

BE-ICS Activities during the LS2 Period

(15 min)

P. SOLLANDER, Eva Sanchez-Corral, Will Booth, Jonas Arroyo, Timo Hakulinen, ...

Outline

- **BE-ICS activities**
 - Status in PLAN
 - Issues
- **Contributions by ICS**
 - Status in PLAN
 - (No issues)
- **Other activities, not yet in PLAN**

28 BE-ICS activities lacking resources/contributions in PLAN

Res. Gp	Sup. Gp	ID	WBS	P	Title	Support description	Comment
BE-ICS	BE-ICS	10036	SPS-UP (LVL3)	4. Ac	New SPS PPS (Personnel Protection System)	I&C of BIW sirenes in all the sites by GS-ASE-SA	Missing 1 FTE Fire Detection i Missing 0.6 FTE Engineering f No budget allocated for North.
BE-ICS	EN-EL	10036	SPS-UP (LVL3)	4. Ac	New SPS PPS (Personnel Protection System)	Control cabling and FO (not yet installed - during YETS)	Resources currently not availa
BE-ICS	TE-EPC	10036	SPS-UP (LVL3)	4. Ac	New SPS PPS (Personnel Protection System)	Commisioning tests with new PPS	Not Available
BE-ICS	EN-EL	10047	LHC-MAC (LVL1)	4. Ac	Modify LHC PPS (Personnel Protection System)	Estimation of cabling & FO needs	Resources currently not availa
BE-ICS	BE-ICS	10047	LHC-MAC (LVL1)	4. Ac	Modify LHC PPS (Personnel Protection System)	BIW and sirens interface	Suite à la discussion avec Pier
BE-ICS	EN-EL	10047	LHC-MAC (LVL1)	4. Ac	Modify LHC PPS (Personnel Protection System)	Control cabling and FO	Resources currently not availa
BE-ICS	EN-EL	10048	LINAC4 (LVL2)	3. HI	Modify PS PPS (Personnel Protection System) for LN4 connection	PPS EIS control cabling	Resources currently not availa
BE-ICS	IT-CS	10048	LINAC4 (LVL2)	3. HI	Modify PS PPS (Personnel Protection System) for LN4 connection	Computing network for PPS control units	After 3 requests for informatio
BE-ICS	BE-ICS	10174	CMS-UP (LVL3)	4a. A	CMS GCS new Gas system (GEM)	Coordination	Not Available
BE-ICS	BE-ICS	10681	SEC-BEAM-AREAS	1. Sa	Deploy - Beam Imminent Warning & Evacuation system - new line in nTOF EAR2	Coordination	Not Available
BE-ICS	BE-ICS	10726	SEC-BEAM-AREAS	1. Sa	Renovation - Beam Imminent Warning & Evacuation system - SPS North Area - Powering , sirens, BGLA, cables	Coordination	Not Available
BE-ICS	BE-ICS	10747	SURF-AREAS-ACC	1. Sa	Renovation - Fire Detection - SURFACE LHC & AWAKE - SM18,SR1,SR2,SR3,SZ33,SR4,SR5,SR6,SR7,SR8,SM18,BA4	Coordination	Not Available
BE-ICS	BE-ICS	10748	SEC-BEAM-AREAS	1. Sa	Renovation - Fire Detection & Evacuation - SFDIN-00268- N.VEGA Zone 9 (ECN3-BA82-EHN2) - by new CASSIOPE	Coordination	Not Available
BE-ICS	BE-ICS	10749	SEC-BEAM-AREAS	1. Sa	Renovation - Fire Detection & Evacuation - SFDIN-00278 - N.VEGA - Zone 13 (TDC2-TCC2-BA80)- by new CASSIOPE	Coordination	Not Available
BE-ICS	BE-ICS	10774	SPS (LVL2)	1. Sa	Renovation - Beam Imminent Warning & Evacuation - SPS North Area - Evacuation Centrals (include Evacuation Matrixes)	Coordination	Not Available
BE-ICS	HSE-SEE	10774	SPS (LVL2)	1. Sa	Renovation - Beam Imminent Warning & Evacuation - SPS North Area - Evacuation Centrals (include Evacuation Matrixes)	Safety validation	Not Available
BE-ICS	EN-EL	10776	SPS (LVL2)	1. Sa	Install - Automatic Fire Extinguishing - SPS - TA, Shaft & High Radiation Areas	Control & powering cabling + FO	Project not approved
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BE-ICS	BE-ICS	10779	SPS (LVL2)	2. Ac	Preventive Maint. - Hard. Safety Alarm instr. (MMD, CSAM)- SPS- Rempl. of General Zone Alarm cabling - ACHARD (?)	Coordination	Not Available
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BE-ICS	HSE-SEE	10781	ACC-COMP (ROOT)	4a. A	Evolutive Maintenance - Hard. Safety Alarm instr. (MMD, CSAM)- CERN	Safety validation	Not Available
BE-ICS	HSE-SEE	10782	ACC-COMP (ROOT)	2. Ac	Preventive Maint. 2015-LS2- Fire Detection & Evacuation - Laser Smoke Detectors - LHC, SPS, PS, Prev., Mey	Safety validation	Not Available
BE-ICS	HSE-SEE	10783	ACC-COMP (ROOT)	2. Ac	Preventive Maint. - Fire Detection & Evacuation - Linear Smoke Detectors - LHC, SPS, PS, Prev., Mey.	Safety validation	Not Available

