Coordination Package 4: Integration/Infrastructure/ Installation + Planning

AWAKE Run 2c Kick-off Meeting 16/7/2024

Motivation for modifications: Run1, 2ab vs Run2





Coordination Package 4 (CP4)

\ \/D #	W/D title	W/P loader	Group
VVF#			Gioup
WP8	Shielding	Ans Pardons	EN-ACE
WP9	Structures and Fire compartments	Ans Pardons	EN-ACE
WP22	Civil Engineering	Alejandro Martinez Selles/John Osbourne	SCE-SAM
WP23	Cooling and Ventilation	Alejandro Mejica Rodriguez	EN-CV
WP24.1	Electrical Services: Electrical Infrastructure	Mickael Lonjon	EN-EL
WP24.2	Electrical Services: Cabling	Guillaume Gros	EN-EL
WP24.3	Electrical Services: Decabling	Christian Bernard	EN-EL
WP25	Transport and Handling	Caterina Bertone	EN-HE
WP26	Access	Didier Vaxelaire	EN-AA
WP27	Fire and Gas Detection, Emergency Systems	Silvia Grau, Denis Raffourt	EN-AA
WP28	Survey	Jean-Frederic Fuchs	BE-GM
WP29	Ethernet, Wifi, GSM, TETRA	Maryse da Costa, Marc-Antoine Denis	IT-CS
CP4.1	Global integration & planning	Ans Pardons	EN-ACE
CP4.2	Facility maintenance & safety	Ans Pardons	EN-ACE

 CP4 does not include the following work packages: magnets, power converters, interlock, vacuum, control, mechanical design-MME

A few words on the (draft) installation planning used here

- Info collected from discussions with WPs 2021-2023: duration of works (according to work assumptions, which may change)
- Not yet (significantly) updated since AWAKE Run2c's approval
- It shows AWAKE's "wishful" planning with a "common sense" sequence, respecting the duration of works received.
- It is not a readiness milestone planning (will come later)
- It does **NOT** take into account
 - **Resource availability** (CERN & contractor), esp. during LS3
 - Late arrival of tech requirements (many not yet received)
 - Various delays (e.g. from changes in spec)
- This meeting will give valuable **input towards a more realistic installation** planning, as well as a **readiness milestone planning**

Planning AWAKE works up to April 2025

- Assuming the LS3 start date remains between Nov 2025 and August 2026 (no more than 8 months delayed w.r.t. current date)
 → no change to CNGS dism and AWAKE installation planning
- AWAKE works before CNGS dism:
 - Survey and network measuring in TCC4-AWAKE (BE-GM, WP28) Oct 2024
 - Run2b dismantling (eq. owners + EN-HE, WP25) Oct 2024 Feb 2025
 - De-cabling of AWAKE area (EN-EL, WP24.3) Feb Mar 2025 (end of/after YETS

Task Name	Duration	Start	Finish	24	24							202	25									202	6					
					Half	2, 20	24		ŀ	Half	1, 20	025		1	Half	2, 2	025			Half	1, 20	26		, н	alf 2	, 202	6	
				J	A S	S O	Ν	D	J I	FN	1 A	Μ	J	J	A S	5 O	N	D	J	FN	A	M	J.	I A	S	0	N	D
RUN2b	460 days	Thu 01.12.22	Thu 03.10.24			~~•																						
Installation & commissioning density step vapor source	3 mons	Thu 01.12.22	Thu 09.03.23	rce																								
Operation (density step)	20 mons	Thu 09.03.23	Thu 03.10.24			0	pera	ation	ı (de	ensit	y ste	ep)																
RUN2c	1497 days	Thu 03.10.24	Fri 09.08.30	R	JN2c	9///																		mm			mn	11
Survey: measurement of the components and TCC4 net	2 wks	Thu 03.10.24	Thu 17.10.24				Surv	/ey: ı	mea	asuro	eme	nt o	f the	cor	npo	nent	s an	d TO	C4	netw	ork	w.r.	t. TT4	1				
Run2b dismantling	71 days	Thu 17.10.24	Fri 07.02.25						-																			
EL - decabling campaing part 1	1,5 mons	Mon 17.02.25	Mon 31.03.25								E	L - d	ecab	ling	can	pair	ng p	art 1	L									
CNGS clearing out	15 mons	Mon 14.04.25	Fri 19.06.26																				C	NGS	clea	ring	out	

