

Long Shutdown Integration

List of Issues

As of 3/8/2012

6 GeV/12GeV Accelerator

1. Cryo work (4K trip) at start of down

- **New 3/8/12:** Need a 4K trip (3 days), do the mods, then back to 2K. This will affect PEPPo and SL CM work. This would cause PEPPo run to start after recovery to 2K – but still keep the 2 weeks run as planned. No more than 1 week shift can be accommodated by PEPPo. Minimal impact to SL CM work. Need to review the weekend time at the start of the down and pull together the plan (Arne/Steve working together)

2. Integrated Cryomodule Plan

- New: 1/26/12: Plan being worked. Needs integration with other work, FEL work, 12GeV CM work, availability of test cave/VTA and labor. POC?
- 2/2/12: POC is J. Mammosser. Plan still being worked.
- 2/9/12: A. McEwen has an SRF schedule for all CM work. Plans are being updated. Need to fold information into integrated schedule once it is ready.
- 2/16/12: waiting for revised plan from SRF
- 2/23/12: No change
- 3/1/12: CTF schedule & cooldowns (inventory management) also to be included (after August 1st this will happen). TEDF schedule/VTA to be reviewed. Revised plan from SRF (A. McEwen to be implemented/cross checked with integrated schedule once revised by SRF)
- **3/8/12: Will review SRF plan against all schedules submitted during review process.**

3. ESR

- No major maintenance planned
- Hall B HDice needs 10 days after beam delivery terminates in May; Hall C want until Nov/Dec for HMS recommissioning and then 12GeV power supply checkout
- Need to take a decision as this impacts staff/resources
- 1/18/12 update from W. Oren: Complete. Current plans have ESR operational until July 15, 2012. Warmup to 300 K after that.
- 1/19/12: Claus states to review Hall C power supply testing later in the down and need for ESR. Dianne to touch base with Glenn/12GeV Physics Team.
- 1/25/12: H. Fenker (12GeV Hall C CAM):
 - His current schedule shows them cooling the HMS as soon as beam goes away so that they can test the first two SHMS power supplies -- finishing on July 3, 2012.
 - They would like to keep the HMS cold from then to the end of time, but realize this won't happen.
 - The final three SHMS power supplies are scheduled for testing, again using the HMS magnets as loads, beginning in November, 2012.
- 1/26/12:

- W. Oren stated the ESR is planned to come back up Jan/Feb 2013 but can come up anytime. They want to keep it down as long as possible.
 - HMS cold for a few years (ops budget to support)
 - Claus asked if they could use Hall D solenoid as a load if needed before Jan 2013– G. Young to check
- 2/2/12: Hall C plan still holds for testing first 2 SHMS power supplies July 3rd. Final 3 power supplies are scheduled for Nov. If the schedule cannot be pushed to Jan 2013, then the Hall D Solenoid is an option as a load to be used. Not an issue, but want to keep an eye on this schedule.
- 2/9/12: Will close the issue once the Hall C schedule is implemented in to the LSD schedule.
- 2/16/12: Power supply testing in beginning of down, HMS plan (ESR), power supply testing later in the down (and load needed for these test) – line item activities to be added to the Hall C De-installation schedule review meeting (this is 12GeV Hall C scope, but needs to be included in the schedule review for de-installation).
- 2/23/12: no change. Will close this once information is entered into the integrated schedule.
- 3/1/12: no change. Will close this once information is entered into the integrated schedule.
- 3/8/12: no change. Will close this once information is entered into the integrated schedule.

