SM18 (SPS) Test Plan

Week: 49-51 Cool-down	Christmas TS (RF Cond. ?)	Week: 02-03 RF/Align Checks	Week: 03-04 Cooldown(?)	Week: 05-08 SPS Installation

This list is a general guideline
Most if not all interface requirements communicated to M7 team by each task

- Warm measurements on the cavities (mostly completed)
- All PU+HOM cables attenuation Cavity-CM (in reflection + TDR) & interlock checkout
- Warm RF coupler conditioning, 1 kW SSA
- 2K cooldown (Cryo) + Frequency (& HOM) tracking during cooldown, B-field sensors
- Freq tuning (400.528-400.788 MHz) with low power RF, motor control
- 2K HOM measurements + full spectrum check for two cavities (low power), determination of Q_L
- Calibration of input power ($\mathrm{P_f}$, $\mathrm{P_r}$, $\mathrm{P_t}$), power level (?) and $\mathrm{Q_{ext}}$ measurement (field decay)
- Pulsed RF conditioning, 1kW SSA
- Kick voltage determination as a function of $\mathrm{P_f}$ & $\mathrm{P_t}$ (after a power recalibration with LLRF)
- LLRF (cavity & tuning loops), feedback, phase noise, RF phasing, amplitude stability
- Lorentz force compensation, Microphonics measurements, pulsed operation (?)
- Dynamic heat load with voltage ramping + feedback on (Q_0meaurement using ΔP)
- Logging of X-rays at high field (at 1 kW, very little or none)

Qualification generally done independently first and then together (cross talk)

HPRF, SSPA & RF Conditioning

E. Montesinos

- ✓ 1.2 kW CW @ 400 MHz
- ✓ Inlet 230 VAC
- ✓ Air cooled
- ✓ 3/8’’ N input from control room
- ✓ 7/8’’ 7-16mm output to bunker
- ✓ 7/8’’ 7-16mm to WG WR3200
- ✓ FPC WG system

1 SSPA available, only one cavity at a time
Stand-alone system, cables in places
Generator RF from LLRF at fixed output (+10 dbm)

IOT solution for SM18 (if no SPS) will require ~4 months of installation

Slow Controls ,Planning

L. Arnaudon, D. Glenat

- To be revised after update on M7 status

	semaine 39							semaine 40							semaine X							Rack	duration
	25	26	27	28	29	30	1	02	03	04	05	06	07	08	x	x	x	x	x	x	x		
SM 18 test stand	SM 18 test stand operation																						
Slow controls																							
installation PLC control	Installation PLC control																					AYZF120/122	1/2 day
Install Interlock	Install Interlock																					AYZF120/122	1/2 day
Blower Power installation	Blower Power installation																					AYZF120/122	1/2 day
Tuner Motor installation	Tuner driver installation																					AYZF120/122	1/2 day
Tuner Motor test								Tuner Motor test														Tunnel M7	1/2 day
Test Control with Cryo, Vaccuum ...															Test Control							SM18	1 day
Test Control system with amplifier															Test PLC with amplifier							SM18	1 day

Software

A. Butterworth

- Power system software:
  - SILECS PLC interface exists for SPS IOTs (David)
  - Control of SM18 amplifiers/additional FESA/Inspector?
- LLRF software list (Niall):
  - Function Generator class (Oct w39)
  - Crab LLRF FESA class (mid Oct w41)
  - Inspector panel (w41)
  - Sequencer (w47-end December)
- ObsBox for quench surveillance (w39)
- All could be tested during a (hypothetical) cryomodule RF test
  - Preconditions: Module cold, conditioned, RF power system operational, LLRF installed/connected