



IBL – Attività e Richieste



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G. Darbo - INFN / Genova

Rev.3



Agenda Page:



Costi

Costo totale 9.6 MCH - suddiviso in:

- *M&O-A: beam-pipe, installazione: 4.0 MCH*
- *M&O-B/Construction CORE: 5.6MCH – di questi sono previsti 4.4MCH (2009 – 2012) nelle tabelle RRB dei M&O-B Pixel.*
- *Una possibilità è coprire i 5.6 MCH con M&O-B “equivalente” (4.4 MC) per i Paesi in cui esistono i Pixel e il rimanente (1.2) con nuovi contributi.*
- *Probabilmente le risorse economiche disponibili in ATLAS sono maggiori del necessario.*

WBS	Name	Cost (kCHF)	MO-A	MO-B/ New Proj	Tax	I	Note
1	Sensors	kCH 642.0	0.0	642.0	0	99	Cost related to chosen technology assumed 3D (higher)
2	Electronics	kCH 2 175.3	0.0	2 175.3	112	523	Chips: FE-I4, VDC(0.13),EOS?(0.13)
3	Hybridisation	kCH 845.8	0.0	845.8	131	131	Assembled module yield 40% (too low?)
4	Local Support (stave)	kCH 487.0	0.0	487.0	92	83	Includes: prototyping, loading, QC, tooling
5	Internal Services	kCH 245.0	0.0	245.0	29	33	Large incertitude, estrapolated form SQP
6	Beam Pipe & Interfaces	kCH 1 990.0	1 570.0	420.0	80	0	Spare beam-pipe notincluded
7	Surface Intergration (Package preparation)	kCH 292.0	0.0	292.0	132	0	Tool, jig and area costs
8	External Services - Routing and installation Procedures	kCH 415.9	293.6	122.3	0	50	Service design and procurement
9	External Cooling and Gas	kCH 361.0	331.0	30.0	30	0	Baseline CO2 (more expensive)
10	Installation in the Pit	kCH 1 495.0	1 495.0	0.0	0	0	Hired manpower included
11	DAQ, DCS and Interlock integration	kCH 682.0	375.7	306.2	200	0	ROS not evaluated yet
12	Irradiation and Test Beam	kCH -	0.0	0.0	0	0	Cost are not in the CORE
		kCH 9 630.9	4 065.3	5 565.6	806	920	
			Assigned	9 630.9			
			To Assign	0.0			
			Total	9 630.9			



Cost Time Profile

		2009	2010	2011	2012	2013	2014	Total
	M&O-A	0.0	180.0	940.0	1 050.8	976.0	918.6	4 065.3
	M&O-B/New	160.6	941.6	1 471.8	1 745.1	1 089.8	156.7	5 565.6
	M&O-B only (~4.4MCH)	200.0	800.0	1 100.0	1 300.0	900.0	100.0	4 400.0
	Total	160.6	1 121.6	2 411.8	2 795.9	2 065.8	1 075.3	9 630.9

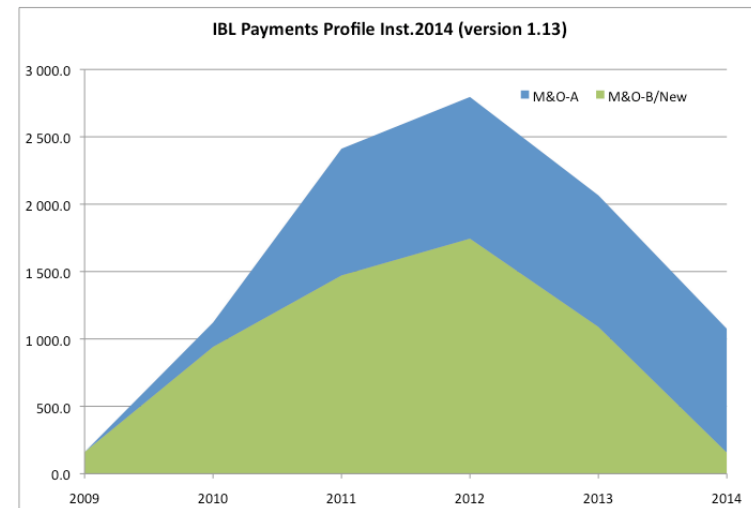
☛ **Total cost (M&O-A – M&O-B/New construction):**
9630 kCH

☛ **Subsistence not included:**

- 2 FTE 2010 & 2011
- 4 FTE 2012, 2013, 2014
- + Same amount of FTE's from Institutes