4. How to cool accelerator back down ?

- New 1/26/12: W. Oren. Maintenance on existing CM and timeframe. Need a minimum load for cryo to function. This is a year from now. Rush to cool new modules?
- 2/2/12: Will understand the timing for this work, but needs information on the process. When to ship He back? L. Harwood needs both sides cold in the spring. Need duration of the cool downs.
- 2/9/12: W. Oren needs duration and logic for the cool downs in the schedule. Which CMs, transfer lines, etc (bigger issue than just linacs), and maintenance on CMs. L. Harwood/S, Suhring working on schedule.
- 2/16/12: CM maintenance work, vacuum work information sent to Ops for review – plans in progress
- 2/23/12: no change
- 3/1/12: vacuum work is ¾ man year – this is like a hurricane recovery. To be captured in Ops Accelerator plan (transfer line work (cryo tech support), CM maintenance (vacuum/SRF support needed). Need cold in January for 12GeV CMs
- 3/8/12: no change, plans in progress

Facilities

• Tunnel Penetration Repair

- 3/1/12: From the 28th Feb Schedule Review held, this scope of work could not be coordinated and has a placeholder in the FML schedule. Need 12GeV Accelerator installation schedule first to determine how to fit in this repair (prototype of waveguide to be considered by FML, penetrations by location to perform).

- 3/8/12: still need information from L. Harwood for tunnel penetration plan. De-humidifier plan being worked by FML and will be implemented in schedule when known.

6 GeV/12GeV Physics

Hall A

- 2/2/12: 12GeV Magnet Mapping (when, where, and by whom), refurbishment of the 9 dipoles (when). Leigh/Will/LeRose to meet to discuss options for mapping and plans for refurbishing. Once worked out, Hall A schedule (12gev & non-12gev) can be reviewed
- 2/9/12: Magnet mapping plan is being worked by L. Harwood and all. Hall A Schedule (minus the magnet mapping section) is ready for schedule validation review.
- 2/16/12: Magnet mapping plan is being worked by L. Harwood and all. Hall A Schedule (minus the magnet mapping section) is ready for schedule validation review.
- 2/23/12: E. Folts working on changes from schedule review. Still need magnet mapping plan from L. Harwood
- 3/1/12: E. Folts working on changes from schedule review. Still need magnet mapping plan from L. Harwood. Action item list still to be resolved with revised schedule submission
- 3/8/12: From Review held: APEX/PREX – don't know which one will be installed first – Ed's schedule has PREX in the schedule now (need decision by Oct/Nov 2012). E. Folts working on changes from schedule review. Still need magnet mapping plan from L. Harwood. Action item list still to be resolved with revised schedule submission

Hall B

- 2/2/12: Hall B De-installation has been submitted to PMI/Dianne, with FY12 scope consistent with an at present assumed 70% funding level.
- 2/9/12: Schedule is being reviewed by hall B team this week and next week. Then ready for schedule validation review.
- 2/16/12: New copy to PMI today, ready for review as planned below.
- 2/23/12: Hall B Team has reviewed the de-installation schedule – W. Akers will send to PMI soon.
- 3/1/12: W. Akers to work with PMI on resource clarification in the revised schedule sent. Preparing for review on 9th March as scheduled on calendars.
- 3/8/12: Ready for review on 9 march 2012

Hall C

- 2/2/12: Need QWeak input for schedule then can review de-installation schedule.
- 2/9/12:
 - Hall C – remapping (general mapping is already in Leigh's beam transport plan, but there are questions/plan to be discussed about additional mapping or something different from Leigh's plan). G. Young/H. Fenker working on mapping requirements.
 - Qweak de-installation plan being worked this week and might be done next week. Alignment, radcon, and all other support groups will be in the plan.
- 2/16/12:
 - Hall C De-installation: QWeak input – answer by next week.
 - Hall C De-installation – push one week to March 5th for review.

- 12GeV Hall C – power supply testing with ESR & HMS cool down time period to test power supplies and HMS keep it cold. – add to Hall C de-installation “review period”
- 2/23/12: no change – still working plan. Walt will send to PMI once ready.
- 3/1/12: no change – still working plan. Walt will send to PMI once ready.
- 3/8/12: no change – still working plan. Walt will send to PMI once ready.

