Beam Commissioning Working Group

Minutes for 16 November 2018

Present: V. Kain, **G. Rumolo**, S. Albright, H. Bartosik, G. Bellodi, H. Damerau, B. Goddard, M. Gourber-Pace, A. Huschauer, K. Li, G. Papotti, F. Roncarlo, F. Tecker,

Meeting objectives

Presentation and discussion of the SPS beam commissioning schedule.

Approval of Minutes and Matters Arising - V. Kain

The minutes of the 2nd and 9th of November are accepted without comment.
The follow-up points are briefly discussed, they will be dicussed in detail in at a future meeting.

SPS Beam Commissioning - K. Li

Presentation

- The baseline schedule is 6 weeks of beam commissioning with an LHCPROBE available on the 19th of March.
- The early part of the schedule is based around the needs of RF, starting with LHCINDIV. The planned time is 1 week but up to 2 weeks is scheduled in case required. G. Papotti says it may be significantly faster but this cannot be known.
- SPS Beam Dump System (SBDS) Commissioning is not yet included in the schedule, but must be included ahead of first acceleration.
- First beam (pilot) to LHC is planned for the end of week 4 based on an optimistic schedule.
- The optimistic schedule has LHC PROBE, Fixed Target beams and first multi-bunch LHC beams available after 6 weeks, more work will still be required to achieve nominal performance.

Discussion

- B. Goddard asks if starting commissioning with Q26 optics, and then switching to Q20 is worthwhile. V. Kain says the transition is quick and easy, and in general the Q26 cycle is easier to acheive.
- G. Rumolo asks about possible impacts of the RF feedbacks on first commissioning, G. Papotti says this is mostly a concern for multi-bunch beams so will only be a factor towards the end of commissioning.
- V. Kain says that before commissioning the beam dump on the ramp there will be some commissioning on the flat bottom required.
- B. Goddard asks if the aperture measurement precedes the beam based alignment, V Kain says yes.

- H. Damerau asks how long it usually takes to get to slow extraction after a YETS, V. Kain says it usually takes two or three weeks. H. Damerau observes that there is a lot that is new, if commissiniong goes smoothly this seems possible, but if there's a delay somewhere it could take a lot longer, V. Kain says this is true and if there's a delay then the schedule will have to be adjusted to compensate.
- B. Goddard asks how far in advance of ramping the beam dump will be tested, V. Kain says it is intended to be about 2 weeks.
- F. Roncarlo asks if the end of week 4 is when 25ns trains are planned, K. Li says no. F. Roncarlo says there may be some beam instrumentation optimisations required for 25 ns trains that would take longer, V. Kain says they will take this into account.
- B. Goddard says there will be a lot of optimisations required before sending bunch trains to the LHC for things like collimator positions, K. Li says this will be taken into account.
- H. Bartosik asks if it is necessary to commission the longitudinal damper so early, as it is a lower priority item. B. Goddard suggests giving prioritisation to the items along with the schedule. K. Li agrees and says in this case the damper is primarily needed for LIU intensities so may be given a lower priority.
- G. Rumolo suggests more time may be needed for scrubbing than currently allotted, V. Kain suggests blocking a week for scrubbing. H. Bartosik says that it's also possible to have a short cycle in parallel with the scrubbing cycle for other tests.
- B. Goddard suggests caution with the schdeule for the intensity ramp up as there may be unexpected problems that arise due to the large number of systems that will be tested and perhaps "scrubbing" should be renamed "conditioning" to account for this (e.g. outgassing of the new beam dump, kicker vacuum conditioning, etc) G. Rumolo and V. Kain agree.
- H. Bartosik asks when the LHC expects pilot and multi-bunch beams to be available. V.Kain says 6 weeks for pilot, there is not a precise time for multi-bunch. B. Goddard suggests giving a reasonable time estimate of when multi-bunch beams will be available from the injector side (instead of having it imposed by the LHC) to allow more realistic planning. V. Kain agrees and says this will be included in the next update of the planning schedule.
- K. Li says that the current schedule has beams available ahead of the baseline schedule. V. Kain thinks this is good as it gives a built-in contingency in case of delays.
- G. Papotti asks if there's an official request for when fixed target beams will be available. V. Kain says users have requested it as soon as possible, but with no specific target.
- B. Goddard asks if it would be worth planning a days technical stop during commissioning to allow equpment teams to have access if needed. V. Kain says there will be a stop during the beam based alignment. B. Goddard suggests a specific day be set aside for access might be beneficial. V. Kain says 24 hours could be planned in case it is necesary to break the vaaccuum. B. Goddard suggests it is worth specifically including it in the schedule as a time when teams can go in to allow it to be planned in advance.
- B. Goddard asks if specific interlock tests are planned from a machine protection point of view, rather than as part of the general Individual System Tests and commissioning. V. Kain says it is not planned yet but should be included (e.g. BLM tests with beam)

- F. Roncarlo suggests adding specific scheduling for beam instrumentation. V. Kain says this is possible, and they would also want to plan it to suit the beams that would be required at each stage.
- G. Rumolo suggests making a reduced schedule that details which beams would be required and when to aid in planning for the injector chain.
- F. Roncarlo asks where to find specific dates that deliverables are expected. G. Rumolo says the master schedule is the best place and a new version is about to be released, but for the SPS there is no change.
- V. Kain says that a lot of work is planned and it is a tight schedule, but as a lot can be done in parallel it is probably not unreasonable.
- F. Roncarlo asks if there is a plan to have experts on shift for 24 hour work during commissioning. V. Kain says this is something that should be discussed. F. Roncarlo says that after LS1 a specific team was set up to be available overnight. B. Goddard thinks making it a regular thing should be avoided due to the number of machines and the time scale involved. G. Papotti says that in case of 24 hour work there is a risk of work being done over night that then needs debugging during the next day, which could cause problems.
- V. Kain suggests making a distinction between what is promised to be available and what is intended to prevent unrealistic expectations.
- F. Roncarlo asks about the SBDS BTV and if this will be part of the SBDS comissioning. V. Kain says yes.
- F. Tecker asks when it will be decided if the first multi-bunch beam will be BCMS or LHC25. V. Kain and G. Rumolo suggest the LHC25 should be a higher priority as they are more useful for scrubbing. H. Damerau says if one of them works the other one should as well so for the PS it will not have a big impact on the schedule.
- V. Kain asks if it is beneficial to discuss the preliminary schedule this early, there is a general consensus that it is. B. Goddard says one specific benefit is that this allows planning well in advance what will be required from preceeding machines.

The next meeting is on the 23rd of November on the Linac4 LBE line run.