



LHC Injectors Upgrade

Status of the BI Work Package in the LIU-PSB frame

J. Tan

Thanks to the contributions of S. Prodon, and the WU holders:

S. Burger, G. J. Focker, E. Effinger, M. Gasior, P. Odier, W. Vigano, C Vuitton,
F. Roncarolo, C. Zamantzas



Outline

- Active work units (- BWS)
- EVM from S. Prodon
- Summary



Active work units: BC 64020

- **Diamond BLMs in 1IL1, OP request**
 - New electronics, BI ready
 - Need 100kCHF : *Approved by LIU ?*

- **Injection line BLMs: L4 baseline**
 - *Locations not yet received from LIU ?*
 - Plan 10256: LBS line
 - Plan 10198: Completion of L4 transfer line installation after sector test
 - Plan 11400: Installation of Beam Loss monitors in LT/LTB/LBE lines

- **Extraction line BLMs: WU 126825, until 12-2019,**
 - On track, cables pulled, installations started. *ECR on the way ?.*
 - Budget: 58kCHF for 2019 for installation patches, supports and cables, OK



Active work units: BC 64021

- **Watchdog BR.TMD in 8L1, Part 2:** WU 91542, **until** 12-2018.
 - HW installed an operational: FBCT + HA + cabling + TRIC (AQN & calibration card) + OASIS
 - WD FESA class : on going, (50 % done), debugging in LAB, (does not depend of the beam for that).
 - Budget: 14kCHF transferred to code 64022 for H0/H- electronics, OK. **Not yet in CET**

- **DCCT electronics upgrade, Part 2:** WU 91543, **until** 12-2019.
 - Upgrade to L4 intensities foreseen for LS2
 - Budget: 30kCHF foreseen for 2019, OK

- **Tune pick-ups:** WU 161665, **until** 12-2019.
 - Installed in YETS, ready to be commissioned
 - Budget:OK, 10kCHF for 2018, 5kCHF 2019 for electronics, OK

- **Stripline PU upstream BI.SMV10:** WU 191503, **until** 12-2019.
 - 3D design and integration ongoing
 - SRR approved. Aim to have preliminary *ECR end of March ?*.
 - Budget: 45kCHF for 2018, 5kCHF 2019, OK

- **Inductive PU upstream PI.SMH42:** WU 191504, **until** 12-2019.
 - Spare ready for vacuum test.
 - Procurements for spare parts starting (Ceramics, Ferrite..)
 - SRR approved. Aim to have preliminary *ECR end of March ?*.
 - Budget: 15kCHF for 2018, 5kCHF 2019, OK





Active work units: BC 64022

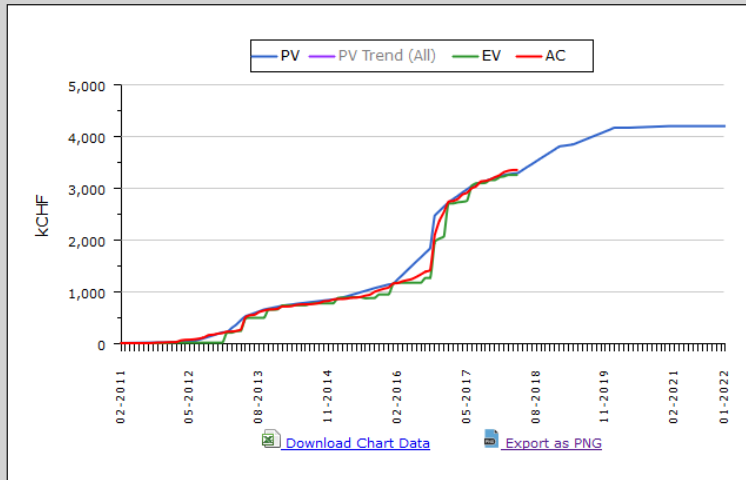
- **H0/H-detectors**, WU 91544, **until** 12-2018
 - Prototype testing ongoing, no major problems so far
 - Will produce 4 operational cards + 4-5 spares
 - Budget: OK with 14kCHF from 64021