Planning AWAKE works from mid 2026 on

- Block 1 (Jun Sep 2026): Survey, tracing, move p+ magnets
 - Perform survey empty TCC4, establish new network (BE-GM)
 - Move proton beam line magnets to end TCC4 (temp position) (EN-HE, TE-MSC)
 - Mark new beam equipment's position (BE-GM)
 - Move proton beam line magnets to final TCC4 position (EN-HE, TE-MSC)
- Block 2 (Jul 2026 Apr 2027): Installation services and cabling part 1
 - Install services part 1: cable trays everywhere & elec general infrastructure (EN-EL), smoke detection and emergency evac equipment in TCC4 (EN-AA), then cabling for TT41 magnets and services (EN-EL)
 - Install services part 2: ventilation, cooling (EN-CV)
 - Install services part 3: GSM and TETRA in TCC4 (IT-CS)
 - Re-install MAD TAG41 (EN-AA)

Planning AWAKE works from mid 2026 on

- Block 3 (Feb 2027 Jan 2028): Installation equipment, supports, vacuum and cabling part 2 (equipment HWC follows after installation)
 - Install supports and beamline equipment (EN-HE: Feb 2027 Jan 2028)
 - Install laser-related equipment (SY-STI: Feb 2027 Jan 2028)
 - Install proton and electron line magnets (TE-MSC, SY-ABT: Feb Oct 2027)
 - Cabling for equipment (EN-EL) (Feb 2027)
 - Install elec infrastructure (+racks) for laser, RF, plasma, etc. (EN-EL) (Mar Apr 2027)
 - Install plasma cells (May 2027)
 - Install RP equipment (May 2027)
 - Install beam instrumentation all lines (SY-BI: Jul Sep 2027)
 - Install electron sources and klystrons (SY-RF: Jun Nov 2027)
 - Install beamline vacuum chambers and e-source bake-out (TE-VSC) (Sep 2027 Jan 2028)
- Block 4 (Jan Sep 2028): Commissioning before operation
 - (commissioning last equipment: UV beam to e-source)
 - Leak detection and pump-down (TE-VSC: June 2028)
 - Electron and laser beam commissioning (Jun Jul 2028)
 - Proton beam commissioning (Aug 2028) (SPS post LS3-start = 3/7/2028)
 - Global commissioning (all beams: Sep 2028) \rightarrow Ready for operation ~Oct 2028

WP8: Shielding – EN/ACE

With

- HSE-RP and SY-STI for Fluka calculations
- EN-HE for handling and transport
- BE-EA for standard shielding procurement
- Design, procure, and install shielding to protect personnel and equipment in the AWAKE area, for example:
 - Shielding (concrete or iron) "carpet" or "wall" in areas in TCC4 with remnant dose rate above 50µSv/h after CNGS dismantling (→ see RP slides) → ~Jun 2026
 - If required (no request received): shielding in TCC4/TSG41 to reduce dose to electronics (Klystron) in TCV4 \rightarrow 2028





WP9 Structures & fire compartments – EN/ACE

With

- PSO, HSE-OHS and HSE-FB for definition of compartments, evacuation routes, fire brigade procedures, etc.
- EN-ACE-COS for construction/order/installation of
 - UV Laser rooms (if not same as current spectro room), streak rooms etc. → install second half 2027 (tbc)
 - fire doors and walls \rightarrow install after Jan 2028 (tbc)



WP22 Civil engineering - SCE

With EN-HE:

- Under discussion: If removal of transformers in TSG4 → removal shielding TSG4 before Jun 2026
- Structure to attach wall shielding TCC4 (depends on CNGS remnant dose rate, only known in March 2026) → Jun 2026 (if needed at all)



WP23 Cooling and ventilation – EN/CV

- Estimated needs from equipment owners on <u>EDMS</u> <u>3135126</u> (extrapolation)
- New UV room, more e-sources, plasma cells, klystrons (cooling)
- TCC4 volume increase (ventilation)→ Needs new AHU in TSG4, connected to TCC4