☛ **SR1/IBL operation:**

- 30k – 2010
- 50k – 2011, 2012, 2013, 2014



WBS	Name	x-check	Cost (kCHF)	MO-A	MO-B/ Constr.	2009	2010	2011	2012	2013	2014
1	Sensors	642.0	kCH 642.0	0.0	642.0	30.0	70.0	204.8	234.8	102.4	0.0
2	Electronics	2 175.3	kCH 2 175.3	0.0	2175.3	25.9	551.1	544.1	640.8	357.9	55.5
3	Hybridisation	845.8	kCH 845.8	0.0	845.8	7.3	31.8	71.3	278.2	457.3	0.0
4	Local Support (stave)	487.0	kCH 487.0	0.0	487.0	48.4	156.0	127.6	155.0	0.0	0.0
5	Internal Services	245.0	kCH 245.0	0.0	245.0	19.0	38.5	107.5	80.0	0.0	0.0
6	Beam Pipe & Interfaces	1 990.0	kCH 1 990.0	1570.0	420.0	0.0	30.0	150.0	180.0	60.0	0.0
7	Surface Intergration (Package preparation)	292.0	kCH 292.0	0.0	292.0	21.0	28.0	97.0	115.0	31.0	0.0
8	External Services - Routing and installation Proc	415.9	kCH 415.9	293.6	122.3	0.0	0.0	122.3	0.0	0.0	0.0
9	External Cooling and Gas	361.0	kCH 361.0	331.0	30.0	9.0	15.0	6.0	0.0	0.0	0.0
10	Installation in the Pit	1 495.0	kCH 1 495.0	1495.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	DAQ, DCS and Interlock integration	682.0	kCH 682.0	375.7	306.2	0.0	21.2	41.2	61.2	81.2	101.2
12	Irradiation and Test Beam	0.0	kCH -	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	rand Total		kCH 9 630.9	4065.3	5565.6	160.6	941.6	1 471.8	1 745.1	1 089.8	156.7
							5 565.6				



Possibile Contributo Italiano

WBS		Name	Assigned	Assigned fraction	Tax	I
1		Sensors	638.0	99%	0%	15%
2		Electronics	2 148.7	99%	5%	24%
3		Hybridisation	911.1	108%	15%	16%
4		Local Support (stave)	487.0	100%	19%	17%
5		Internal Services	245.0	100%	12%	14%
6		Beam Pipe & Interfaces	420.0	100%	19%	0%
7		Surface Intergration (Package preparation)	292.0	100%	45%	0%
8		External Services - Routing and installation Procedures	122.3	100%	0%	41%
9		External Cooling and Gas	30.0	100%	100%	0%
10		Installation in the Pit				
11		DAQ, DCS and Interlock integration	306.2	100%	65%	0%
12		Irradiation and Test Beam				
Assigned - tax					14%	17%
Assigned						1053
						19%

Possibile contributo Italiano:

- Assigned for responsibilities: 930 kCH (17%) + "Tassa": 133 kCH = 1053 kCH (19 %)
- M&O-A: frazione secondo regole ATLAS
- Cost divided in deliverables + common orders (Sensor, FE-I4, bump-bonding) + cash + M&O-A

CORE Pixel		4 343.9		
New proj.		1 221.7		
			Sensor/Bump-bon	
	Cost		Tax	I
Sensor	512.0		0.0	76.8
			0%	15%
FE-I4	1 329.84		0.0	106.4
			0%	8%
Bump-bonding	653.3		130.7	0.0
	2 495.152		20%	0%
PDF+I+US+RZ)	1890.2			
New Project	604.9			



Deliverables INFN: 920kCH

17 %

Quota Tassa: 133 kCH

Totale : 1053 kCH

19 %

WBS	Name	Cost (kCHF)	MO-A	MO-B/ New proj.	Tax	I	Bologna	Genova	Milano	Udine/Trento	Conflict	Covered
1	Sensors	kCH 642.0	0.0	642.0	0.0	99.3						
1.2.1	3D	kCH 60.0		60.0		30%		3		2	3	3
1.2.2	Planar	kCH 40.0		40.0						2	3	3
1.3	Sensor Production & QC											
1.3.1	Sensor Production	kCH 512.0		512.0		15%				2		3
1.3.2	Sensor QC	kCH 30.0		30.0		15%				2		3
	Electronics	kCH 2 175.3	0.0	2 175.3	112.4	523.2						
2.1	FE-I4											
2.1.1	FE-I4 v1 engineering	kCH 504.0		504.0		8%		2				3
2.1.2	FE-I4 v2 engineering	kCH 584.6		584.6		8%		2				3
2.1.3	FE-I4 Production & QC	kCH 241.2		241.2		8%		2				3
2.2.3	EOS card design & prototype	kCH 5.0		5.0				3			2	3
2.2.4	EOS card production & QC	kCH 16.0		16.0				3			2	3
2.5	ROD	kCH 380.8		380.8		100%	3	2			3	3
2.6.2	PP2 power regulation	kCH 36.0		36.0		100%			3			3
3	Hybridisation	kCH 845.8	0.0	845.8	130.7	131.3						
3.1.1	Bump-bonding vendor qualification	kCH 72.5		72.5		50%		2				3
3.1.2	Bump-bonding production	kCH 653.3		653.3	20%			1				3
3.2.1	HDI design and prototype	kCH 20.0		20.0		100%		3				3
3.2.2	HDI production and QC/QA	kCH 50.0		50.0		100%		3				3
3.3.1	Bare module QC procedure							3				3
3.3.2	Bare module production & QC/QA	kCH 50.0		50.0		50%		3				3
4	Local Support (stave)	kCH 487.0	0.0	487.0	92.0	82.6						
4.1.1	Bare Stave Design & Prototype	kCH 242.0		242.0		30%				3		3
4.1.2	Bare Stave Production & QC	kCH 100.0		100.0	60%	10%		2	3			2
5	Internal Services	kCH 245.0	0.0	245.0	28.5	33.3						
5.2	Internal Cooling Pipes	kCH 95.0		95.0	30%	35%			2			
6	Beam Pipe & Interfaces	kCH 1 990.0	1 570.0	420.0	80.0	0.0						
6.3.1	Support of staves, EOS card, internal serv	kCH 300.0		300.0								3
7	Surface Intergration (Package prepa	kCH 292.0	0.0	292.0	132.0	0.0						
8	External Services - Routing and insta	kCH 415.9	293.6	122.3	0.0	50.0						
8.2	Opto-box on ID endplate	kCH 20.0		20.0		100%			2			2
8.3	PP2 Modifications	kCH 30.0		30.0		100%			3			3
8.4	Cables specifications and Procurements											
9	External Cooling and Gas	kCH 361.0	331.0	30.0	30.0	0.0						
9.1	Cooling Plant		0.0									
9.1.1	Cooling design qualification	kCH 30.0		30.0	100%				3		1	
10	Installation in the Pit	kCH 1 495.0	1 495.0	0.0	0.0	0.0						
11	DAQ, DCS and Interlock integration	kCH 682.0	375.7	306.2	200.0	0.0						
11.3	DCS Hardware	kCH 106.2		106.2							2	
12	Irradiation and Test Beam	kCH -	0.0	0.0	0.0	0.0						