- **BTVs at extraction**, BT.BTV10-30, WU 91547, **until** 12-2019
 - Ready
 - Budget: 5kCHF 2019, OK

- **New Tank for BI.BTV30**, Part 2: WU 93002, **until** 12-2019
 - Manufacturing and installation in LS2
 - Budget: 22kCHF foreseen for 2019, OK (*transfer to BTV Cons ?*)

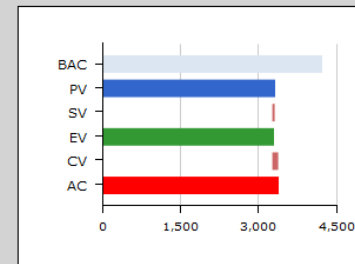
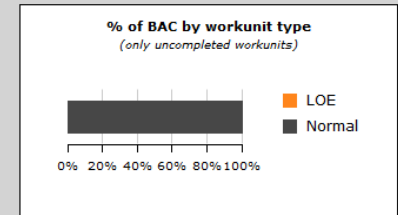
- **TbT profile meas. for injection matching**: WU 96106, **until** 12-2019
 - One tank installed.
 - Commissioning after LS2.
 - Electronics delayed since priority now shifted to PS
 - Production ongoing hope to be ready for tests with *beam in PS in June (ITS1) STATUS ?*
 - Budget: Extra 30kCHF for electronics production 2018 approved by LIU management. *Not yet in CET.*

LIU-PSB EVM Curves CSR 2018



WBS BAC vs Other BAC

Not applicable for the root node of the project.



Uncompleted Workunits/Total Workunits
(workunits only in PL, AC and CO statuses)

14/40

Metrics on the 12-Mar-2018

PV (kCHF)	EV (kCHF)	AC (kCHF)	BAC (kCHF)	PV Trend (All) (kCHF)	SV (kCHF)	SPI (%)	CV (kCHF)	CPI (%)	SV(t) (months)
3,277	3,247	3,343	4,190	3,277	-30	99	-96	97	-2.19

- Schedule variance 2.2 months:
 - Two-months delay:
 - Additional request of stripline BPM upstream BI.SMV10 and inductive BPM upstream PI.SMH42.
 - BWS spending on MME code and not yet on BI code

LIU-PSB EVM Metrics from Project Start to Date

CSR 2018

	From Project Start To Date					Total
	CV	SV	PV	EV	AC	PV
64020 - LIU-PSB BLM Upgrades	771	0	1,097,000	1,097,000	1,096,229	1,155,000
64021 - LIU-PSB PU & BCT Upgrades	-7,786	-17,260	1,112,260	1,095,000	1,102,786	1,230,000
64022 - LIU-PSB Profile Measurement Upgrades	-79,743	-4,572	444,972	440,400	520,143	535,000
64023 - LIU-PSB Wire scanners upgrade	-115	0	468,000	468,000	468,115	468,000
64024 - LIU-PSB mechanical production and installation	626	-9,000	41,000	32,000	31,374	391,000
64025 - LIU-HST Beam Instrumentation	149	0	62,000	62,000	61,851	62,000
64026 - LIU-PSB electronics production and cables	-9,329	0	7,522	7,522	16,851	135,000
64027 - LIU-PSB control electronics	-8,404	0	30,679	30,679	39,083	155,000
64028 - LIU-PSB mechanical commercial components	7,004	0	14,000	14,000	6,996	59,000
Grand Total	-96,827	-30,832	3,277,434	3,246,601	3,343,428	4,190,000

