reiterates its belief that the 1 TeV upgrade option should be maintained.”*



AAP Review - Conclusion (1)

“The SB2009 exercise was carried out to save cost and consolidate the design. The cost savings in SB2009 amount to 12.6% and are composed of several savings at the few per cent level. The AAP recognizes that a cushion of savings at this level will have to be identified to contain the cost of the project which is likely to change because of both a better understanding of the cost composition, of progress in optimization and of external influences such as the variations in cost of raw material and external services until the end of Technical Phase II.”



Recommendations of GDE EC (1)

- After review and subsequent discussion of the AAP SB2009 Review Report, the GDE EC agreed and confirmed:
 - That containment of the capital cost (VALUE) estimate at the RDR level is a primary TD Phase 2 goal. Our design activity is now aimed at making the project more robust against possible (expected) unit cost increases.
 - To move forward with studies aimed at the possible adoption of the themes in SB2009 proposal, but not necessarily the exact details.
 - To establish a formal process to make these changes to the baseline in an open and transparent fashion, and where necessary after due process and consultation with all stakeholders.

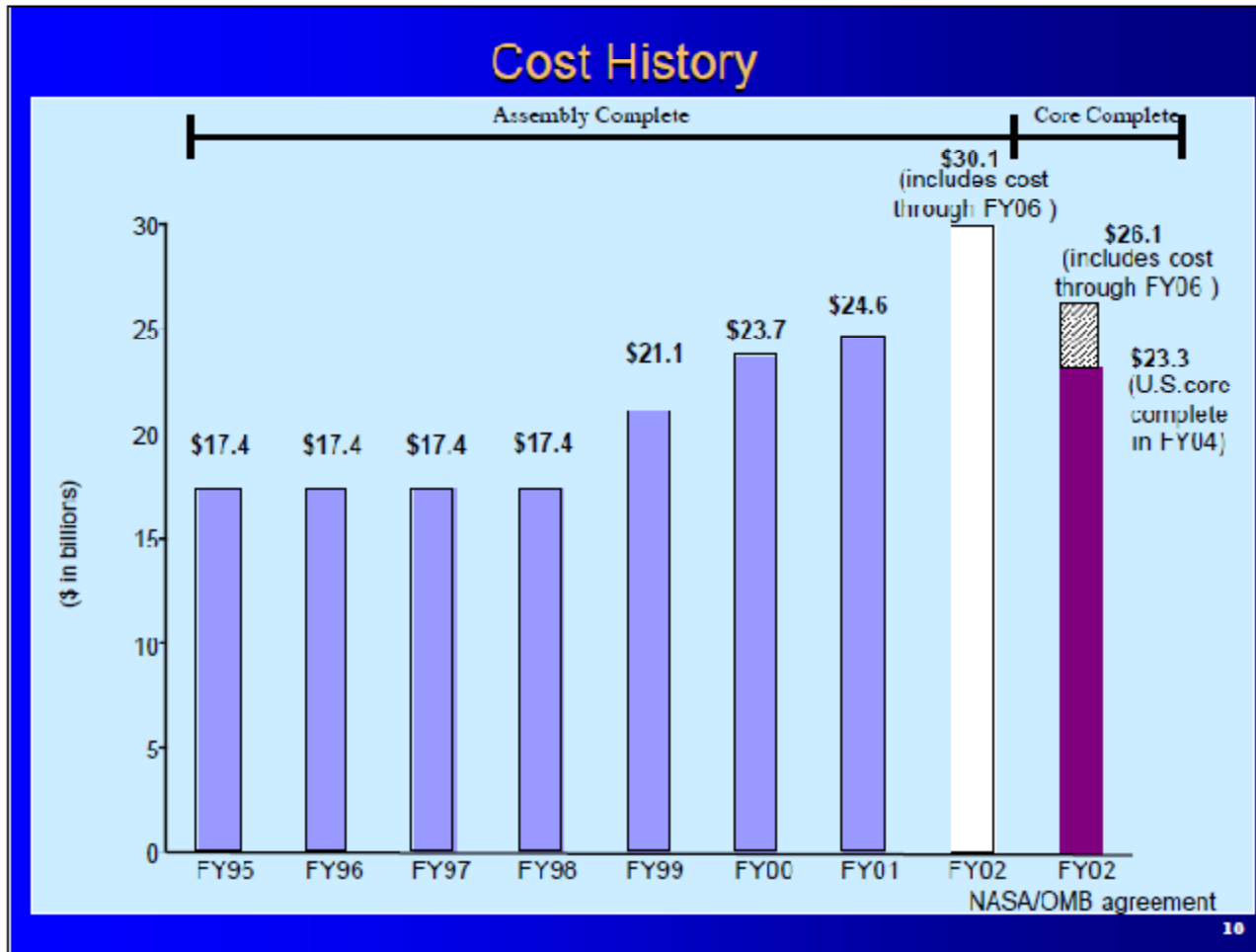


TDR vs RDR Costs

- Why does cost containment matter?
 - **Cost of large international science projects have a very bad history and governments are more and more cautious as a result.**
- Will a ~ 15% cost savings make a difference for project approval?
 - **We are on record for a cost of 6.6 BILCU for the ILC. That cost has frightened governments!**
 - **15% corresponds to \$1B, not a negligible amount**
 - **We will have unavoidable areas of cost growth, probably greater than the anticipated savings.**
- Significant net cost increase for the TDR over RDR will be considered (by some) as a signal of another 'out of control' project.

