

HL_LHC, WP17.2 - **Electrical distribution**

Review of EN-EL cooling and ventilation equipment needs (not included DC cabling)

17 Dec 2015 – EDMS xx N. Dos Santos (on behalf of EN-EL group)





Presentation content:

- Equipment inventory per building
- Thermal loads and temperature needs per building
- Thermal loads and temperature-humidity parameters update
- Conclusions

For DC cabling needs, please refer to JC. Guillaume presentation



Equipment inventory per building (LHC1 = LHC5)

Name track	Name convention	Location	Description	Numb	Nomb re reser	Homb re total	abrica	Model	4aterie	Commentaires	P Engine	¥₽	Length / Width / Height (mm)	Veight (kg)	Position •	Electricity	Cooling	/entilation	Control	Transport	Control cables & optical fibers
WP17.2.E.1		SE17	EMDV17E	12	3	15	m	(1)	HT	(1) - dimensions maxi de la nouvelle spec (voir onglet Cellules-HT-LHC1)	G. Cumer	WP17.2	2000/300/3100	200	SE17	×		×		x	112(1)
WP17.2.E.2		SE17	EKD¥17E	7	3	10	(1)	(1)	нт	(1) - dimensions maxi de la nouvelle spec (voir onglet Cellules-HT-LHC1)	G. Cumer	WP17.2	2000/ 900/ 3100	200	SE17	×		×		×	
WP17.2.E.3		SE17	Tfo 18/.4 kV	2	2	4	ABB		HT	Tro 2 MVA a fextérieur	G. Cumer	WP17.2	2513 / 1600 / 3119	6200	SE17	×		×		×	
WP17.2.E.4		SE17	Tfo 18/3.3 kV	1	1	2	ABB		HT		G. Cumer	WP17.2		15000	SE17	×		×		х	
WP17.2.E.5		SE17	Racks EYMxx/17E	4	2	- 6		Type LH	нт		G. Cumer	WP17.2	900/600/2200	150	SE17	×		×		×	
		SE17	Racks EYKxx/17E	2	3	5		Type LH	HT		G. Cumer	WP17.2	900/600/2200	150	SE17	×		×		×	
WP17.2.E.6		SE17	TGBT T.1- EBD¥17E		0	1	HH	Capitolo	BT		G. Cumer	WP17.2	5800/700/2300	4000	SE17	×		×		×	
WP17.2.E.7		SE17	TGBT T.1- ESD¥17E		0	1	HH	Capitolo	BT		G. Cumer	WP17.2	6800/700/2300	4600	SE17	×		×		×	
WP17.2.E.8		SE17	Type3 - EBD2/17E	1	0	1	Schneid		BT		G. Cumer	WP17.2	1200 / 400 / 2100	150	SE17	×		×		×	—
WP17.2.E.9		SE17	Type3 - ESD3/17E		0	1	Schneid		BT		G. Cumer	WP17.2	1200 / 400 / 2100	150	SE17	×		×		×	
		SE17	Type3 - EAD¥17E		0	1	Schneid		BT		G. Cumer	WP17.2	1200 / 400 / 2100	150	SE17	×		×		×	
WP17.2.E.10		SE17	Chargeurs 48 VDC	4	0	4	Borri	200A	BT		G. Cumer	WP17.2	700/800/2200	300	SE17	×		×		×	Ь——
WP17.2.E.11		SE17	strib 48VDC - ECDxx/		0	1	Borri		BT		G. Cumer	WP17.2	700/800/2200	200	SE17	×		×		×	
WP17.2.E.12		SE17	Batt 48 VDC	2	0	2	Borri	425Ah	BT		G. Cumer	WP17.2	700/800/2200	600	SE17	×		×		X	↓
WP17.2.E.13		SE17	AES (UPS eclairage) 2	0	2	Borri	20 kVA	BT		G. Cumer	WP17.2	800 / 600 / 1200	100	SE17	×		×		x	
WP17.2.E.14		SE17	Batt AES	2	0	2	Borri	3 kW	BT		G. Cumer	WP17.2	800 / 600 / 1200	300	SE17	×		×		×	
