

LIU project team meeting

Notes from the meeting held on 5 October 2017

Present: G. Bellodi, J. Coupard, A. Funken, B. Goddard, K. Hanke, M. Meddahi,
G. Rumolo, R. Scrivens

Excused: A. Lombardi

• Arising matters (M. Meddahi)

- Chamonix 2018: Next preparation meeting will take place on 10 October and a draft program of the LIU session with names of the convener(s), scientific secretary and speakers should be presented. Also the list of the invitees should be given. Malika presented a possible [outline for the LIU session](#). Malika and Giovanni will be conveners and will open the session with a short introduction on the beam parameters and the questions that will be addressed in the session (including the recommendations from the reviewers in 2017). Possible speakers have been suggested. Everybody agreed that, as far as possible, young people with an overview on the different machines should be given the chance to present in Chamonix 2018, too, as it was the case last year. The current proposal for the source+Linac4 talk is Alessandra, she will confirm. The ions for PS-injectors will be presented by Reyes Alemany, LIU-PSB by Gian Piero Di Giovanni, LIU-PS by Alex Huschauer, LIU-SPS by either Kevin Li or Hannes Bartosik. A talk on first ideas of post-LS2 recommissioning and what we can still learn for the 2018 restart will be given by Verena and the session will be closed by a talk of Julie on the LIU planning in LS2, which will bridge our session to the LS2 session. Malika also suggested dates for the presentations of the outlines of the talks in the slots of the LIU-PT meeting or others. Invitation will be sent out shortly.
- LIU Working Groups: There has been quite some discussion lately on the need to have dedicated beam dynamics working groups for the different machines. A new beam dynamics WG for the PS activities has been formed and meets regularly. Concerning the PSB, a list of activities has been compiled and these questions could be addressed in the framework of the bi-weekly LIU-PSB meetings (which could be devoted to beam dynamics once a month). In order not to multiply the number of working groups and meetings to attend, Malika proposes a [new structure](#) in which the LIU-PT meetings will take place bi-weekly and will be interleaved with LIU-PT beam performance meetings, which will de facto replace the monthly LIU Beam Parameter WG meetings and will be run with a very similar list of attendees. In these meetings, the beam dynamics activities will be reviewed at the project level following the list of priorities emerged from the LIU Beam Parameter WG meetings.
- The extraction from EVM has been sent by Sylvie and is much more in line with what expected, which indicates correct reporting from WP holders. From now on, cost and schedule variances will be sent around both according to the current baseline, which is stamped regularly by Malika, and according to the last C&S Review. That's why some items will appear as being late by several months with

respect to this second reference – which we will have to be presented at the next C&S Review and adequately defended.

- **Update on LIU-PLI activities (J. Coupard)**

- Linac4: Technical stop is in progress, the installation of debuncher is being finished. Instrumentation is being installed, too, for which some safety documentation is still missing. The RR will then continue as planned.
- Installation readiness: 99% completed, VSC information yet to be included. Items with late readiness need to be checked. Next week the results will be presented before releasing this information in EDMS.
- PLAN: Version 3 is now ongoing and WP have been notified. From the next LIU-PT meeting onwards a follow up on this will be presented. There are about 15 activities in the 'Created' state to be followed up. Partial dismantling of the Linac2 for the Linac4 connection is now in PLAN with all the group contribution requests.
- ECR follow-up: Only few ECRs for the YETS are still missing (although deadline has passed), such as the SEM Grid in the PSB. The process has now started for LS2. This will be closely followed up in LIU coordination and a reminder of all that is expected for LS2 ECR will be sent out.
- An LIU-PLI meeting will be organized to review some of the received SRRs + ECR for the impedance reduction and a-C coating for YETS.
- The LS2 schedule will be presented on 19th October.
- If one additional week for LHC, this will not change the schedule for the injectors as the fixed target beam has to be provided for the other experimental areas.
- PS Parallel Configuration: Report this afternoon by Vojtech Simetka

- **Round table on progress on the various activities**

Linac4 – G. Bellodi

- Average 91% availability recorded during the first round of RR.
- After source exchange, a current of 35 mA is available out of the source, to be compared with the 23 mA available with the old source.
- The tunnel has been opened for the installation of debuncher + miscellaneous BI activities (laser detector, WS)
- Now will move to special permit phase for RF conditioning. The tunnel will have to be opened again on 20 October for a visit.
- On 30 October the proper restart of the RR will take place with full passage of responsibilities to OP.

PSB + PS – K. Hanke

- PSB:
 - Last meeting was on PSB scrapers, for which there is now a solid design. A new version of the EDMS document of functional specifications has been edited by Gian Piero and is now in the hands of Frank Schmidt. He promised to go through the document upon his return from the SC workshop. EN-STI have to start writing the document on the engineering specifications. Iñigo agreed during last LIU-PSB meeting to provide it in the coming months.

