

Plans for the SPL study

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Important events in 2010

To be able to finalize prototype design details and launch constructions early in 2010, the following meetings are foreseen:

- SPL technical meetings / decisions:

- RF for the SM18 test place January 21 at CERN
- Review of options for RF couplers March 16-17 at CERN
- sc cavities Periodic video meetings starting on January 11
- follow-up of cryo workshop (Vittorio) ?
- high power RF for the SPL May (week 20) at CERN
- collimation: June

- SPL collaboration meetings:

- 4th meeting jointly with ESS June 30 – July 2 in Lund
- 5th meeting November 2010 at CERN

Tasks and deliverables

2008	Analysis and selection of basic design choices (frequency and cryogenics) with report.
2009	<ul style="list-style-type: none"> • Specs of components and layout parameters (HOM damper, RF couplers, cryogenics...) • Progress in the design of the accelerator (error studies etc.) / Design of components [H⁻ ion source, cavities, cryomodule, etc.] / Ordering of electro-polishing equipment.
2010	<ul style="list-style-type: none"> • Development of H⁻ source, Study of RF field stabilization / Design of components (HOM damper, RF coupler, ...) • Processing of sample sc cavities / Detailed design of cryomodule and its content. • Orders of raw material (Nb etc.) + processing and testing systems • Start fabrication of cavities, RF and HOM couplers, tuners, prototype cryomodule, He tanks... • <u>Orders for upgrade of SM18 test stand (704 MHz high power amplifier with of pulsed power converter, clean room equipment, auxiliary systems, 2 K cryogenics...)</u>
2011	<ul style="list-style-type: none"> • Reports on H⁻ source development and RF field stabilization • Low and high power test of externally built cavities (BNL + CEA) • Processing and measurement of sc cavities at CERN • Delivery of components for prototype cryomodule (tuners, He tanks, RF couplers...) • Upgrade of SM18 (704 MHz RF system and cryogenics) • Draft of detailed CDR
	<ul style="list-style-type: none"> • Commissioning of 704 MHz RF system in SM18 • Assembly and test of complete cryomodule with 8 cavities / High power test of multiple cavities • Publication of Detailed Conceptual Design Report and cost estimate



Management instructions

- Question (January 8) to Steve Myers:
“... we are almost ready to spend for upgrading SM18, building SC cavities and their auxiliary devices, designing in detail an SPL cryomodule and building it...”
- Answer (January 11):
“... All of this seems related to R&D rather than construction so I believe it is fine. For the time being I would like to avoid any expenditure on construction related work with SPL and PS2. We may have a better idea after Chamonix etc. So assuming my belief is correct this spending is OKed.”

Budget requested/approved in the MTP2009

Item			2010	2011	2012	TOTAL
1.8	Upgrade of clean room equipment and auxiliary systems in SM18	Manpower (FTE)	0.5	0.5		1
		Material (kCHF)	200	1000	430	1630
1.9	Upgrade of cryogenics in SM18	Manpower (FTE)	0.2	0.2		0.4
		Material (kCHF)		2350		2350
3.1	High power amplifier and 704 MHz	Manpower (FTE)		0.5	0.5	1
		Material (kCHF)	100	700	700	1500
3.2	Modulator design and construction	Manpower (FTE)		1	1	2
		Material (kCHF)		300	500	800
TOTAL		Manpower (FTE)	0.7	2.2	1.5	4.4
		Material (kCHF)	300	4350	1630	6280

Warning! Only the total Material budget is reasonably secured.

- **Manpower is still a subject of negotiation with Group Leaders/ Department Heads. It will be finalized in the context of the preparation of the MTP2010.**
- **The Material budgets finally allocated will differ because:**
 - external in-kind contributions (e.g. ESS-paid Modulator) are likely to reduce the CERN allocation
 - additional needs have been found (e.g. development of RF coupler)

Time and resources are limited!

⇒ Focus on implementing basic capabilities

(no time to develop new RF amplifier, but essential to have high rep. rate pulsing)

⇒ Distribute the work in synergy with partners

(ESS engineer to help with klystron specs.?)

⇒ Look for external in-kind contribution(s)

(Swedish modulator as a demonstrator of Scandinova's capability to provide ESS-type of device)



It will not be easy...