		SE17	ype3 - EODx/17E (Ecl		0	1	Schneid		BT	63A avec 1 arrivée et 5 départs NSX100 + 10 départs disj. NG125L - 0.9 m large x 0.4m pro		WP17.2	1200 / 400 / 2100	150	SE17	×		×		×	
		SE17	UPS distrib Surface		0	1	Borri	20 kVA	BT	30 x 60 x 1200 mm - UPS 20 kVA avec batt 10 min integrees	G. Cumer	WP17.2	800 / 600 / 1200	100	SE17	×		×		×	
		SE17	ype3 - EODx/17E (Ecl		0	1	Schneid		BT	63A avec 1 arrivée et 5 départs NSX100 + 10 départs disj. NG125L - 0.9 m large x 0.4m pro		WP17.2	12007 4007 2100	150	SE17	×		×		×	↓
WP17.2.E.15		SE17	Rack EYCxx/17E		1	4		Type LH	co		G. Cumer	WP17.2	900/600/2200	150	SE17	×		×		x	×
WP17.2.E.16		SE17	Rack EYUxx/17E	1	0	1		Type LH	OP		G. Cumer	WP17.2	900/600/2200	150	SE17	×		×		×	
		SE17	Rack EYYxx/17E	2	0	2		Type LH	EL		G. Cumer	WP17.2	900/600/2200	150	SE17	×		x		x	
WP17.2.E.17		SH17	Tfo 3.3/.4 kV	1	0	1		ABB	HT	Třo 800/630 kVA?? En exterieur	G. Cumer	WP17.2	2000/2000/3000	4000	SH17	×		x		×	
WP17.2.E.18		SH17	Type2 - EQD¥17H	1	0	1	HH	ATOL	BT		G. Cumer	WP17.2	5800/700/2300	4000	SH17	×		×		×	
WP17.2.E.19		SH17	Type2 - EBD¥17R-S	1	0	1	HH	Capitolo	BT		G. Cumer	WP17.2	5800/700/2300	4000	SH17	×		x		x	
WP17.2.E.20		SH17	Type3 - EBD2/17H	1	0	1	Schneid	Spacial	BT		G. Cumer	WP17.2	1200 / 400 / 2100	150	SH17	×		×		×	
WP17.2.E.21		SU/SD17	Tfo 18/.4 kV	1	0	1	ABB		HT	Třo 2 MVA a řextérieur	G. Cumer	WP17.2	2513 / 1600 / 3119	6200	SU/SD17	×		x		x	
WP17.2.E.22		SU/SD17	Type2 - EBD¥17U-D	1	0	1	HH	Capitolo	BT	l=1.2kA, 1 arriv + 2 couplage (100%), 3 colonnes départs <=630A	G. Cumer	WP17.2	5800/700/2300	4000	SU/SD17	×		×		×	
WP17.2.E.23		US17	Tfo 18/.4 kV	2	0	2	ABB		HT	TFo 2 MVA	G. Cumer	WP17.2	2513 / 1600 / 3119	6200	US17	x		x		х	
WP17.2.E.24		US17	Tfo 18/.4 kV	1	0	1	ABB		HT	Tfo 3.15 MVA	G. Cumer	WP17.2	2900 / 1870 / 3114	10300	US17	×		×		×	
WP17.2.E.25		US17	GBT T.1- EDDxx/17R-	S 1	0	1	НН	Capitolo	BT	I=3.2kA, 1 arriv + couplage (100%), 4 colonnes départs <=630A - N/4	G. Cumer	WP17.2	5275 / 650 / 2300	4000	US17	×		×		×	
WP17.2.E.26		US17	TGBT T.1- EZDxx/17R-	4 1	0	1	НН	Capitolo	BT		G. Cumer	WP17.2	5250/775/2300	4000	US17	×		×		×	
WP17.2.E.27		US17	Type1 - EBD¥17S	1	0	1	HH	Capitolo	BT	I=2kA, 1 arriv + 1 couplage (100%), 3 colonnes départs <=630A - N 5	G. Cumer	WP17.2	5875765072300	4000	US17	×		×		×	
WP17.2.E.28		US17	Type3 - EBD2/17S	1	0	1	Schneid		BT		G. Cumer	InP17.2	1800 / 400 / 1900	300	US17	×		×		×	
WP17.2.E.29		US17	UPS Cryo (style UA)	2	1	3	Borri	20 kVA	BT	30 x 60 x 1200 mm - UPS 20 kVA avec batt 10 min integrees	G. Cumer	WP17.2	800 / 600 / 1200	100	US17	×		×		×	1
