HL Consolidation Day

Analysis of needs from BE-ICS

Timo Hakulinen on behalf of the BE-ICS group
with contributions from Silvia Grau, Rui Nunes, and Peter Sollander

HL Consolidation day, 26 September 2017

CONS and HL-CONS approved requests
(for HL-CONS except spares)

Item n.	Description	Approved Budget	Funding (CONS/HL-CONS) %	Budget to be allocated in the years
1	LHC Access System upgrade LS2 (LCI-CONS/LHC-ACCESS)	4.9 MCHF	0	1-2 MCHF
2	Linear smoke detection replaced by ASD - LHC	970 kCHF	100	
3	Laser Fire detectors replacement - LHC	70 kCHF	100	
4	CV Controls Renovation (Wizcon + PCVue to WinCCOA + UNICOS	1.12 MCHF	100	
5	EL Controls Renovation (SCATEX to WinCCOA + UNICOS	121 kCHF	100	

CONS and HL-CONS requests pending approval or refused

(mark in red items that are more important in view of HL-LHC)

Item n.	Description	Budget request	Budget to be allocated in the years	Pending	Refused
6	LHC machine - ODH detection renovation and double density of detectors in arc areas	6 MCHF	2022-26	yes	
7	LHC surface fire detection renovation	4.2 MCHF	2022-26	yes	

ITEM 6: LHC machine - ODH detection renovation and double density of detectors in arc areas

Rational of the request			
Total Budget request	6 MCHF	Budget to be allocated in years (from-to)	2022-26
Material budget request	6 MCHF (new contract to be set up)	Personnel available [y/n] in addition to personnel budget request	yes
Personnel budget request (M2P budget for MPAs and fellows)			
Consequences of suppression of request			
Obsolescence of material at end-of-life.			
Consequences of delay of request			
Risk of malfunctions and non-availability of ODH detection in tunnel zones.			

ITEM 6: LHC machine ODH upgrade

- Renovation of the ODH (Oxygen Deficiency Hazard) detection system in the LHC tunnel.
- Doubling of the density of detectors and Flash devices due to results of Helium spill tests.
- Note: Budget request and period in APT currently not up to date.

ITEM 7: LHC surface fire detection renovation

Rational of the request			
Total Budget request	4.2 MCHF	Budget to be allocated in years (from-to)	2022-26
Material budget request	4.2 MCHF	Personnel available [y/n] in addition to personnel budget request	
Personnel budget request (M2P budget for MPAs and fellows)			
Consequences of suppression of request			
Obsolescence of material at end-of-life.			
Consequences of delay of request			
Risk of malfunctions and non-availability of fire detection in LHC surface buildings.			

ITEM 7: LHC surface fire detection renovation

- Renovation of the fire detection system in the LHC surface buildings.
- Work to be carried out during LHC runs as much as possible.
- Note: Budget request and period in APT currently not up to date. Analysis of the project required for more exact cost.

New requests in view of HL-LHC installation

(to meet HL-LHC goals)

New requests for conversion of LHC into HL-LHC

Item n.	Description	Budget request	Budget to be allocated in years (from-to)	Priority (1-3) 1 top 3 low
8	LHC Access System consolidation LS3	˜5 MCHF	2021-26	1
9	Fire detection + SSS + SMSI – LHC machine underground	9 MCHF	2022-26	1
10	Fire detection + SSS + SMSI – LHC experiments underground	5 MCHF	2022-26	1
11	Gas detection consolidation – surface LHC experiments	800 kCHF	2022-26	1
12	CSAM upgrade (LHC part)	~2.5 MCHF	2021-23	2

ITEM 8: LHC Access System consolidation LS3

Rational of the request			
Total Budget request	~5 MCHF	Budget to be allocated in years (from-to)	2021-26
Material budget request	~5 MCHF	Personnel available [y/n] in addition to personnel budget request	yes
Personnel budget request (M2P budget for MPAs and fellows)			
Consequences of suppression of request on HL performance			
LHC access safety infrastructure equipment will no longer be supported by the vendor. Broken equipment cannot be replaced.			
Consequences of delay of request to LS4 or later			
High risk of equipment failure due to end-of-life. Each malfunction risks loss of beam time.			

ITEM 8: LHC Access System consolidation LS3

- Renovation of the LASS control infrastructure: PLCs, I/O modules, sensors, signal paths, control room information system.
- Consolidation of the SSA (Atlas Safety System). Proper integration into the LASS.
- Any other access and safety system issues to be addressed for the HL-LHC.
- Detailed definition and costing of the work package to come later.

