Report on the TESLA Engineering Study/Review

July 8, 2002

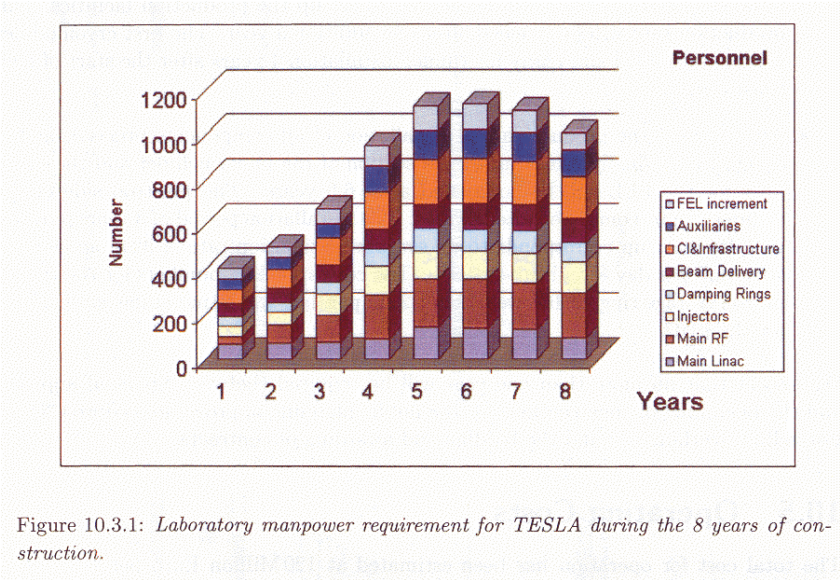

Figure 10.3.1: *Laboratory manpower requirement for TESLA during the 8 years of construction.*

B. Industrial Studies

Much of the technical component part of the TESLA cost estimate has been based on industrial studies commissioned by DESY and/or the collaboration. These studies addressed possible production plans and strategies and provided a bottoms-up look at how production could be carried out and what its estimated cost would be. Major studies were typically of 6 months duration and ~ 100K$ expense.

This cost estimating approach by industrial study is notable as it is not typical of procedures used in the U.S. at this phase of project planning.

The major industrial studies included:

Niobium production	Wah Chang, Albany, OR, USA
	Cabot Corp., Boyertown, PA, USA
Cavity fabrication	Babcock Noell Nuclear GmbH, Wuerzburg, Germany, with Dornier consultant, and 2 additional studies by Accel and Zanon
Cold mass	E. Zanon SpA, Schio, Italy

Cryomodule Assembly	two studies: Accel, Bergisch Gladbach, Germany and Noell-Babcock, with DESY and INFN (Zanon) advisors to both
Input RF Coupler	Thomson-Thales, Velizy, France
Klystron tubes	Thomson-Thales
Modulators	PPT Puls-Plasmatechnik GmbH, Dortmund, Germany – this study also included the pulse transformer (by ABB), the IGCT switch (by ABB), and the HV power supplies for the modulators (by FUG Beerwald who build HVPS for new TTF modulators
Pulsed Modulator cables	Nexans Deutschland, Mönchengladbach, Germany
Other RF components:	
Directional Couplers:	Spinner, Munich, Germany
Drivers:	SSB
Circulators & loads:	Domen SPA Ferrite, St. Petersburg, Russia
400 kW circulators:	AFT

Other Cost Basis studies included:

Cryogenic Plants	estimate by Dr. H. Quack (Dresden) with consultants from Linde AG Unternehmenszentrale, Araham Lincoln Strasse 21, 65189 Wiesbaden, Germany, and L'Air Liquide, Corporate Communications, 75 Quai d'Orsay, 75321 Paris cedex 07, France based on CERN studies & LHC & HERA experience
Civil Construction	based on HERA construction experience in consultation with the firms of Windels, Timm, & Morgen, Ballindamm17, 90095 Hamburg, Germany, and Amberg Ingenieurbüro AG, Trockenloostrsse 21, Postfach 27, CH-8105 Regensdorf-Watt, Switzerland