				Charged to Budget Code (CHF)	Annual Commitment (CHF)	Annual Open Commitment (CHF)	Payment Budget (CHF)	Pipeline (CHF)
LIU-PSB	64020	LIU-PSB BLM Upgrades	2017	58,912.84	58,912.84	0.00	60,000.00	0.00
	64021	LIU-PSB PU & BCT Upgrades	2017	191,087.21	196,397.82	5,310.61	195,000.00	0.00
	64022	LIU-PSB Profile Measurement Upgrades	2017	132,845.80	140,587.78	7,741.98	84,000.00	0.00
	64023	LIU-PSB Wire scanners upgrade	2017	101,465.53	106,434.75	4,969.22	102,000.00	0.00
	64024	LIU-PSB mechanical production and installation	2017	23,512.80	69,228.45	45,715.65	32,000.00	0.00
	64025	LIU-HST Beam Instrumentation	2017	0.00	0.00	0.00	0.00	0.00
	64026	LIU-PSB electronics production and cables	2017	16,850.89	16,850.89	0.00	8,000.00	0.00
	64027	LIU-PSB control electronics	2017	37,953.72	40,752.54	2,798.82	31,000.00	0.00
	64028	LIU-PSB mechanical commercial components	2017	6,993.97	18,759.26	11,765.29	5,000.00	0.00
Grand Total:				569,622.76	647,924.33	78,301.57	517,000.00	0.00
				Charged to Budget Code (CHF)	Annual Commitment (CHF)	Annual Open Commitment (CHF)	Payment Budget (CHF)	Pipeline (CHF)
LIU-PSB	64021	LIU-PSB PU & BCT Upgrades	2018	9,821.58	28,254.34	18,432.76	0.00	859.00
	64022	LIU-PSB Profile Measurement Upgrades	2018	21,070.83	24,255.56	3,184.73	0.00	4,277.40
	64023	LIU-PSB Wire scanners upgrade	2018	251.44	5,220.65	4,969.21	0.00	0.00
	64024	LIU-PSB mechanical production and installation	2018	483.70	46,199.35	45,715.65	0.00	356.22
	64026	LIU-PSB electronics production and cables	2018	0.00	0.00	0.00	0.00	5,796.25
	64027	LIU-PSB control electronics	2018	-73.84	5,699.73	5,773.57	0.00	0.00
	64028	LIU-PSB mechanical commercial components	2018	1.66	23,804.21	23,802.55	0.00	3,250.00
Grand Total:				31,555.37	133,433.84	101,878.47	0.00	14,538.87