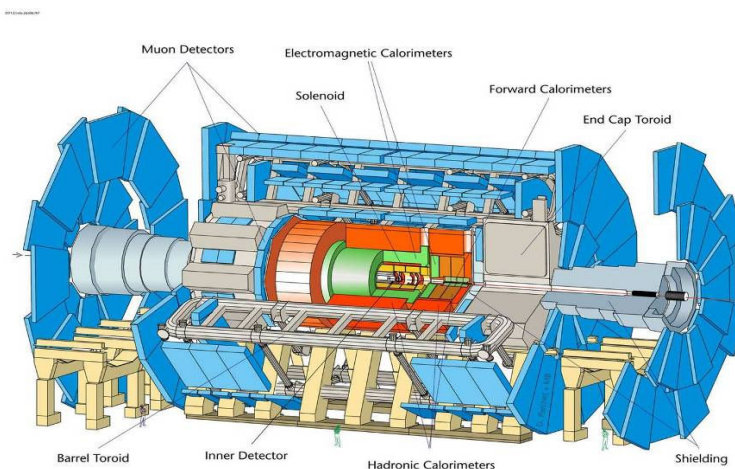
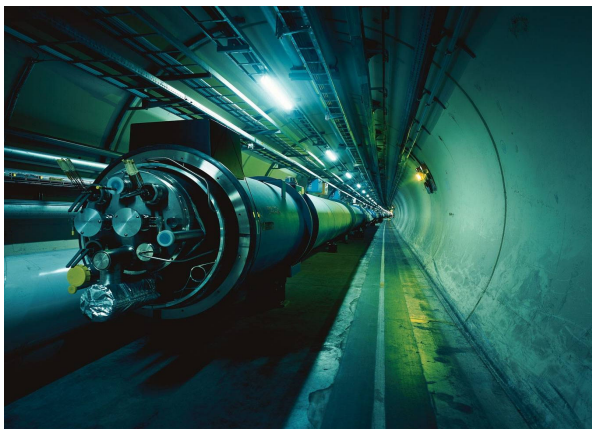


International Space Station



Final and Total Cost Growth Even Greater

- “The construction of LHC was originally approved in 1995 with a budget of 2.6 billion Swiss francs, with another 210 million francs (140 M€) towards the cost of the experiments. *However, cost over-runs, estimated in a major review in 2001 at around 480 million francs (300 M€) in the accelerator, and 50 million francs (30 M€) for the experiments, along with a reduction in CERN's budget pushed the completion date out from 2005 to April 2007.*[12] 180 million francs (120 M€) of the cost increase has been the superconducting magnets.” - (Wikipedia)



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Editorial

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The price isn't right

ITER will cost more to build than previously thought. Now is the time to be honest about how much.

Quoting a price for a major new scientific instrument is notoriously tricky. Researchers have to estimate costs for equipment that has never been built, forecast expenditures years in advance, allow for unknown contingencies, and win approval from sceptical politicians who always want the project to cost less.

So it is not a complete surprise that a recently finished design review of ITER, a major fusion experiment to be built in Cadarache, France, is forecasting a delay of 1–3 years in its completion date and a roughly 25–30% increase in its €5-billion (US\$7.8-billion) construction cost (see [page 829](#)).

The seven international partners in ITER (the United States, the European Union, Russia, China, Japan, India and South Korea) will no doubt be displeased by the news. They reached a final

agreement to go ahead with ITER in 2006 based on a partially incomplete 2001 design, and may well



Cost Containment is essential for ILC

- Our problem is worse than the example projects
 - International Space Station was dominantly a US project that was heavily supported by US industry, so it could absorb large increase without cancellation
 - LHC has a large well-funded host laboratory that could absorb cost increase by stretching schedule and paying for it from future years
 - ITER has more trouble and more jeopardy! A significant (~ 25-30 % increase) is causing enormous problems for the project.
- We need governments to take ILC seriously. That requires 1) science goals that are important enough to convince making the investment, a technical design and project that is considered robust and worthwhile, and finally, costs that are considered affordable and UNDER CONTROL.

- We must continually balance science performance with cost and risk to propose a convincing construction project.
- We must have continuing close GDE / detector / physics studies and interaction to evaluate science impact of proposed changes to ILC baseline.





Technical Design Phase and Beyond