AWAKE Run 2c

Comments

Unchanged

New room (UV laser) in TSG4 ->

+2.5kW in TSG4

extra e-source --> + 25kW, full

load (50kW) moves from TCV4 to TCC4 3 extra klystrons -> + 90kW in

TCV4 (25kW removed -> Net

+65kW for TCV4 extra plasma cell -> +5kW in

TCC4

Unchanged

moved from TSG41 to TSG4 some magnets are relocated to

TCC4

Comments

location

1. TSG40

2. TSG4, at

junction with

TSG42

TCC4-C

TCV4

TCC4-C

TCC4-A

TSG4

TT41 + TCC4

AWAKE Run 2c

Heat loads kW

Power kW

2.4

2.4

50

120

10

28

10

1500

Position in run 2

quality

raw/chilled

demineralised

demineralised

demineralised

demineralised

chilled

demineralised

tructure

Structure

IR Laser

UV Laser

Electron gun

Klystron

Plasma cell

Spectromagnet

GALDEN chillers

Proton beam magnets

WP23 Cooling and ventilation – EN/CV

ID	Task Name	Duration	Start	Finish	24	20	025	2026		202	7	2	028	202
					Half 2, 2024	Half 1, 2025	Half 2, 2025	Half 1, 2026 Half	f 2, 2026	Half 1, 2027	Half 2, 2027	Half 1, 2028	Half 2, 2028	Half 1, 2029
					JASON	JFMAMJ	JASOND	JFMAMJJA	SOND	JFMAMJ.	IASOND	JFMAM	JJASOND	JFMAMJ
4	RUN2c	1497 days?	Thu 03.10.24	Fri 09.08.30	RUNZC -									
42	Run 2c Preparation	590 days	Fri 19.06.26	Fri 06.10.28			Run 2c	Preparation •					9	
51	Installation services	185 days	Fri 17.07.26	Fri 16.04.27			Insta	llation services winner						
62	EN-CV	105 days	Fri 06.11.26	Fri 16.04.27				EN	I-CV ••••••					
63	HVAC installations	70 days	Fri 06.11.26	Fri 26.02.27				HVAC installation	ions 🔤	9				
64	TCC4 ventilation	2,5 mons	Fri 06.11.26	Fri 29.01.27						TCC4 ventilati	on			
65	UV laser room Ventilation	6 wks	Fri 08.01.27	Fri 19.02.27						UV laser roo	om Ventilation			
66	Streak Camera ventilation	2 wks	Fri 12.02.27	Fri 26.02.27						Streak Cam	era ventilation			
67	Hydraulic installations	75 days	Fri 06.11.26	Fri 05.03.27				Hydraulic installation	ions •					
68	Demineralised water pipe extension to TCC4	6 wks	Fri 20.11.26	Fri 15.01.27						Demineralised	water pipe exte	ension to TCC4		
69	20 magnets mnifolds displacement	3 mons	Fri 06.11.26	Fri 12.02.27						20 magnets	mnifolds displa	cement		
70	Plasma cell manifolds	2 wks	Fri 12.02.27	Fri 26.02.27						📄 Plasma cell	manifolds			
71	Demineralised subcircuit	3 mons	Fri 20.11.26	Fri 26.02.27						Deminerali	sed subcircuit			
72	Electron gun manifold	1 wk	Fri 26.02.27	Fri 05.03.27						Electron gu	ın manifold			
73	Commissioning	1,5 mons	Fri 05.03.27	Fri 16.04.27						Commi	ssioning			

WP24.1 Electrical Infrastructure – EN/EL

- First EN-EL (M. Lonjon) reflections, based on estimates from equipment owners in 2020: EDMS 2471171
- An extract:
 - Upstream TSG4: (doubling installed power: Replace 630kVA transformer with 1250kVA, and replace of the EBD1 switchboard → space needed in TSG4
 - TCV4: (4xKlystrons): Replace switchboard EZD
 - Adding lights and electrical infrastructure (cables) in TCC4-CNGS