LIU-PSB Active Workunits CSR 2018

▲ ID	Completion	Status	LOE	Description	WBS	Holder	Start Date	Finish Date	BAC(kCHF)	PV(kCHF)	EV (kCHF)	SV (kCHF)	SV (Months)
91542	<input type="checkbox"/>	●	No	Watchdog BR8.TMD (4 monitors): Part 2	LIU-PSB 6	Patrick Odier (BE-BI)	01-Jan-2013	31-Dec-2018	168	152	148	-4	-2.35
91543	<input type="checkbox"/>	●	No	DCCT: Part 2	LIU-PSB 6	Patrick Odier (BE-BI)	01-Jan-2013	31-Dec-2019	105	75	75	0	0.0
91544	<input type="checkbox"/>	●	No	H0/H- population measurement at injection dump	LIU-PSB 6	Federico Roncarolo (BE-BI)	01-Jan-2014	31-Dec-2018	64	40	38	-2	-4.29
91547	<input type="checkbox"/>	●	No	Screens at extraction BT.MTV10+30	LIU-PSB 6	Stephane Burger (BE-BI)	01-Jan-2013	31-Dec-2019	56	51	51	0	0.0
93002	<input type="checkbox"/>	●	No	New tank for BI.MTV30 due to the replacement of BI.SMV: Part 2	LIU-PSB 6	Stephane Burger (BE-BI)	01-Jan-2014	31-Dec-2019	57	35	35	0	0.0
95106	<input type="checkbox"/>	●	No	turn-by-turn transverse profile measurements at injection : ring 3 for H +V planes	LIU-PSB 6	Federico Roncarolo (BE-BI)	01-Jan-2016	31-Dec-2019	176	137	134	-3	-1.26
126825	<input type="checkbox"/>	●	No	PSB Extraction line BLM system	LIU-PSB 6	Christos Zamantzas (BE-BI)	01-Jan-2015	31-Dec-2019	136	78	78	0	0.0
161665	<input type="checkbox"/>	●	No	New Tune PU for section 3L1	LIU-PSB 6	Marek Gasior (BE-BI)	01-Jan-2016	31-Dec-2019	150	137	135	-2	-2.35
190718	<input type="checkbox"/>	●	No	Mechanics production and installation for PSB operational BWS (8 devices)	LIU-PSB 6	Raymond Veness (BE-BI)	01-Jan-2017	31-Dec-2020	391	41	32	-9	-2.39
190719	<input type="checkbox"/>	●	No	Procure mechanical commercial components for PSB BWS	LIU-PSB 6	Raymond Veness (BE-BI)	01-Jan-2017	31-Dec-2020	59	14	14	0	0.0
190727	<input type="checkbox"/>	●	No	Control electronics for PSB wire-scanners	LIU-PSB 6	Federico Roncarolo (BE-BI)	01-Jan-2017	31-Dec-2020	155	31	31	0	0.0
190728	<input type="checkbox"/>	●	No	Acquisition electronics and cables for PSB wire-scanners	LIU-PSB 6	Federico Roncarolo (BE-BI)	01-Jan-2017	31-Dec-2020	135	8	8	0	0.0
191503	<input type="checkbox"/>	●	No	Stripline PU upstream BI.SMV10	LIU-PSB 6	Michele Bozzolan (BE-BI)	01-Jan-2018	31-Dec-2019	50	9	0	-9	-2.35
191504	<input type="checkbox"/>	●	No	Inductive PU upstream PI.SMH42	LIU-PSB 6	Michele Bozzolan (BE-BI)	01-Jan-2018	31-Dec-2019	20	3	0	-3	-2.35

