Table 3.1c: List of Deliverables

Deliverable (number)	Deliverable name	Work package number	Short name of lead participant	Type	Dissemination level	Delivery date (in months)
1.1	Data-management plan	1	CERN	O	P	5
1.2	Preliminary ESPPU report	1	CERN	R	P	36
1.3	Consolidated ESPPU report	1	CERN	R	P	48
2.1	Beam-induced background and detector configuration	2	UniPD	Data	PU	30
2.2	Detector performance by using physics processes	2	DESY	R	PU	36
3.1	Final report on parameters and initial study for the Proton Complex	3	ESS	R	PU	45
4.1	Development of BDSIM simulation	4	UKRI	Other	PU	24
4.2	Advisory Report on key subsystems for ESPPU input	4	UKRI	R	PU	33
4.3	Consolidated Report on key subsystems	4	UKRI	R	PU	45
5.1	Report on the collider ring design	5	CERN	R	PU	45
5.2	Report on the design of high energy acceleration complex	5	CEA	R	PU	44
6.1	Report on RF for MCC and HEC	6	CEA	R	Public	45
6.2	Report on design of high power and high efficiency RF power sources	6	ULA	R	Public	42
7.1	Preliminary report on muon collider magnets	7	CERN	R	PU	33
7.2	Consolidated report on muon collider magnets	7	CERN	R	PU	45
8.1	Presentation of cooling cell conceptual design	8	UMIL	O	PUBLIC	15
8.2	Final report on cooling cell design	8	UMIL	R	PUBLIC	42

Table 3.1d: List of milestones

Milestone number	Milestone name	Related work package(s)	Due date (in month)	Means of verification
M1.1	Web Site Available	1	2	Website online
M1.2	Kick-off meeting	1	3	Indico site
M1.3	Design data-base available	1	6	DMP published
M1.4	Annual meeting 1, 2, 3	1	15, 27,	Indico site, turn

			39	into three milestones
M2.1	Training on detector design and physics performance tools	2	6	Training material
M2.2	Workshop on MDI and IR design	2	13	Indico site
M2.3	Release of simplified detector performance model (DELPHES card or/and similar format)	2	18	Model published on the website
M2.4	Workshop on detector design and physics performance with a public lecture on Muon Collider	2	24	Indico site with presentations
M2.5	Publication of report of detector performance with major physics process at several CoM energies	2	48	Peer reviewed paper, risky
M3.1	Update for the proton complex parameters and review with WP4	3/4	13	Table of parameters approved by SL Report
M3.2	Preliminary report on the linac and accumulator work	3	33	Report
M4.1	Baseline Demonstrator Cooling cell design	4	12	Specification report
M4.2	Initial Assessment of Target radiation load on magnet systems	4	11	Report
M5.1	Mini-Workshop with pulsed magnets	5	15	Indico site
M5.2	Tentative design of the interaction region	5	18	Optics files
M5.3	Preliminary design of the collider	5	33	Optics files
M5.4	Preliminary design of the pulsed synchrotrons	5	32	Optics files
M5.5	Tentative design of the FFA	5	24	Optics files
M5.6	Tentative Impedance budget in the collider and pulsed synchrotron	5	24	Dataset
M6.1	Preliminary report on breakdown mitigation for cavities for muon cooling cells	6	24	Report published
M6.2	Preliminary report on RF acceleration for rapid cycling cyclotrons of HEC	6	33	Report published
M6.3	Preliminary set of parameters for cavities for muon cooling complex	6	32	Report published
M6.4	Preliminary assessment of specifications for RF power sources for muon collider	6	24	Report published
M7.1	Report on solenoids and TPL experiments	7, 4, 8	12	Report
M7.2	Same as M5.1, remove?	7, 5	15	Indico Site
M7.3	Report on RCS and HCS configurations	7, 5	24	Report
M7.4	Workshop on ultra-high-field solenoids	7	30	Indico Site
M7.5	Report on HTS fast-cycled magnets	7	32	Report
M7.6	Report on solenoid conceptual design	7, 8	34	Report
M7.7	Report on high-field collider magnet design	7, 2, 5	33	Report
M7.8	Workshop on high-field collider magnets	7	42	Indico Site
M7.9	Report on footprint, power and cost model	7, 1	44	Report
M7.10	Report on R&D and impact	7, 1	44	Report

M8.1	Selection of Technology: RadioFrequency	8	12	Report
M8.2	Selection of Technology: Solenoid	8	12	Report
M8.3	Selection of Technology: Absorber/window	8	12	Report
M8.4	Cooling cell Design Intermediate Report	8	24	Report
M8.5	Cooling cell design 3D model achieved	8	33	3D model completed, report?