ŀ.	Nouveaux besoins pour l'expérience AWAKE
4.1	Zone expérience (ex. CNGS)
1.1.1 1.1.2	GALERIE TECHNIQUE (TSG4) SALLE LASER (TSG40) RE GUN ET KLYSTRON (TCV4)
1.1.4	TUNNEL ÉLECTRON (TT43)
1.1.5 1.1.6	LIGNE PROTON (TT41) CELLULE PLASMA (TT41)
1.1.7	ZONE EXPÉRIMENTALE (TCC4)
4.1.8 4.2	 VOIE EVACUATION SECOURS DU TSG4 (TCC²) NOUVELLE DISTRIBUTION ÉLECTRIQUE AWA Salle de contrôle AWAKE - ECA4
4.3	Convertisseurs de puissance AWAKE - BHA4.
4.4	Consolidation des infrastructures de supervisi



WP24.3 De-cabling – EN/EL

- Estimated at 450kCHF (estimate from 2021)
- Dedicated de-cabling preparation meetings for equipment owners organized by EN-ACE
- Starts end of YETS, when EN-EL resources available

WP24.3 Cabling – EN/EL

Estimate given to EN-EL 15/4:

- ~1150 control cables (63km)
- ~140 DC cables (11km)
- EL recent cost estimate ~1.5MCHF





WP24 - EN/EL

ID	Task Name	Duration	Start	Finish	24	2	025	202	26	202	27	2	028		20
					Half 2, 2024	Half 1, 2025	Half 2, 202	5 Half 1, 2026	Half 2, 2026	Half 1, 2027	Half 2, 2027	Half 1, 2028	Half 2, 20	28 Ha	lf 1, 2029
					JASON	DJFMAM	JASON	DJFMAMJ	JASOND	JFMAMJ	JASOND	JFMAMJ	JASO	N D J F	MAMJ
4	RUN2c	1497 days	? Thu 03.10.24	Fri 09.08.30	RUNZC datate										
38	EL - decabling	1,5 mons	Fri 07.02.25	Fri 21.03.25		EL - de	cabling								
42	Run 2c Preparation	590 days	Fri 19.06.26	Fri 06.10.28			Ru	n 2c Preparation 📼							
51	Installation services	185 days	Fri 17.07.26	Fri 16.04.27			- I	nstallation services							
52	EN-EL	70 days	Fri 17.07.26	Fri 23.10.26				EN-EL	0 0						
53	Cable trays, conforming security linghting, inst	8 wks	Fri 14.08.26	Fri 09.10.26					Cable	trays, conformin	g security linghti	ng, installating	new ones (m	ainly TCC/	4)
54	Nouveau transformateur (TSG4)	2 wks	Fri 17.07.26	Fri 31.07.26					Nouveau tra	insformateur (TS	G4)				
55	EBD1/TS4 (TSG4)	2 wks	Fri 31.07.26	Fri 14.08.26					EBD1/TS4 (TSG4)					
56	Switchboards (TSG4)	7 wks	Fri 14.08.26	Fri 02.10.26					Switch	boards (15G4)					
		2 under	5-100 10 00	5-100.00					- cabli	ng for TT41 mog	ate and convices				
57	cabling for 1141 magnets and services	2 WKS	Fri 09.10.26	Fri 23.10.26					Cabli	ng lor 1141 magn	iets and services				
74	IT (S	20 days	Fri 20 01 27	Fri 26 02 27					IT-C	5					
/4	11-05	20 uays	FIT 29.01.27	FIT 20.02.27											
75	GSM and Tétra	10 days	Fri 20 01 27	Fri 12 02 27					GSM and Tétra						
/5	USIN and retta	10 0043	11125.01.27	111 12.02.27											
76	Cabling	1 wk	Fri 29.01.27	Fri 05.02.27						Cabling					
84	Installation equipment	250 days	Fri 05.02.27	Fri 21.01.28				Install	lation equipmer	nt vuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuuu					
95	EN-EL	65 days	Fri 05.02.27	Fri 07.05.27					EN-E	L 0					
		-													
96	electrical infrastructure for LASER, RF, PLASMA	9 wks	Fri 05.03.27	Fri 07.05.27						elec	trical infrastruct	ure for LASER, I	RF, PLASMA		
97	Cabling for equipemnt	4 wks	Fri 05.02.27	Fri 05.03.27						Cabling fo	r equipemnt				