LIU-PSB Active Deliverables CSR 2018

▲ Workunit ID	Workunit desc.	Deliverable desc.	Completion (%)	BAC (CHF)	PV (CHF)	EV (CHF)	Start date	Finish date	Last progress
91542	Watchdog BR8.TMD (4 monitors): Part 2	OASIS and electronics		20,000	3,890	0	01-Jan-2018	31-Dec-2018	05-Feb-2018
91544	H0/H- population measurement at injection dump	Electronics (2018)		24,000	0	0	01-Apr-2018	31-Dec-2018	19-Jan-2018
96106	turn-by-turn transverse profile measurements at injection : ring 3 for H +V planes	monitors production H+V		40,000	40,000	38,000	01-Jan-2017	24-Feb-2018	19-Jan-2018
96106	turn-by-turn transverse profile measurements at injection : ring 3 for H +V planes	Electronics production (2018)		35,000	1,061	0	01-Mar-2018	31-Mar-2019	19-Jan-2018
161665	New Tune PU for section 3L1	Mechanics and electronics (2018)		10,000	1,945	0	01-Jan-2018	31-Dec-2018	30-Jan-2018
190718	Mechanics production and installation for PSB operational BWS (8 devices)	Production vacuum tanks and chambers 2018		163,000	0	0	01-Apr-2018	31-Dec-2018	22-Jan-2018
190718	Mechanics production and installation for PSB operational BWS (8 devices)	Production and special components 2018		30,000	0	0	01-Apr-2018	31-Dec-2018	22-Jan-2018
190718	Mechanics production and installation for PSB operational BWS (8 devices)	Vacuum pipes, supports and assembly 2018		9,000	0	0	01-Apr-2018	31-Dec-2018	22-Jan-2018
190718	Mechanics production and installation for PSB operational BWS (8 devices)	Scanners operational		0	0	0	01-Jun-2017	31-Dec-2020	22-Jan-2018
190718	Mechanics production and installation for PSB operational BWS (8 devices)	Extension D. Gudkov		27,000	27,000	18,000	01-Sep-2017	28-Feb-2018	22-Jan-2018
190719	Procure mechanical commercial components for PSB BWS	Resolvers, optical and feedthrough (2018)		25,000	0	0	01-Apr-2018	31-Dec-2018	22-Jan-2018
190719	Procure mechanical commercial components for PSB BWS	Procure viewports and fasteners		20,000	0	0	01-Apr-2018	31-Dec-2018	22-Jan-2018
190727	Control electronics for PSB wire-scanners	Design office 2018		20,052	0	0	01-Apr-2018	31-Dec-2018	19-Jan-2018
190727	Control electronics for PSB wire-scanners	VFC production (control) 2018		32,083	0	0	01-Apr-2018	31-Dec-2018	19-Jan-2018
190727	Control electronics for PSB wire-scanners	Int drive, inverter and DC bus (2018)		29,075	0	0	01-Apr-2018	31-Dec-2018	19-Jan-2018
190727	Control electronics for PSB wire-scanners	Procure electronics (2018)		9,023	0	0	01-Apr-2018	31-Dec-2018	19-Jan-2018
190727	Control electronics for PSB wire-scanners	Cabling assembly and test (2018)		7,018	0	0	01-Apr-2018	31-Dec-2018	19-Jan-2018
190728	Acquisition electronics and cables for PSB wire-scanners	VME crates and standard BE/CO modules (2018)		7,522	0	0	01-Apr-2018	31-Dec-2018	27-Sep-2017

LIU-PSB Active Deliverables CSR 2018

▲ ID	Completion	Status	LOE	Description	WBS	Holder	Start Date	Finish Date	BAC(kCHF)	PV(kCHF)	EV (kCHF)	SV (kCHF)	SV (Months)
190728				Acquisition electronics and cables for PSB wire-scanners	VFC production (acquisition) 2018		16,048	0	0	01-Apr-2018	31-Dec-2018	27-Sep-2017	
190728				Acquisition electronics and cables for PSB wire-scanners	ADC mezzanines (2018)		3,611	0	0	01-Apr-2018	31-Dec-2018	27-Sep-2017	
190728				Acquisition electronics and cables for PSB wire-scanners	Produce GEFE (2018)		14,042	0	0	01-Apr-2018	31-Dec-2018	27-Sep-2017	
190728				Acquisition electronics and cables for PSB wire-scanners	Procure HV PS (2018)		5,015	0	0	01-Apr-2018	31-Dec-2018	27-Sep-2017	
190728				Acquisition electronics and cables for PSB wire-scanners	Procure detectors + assembly (2018)		5,015	0	0	01-Apr-2018	31-Dec-2018	27-Sep-2017	
191503				Stripline PU upstream BI.SMV10	drawing office CERN		20,000	3,890	0	01-Jan-2018	31-Dec-2018	09-Jan-2018	
191503				Stripline PU upstream BI.SMV10	Pick-up production		15,000	2,918	0	01-Jan-2018	31-Dec-2018	09-Jan-2018	
191503				Stripline PU upstream BI.SMV10	ADC SIS3302		10,000	1,945	0	01-Jan-2018	31-Dec-2018	09-Jan-2018	
191504				Inductive PU upstream P1.SMH42	Pick-up production		15,000	2,918	0	01-Jan-2018	31-Dec-2018	09-Jan-2018	



Summary

- Feedback from LIU on BLM locations needed
- Budget needed for Diamond electronics
- TbT profile measurements:
 - Extra 30kCHF approved for electronics production 2018
 - Tests in PS foreseen **as from this summer. Status ?**
- 10 other active WU on track