SPARES

Resources [1/3]

"New Initiatives"

		2008	2009	2010	2011	2012	TOTAL
Management (travels and visitors)	Manpower (FTE)	0.75	1	1	1	0	3.75
	Material (kCHF)	20	30	50	50	0	150
Optics design and beam dynamics	Manpower (FTE)	0.5	1	1.5	1.5	0.5	5
	Material (kCHF)	0	0	0	0	0	0
SLHC-PP [CNI in FP7] (H- source and RF field stabilization)	Manpower (FTE)	0.6	1.8	2	0.8	0	5.2
	Material (kCHF)	10	302	600	180	0	1092
Cryomodule devt. (CERN)	Manpower (FTE)	0.75	1.3	1.3	1.2	0.5	5.05
	Material (kCHF)	0	150	550	150		850
Beam instrumentation	Manpower (FTE)	0	0.2	0.3	0.5	0.5	1.5
	Material (kCHF)	0	0	10	50	40	100
SC cavities technology	Manpower (FTE)	0	0.75	0.75	0.75	0	2.25
	Material (kCHF)	0	50	100	50	0	200
Radio protection study	Manpower (FTE)	0	0.6	0.8	0.8	0.8	3
	Material (kCHF)	0	0	0	0	0	0
Civil Engineering study (with infrastructure)	Manpower (FTE)	0	0	1	1	0	2
	Material (kCHF)	0	0	80	80	0	160
Equipment design (vacuum, nc magnets, power converters, etc.)	Manpower (FTE)	0	0	1.5	2	1.25	4.75
	Material (kCHF)		0	0	0		0
TOTAL (CERN)	Manpower (FTE)	2.6	6.65	10.15	9.55	3.55	32.5
	Material (kCHF)	30	532	1390	560	40	2552
Cryomodule devt. (French in-kind)	Manpower (FTE)	0	2	2.5	2.5	0.5	7.5
	Material (kCHF)	0	0	210	200		410
TOTAL	Manpower (FTE)	2.6	8.65	12.65	12.05	4.05	40
	Material (kCHF)	30	532	1600	760	40	2962

Resources [2/3]

Additional resources

Item		2010	2011	2012	TOTAL	
1.1	Management (travels and visitors)	Manpower (FTE)		1	1	
		Material (kCHF)		50	50	
1.2	Fellows and students	Manpower (FTE)	4	4	4	12
		Material (kCHF)				0
1.3	Niobium procurement	Manpower (FTE)				0
		Material (kCHF)	300			300
1.4	Upgrade of workshop equipment (HPWR stations)	Manpower (FTE)	0.5			0.5
		Material (kCHF)	200			200
1.5	Adaptation of CEA RF coupler for integration in cryomodule	Manpower (FTE)	0.5	0.5		1
		Material (kCHF)	150			150
1.6	Fabrication of 8 cavities with RF and HOM couplers	Manpower (FTE)	1	1		2
		Material (kCHF)	250	850		1100
1.7	Processing and measurement of 8 sc cavities	Manpower (FTE)	1	1.5		2.5
		Material (kCHF)	30	100		130
1.8	Upgrade of clean room equipment and auxiliary systems in SM18	Manpower (FTE)	0.5	0.5		1
		Material (kCHF)	200	1000	430	1630
1.9	Upgrade of cryogenics in SM18	Manpower (FTE)	0.2	0.2		0.4
		Material (kCHF)		2350		2350
2.1	Fabrication of 8 tuners and He	Manpower (FTE)		2		2
		Material (kCHF)		800		800
2.2	Assembly of complete cryomodule	Manpower (FTE)		1.5	1.5	3
		Material (kCHF)		300	100	400
3.1	High power amplifier and 704 MHz	Manpower (FTE)		0.5	0.5	1
		Material (kCHF)	100	700	700	1500
3.2	Modulator design and construction	Manpower (FTE)		1	1	2
		Material (kCHF)		300	500	800
TOTAL		Manpower (FTE)	7.7	12.7	8	28.4
		Material (kCHF)	1230	6400	1780	9410

Summary

		2008	2009	2010	2011	2012	TOTAL
"New Initiatives" (CERN)	Manpower (FTE)	2.6	6.65	10.15	9.55	3.55	32.5
	Material (kCHF)	30	532	1390	560	40	2552
Additional	Manpower (FTE)			7.7	12.7	8	28.4
	Material (kCHF)			1230	6400	1780	9410
TOTAL for CERN (all priorities)	Manpower (FTE)	2.6	6.65	17.85	22.25	11.55	60.9
	Material (kCHF)	30	532	2620	6960	1820	11962