- Interlock document: The [last version](#) is under approval in EDMS, to be made sure now that the final implementation will remain within the additional 56 kCHF envelope
- Beam dynamics list has been sent to Malika
- Q-strip power supplies are under discussion; it had been overlooked that they have to work throughout the whole cycle up to 2 GeV. Different solutions have been proposed (e.g. new power supplies, a modification of the cycle, which could be cost neutral but implications need to be clarified not only from the RF point of view)
- BTP line integration is on the agenda for the next meeting, J-M. Lacroix has been contacted again with Yvon in CC. If no progress is made, another task force may be needed.
- PS:
 - Internal dump review was held yesterday. There seems to be a huge progress since last time and a solid technical solution has been presented. However, the timing is tight and there is no time left for drastic design changes. A written report will be provided in ~2 weeks time
 - Injection bumper task force ongoing: Two meetings have been already held and a shorter magnet design is in progress. The power supplies can progress once the electrical parameters of the magnets are defined.
 - TFB: A discussion with Massimo took place, ABP does not want to take any responsibility concerning this system. Someone in OP has been identified to take care from the OP side and while the RF group will still be responsible for the hardware.
 - The EVM data look now very good.

SPS – B. Goddard

- High intensity run is being planned for next week, there is an extended list of important tests to be made with high quality $2e^{11}$ from PS. Detailed tests and shifts will be discussed in a meeting on Friday morning.
- STI has given good proposals to solve the 2 remaining issues with the TCDIL for deep impact (10 s) failure. The production is progressing well.
- The 200 MHz main amplifier demonstrator still has not been accepted, a decision on this will be taken by end of this year.
- Progress with understanding of SPS injection losses: Measurements show very limited momentum acceptance in negative dp direction, which seems to be at QDs in the arcs with the Q20 dispersion peaks, as confirmed by physical aperture measurements. Discussions are ongoing with VSC as there may be a Non-Conformity in some QD locations of the order of 5mm, which needs to be confirmed urgently in the ring. MDs and simulations are continuing, including bunch rotation improvement with 3x 80 MHz and quantifying uncaptured beam coming from PS, and Q22 optics deployment.
- An overview of outstanding impedance issues was presented at LIU-SPS Coordination meeting. Nothing is red-flagged, a lot of work is being done by IWG and VSC to improve around the ring, need to converge by end of this year.
- Documentation is coming thick and fast, on track for the deadlines for various ECRs, FS, DIC, PLAN, etc.
- Out of the 8.6 MCHF annual budget, 10.5 MCHF (123%) are committed, 4.6 MCHF (53%) have been paid.

LIU-ions PS injectors – R. Scrivens

- Follow up on Faraday Cup, for which the ECR was refused by TE/VSC. The issues can be sorted out technically and the design office is on it. By next Friday the loop on the drawing can be closed.

Safety – A. Funken

- [LIU and BE/ICS activities meeting on 28/09](#): list of EIS beam intercepting devices changed or upgraded for LIU to be provided to P. Ninin. Anne said that the only impacts of LIU on the PS complex beam stoppers (EIS) that are documented in the safety files concerns the BI.STP-SW and BI-STP-FA beam stoppers for the PSB and the replacement of Linac2 EIS by Linac4 EIS. The impact on the other beam stoppers needs also to be documented. Malika confirmed that EN/STI should have evaluated/simulated the impact of LIU beams on the different beam stoppers and protection devices. The elements that withstand the LIU beams and the ones that do not should then be known. Action: Klaus to provide the reference of EN/STI studies to the LIU PT team.
- Safety file LIU-PSB POPS-B:
 - POPS-B: descriptive part presented to the PS-CSAP in July being updated (EIS, drain system), then to be sent to Malika for approval.
 - Injection, Rings, Extraction: descriptive parts released.
 - Demonstrative part Injection/Rings/Extraction: draft version circulating with the BE Safety Unit, will then be discussed and completed with the inputs of the SPCs (mid-October).
- Safety file LIU-PS:
 - RF systems, Injection: descriptive parts released.
 - Ring: comments from Malika to integrate before approval.
 - PS dump and TT2 consolidation: no progress to report - descriptive parts to finalize and send to DSOs (postponed to October due the unavailability of the SPCs), then to be presented to a PS-CSAP.
- Safety file LIU-SPS:
 - LIU-SPS dump upgrade: presentation of the descriptive part at the SPS-CSAP on 19/10 (Etienne/Anne).
 - LIU-SPS RF system upgrade: G. Cipolla is collecting the missing contributions for the descriptive part. Once done, the document will be sent to the DSOs (aim: by mid-October).
 - LIU-SPS Ring and transfer line: ready to be sent the DSOs.
 - LIU-SPS aC coating and flange impedance reduction: comment from Malika to integrate before release. Presentation of the safety file and further needs from the project team at the coordination meeting next Monday, 9/10 (Anne).
 - Remaining descriptive parts to be presented to a SPS-CSAP by the end of this year: 23/11 - SPS Ring & TF line + RF systems upgrade if ready. To be confirmed.
- Collect of the documents required by the HSE LSA: meeting organised by Dario on 10/10 to apply the generic modules developed by EN (for EN/CV, EN/EL equipment) to the LIU-PSB and LIU-PS, see templates for EN <https://edms.cern.ch/document/1799941/1/approvalAndComments>. Anne has organised a meeting with BE/BI (Lars Jensen) to discuss the preparation of such templates for BE/BI equipment in the context of the LIU-SPS.

- **AOB**

- The next LIU-PT meeting is scheduled on Thursday 19th October 2017 in Room 865-1-D17. On Thursday 12th October, the LIU-PT slot will be taken by the [LIU meeting with TE/VSC](#).

Minutes by G. Rumolo