WP17.2.E.30		US17	pe3 - EODx/17R-S(ci	ry 1	1	2	Schneid	Spacial	BT	63A avec 1 arrivée et 20 départs disj. NG125L - N° 6	G. Cumer	WP17.2	1200 / 400 / 2100	150	US17	×		×		×	
WP17.2.E.31		US17 (stafe room)	Type1 - ESD¥17S	1	0	1	НН	ATOL	BT	I=630A, 1 arriv , 2 colonne départs <=630A/1 acouplage 630A - N°2	G. Cumer	WP17.2	2175 / 375 / 2300	300	US17 (stafe room	×		×		×	
WP17.2.E.32		US17 (stafe room)	Type3 - ESD3/17S	1	0	1	Schneid	Spacial	BT	160A avec 1 arrivée et 20 départs disj. NG125L - 2 x N° 6	G. Cumer	WP17.2	1800 / 400 / 2100	300	US17 (stafe room	×		×		×	t
WP17.2.E.33		US17 (stafe room)	Type3 - EADV17S	1	0	1	Schneid	Spacial	BT		G. Cumer	WP17.2	300 / 400 / 2100	150	US17 (stafe room	×		x		×	
WP17.2.E.34		US17 (stafe room)	Chargeurs 48 VDC	4	0	4	Borri	100A	BT		G. Cumer	WP17.2	700/800/2200	300	US17 (stafe room	×		×		×	1
WP17.2.E.35		US17 (stafe room)	strib 48VDC - ECDxx/	1 1	0	1	Borri		BT	Idem comme SEH9	G. Cumer	WP17.2	700/800/2200	200	US17 (stafe room	×		×		x	
WP17.2.E.36		US17 (stafe room)	Batt 48 VDC	2	0	2	Borri		BT		G. Cumer	WP17.2	700/800/2200	600	US17 (stafe room	×		x		×	
WP17.2.E.37		US17 (stafe room)	AES (UPS eclairage)	1 2	0	2	Borri	20 kVA	BT	90 x 60 x 1200 mm - idem SE5-SE7	G. Cumer	WP17.2	800 / 600 / 1200	100	US17 (stafe room	×		×		×	
WP17.2.E.38		US17 (stafe room)	Batt AES	2	0	2	Borri	3 kW	BT	90 x 60 x 1200 mm - idem SE5-SE7	G. Cumer	WP17.2	800 / 600 / 1200	300	US17 (stafe room	×		×		×	
WP17.2.E.39		US17 (stafe room)	listrib Eclai EPDxx/1	7 1	0	1	??	??	BT	Coffret mural 0.9 m large x 0.3 m prof x 1.2 m haut	G. Cumer	WP17.2	900/300/1200	100	US17 (stafe room	×		×		×	
		US17 (stafe room)	Rack EYCxx/17S	3	1	4		Type LH	CO	Accés avant et arriére	G. Cumer	WP17.2	900/600/2200	150	US17 (stafe room	×		×		x	×
		US17 (stafe room)	Rack EYUxx/17S	1	0	1		Type LH	OP	Accés avant et arriére	G. Cumer	WP17.2	900/600/2200	150	US17 (stafe room	×		×		x	1
		UR15	Tfo 18/.4 kV	3	0	3	ABB		HT	Tro 3.15 MVA	G. Cumer	WP17.2	2900/1870/3114	10300	UR15	×		×		x	
		UR15	Tfo 18/,4 kV	0	0	0	ABB		HT		G. Cumer	WP17.2	2513 / 1600 / 3119	6200	UR15	×		×		×	
		UR15	GBT T.4- ERDxx/15R-		ŏ	2	HH	Capitolo	BT		G. Cumer	WP17.2	4250/775/2400	4000	UR15	×		×		x	
		UR15	TGBT T.1- EZDxx/15R-		0	1	HH	Capitolo	BT		G. Cumer	WP17.2	5250/775/2300	4000	UR15	×		×		×	
		UR15	Type2 - ERDx/15R	1 4	i o	4	HH	ATOL	BT		G. Cumer	WP17.2	2175 / 375 / 2300	300	UR15	×	1	×		×	
		UR15	Tupe2 - EBDx/15R	2	ŏ	2	HH	Spacial	BT		G. Cumer	WP17.2	300 / 400 / 2100	150	UR15	×		×		x	
		UR15	JPS machine (style U.		0	4	Borri	100 kVA	BT		G. Cumer	WP17.2	815 / 825 / 1500	630	UR15	×		×		×	
								Spacial			G. Cumer		900/400/2100	150	UR15						+