Status in PLAN not fully up to date

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OK

LS3

OK

Pending approval (SHIP)

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Planned maintenance work pending resources

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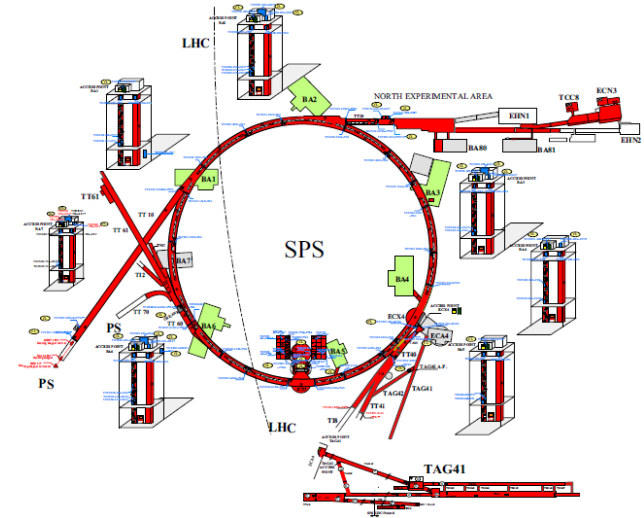
Pending approval (SHIP)

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SPS Personnel Protection System

- Refurbishment of Access Safety and Control system
 - EDMS 1711842 status report 5/8/16 at IEFC
 - 16 access zones of the primary beam areas
 - replace the obsolete components with the main objective being standardization across the CERN accelerator complex, PS, LHC
- Pilot - new access point ECA5 mid 2018
- Full installation during LS2
- Contributions not yet approved
 - cabling by EN-EL, -- Main worry!
 - commissioning test with equipment groups
 - Final validation with DSO



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SPS PPS planning

- 4Q 2016: Specification / Sectorisation ready
- 1Q 2017: Contract start
- 4Q 2017: Test Platform new SPS0 @ bld.104

Test
platform

- 3Q 2018: Pilot Installation – ECA5
 - Verify the installation procedures and team
 - Provide an access point for future access to the ECA5 cavern
 - Keep the interlocked envelope at the current location (door in front of the lift)

Pilot

- 1Q 2019 - 1Q 2020: On-site installation
 - **Driven by cabling campaign schedule**
 - Start with BA4 and BA6, possibly other surface access points during the radiation cool-down at the beginning of the LS2
 - The hottest zones at the end (e.g. BA1)
 - Use the central infrastructure in bld. 104 temporarily, keep current *system for monitoring of the external envelope*
- 2Q 2020: Installation of central infrastructure in the CCC/CCR
- 3Q 2020: Tests, tests, tests...
- 4Q 2020: DSO Test – attention all EIS-beam/machine must be ready

Site



PS Personnel Protection System

- Ongoing work (Yearly ECRs plus maintenance work)
 - EYETS, YETS, ...
 - Workplan: <http://ps-proj-access-public.web.cern.ch/ps-proj-access-public/>
 - MEDICIS PPS installation and commissioning June 2017
- LS2: Modify PS access control for Linac4 connection to PSB
 - Modification on Linac2, Switchyard and PSB implied
- Contributions not yet validated
 - Cabling by EN-EL
 - Network by IT-CS

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BE-ICS	IT-CS	10048	LINAC4 (LVL2)	3. HL-LHC	Modify PS PPS (Personnel Protection System) fo	Computing network for PPS control units	After 3 requests for information, the