Hall D

- 2/2/12: Need CAM review first before schedule can be reviewed by this team.
- 2/9/12: In two to three weeks, Hall D schedule will be ready for review.
- 2/16/12: on schedule for review as planned below.
- 2/23/12: Schedule changes made and is ready to be pulled from the 12GeV project schedule into the integrated schedule. Dianne/PMI will implement.
- 3/1/12: Will pull from 12GeV project schedule. Glenn/Tom/Tim will meet to cross check against detailed schedule, then implement any changes into integrated schedule. Review will follow. Dianne coordinating review on calendars for march 15th
- 3/8/12: Glenn/Tom/Tim will meet to cross check against detailed schedule, then implement any changes into integrated schedule. Review scheduled for 15 march

FEL

- 1/26/12: They have run plans. Schedule being worked. Prelim plans are in the integrated schedule and will be updated as they firm up details/plans with resources. CM (construction & refurbishment) plans need evaluation against other work for 12GeV (labor)
- 2/2/12: If Navy approves their proposal in 4 weeks will know more and initial funding coming in 4 weeks. FEL is reviewing the CM plans (FEL02/FEL04) and Admiral. FEL 03 & 04 will be Argonne gas processed and whichever one works the best will stay in the FEL. Other will be replaced by Admiral (still to be disassembled, processed and installed). FEL is also working on the physics design (2 weeks) for cryo unit on top of the test cave. Cryo unit from FEL has to be pulled out.
- 2/9/12: Plans being updated and in progress.
- 2/16/12: Plans being updated and in progress.
- 2/23/12:
 - G. Neil’s presentation – see website for presentation link. Key points listed below.
 - Run Ops until July 31
 - IR-FEL March/April/May
 - UV-FEL May/June (vacuum/alignment help needed)
 - Darklight (NP) June (vacuum/alignment help needed)
 - 2 week experiment
 - In parallel – refurbish Admiral as new C100 (srf help) – this plan being wrapped up
 - Aug 1 – Dec 1:
 - Firm plans being wrapped up: Install admiral in FL02 & (AR process FEL 03/04)
 - Funding dependent & more planning to be done : Remove existing gun, quarter, install new gun, new cryounit tbd, transfer line work as well

- A few months float on this if not done by Dec, but major impacts if longer – will be evaluated when the entire integrated schedule is put together.
 - Vacuum/alignment/mechanical/cryo/electrical help needed for all work
- 3/1/12: Plans being reviewed and pulled together – will be ready for the review as scheduled March 14th
- 3/8/12: Ready for review March 14th – schedule will be sent to review team no later than 9 march 2012

ES&H

- 1/26/12: ARR: Mary sent slides. The plan is good per Leigh. Need to fold in schedule/plan into integrated schedule
- 2/16/12: ESH&Q scope of work that has their resources so they can be folded into the integrated schedule (like RadCon, etc). Dick will follow up for information for schedule.
- 2/23/12: Nothing new to add to the schedule for RadCon or other ES&H personnel tasks for the long shutdown schedule.
- 3/1/12: ARR at BNL being reviewed by Paul this week and comparing what we have done. Dick working ESH&Q resource activities for the schedule.
- 3/8/12: D. Napier/PMI to pull in “keep the lights on” Radcon activities from the 6MSD schedule for this schedule and review with K. Welch. ARR phased process prior to commissioning with beam – need to fold into schedule.

Lab-wide integrated schedule

- **As of 3/8/12: Schedule validation reviews plan:**
 - **Schedules Reviewed:**
 - Hall A (12GeV & Non-12GeV) – not including magnet mapping – Feb 16th review held – Folts/PMI working on changes.
 - FML – Feb 28th review held – Sperlazza working on changes, revision sent
 - **Schedules to be Reviewed:**
 - Hall B De-Installation – March 9th meeting scheduled
 - FEL – March 14th meeting scheduled
 - 12GeV Hall D – March 15th meeting
 - Hall C De-Installation – March 21st meeting scheduled
 - Peppo & Non-12GeV Accelerator – week of March 19th
 - 12GeV Accelerator – week of March 26th
 - 12GeV Hall B (installation starts ~Dec 2012) – week of March 26th
 - 12GeV Hall C (installation starts ~Oct/Nov 2012) – week of March 26th