WP17 Equipment characteristics and the technical needs - Technical infrastructure - https://edms.cern.ch/document/1516703/0.2



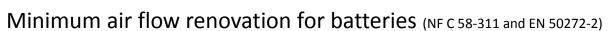
Thermal loads and temperature needs per building (LHC1 = LHC5)

		Puissance totale (kW) Ventilation parameters	
Document owner	Paul Pepinster	LE requirements on 17 Jul	y 2013
Updat ed on	17.07.2015 EN-EL	EL requirements on 17 Jul	v 2015
tion			
Hi Luminosity User Ventila	requirement		

					Puissance	totale (kW)	Venti	ilation pa	rameters			
WP related		Local	Utilisateur	Racks/Equipement	Nombre	Nominale	Dissipé e	Temp. Range [°C]	HR Range [%]	Delta Temp. [K]	Commentaires	Contact
N/EL	P1	UR15	EN/EL	transfos			33	15-30				G. Cumer
EN/EL	P1	UR15	EN/EL	TGBT, UPS, batteries, tableaux, eclair.			8	15-30			Batt. UPS renouvellement d'air mini= 4 m3/h	G. Cumer
N/EL	P1	US17	EN/EL	transfos			17	15-30				G. Cumer
EN/EL	P1	US17	EN/EL	TGBT, UPS, batteries, tableaux, eclair.			5	15-30			Batt. UPS renouvellement d'air mini= 1 m3/h	G. Cumer
N/EL	P1	US17 safe room	EN/EL	TGBT, UPS, 48V, batteries, tableaux, eclair.			7	15-30			Batt 48VDC renouvellement d'air mini= 180 m3/h	G. Cumer
N/EL	P1	SE17	EN/EL	Local Haute Tension (cellules HT)			0	15-30			idem SE2 et SE8, 3.3kV dans SE et non dans SHM	G. Cumer
N/EL	P1	SE17	EN/EL	Local Basse Tension (TGBT, UPS, 48V, Batteries,))		11	15-30			Batt 48VDC renouvellement d'air mini= 180 m3/h. Batt. UPS renouvellement d'air mini= 1 m3/h	G. Cumer
N/EL	P1										2 110/11	
N/FI	D1											

EL thermal loads per building

Min/Max Temperature per building





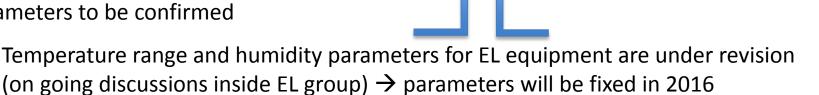


Thermal loads and temperature-humidity parameters update

	HI Lum	inosity User re	quirement										
	Ventila												
	tion												
	Updat ed on		17.12.2015	FN-FI						und	ate of 1	7 Dec 20:	 15
		ent owner	Paul Pepinster							ара	ate or 1	, DCC 20.	
										_			
					Puiss	nce totale	(kW)		Ventilation	parameters			
WP related		Local	Utilisateur	Racks/Equipement	Nombre	Nominale	Dissipée	Temp. Range [°C]	HR Range [%]	Delta Temp. [K]	Airflow renovation for batt. [m3/h]	Commentaires	Contact
N/EL	P1	UR15	EN/EL	transfos			33					before was 15-30°C	S. Bertolasi
N/EL	P1	UR15	EN/EL	TGBT, UPS, batteries, tableaux, eclair.			21	20-25*			4 m3/h (100 kVA UPS@10min)	before was 8 kW	S. Bertolasi
N/EL	P1	US17	EN/EL	transfos			25					before was 17 kW	S. Bertolasi
N/EL	P1	US17	EN/EL	TGBT, UPS, batteries, tableaux, eclair.			5	20-25*			1 m3/h (20 kVA UPS@10min)	before was 15-30°C	S. Bertolasi
N/EL	P1	US17 safe room	EN/EL	TGBT, UPS, 48V, batteries, tableaux, eclair.			7	20-25*			180 m3/h (48 Vdc Batt.)	before was 15-30°C	S. Bertolasi
N/EL	P1	SE17	EN/EL	Local Haute Tension (cellules HT)			0	15-30**				idem SE2 et SE8, 3.3kV dans SE et non dans SHM	S. Bertolasi
N/EL	P1	SE17	EN/EL	Local Basse Tension (TGBT, UPS, 48V, racks,)			11	15-30**					S. Bertolasi
N/EL	P1	SE17	EN/EL	Local Batteries			3	20-25*			180 m3/h (48 Vdc Batt.)	New Room	S. Bertolasi
	P1												
N/EL	P1												
		UR15?	unknown user	racks utilisateurs			?	?				eau mixte?	IBA + unknown use
N/EL	P1	UR15?	unknown user	racks utilisateurs			?	?					IBA + unknown use

Orange cells → update

- batteries presence
- ** parameters to be confirmed





Conclusions

- New batteries room inside SE17/57 to be foreseen → layout to be defined, hopefully no impact in SEs' building dimensions
- Final temperature and humidity parameters to be accorded between EL and CV



Thank you for attention.