WP25 Transport and handling – EN-HE

- After disconnection by equipment owners, remove AWAKE equipment (Oct 2024 – Feb 2025), vacuum, supports, TSG41 shielding, etc. (see dedicated AWAKE dism meetings)
- Move proton beamline magnets (Jul Sep 2026)
- Install supports and beamline equipment (Feb 2027 Jan 2028)
- Plus: crane maintenance, transport support to other teams



WP26 Access system – EN/AA

- [Remove MAD before CNGS dism], reinstall MAD before AWAKE equipment installation (temporary conditions)
- Update of existing access system during AWAKE small equipment/support installation : software, hardware, cabling, documentation, tests
 Update of existing access system during AWAKE small equipment/support installation : software - to be dismantled
 - Extension in TCC4
 - Opening of a few TSG4x galleries
 - Changes TCV4, TT41, TT43, TT41 ... →
 - New racks (location?)
- Minutes preliminary discussion: <u>EDMS 3082925</u>



WP26 Access system – EN/AA

- Reinstall MAD: Feb 2027
- Install and test the new access system: March-April 2027
- [Start of AWAKE equipment installation:

ID	Task Name	Duration	Start	Finish	24				2025				2026	6			202	7		202	28			20	2
					Ha	lf 2, 2024	4 H	alf 1, 202	25 H	lalf 2, 202	25	Half 1, 202	26	Half 2, 1	2026	Half 1, 20	027	Half 2, 2027	Half 1,	2028	Half 2, 2	028	Half 1	, 2029	-
	DUND-	4 407 4 7	Thu 02 40 24	5.100.00.00		SON	DJI	MAM	1]]]	ASON	DJ	FMAN	V J J		OND.	FMA	M 1 1	ASONI	JFMA	AMJ	JASO	ND.	JFM	AMJ	_
4	RUNZC	1497 days?	Thu 03.10.24	Fri 09.08.30	RUNZ	C 9																			-
42	Run 2c Preparation	590 days	Fri 19.06.26	Fri 06.10.28						Ru	un 2c P	reparation	n 😎												
51	Installation services	185 days	Fri 17.07.26	Fri 16.04.27							Installa	ation servi	ices 🛛												
		-																							
81	EN-AA (access)	5 days	Fri 29.01.27	Fri 05.02.27										EN-AA ((access)										
		,-																							
82	Dismount temporary door + mount MAD	1 wk	Eri 29.01.27	Fri 05 02 27												Dismo	unt ten	nporary door	+ mount M						
02	bishount temporary door + mount mad	1 WK	111 25.01.27	111 03.02.27																					
02	Start aquipment install	0 days	Eri 05 02 27	Eri 05 02 27								61	tart or	quinmor	nt install	05.02									
00	start equipment instan	Udays	FI1 05.02.27	FIT 05.02.27								31		quipinei	iit iiistaii	• 05.02									
			5 1 05 00 07																						
109	Access	41 days	Fri 05.03.27	Mon 03.05.27											ALCE	:55									
110	New access system equipment installation	2 wks	Fri 05.03.27	Fri 19.03.27												Ne	w acce	ss system equ	iipment ins	tallatio	n				
111	Electrical connections	2 wks	Fri 19.03.27	Fri 02.04.27												E E	lectrica	l connections							
112	Hard/software checks	2 wks	Fri 02.04.27	Fri 16.04.27												1 1 1	Hard/s	oftware checl	s						
113	AWAKE commissioning	2 wks	Fri 16.04.27	Fri 30.04.27													AWA	E commissio	ning						
																			-						
11/	DSO tests	1 day	Eri 20 04 27	Mon 03 05 21													DSO t	ests							
114	030 (63(3	Tuay	111 30.04.27	1011 03.03.21													2501								

WP27 Fire and Gas Detection, Emergency systems – EN/AA

- Install infrastructure in the rest of TCC4 (the former CNGS area was not equipped because of radiation level during beam)
- According to HSE requirements (incl. fire compartmentalization), install additional equipment in the existing AWAKE area.