Closed Issues

1. **(FML) Waste & Recycle Requirements for LSD**
 - 2/2/12: Waste, recycle, and space requirements for waste are needed by FML for the long shutdown activities. RadCon is already working with groups for activated waste estimates.
 - 2/9/12: All to send requirements for Waste, etc to B. Sperlazza. Walt has provided a plan for physics. Bob will organize a meeting.
 - 2/16/12: Meeting set up for 1 march – if it’s not on your calendar and you need to attend, or have others that need to attend – please contact B. Sperlazza

- 2/23/12: no change. Meeting planned for 1 March – on calendar program
 - **3/1/12: meeting held today 1 March at 0900. Bob organizing further meetings to get further details. Issue is closed and being worked by FML**
- 2. (Non-12GeV Accelerator) Hall A Dump**
- 2/2/12: Steve stated the Hall A Beam Dump plan will be developed and provided for the schedule.
 - 2/9/12: Plan in progress
 - 2/16/12: Plan in progress – re-evaluating in light of Hall C dump issues recently experienced
 - 2/23/12: no change
 - **3/1/12: group has been formed and working on the plan/timing for the work. Issue is closed and information will be entered into the integrated schedule under non-12gev accelerator WBS (Arne/Steve)**
- 3. PEPPO running at start of down**
- Meeting 1/17/2012 with L. Harwood to discuss compatibility of Peppo running concurrently with installation work in the NL. Seems feasible. To be discuss with the rest of the LDS Team.
 - 1/26/2012 Discussion Topic at LSD Meeting
 - Per Leigh: In the north linac, 12GeV accelerator plans:
 - West Recombiner, OR section, warm gas piping
 - This work will occur at start of down and throughout the summer
 - Work to be done during the day and a half of the swing shift
 - This work schedule for the North Linac will allow for PEPPO to run in parallel (second part of swing shift and owl shift)
 - PEPPO requires cryogenics and will have to delay warming up the North linac. Leigh states there is float for warming up the north linac work.
 - PEPPO requires a PSS system as well
 - Leigh states we wouldn't start de-certification of the North linac upgrade until Peppo is done, but staffing needs to be considered if this work is delayed (and spiked later)
 - Will Oren doesn't want to do transfer line work in parallel with other work so he doesn't want to delay the work much longer.
 - PEPPO (M. Poelker)
 - PAC wants two weeks
 - Want ~5 days (24/7) of beam time at the beginning of the down (after the open house), then convert to the swing/owl shift for running (until Aug 1st when CHL goes down)
 - Matt has the manpower to support this
 - To be considered for integrating PEPPO:
 - Can they run for 5 days?
 - All feel this could be accommodated, but should be looked at in the schedule
 - Need to warm up the linac and can't run PEPPO at the same time (and delay of PSS upgrade for North Linac)
 - Matt to find out how long they need to run on the swing/owl shifts

- Leigh & Will state 3 to 4 weeks can be accommodated and after this creates peaks in staffing for Cryo and PSS groups – Leigh and Will to review this.
 - Matt/Arne to take these 3 to 4 weeks to PEPPo collaboration and get feedback.
 - F. Pilat states we need a decision in 2 week timeframe.
 - 2/2/12: L. Harwood stated that he cannot commit to the 5 days for running Peppo. Meeting planned for Monday 6th Feb for PEPPo discussion.
 - 2/9/12: Meeting held Monday 6th Feb to discuss options with Peppo.
 - Request from the collaboration is 2 weeks of 24/7 run at the start of the down, plus 3 weeks evening/weekends at a later time)
 - Cryo work can only delay 4-5 weeks or there will be impacts
 - Safety system can delay for the 2 weeks
 - L. Harwood considering scenario as this has more impacts on his plan and will provide feedback by 20th Feb.
 - L. Harwood states his plan only has 4 weeks of float and giving up 2 weeks on the front end needs evaluation. Leigh is working to increase the float in his schedule.
 - 2/16/12:
 - taking off line with collaboration – more details to come.
 - Leigh evaluation by 20th of Feb update:
 - discussion with the work groups (S&A, etc) and timing.
 - Can accommodate 2 weeks 24/7 running of Peppo by shifting S/R work into the area of the machine that is accessible during Peppo run. BUT
 - Other concern is the network resurvey that was planned for the start of the down – Leigh assumed 2 alignment crews available (but not booked for the entire down for 12GeV accelerator scope) – as long as these 2 crews are available when Leigh needs them, then this Peppo 2 week running can be supported.
 - Will has postings to support 2 crews but aiming for 3 crews. If 3 crews aren't available – then this may impact Peppo run.
 - 2/23/12:
 - The 2 run at the beginning of the down can be supported with some caviats for staffing. Then 3 weeks of parasitic running during the down.
 - Power meter reading impact? No per Will
 - Is this the entire scope for PEPPo – yes. If more experiments are needed, then it has to be submitted to PAC.
 - Overall staffing concerns – mech techs and alignment techs.
 - Still some if's in the analysis of impacts to PEPPo – need to integrated schedule for the full analysis for staffing impacts.
 - **3/1/12: closed issue. Will implement PEPPo run schedule with resource support needed (by Arne/Steve)**
- 4. (Non-12GeV Accelerator): Hall C Dump**