East Area renovation

- Personnel Protection System (access control)
 - ECR studies to be launched with RP and EN – Risk Analysis and specification of safety functions
 - Add new sectors and **review of EIS** in primary zone (Important Safety Elements)
 - Access sectors according to radiation exposure
 - **Interlock required for new ventilation system?**
 - Improve access paths, e.g. avoid passing through IRRAD to reach secondary zone
 - Rationalise with other PS areas, improve maintainability
 - Secondary area PPS will be affected by dump replacement
 - Limited changes as the PPS interface is clearly defined. The one of the primary area are located in the PS and will be also replaced.
 - Cost estimates being prepared
- Alarm Systems (fire/gas detection, evacuation)
 - Pending meeting with EA team to have details on the renovation project and launch ECR studies
 - Shielding placement will have an impact on fire detection layout
- WIC (activity 10812): Resources available,
 - *but cannot update PLAN*
- New project – can be done, but budget necessary

SPS Fire Safety project

Improve Safety in the SPS in case of fire: compartments, detection, protection and fire-fighting

- **WP1- Fire compartments:**
 - A system consisting of normally open fire compartments distributed around the SPS ring, its main transfer lines TT10 and TT20, its vertical access shafts and liaison galleries. This includes the installation of fire doors and fire dampers, and the consolidation of existing infrastructure.
- **WP2- Upgraded automatic fire detection and fire protection system:**
 - An upgraded automatic fire detection and fire protection system to pilot the closure of fire compartments and to launch the evacuation alarms in predetermined zones based upon the location of smoke detection. Also to isolate the ventilation system accordingly. Note that the fire protection system includes both emergency evacuation and compartmentalisation functions.
- **WP3- Equipment to improve manual fire-fighting:**
 - Complementary equipment to improve manual fire-fighting in the form of a dry riser (aka: “colonne sèche”, standpipe) to cover the entirety of the SPS main ring tunnel, and improved firefighting trolleys for each BA, equipped with portable CAFS (compressed air foam system) extinguisher.
- **WP4- Automatic fixed firefighting system (sprinkler):**
 - A new automatic fixed firefighting system (sprinkler) in the vertical shafts, TA access gallery and intersection with LSS sections, including high radiation areas in BA1 and BA2.

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BE-ICS	EN-EL	10776	SPS (LVL2)	1. Safety	Install - Automatic Fire Extinguishing - SPS - TA, S	Control & powering cabling	Project not approved

15 contributions by BE-ICS declined in PLAN (all for EN-CV controls)

Res. Gp	Sup. Gp	ID	WBS	P	Title	Support description	Comment
EN-CV	BE-ICS	10448	SM18 (LVL2)	3. HL-LHC	Install new cooling towers for the upgrade of the cooling systems of point 18 - S	Support during testing	need more precise dates i
EN-CV	BE-ICS	10516	CMS (LVL2)	4a. Appro	Upgrade of the cooling power at the chilled water station by 1.5 MW	coding of control software	need more precise dates i
EN-CV	BE-ICS	10516	CMS (LVL2)	4a. Appro	Upgrade of the cooling power at the chilled water station by 1.5 MW	support during test and commissioning phase	need more precise dates i
EN-CV	BE-ICS	10528	LHCb (LVL2)	2. Activit	Install the new cooling station for FE electronics - LHCb	coding of control software	need more precise dates i
EN-CV	BE-ICS	10528	LHCb (LVL2)	2. Activit	Install the new cooling station for FE electronics - LHCb	support during test and commissioning	need more precise dates i
EN-CV	BE-ICS	10546	LHC-MAC-OP (LV	2. Activit	Consolidate the SEQ cooling plants in LHC	coding of software control	need more precise dates i
EN-CV	BE-ICS	10546	LHC-MAC-OP (LV	2. Activit	Consolidate the SEQ cooling plants in LHC	support during test and commissioning phase	need more precise dates i
EN-CV	BE-ICS	10644	LINAC2 (LVL2)	4a. Appro	Consolidate the Linac 2 ventilation control and regulation system	control programming	need more precise dates i
EN-CV	BE-ICS	10644	LINAC2 (LVL2)	4a. Appro	Consolidate the Linac 2 ventilation control and regulation system	support to the test and commissioning work	need more precise dates i
BE-RF	BE-ICS	10835	SPU-PRJ (LVL3)	3. HL-LHC	LIU-SPS RF power upgrade BAF3	coding of the control software	need more precise dates i
BE-RF	BE-ICS	10835	SPU-PRJ (LVL3)	3. HL-LHC	LIU-SPS RF power upgrade BAF3	Support during testing of CV installations	need more precise dates i
EN-CV	BE-ICS	10964	SPS-UP (LVL3)	3. HL-LHC	Cooling plant for BAF3 and RF equipment	Coding of control software	need more precise dates i
EN-CV	BE-ICS	10964	SPS-UP (LVL3)	3. HL-LHC	Cooling plant for BAF3 and RF equipment	support during test and commissioning	need more precise dates i
EN-CV	BE-ICS	10964	SPS-UP (LVL3)	3. HL-LHC	Cooling plant for BAF3 and RF equipment	Coding of control software	need more precise dates i
EN-CV	BE-ICS	10964	SPS-UP (LVL3)	3. HL-LHC	Cooling plant for BAF3 and RF equipment	support during test and commissioning	need more precise dates i