ID	Task Name	Duration	Start	Finish	24			2	025			2026		2	027		202	28			20
					Half 2	, 2024 OND	Half J F N	1, 2025 M A M J	Half 2	, 2025 O N D	Half 1, 202	26 H / JJ/	lalf 2, 2026 A S O N D .	Half 1, 2027 J F M A M J	Half 2, 2027	Half 1, 2	2028 M J	Half 2, J A S	2028 O N D	Half J F N	1, 2029 M A M J
4	RUN2c	1497 days?	Thu 03.10.24	Fri 09.08.30	RUN2c	•															
42	Run 2c Preparation	590 days	Fri 19.06.26	Fri 06.10.28						Run 2	: Preparatio	n •							,		
51	Installation services	185 days	Fri 17.07.26	Fri 16.04.27						Inst	allation servi	ices vzz		••••••							
58	EN-AA-AS	20 days	Fri 09.10.26	Fri 06.11.26								EN-AA	-AS 222								
59	Add new ASD (Air Sampling smoke Detector) ir	1,5 wks	Fri 16.10.26	Tue 27.10.25									Add n	ew ASD (Air S	ampling smoke D	etector) in	TCC4				
60	Add sirens and "break the glass" buttons in TC	(1,5 wks	Tue 27.10.26	Fri 06.11.26									Add	sirens and "br	eak the glass" bu	ttons in TC	C 4				
61	Fire detection in new UV laser room	1 wk	Fri 09.10.26	Fri 16.10.26									Fire de	tection in new	UV laser room						

WP28 Survey – BE/GM

- Survey of AWAKE before AWAKE 2b dism (Oct 2024)
- Survey of emptied, decontaminated CNGS area (Jun 2026)
- Establishment of new geodesic network TCC4 (Jul 2026)
- Marking position new components (Aug 2026)
- Alignment of new components (May Jun 2027)
- Smoothing (V/H) and 3D scan (~early 2028 \rightarrow add to planning)
- Minutes preliminary discussion: EDMS 3082925

WP28 Survey – BE/GM

ID	Task Name	Duration	Start	Finish	24			202	25		2026	20	27	20	28		202
					Half	2, 2024	Half 1,	2025	Half 2, 2025	Half 1, 2026	Half 2, 2026	Half 1, 2027	Half 2, 2027	Half 1, 2028	Half 2, 2028	Half 1, 202	29
					JAS	6 O N D	JFM	AMJ.	JASOND	JFMAM	JJASOND	JFMAMJ	JASOND	JFMAMJ	JASOND	JFMAN	N 1 1
4	RUN2c	1497 days?	Thu 03.10.24	Fri 09.08.30	RUNZC												
5	Survey: measurement of the components and TCC4 ne	12 wks	Thu 03.10.24	Thu 17.10.24		Surve	y: measu	irement (of the compone	nts and TCC4 i	network w.r.t. TT4	11					
42	Run 2c Preparation	590 days	Fri 19.06.26	Fri 06.10.28					Run 2c	Preparation	•••••••						
43	BE-GM	20 days	Fri 19.06.26	Fri 17.07.26						BE-GM	9229						
44	Survey of cleared out CNGS area	1 wk	Fri 19.06.26	Fri 26.06.26							Survey of clear	ed out CNGS are	a				
45	Establishment and maintenance of new geodeti	20 days	Fri 19.06.26	Fri 17.07.26	nce of r	new geod	etic refer	rence net	tworks for AWA	KE extension	9779						
						-											
46	Installation	1 wk	Fri 19.06.26	Fri 26.06.26							Installation						
			111 25100120	20100120													
47	Measurements	2 wkc	Eri 26.06.26	Fri 17 07 26							Measuremer	its					
47	inicasul efficiency	3 WK3	111 20.00.20	11117.07.20													
40	DE CM modilies out the new comment have a	المراجعة المراجعة	5-14.00.20	Mar 17 00 20							PE GM m	arking out the pr	w component be	om nointe on th	o floor (reference	o for installs	ation
49	BE-GWI- marking out the new component beam po	uluay	Ff1 14.08.20	Won 17.08.20							DE-OW- III	arking out the ne	w component be	an points on th			iuon a
110		ar dava	Mar 47.05.0							6. mm - 1.1							
116	Survey (/:\ no activities in parallel /!\)	25 days		1Mon 21.06.27						Survey (/	Vito activities in p	baraner / ! \)					
	Details to be defined. Alight	nent 'C	iz-Us 20.	27,													
	Smoothing Q1 2028, 3D)-Scan Q	2 2028														