Table 3.1e: Critical risks for implementation

Description of risk (indicate level of (i) likelihood, and (ii) severity: Low/Medium/High)	Work package(s) involved	Proposed risk-mitigation measures
Unilateral withdrawal of a Partner (low, medium-severe)	1	Other partners will take over responsibility and, ultimately, remaining participants will find the necessary additional resources to compensate.
Significant delay on deliverables (low, medium).	WP 7, WP 4, WP 5, WP 8	Early warning is already foreseen to be given. If more manpower is needed the WP must find the way to reallocate resources. If other deliverables are affected the management have to propose ways to overcome the problem.
Failure to achieve performance goals with realistic target performance specifications		Identify additional means to improve the performance Rebalance the design of the project Adjust performance goals, if unavoidable
Additional challenges are identified that require additional efforts		Participants will make additional resources available, reprioritisation of efforts
Delay in the availability of 10 TeV centre-of-mass energy IR lattice (low likelihood, high severity)	2	Study a procedure to scale the 3 TeV centre-of-mass results to high energy with much less accuracy
Lack of computing resources to fully simulate the beam-induced background for all the IR configurations (likelihood: low, medium severity)	2	Ask the US and Cina associated members to contribute with computing resources
Same as at the beginning		
Same as at the beginning		
Incompatibilities in studies from different tasks (Low Level)	WP3	The WP leader will find a way to accommodates needs on the studies between tasks in a way the interfaces connect and make sense
In the course of the study we find that a certain parameter required by the target (WP4) cannot be achieved (Medium Level)	WP3/WP4	The WP will find a way to increase communication in order to clarify the needs from both WP3 and WP4. Regular meetings between the involved people will be set up in order to find a

		compromise and a solution to the issue.
Hiring difficulty Likely/Medium	All	To promote the open positions on different professional networks to be the most attractive
Accelerator parameters are not feasible Likely/High severity	5	1) To discuss with WP6 and WP7 to find a set of more realistic parameters 2) To reduce a bit the target luminosity to get margins
We know neutrino flux requires mitigation		
Late decision of magnet performance targets for the muon collider complex. Likely for at least parts of the collider complex. Medium severity (potential delay on beginning of magnet design study)	WP3, WP4, WP5, WP7	Use the results of the US-MAP as baseline for feasibility and readiness study, and to define required R&D
Complexity or cost of Technology Performance Limits (TPL) experiments beyond the scope of the work planned	WP7	Resort to basic electro-mechanical characterization measurements to identify design limits, postponing full TPL experiments to the R&D phase
Selected components do not fit available space (risk: medium, Severity: high)	8	Additional iteration on components design, and cooling cell architecture. Organisation of a dedicated workshop open to international experts.

Table 3.1f: Summary of staff effort

	WPn	**WPn+1**	**WPn+2**	**Total Person-Months per Participant**
Participant Number/Short Name				
Participant Number/ Short Name				
Participant Number/ Short Name				
Total Person Months				

Table 3.1g: 'Subcontracting costs' items

Participant Number/Short Name		
	Cost (€)	**Description of tasks and justification**
Subcontracting		

Table 3.1h: 'Purchase costs' items (travel and subsistence, equipment and other goods, works and services)

Participant Number/Short Name		
	Cost (€)	Justification
Travel and subsistence		
Equipment		
Other goods, works and services		
Remaining purchase costs (<15% of pers. Costs)		
Total		

Table 3.1i: 'Other costs categories' items (e.g. internally invoiced goods and services)

Participant Number/Short Name		
	Cost (€)	Justification
Internally invoiced goods and services		
…		

Table 3.1j: 'In-kind contributions' provided by third parties

Participant Number/Short Name			
Third party name	Category	Cost (€)	Justification
	Select between Seconded personnel Travel and subsistence Equipment Other goods, works and services Internally invoiced goods and services		