Status in PLAN not fully up to date

Res. Gp	Sup. Gp	ID	WBS	P	Title	Support description	Comment
EN-CV	BE-ICS	10448	SM18 (LVL2)	3. HL-LH	Install new cooling towers for the upgrade of the cooling systems of point	Support during testing	need more precise dates i
EN-CV	BE-ICS	10516	CMS (LVL2)	4a. Appr	Upgrade of the cooling power at the chilled water station by 1.5 MW	coding of control software	need more precise dates i
EN-CV	BE-ICS	10516	CMS (LVL2)	4a. Appr	Upgrade of the cooling power at the chilled water station by 1.5 MW	support during test and commissioning ph	need more precise dates i
EN-CV	BE-ICS	10528	LHCB (LVL2)	2. Activit	Install the new cooling station for FE electronics - LHCB	coding of control software	need more precise dates i
EN-CV	BE-ICS	10528	LHCB (LVL2)	2. Activit	Install the new cooling station for FE electronics - LHCB	support during test and commissioning	need more precise dates i
EN-CV	BE-ICS	10546	LHC-MAC-OP (L	2. Activit	Consolidate the SEQ cooling plants in LHC	coding of software control	need more precise dates i
EN-CV	BE-ICS	10546	LHC-MAC-OP (L	2. Activit	Consolidate the SEQ cooling plants in LHC	support during test and commissioning ph	need more precise dates i
EN-CV	BE-ICS	10644	LINAC2 (LVL2)	4a. Appr	Consolidate the Linac 2 ventilation control and regulation system	control programming	need more precise dates i
EN-CV	BE-ICS	10644	LINAC2 (LVL2)	4a. Appr	Consolidate the Linac 2 ventilation control and regulation system	support to the test and commissioning wo	need more precise dates i
BE-RF	BE-ICS	10835	SPU-PRJ (LVL3)	3. HL-LH	LIU-SPS RF power upgrade BAF3	coding of the control software	need more precise dates i
BE-RF	BE-ICS	10835	SPU-PRJ (LVL3)	3. HL-LH	LIU-SPS RF power upgrade BAF3	Support during testing of CV installations	need more precise dates i
EN-CV	BE-ICS	10964	SPS-UP (LVL3)	3. HL-LH	Cooling plant for BAF3 and RF equipment	Coding of control software	need more precise dates i
EN-CV	BE-ICS	10964	SPS-UP (LVL3)	3. HL-LH	Cooling plant for BAF3 and RF equipment	support during test and commissioning	need more precise dates i
EN-CV	BE-ICS	10964	SPS-UP (LVL3)	3. HL-LH	Cooling plant for BAF3 and RF equipment	Coding of control software	need more precise dates i
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Res. Gp	Sup. Gp	ID	WBS	P	Title	Support description	Comment	
EN-CV	BE-ICS	10448	SM18 (LVL2)	3. HL-LH	Install new cooling towers for the upgrade of the cooling systems of point	Support during testing	need more precise dates i	
EN-CV	BE-ICS	10516	CMS (LVL2)	4a. Appr	Upgrade of the cooling power at the chilled water station by 1.5 MW	coding of control software	need more precise dates i	
EN-CV	BE-ICS	10516	CMS (LVL2)	4a. Appr	Upgrade of the cooling power at the chilled water station by 1.5 MW	support during test and commissioning ph	need more precise dates i	
EN-CV	BE-ICS	10528	LHCB (LVL2)	2. Activit	Install the new cooling station for FE electronics - LHCB	coding of control software	need more precise dates i	
EN-CV	BE-ICS	10528	LHCB (LVL2)	2. Activit	Install the new cooling station for FE electronics - LHCB	support during test and commissioning	need more precise dates i	
EN-CV	BE-ICS	10546	LHC-MAC-OP (L	2. Activit	Consolidate the SEQ cooling plants in LHC	coding of software control	need more precise dates i	
EN-CV	BE-ICS	10546	LHC-MAC-OP (L	2. Activit	Consolidate the SEQ cooling plants in LHC	support during test and commissioning ph	need more precise dates i	
EN-CV	BE-IC:	Consolidate the Linac 2 ventilation control and regulation system is now scheduled after LS2						more precise dates i
EN-CV	BE-IC:							more precise dates i
BE-RF	BE-ICS	10835	SPU-PRJ (LVL3)	3. HL-LH	LIU-SPS RF power upgrade BAF3	coding of the control software	need more precise dates i	
BE-RF	BE-ICS	10835	SPU-PRJ (LVL3)	3. HL-LH	LIU-SPS RF power upgrade BAF3	Support during testing of CV installations	need more precise dates i	
EN-CV	BE-ICS	10964	SPS-UP (LVL3)	3. HL-LH	Cooling plant for BAF3 and RF equipment	Coding of control software	need more precise dates i	
EN-CV	BE-ICS	10964	SPS-UP (LVL3)	3. HL-LH	Cooling plant for BAF3 and RF equipment	support during test and commissioning	need more precise dates i	
EN-CV	BE-ICS	10964	SPS-UP (LVL3)	3. HL-LH	Cooling plant for BAF3 and RF equipment	Coding of control software	need more precise dates i	
EN-CV	BE-ICS	10964	SPS-UP (LVL3)	3. HL-LH	Cooling plant for BAF3 and RF equipment	support during test and commissioning	need more precise dates i	