WP29 Ethernet, Wifi, GSM, TETRA – IT/CS

- Extend existing GSM, TETRA infrastructure towards the rest of TCC4 (the former CNGS area is not equipped)
- According to requirements from other CPs: add Wifi, Ethernet where needed

ID	Task Name	Duration	Start	Finish	24			2	2025				20	26	2	027		202	8			20
					Half	2,2024	Half	1,2025	H	alf 2, 2025		Half 1, 20	026 M	Half 2, 2026	Half 1, 2027	Half 2, 2027	Half 1, 20)28 M	Half 2, 202	28 H	Half 1, 20	29 M
4	DUNDe	1407 days2	Thu 02 10 24	Eri 00 08 20					, <u>,</u>					JAJONU					AJUI			<u>WI J</u>
4	NUNZC	1497 uays:	110 05.10.24	FII 09.06.50	NO NZU																	
42	Run 2c Preparation	590 days	Fri 19.06.26	Fri 06.10.28						Run	n 2c Pr	eparati	ion 📼									
E1	Installation convisos	10F days	Fri 17 07 26	Fri 16 04 27						In	etalla	tion sor	vicos									
51	Installation services	185 úays	FII 17.07.20	FII 10.04.27							istana	uon sei	vices									
74	IT-CS	20 days	Fri 29.01.27	Fri 26.02.27										IT-CS	00							
75	CCM and Tátra	10 days	Eri 20 01 27	Fri 12 02 27										GSM and Tétra	88							
75	GSIM allu Tetra	10 days	FII 29.01.27	FII 12.02.27										USIVI and retra	-							
77	Put connectors	1 wk	Fri 05.02.27	Fri 12.02.27											Put conne	ctors						
70	Ethornot	1 wk	Eri 12 02 27	Eri 19 02 27	-										Ethernet							
/0	Ethemet	1 WK	FIT 12.02.27	FIT 15.02.27											Lucinet							
79	Wifi	1 wk	Fri 19.02.27	Fri 26.02.27											Wifi							

Critical issues in integration

- Integration: fitting "everything(*)" in TSG4. "Everyone" wants an area shielded from radiation and close to beamlines.
- Safety: Personnel access to/in/from equipment in TCC4 is tricky because of diagonal e-lines spanning the cavern width.
- Cable routing from TSG4 to TCC4 (hopefully easier than Run1!) and in TCC4 (leave passage, do not interfere with crane)
- RF-guide routing ("as straight as possible") from TCV4 (via TT43, TT41?) to TCC4 do not interfere with crane and o not limit passage height.
- Many (TE-VSC, EN-MME for supports, EN-EL for cables, EN-CV for magnet cooling, etc.) need a layout with functional positions, heights, etc. already now, but main beamline equipment is not designed yet → use simplified layout, use assumptions based on groups' expertise.

(*) all equipment and services racks, AHU for TCC4, UV laser room, one or two streak rooms, one spectrum room, UPS, transformer, ...

Critical issues in tech requirement collection

- Late full funding of AWAKE run 2c (Jun 2024)
- Needed to give first cabling list Apr 2024, final list in Sep 2024 (also for racks and fibers) while some equipment studies have only just (re)started → extrapolate from Run 1, best guesses
- Need to know CV needs (heating, cooling, alarms) and EL needs of main equipment owners by ~Sep 2024 to ensure equipment can be designed and procured for timely installation → extrapolate from Run 1, best guesses (some margin in design)
- TE-VSC, EN-MME need to know what the other CPs (laser, beamlines, e-sources, beam instrumentation) need in specs. CP4 provides a simplified layout, the rest must come from others.

Next steps for CP4

- Distribute simplified layout (with CAD model) when available
- Start pre-integration meetings when the service experts have sufficient input from CPs/WPs – start with EN-EL and EN-CV
- Collect any comments on planning from this meeting (and subsequent discussion) – though it may be too early
- With information from CPs and WPs: start establishing a first "readiness milestone" planning