

Organization

CBM-TRD TDR Review Meeting

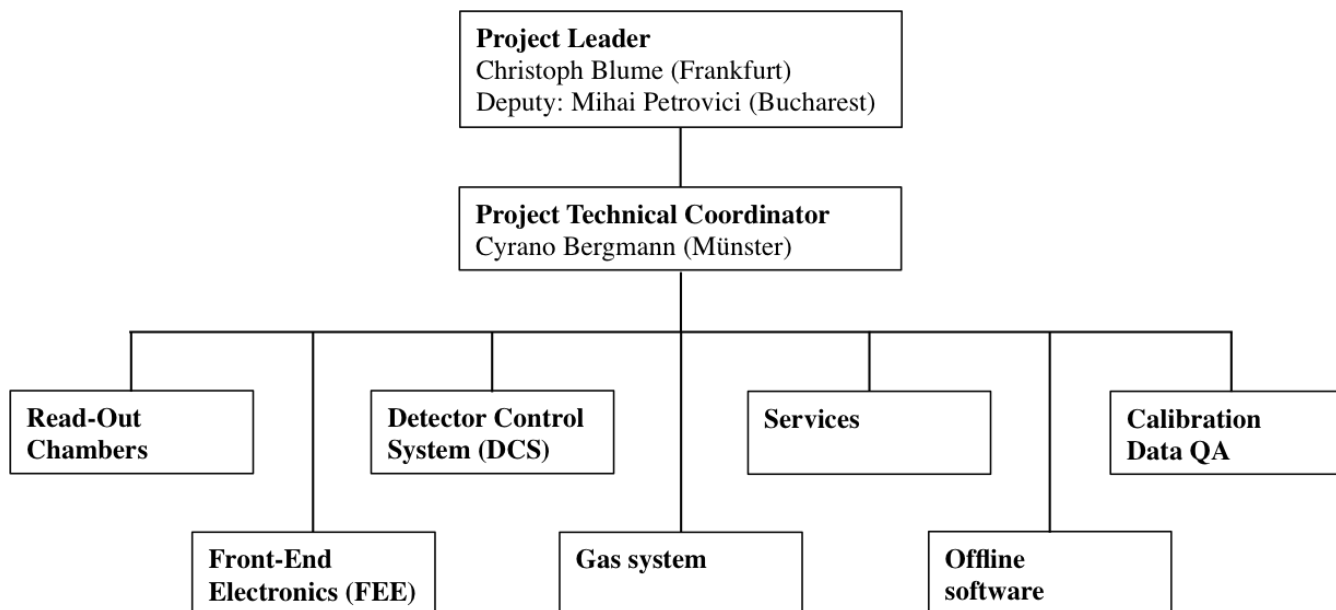
GSI Darmstadt, Germany
March 14+15, 2017



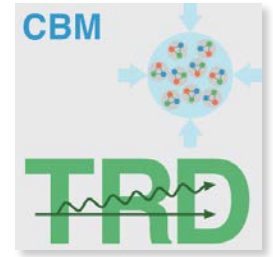
Christoph Blume
University of Frankfurt



Project Organization



Project Organization



Read-Out Chambers

Installation, commissioning and operation (incl. radiators)

Front-End Electronics (FEE)

Integration, commissioning and operation. Online processing

Detector Control System (DCS)

Integration and maintenance of the TRD into CBM-DCS system

Gas system

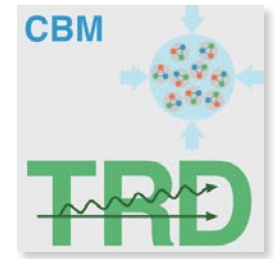
Development, installation and operation

Services

Installation and maintenance of the LV, HV and cooling system

Offline software

Implementation and maintenance of TRD offline software
(simulation, geometry, tracking and PID algorithms)



Participating Institutions

Bucharest, Romania

National Institute of Physics and Nuclear Engineering (IFIN-HH)

Frankfurt, Germany

Institut für Kernphysik (IKF), Goethe-Universität

Institut für Informatik, Infrastruktur und Rechnersysteme in der Informationsverarbeitung (IRI), Goethe-Universität

Heidelberg, Germany

Institut für Technische Informatik (ZITI), Ruprecht-Karls-Universität

Münster, Germany

Institut für Kernphysik (IKP), Westfälische-Wilhelms-Universität

Sharing of Tasks



Item	Institutions
ROCs	Bucharest (IFIN-HH) Frankfurt (IKF) Münster (IKP)
Radiators	Münster (IKP)
ASIC	Heidelberg (ZITI)
FEBs	Frankfurt (IKF)
ROBs	Münster (IKP)
Gas system	Münster (IKP)
Cooling	Münster (IKP)
LV system	Frankfurt (IKF)
HV system	Münster (IKP)
On-detector & environment monitoring	Frankfurt (IKF)
CRI layer (firmware design)	Frankfurt (IRI)
Offline software	Frankfurt (IKF)

Costs: Readout Chamber

Item	Module-type	Cost (Euro)					
		1	2	3	6	7	8
Honeycomb		610	610	610	1,320	1,320	1,320
Pad plane		450	450	450	1,490	1,490	1,490
Gas plugs		50	50	50	50	50	50
Aluminum frame		50	50	50	90	90	90
FR4 ledges		540	540	540	900	900	900
Kapton single sided aluminum sputtered		40	40	40	40	40	40
Carbon lattice		60	60	60	120	120	120
Araldite glue		20	20	20	20	20	20
Anode wire		20	20	20	40	40	40
Cathode wire		30	30	30	80	80	80
Radiator foam foil CellAir 2 mm		50	50	50	70	70	70
Radiator box 10 mm Rohacell HF71		110	110	110	220	220	220
Signal cable 40-pin				20	30	20	20
Signal cable 64-pin			30				
Signal cable 96-pin		90					
Expendables		260	260	260	410	410	410
Total		2,380	2,320	2,310	4,880	4,870	4,870
Sum		730,960					