Considerable effort for CV controls 2017-2020

- Many projects of variable size
 - Control re-engineering LHC
 - Renovation PS, PSB, SPS
 - Detector cooling (new and re-engineering)
 - New projects
- Possible HW replacement
 - S5, Premium?
- Very tight Planning (a lot of code to be prepared *before* LS2)
 - Deployment > Peak PS mid LS2
 - Peak LHC (ATLAS, CMS)
 - 2017 : overlap Bat 107 + CMS cavern ventilation prep
 - 2018 : peak ATLAS cavern ventilation prep
 - 2019 : peak deployment of CMS ventilation + PS/PSB

	2017				2018				2019				2020			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
# FAT	36				27				9				2			
	7	14	12	3	3	6	10	8	1	0	5	3	1	0	1	0
# SAT	32				11				29				14			
	9	7	2	14	6	2	0	3	7	9	5	8	5	6	0	3

Current CV planning, courtesy R. Barillere



LS2
Days

QPS upgrades

- IPQ, IPD, IT upgrade of WinCC OA and FESA (PLAN 10805)
 - Scheduling: no contribution request yet
 - Missing specification
 - BE-ICS resources: **cannot be evaluated**
- 11T devices, upgrade WinCC OA and FESA (PLAN 10823)
 - Scheduling: before LS2, no contribution request yet
 - Missing specification
 - BE-ICS resources: **cannot be evaluated**
- Test bench B180, FAIR (PLAN: no activity yet)
 - Scheduled: EYETS
 - Resources: OK
- Test bed for QPS PIC WIC Circuit (PLAN: no activity yet)
 - Requested for EYETS
 - Resources: being evaluated – **NOT possible** in first estimation

WIC PS, WIC TT2

- Activities 10809, 10811
 - Contribution from BE-ICS **OK**
 - (but we cannot update PLAN database)

LHC Personnel Protection System

- Upgrade all access control infrastructure (HW and SW) for obsolescence reasons
- New access point in PZ65
- 2 contracts must be extended before end 2017
- HL-LHC preparation work
 - LASS interlocked areas in UA/UPR 17, 57 end LS2 (depending on civil engineering)
- **NO problems with resources**

Summary

- Many activities from now to end of LS2
- Only few (but critical) issues
 - Cabling for SPS Personnel Protection System
 - Cabling for PS Personnel Protection System
 - Linac4 connection and Linac2 modifications
 - Cabling for SPS fire extinguishing system
- Other incoming requests
 - QPS upgrades to be specified
 - HL-LHC WP17.4, 17.5 work to be confirmed
 - 17.4 Access and Alarms
 - 17.5 Technical Monitoring