- K. Welch email 5 Jan 2012 regarding plans and potential scope/improvements for Hall C Beam Dump
 - These improvements help reduce or eliminate exposures to radiation and other health hazards, improve system reliability and reduce the chances of major system failures which could interrupt the physics program for long periods.
 - NEW: 1/19/12: POC? Plan/Funding/other concerns?
 - 1/26/12: Arne is working on developing the team and POC and funding for this work. He fully supports this work and the timing. Hall A Beam Dump to be included in the scope. Work to be done prior to beam to Hall A, Hall C
 - **2/2/12: Steve stated the Hall A Beam Dump plan will be developed and provided for the schedule. Hall C Beam Dump work still needed prior to beam to Hall C, but may not fit in this integrated schedule timeframe. D. Napier to move Hall C portion of this to the closed issues below.**
- 5. (FML): CHL #1 Cooling tower maintenance & replacement**
- Duration – 3 months? Need information from FML. Can Start Aug 1. This is a bank of 4 cooling towers. Bob is working up detailed schedule.
 - One CHL is needed for CM commissioning (May 18-Aug 1) if CHL 1. Then CHL1 can go down and cooling towers can be replaced.
 - FML working alternative plan without rental towers with switch in mid may (Can't run CHL1 and 2 at the same time with current configuration)
 - Interconnect will feed CHL 1 from CHL2 cooling towers, but cannot take CHL1 towers down.
 - This interconnect will be removed Aug
 - 1/18/12 update from Sperlazza: - Current plan to align with 3 month shutdown of CHL #1 - "Contract Award" in April, "Submittal Reviews" in May, "Materials Ordering" from June - July and "Construction/Commissioning of Towers 1&2" - Aug-Oct'12
 - 1/19/12: Need to check interconnects/cross connects. B. Sperlazza states this is not funded currently and has an estimate of ~\$20K
 - 1/26/12: If CHL1 cooling towers goes down (because of issues/it fails), need this interconnect funded b/c we have to keep CHL1 cold until Aug 1st.
 - B. Sperlazza to discuss with Rusty about the funding and plan for interconnect (schedule) – this is a must item.
 - **2/2/12: Parts are already on order for interconnect. Funding is not a concern. Fittings will go into CHL#1 chambers this month. Partial cell shutdown is needed if it's not cold enough outside and this is being coordinated with S. Suhring/C. Jones/Cryo group. In May, connection to CHL#2 cooling towers will be done. Issue is closed and information will be in schedule (FML/integrated).**
- 6. FML needs schedule information for contracts (but may have changed due to budget cuts):**
- Acc Tie Feeder – not an issue – all decided after June 15th sometime
 - 1/18/12 update from Sperlazza: Construction scheduled during CHL#1 down - Aug-Sept'12.
 - 1/26/12: Issue closed. Information will be captured in the schedule. Work planned for one 8-hour outage and on the weekend. Exact date being worked out, but will be between Aug & Sept 2012
 - Backup towers and header mods