ITEM 9: Fire detection + SSS + SMSI – LHC machine underground

Rational of the request			
Total Budget request	9 MCHF	Budget to be allocated in years (from-to)	2022-2026
Material budget request	9 MCHF	Personnel available [y/n] in addition to personnel budget request	yes
Personnel budget request (M2P budget for MPAs and fellows)			
Consequences of suppression of request on HL performance			
No fire detection / evacuation signals in a zone.			
Consequences of delay of request to LS4 or later			
High risk of equipment failure due to end-of-life.			

ITEM 9: Fire detection + SSS + SMSI – LHC machine underground

- Renovation of the fire detection system in the LHC machine.
- Includes implementation of SSS (Système de Sonorisation Sécurité) and SMSI (Système de Mise en Sécurité Incendie). Replaces the current emergency evacuation system.
- A risk analysis shall be carried out during LS2 to determine if the hypotheses for the project are still correct.
- Price estimates are based on current contracts.

ITEM 10: Fire detection + SSS + SMSI – LHC experiments underground

Rational of the request			
Total Budget request	5 MCHF	Budget to be allocated in years (from-to)	2022-2026
Material budget request	5 MCHF	Personnel available [y/n] in addition to personnel budget request	yes
Personnel budget request (M2P budget for MPAs and fellows)			
Consequences of suppression of request on HL performance			
No fire detection / evacuation signals in a zone.			
Consequences of delay of request to LS4 or later			
High risk of equipment failure due to end-of-life.			

ITEM 10: Fire detection + SSS + SMSI – LHC experiments underground

- Renovation of the fire detection system in the LHC experimental areas.
- Includes implementation of SSS (Système de Sonorisation Sécurité) and SMSI (Système de Mise en Sécurité Incendie). Replaces the current emergency evacuation system.
- A risk analysis shall be carried out during LS2 to determine if the hypotheses for the solution are still correct.
- Price estimates are based on current contracts.

ITEM 11: Gas detection consolidation – surface LHC experiments

Rational of the request			
Total Budget request	800 kCHF	Budget to be allocated in years (from-to)	2022-2026
Material budget request	800 kCHF	Personnel available [y/n] in addition to personnel budget request	yes
Personnel budget request (M2P budget for MPAs and fellows)			
Consequences of suppression of request on HL performance			
Obsolescence of material at end-of-life.			
Consequences of delay of request to LS4 or later			
Risk of malfunctions and non-availability of gas detection in the affected zones.			

ITEM 11: Gas detection consolidation – surface LHC experiments

- Renovation of the gas detection system in the LHC surface buildings and experimental areas.
- A risk analysis shall be carried out to determine if the hypotheses for the project are still correct.
- Price estimates are based on current contracts.

ITEM 12: CSAM-II (LHC part)

Rational of the request			
Total Budget request	~2.5 MCHF	Budget to be allocated in years (from-to)	2021-2023
Material budget request	~2.5 MCHF	Personnel available [y/n] in addition to personnel budget request	yes
Personnel budget request (M2P budget for MPAs and fellows)			
Consequences of suppression of request on HL performance			
Obsolescence of material at end-of-life. Replacement of parts no longer possible.			
Consequences of delay of request to LS4 or later			
Risk of malfunctions and non-availability of Level-3 alarm delivery in the affected zones.			

ITEM 12: CSAM-II (LHC part)

- Renovation of the CSAM (CERN Safety Alarm Monitoring) system, which delivers Level-3 alarms to the fire brigade.
- The full budget CERN-wide 9.5 MCHF (32 zones), of which LHC consolidation 2.5 MCHF (9 zones including SM18).
- Can be mostly carried out during run 3.
- Price estimates are based on current contracts.

Summary

Priority (1-3)	Item n.	Description	Approval Status:
1	1	LHC Access System upgrade LS2 (LCI-CONS/LHC-ACCESS)	Approved by LCI-CONS
1	2	Linear smoke detection replaced by ASD - LHC	Approved by CONS
1	3	Laser Fire detectors replacement - LHC	Approved by CONS
1	4	CV Controls Renovation (Wizcon + PCVue to WinCCOA + UNICOS	Approved by CONS
1	5	EL Controls Renovation (SCATEX to WinCCOA + UNICOS	Approved by CONS
1	6	LHC machine ODH upgrade	Not approved by CONS
1	7	LHC surface fire detection renovation	Not approved by CONS

Summary (New requests)

Priority (1-3)	Item n.	Description	Approval Status:
1	8	LHC Access System consolidation LS3	New (not in APT yet)
1	9	Fire detection + SSS + SMSI – LHC machine underground	New
1	10	Fire detection + SSS + SMSI – LHC experiments underground	New
1	11	Gas detection system consolidation – surface LHC experiments	New
2	12	CSAM upgrade (LHC part)	New