

LIU Wire Scanner Series Costs

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Basis of costing

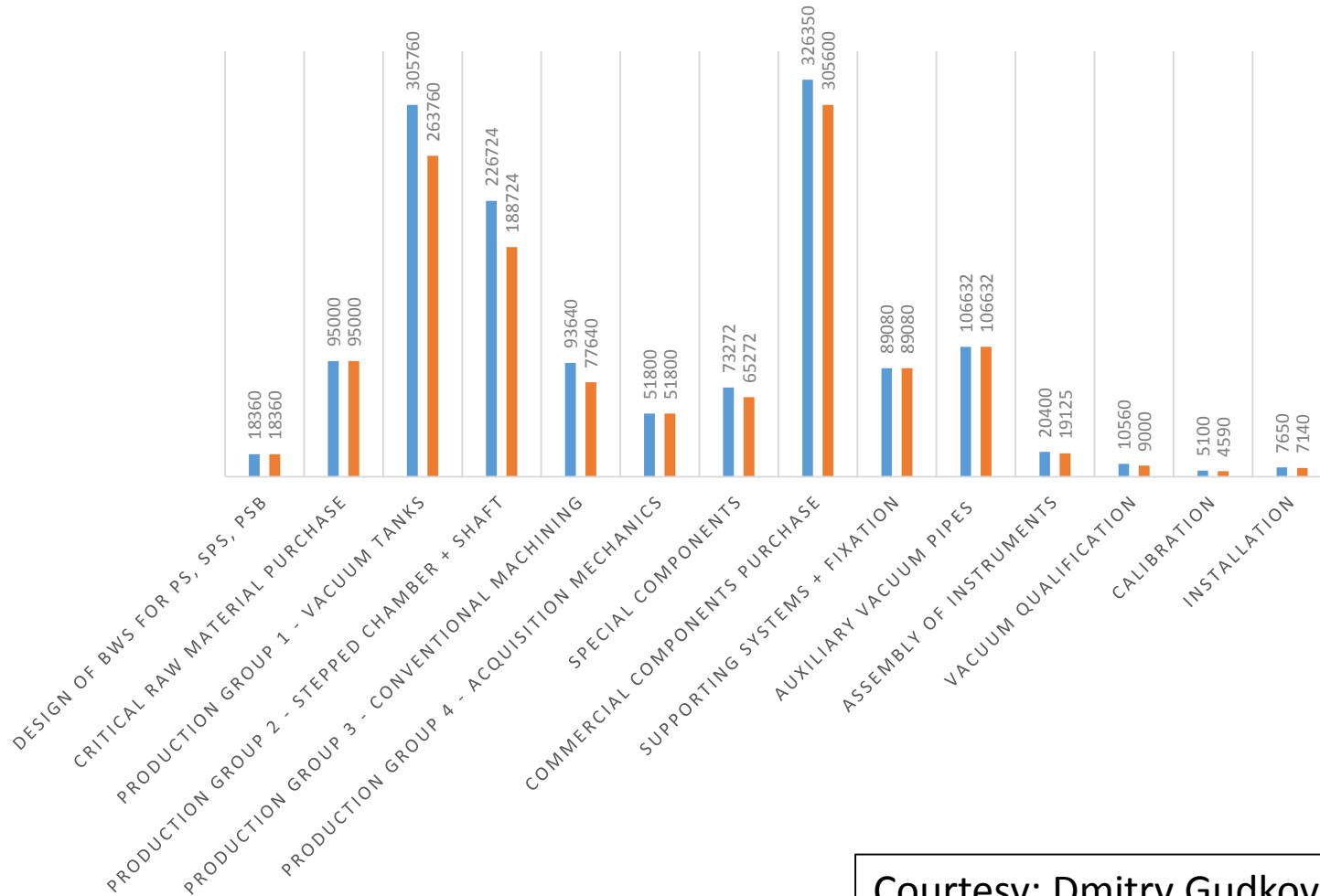
- Assume standard CERN costing, i.e.
 - No overhead for staff or existing infrastructure,
 - No charge for other CERN services such as vacuum qualification and installation
- Include all billed costs
 - Cabling, design office, cleaning and leak detection,
- Costing includes
 - Additional FSU dedicated to the assembly, test, installation of the series
 - Cost for the preparation of a dedicated assembly area (as requested to LIU)
- Costing does not currently include
 - Fellows, students funded by LIU