- 1/18/12 update from Sperlazza: North and South Back-up Towers and Bldg 92 Headers not scheduled until FY 14
 - 1/19/12: Issue Closed
- CHL cooling tower upgrade (CHL #1 cooling tower upgrade (electrical outages coordinated by P. Powers (FML) and J. Creel (Cryo group) – status on coordination)
 - 1/18/12 update from Sperlazza: Current plan to align with 3 month shutdown of CHL #1 - "Contract Award" in April, "Submittal Reviews" in May, "Materials Ordering" from June - July and "Construction/Commissioning of Towers 1&2" - Aug-Oct'12
 - 1/26/12: Issue closed. Timeframe for work and duration will be captured in FML schedule, no concerns from the team (other than the interconnect listed as a separate issue).
- 7. (FML): Counting house rehab and Hall C spectrometer commissioning impacts/coordination & Hall B**
 - 1/18/12 update from Sperlazza: Current Rehab schedule has construction from mid to late June'12 - Apr'13
 - 1/19/12: Most of work in the FML scope is for the 1st floor of the counting house. Walt states only electrical and network need to be up and running. Hall B room also has scope that needs review for impacts with Hall B. W. Akers coordinating with FML
 - 1/26/12: All seems to be going right. Issue closed. 2nd floor work is where the impact would be, but FML doesn't have plans for the 2nd floor now. If additional funds come available (maybe FY14).
- 8. (FML): Switch for 40MVA**
 - Rusty's needs funding for switch to allow for power loops or there will not be enough power in the current 37MVA.
 - The switch will be include in this year's Tie Line package as an option - 12 GeV management will need to decide if they will fund it
 - If not funded, there will not be enough power in 14/15.
 - Switch will buy time until 40MVA can be upgraded
 - 1/19/12: C. Rode stated he (12GeV) cannot fund the switch. If UIM is planned for FY14 and covers the scope needed (i.e., switch not needed), then this issue is closed. C. Rode noted that we need 10GeV for CD4B. B. Sperlazza to follow up.
 - 1/26/12: Not funded with UIM, but needs to be done during the same timeframe. Tie line will still be done (22MVA will be connected to the 40MVA). Issue is closed. Will track work in FML schedule.
- 9. (6GeV/12GeV Accelerator): Transfer Line work**
 - When to do?
 - 1/19/12: L. Harwood states this work is currently planned to be done in parallel with the warm gas work at the beginning of the down and then complete the south linac. Leigh noted that the dummy CM in the SLinac will be pulled when the south linac is warm (5th CM will go into the north linac). Issue closed?
 - 1/26/12: Issue is closed. Work will happen as soon as CHL goes down and gets fit in with labor
- 10. (6GeV/12GeV Accelerator): CHL #1**
 - Major maintenance needed (with full warmup of 3 months)
 - If not doing maintenance, then staff can work on CHL2 – need decision ASAP and if so – need to start design on transfer line ASAP for CHL2

- 1/18/12 update from W. Oren: CHL 1 & 2 "dance" is decided. Scheduling of actual maintenance work for CHL1 needs to be done as does the Transfer Line work and cooling tower "dance". Won't do maintenance until CHL #2 up and running (December timeframe)
- 1/19/12: CHL will run until August 1st. If CHL2 is late, then CHL1 is up.
- 1/26/12: Issue is closed. Need to watch progress of CHL2 – but will be done in the schedule

11. (6GeV/12GeV Accelerator): Steve Suhring's alternate proposal for 12gev accelerator work – review/feedback from Leigh

- Warm gas piping not in the North Linac (per Claus/Leigh)
- PSS work ~6 weeks (2 weeks in Suhring proposal)
- 1/19/12: Leigh stated this proposal will not work as the plan is to warm up the north linac on the 1st day of the down. Issue is closed.

12. (FML): CHL #2 cooling tower – elevate structure

- CHL #2 cooling towers shutdown? (length?) to elevate the structure for access – need information from FML
- 1/18/12 update from Sperlazza: work has been cancelled
- 1/19/12: Issue is closed

13. (FML): FML needs schedule information for contracts:

- Backup towers and header mods
 - 1/18/12 update from Sperlazza: North and South Back-up Towers and Bldg 92 Headers not scheduled until FY 14
 - 1/19/12: Issue Closed