Costs: Front End Electronics



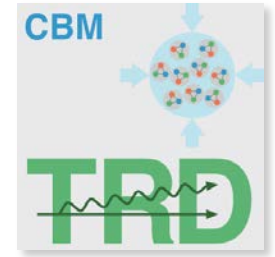
Item	Cost/channel (Euro)	Cost (Euro)
ASICs	3.59	130,384.00
FEBs	0.33	93,880.00
GBTx	0.79	227,440.00
DPB	0.19	156,116.00
Optical fibers	0.36	104,000.00
Total	5.09	711,820.00

Costs: Total TRD Setup



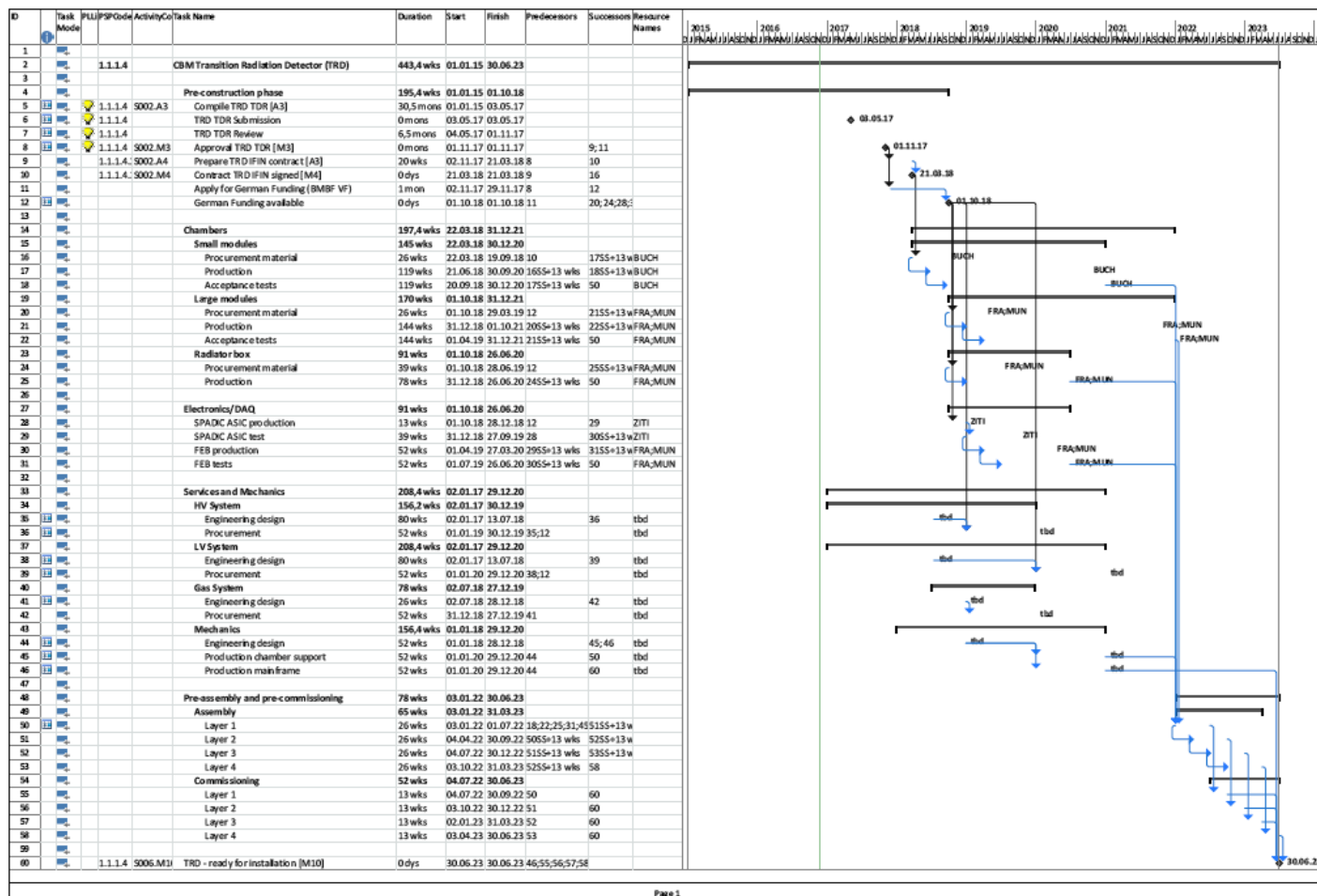
SIS100 version	
Item	Cost (kEuro)
ROC (200 chambers)	731.0
FEE (287,744 channels)	711.8
Xe/CO ₂ (1.4 m ³)	11.0
HV (400 channels)	145.4
LV PS FEB & ROB	359.5
HV cables	3.5
LV cable & bus bars	150.0
DC-DC converter	67.8
Gas system	23.0
Total	2,112.2

Milestones



Milestone	Date
Start of production	31.12.2017
End of small modules production	31.12.2020
End of large modules production	31.12.2021
End of SPADIC production	28.12.2018
End of FEB production	27.03.2020
End of detector pre-assembly	31.03.2023
End of detector commissioning	30.06.2023
Ready for installation	30.06.2023

Project Plan



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BACKUP