Electronics, acquisition and control

- Slides from Federico, Jonathan, Jose

BWS series for LIU. Cost estimate

Project Start	Project Finish	Cost (18 tanks+18 instruments, no spares)	Cost (21 tanks + 22 instruments)
Mon 14/11/16	Mon 02/07/18	CHF 1,301,723	CHF 1,430,328



Task	Cost (21 tanks + 22 instruments)	Cost (18 tanks+18 instruments, no spares)
Design of BWS for PS, SPS, PSB	CHF 18,360.00	CHF 18,360.00
Critical raw material purchase	CHF 95,000.00	CHF 95,000.00
Production Group 1 - Vacuum tanks*	CHF 305,760.00	CHF 263,760.00
Production Group 2 - Stepped chamber + shaft**	CHF 226,724.00	CHF 188,724.00
Production Group 3 - Conventional machining	CHF 93,640.00	CHF 77,640.00
Production Group 4 - Acquisition Mechanics	CHF 51,800.00	CHF 51,800.00
Special Components	CHF 73,272.00	CHF 65,272.00
Commercial components purchase	CHF 326,350.00	CHF 305,600.00
Supporting systems + fixation	CHF 89,080.00	CHF 89,080.00
Auxiliary vacuum pipes	CHF 106,632.00	CHF 106,632.00
Assembly of instruments	CHF 20,400.00	CHF 19,125.00
Vacuum qualification	CHF 10,560.00	CHF 9,000.00
Calibration	CHF 5,100.00	CHF 4,590.00
Installation	CHF 7,650.00	CHF 7,140.00

Courtesy: Dmitry Gudkov

*1 x Vacuum tank = 14000 CHF

**1 x Stepped chamber + shaft = 9500 CHF

Other costs

- Dedicated assembly area:
 - Could be in B.283, currently occupied by BL section, but there is room to share
 - Would need significant renovation – perhaps the installation of a closed semi-clean area.
 - First cost estimate at 50-100 kCHF
 - Would need to be operational by end 2017
- Prototype PS scanners
 - Requested by the project for installation in YETS 17-18
 - Mechanical materials ordered, production scheduled for 2 instruments + 2 tanks
 - Estimate cost ~150 kCHF



Total series costs

- ‘Baseline’ series estimate is the sum of the estimates from mechanics and electronics plus assembly area
- Unit costs:
 - ~72 kCHF for the mechanics
 - ~61 kCHF for the electronics (control, acquisition, cabling)
 - ~133 kCHF for an installed, working instrument
- Includes the spares agreed with the project
- Should be a ‘reasonable upper bound’, but excluding any margin for unforeseen technical or other issues

	Baseline estimate (kCHF)
Series electronics	1379
Series mechanics	1430
Assembly area	100
Total series	2909

Existing situation in APT

- Includes
 - Costs of development and design,
 - Prototypes in the SPS, PSB,
- SPS budget situation (*) is not clear
 - Budget code is mixed with the LIU BGI
- Budgeted series production costs are:
 - ~50 kCHF for mechanics (cf. 72 estimate)
 - ~**15** kCHF for electronics (cf. **61** estimate)
- 'Paid' numbers do not include costs for the PS prototypes

	Budget (kCHF)	Paid (kCHF)
PSB (64023)	970	403
PS (64033)	500	49
SPS (64040)*	532	666
Totals	2002	1118

Budget scenarios

'Baseline' scenario

- Baseline cost with all spares and FSU manpower
- Includes costs already paid in APT for BWS (and BGI)

	Budget (kCHF)	Cost (kCHF)
Baseline cost		2909
Design + proto		1118
PS protos		250
Baseline budget	2002	
Totals	2002	4277
Balance		-2275

'Series only' scenario

- Baseline cost with **no spares** (-129 kCHF for mechanics, -158 kCHF for electronics) **or FSU** (-150 kCHF)
- No budget or costs for design and prototyping ('**clean slate**') for the series production

	Budget (kCHF)	Cost (kCHF)
Baseline cost		2472
Design + proto		0
PS protos		250
Baseline budget	1514	
Totals	1514	2722
Balance		-1208

Issues with APT

- The cost of design and development was underestimated
 - 488 kCHF budget in APT, ~1370 expected cost
 - Only 220 kCHF was budgeted for a PSB prototype, whereas they have been installed in all 3 machine
- The series costs estimates are higher than expected, particularly the electronics
 - 44% increase for mechanics, but 400% for electronics