Legend	
	Lead Institute
	Other participant Institute
	Interested Institute



Contributions to the Project

- Contributions to the project could come as:
 - *Participating Institute – M&O-B/New-project*
 - Sensor, Hybridisation, Electronics, Stave & TM, Integration, part of mechanics
 - Leading Institute(s) ■, Contributing Institutes ■, Interested Institutes ■
 - Leading must be one or maximum two institutes
 - *Participation through the Upgrade Project Office – M&O-A*
 - Beam-pipe, IBL insertion/beam-pipe extraction, cooling plant, external services, power supply, DAQ ...
 - Central design – possible in-kind contribution to deliverables

IBL Some “Envelopes” to Shape Participation

IBL Total Cost: 9.6 MCH

- *M&O-A: 4.0 MCH*
- *M&O-B (for Countries with “pixel M&O-B” budget line – listed in the table): 4.4 MCH*
 - CZ, F, D-BMBF, D-DESY, I, RZ, US, CERN
- *New project contributions: 1.2 MCH*
 - CH, E, N, UK

IBL M&O-B:

- *There are not a-priory boundaries amongst Countries, but some reference can be considered from the old Pixel CORE to evaluate how countries are consolidated in the “pixel technology” needed for IBL*
- *FA will have in “mind” the old CORE contribution.*

Funding Agency	Pixel CORE Fraction	Total IBL (pro-rata of Pixel CORE)
Czech Republic	1.3%	57.2
France IN2P3	13.7%	602.8
Germany BMBF	28.9%	1271.6
Germany DESY	0.0%	0
Italy	31.8%	1399.2
Taipei	3.2%	140.8
US DOE + NFS	21.0%	924
CERN	0.0%	0
	100%	4396



Matching Responsibilities, Deliverables & Money

- Contribution in funds to the project to match taken responsibilities and deliverables:
 - ~80 % covered from Leading and Participant Institutes (through their FA)
 - ~20 % are “tax” - weighted on the fraction of the total contribution
- There are 3 large common orders (2.5 MCH)
 - *Sensors (0.5 MCH) – Spread in cost for different technologies (0.3 to 1.6 MCH) from planar, 3D and diamond.*
 - Spread the cost to several countries – everybody interested in sensors – readjust in the future
 - *FE-I4 (1.35 MCH) - Bonn and LBNL (Leading) have large contribution, CPPM, Genova and Nikhef contribute. Geneva propose itself as “big” contributor.*
 - *Bump-bonding (0.65 MCH) – IZM starts as favourite from past Pixel experience. Selex might be considered as second option (different technology) to be qualified for the tender.*



Contributo 2009 e 2010

● Possibile contributo Italiano:

- *Deliverables: 0.9 MCH*
- *“Tassa”: 150 kCH*
- *M&O-A: frazione secondo regole ATLAS*

● Contributo totale (non M&O-A)

- *~20 % dell'IBL (~19% di 5.6 MCH)*

● 2009

- *Ci sono 200 k€ di sj – In pratica non possiamo spendere IBL budget nel 2009 – difficile sbloccarlo senza considerarlo un possibile anticipo 2010*

● 2010

- *Si può considerare ~200 k€ - parte nel costo del progetto 70% e parte per “rivitalizzare” laboratori e prototipaggio.*

● Va studiato il dettaglio...