

Fall2016

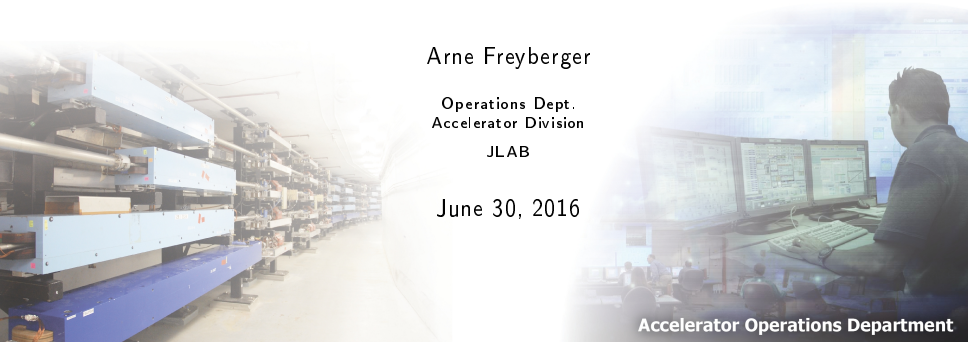
Shutdown to Beam Transition and CEBAF Configuration

Arne Freyberger

Operations Dept.
Accelerator Division

JLAB

June 30, 2016

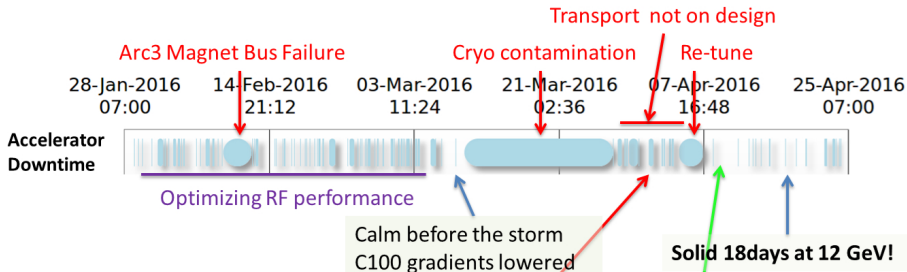


Accelerator Operations Department

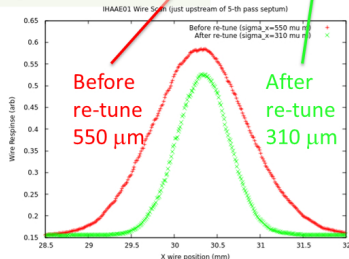
- 1 Review of Spring/Summer 2016 Operations
 - Energy Reach versus CEBAF Uptime
- 2 2016Fall Overview
- 3 Issues/Questions

- 1 Review of Spring/Summer 2016 Operations
 - Energy Reach versus CEBAF Uptime
- 2 2016Fall Overview
- 3 Issues/Questions

Spring 2016 Beam Operations



- First Physics runs with CEBAF at design energy, 12 GeV to Hall-D, 11 GeV to Hall-A (5-pass).
- 5-pass separation at design energy (11 GeV).
 - 5th pass separation has no margin and requires beam transport to be on-design for robust operation.



Horizontal beam size upstream of 5th pass septum

Summary

Total Downtime (Hours):	27.0
MTTR (Hours):	0.8
Total Suspend (Hours):	22.8
Total Restore (Hours):	4.2
Period Duration (Hours):	422.0

$$\text{Scheduled Maintenance: } \frac{422h}{168h} \times 4h = 10h$$

Total Downtime 27h

$$\text{Unscheduled Downtime } 27h - 10h = 17h$$

$$\text{Scheduled Hours } \frac{422h}{168h} \times 164h = 412h$$

$$\mathcal{R} = 100. \times \frac{412h - 17h}{412h} = 96\%$$

Note: FSD trips (downtimes less than 5 minutes) are not included in this calculation. **As long as FSD trip rate < 15 trips/h (RF related trip rate < 10 trips/h), this is the cost of doing business. CEBAF supports the program.**

Energy Reach versus CEBAF Uptime

Retreat!

In order to provide some gradient margin, lower CEBAF energy to 1050 MeV/linac (based on the requirement to have at least 50 MeV/linac of margin at the end of the year, Spring 2017).

Pass	Beam Energy (MeV)
1	2217
2	4317
3	6417
4	8517
5	10617
5.5	11667

Energies in the upper passes will be slightly lower due to synchrotron radiation losses which are not included in the above table.

50 MeV/linac of gradient margin will permit:

- Problematic (high field emitting) cavities to be turned down (or off).
- Ability to by-pass problematic cavities.
- Ability to absorb a C20/C50 catastrophe (by-pass entire zone) without major impact to the run.

- 1 Review of Spring/Summer 2016 Operations
- 2 2016Fall Overview
- 3 Issues/Questions

- Linacs** Set to 1050 MeV/linac, 11.6 GeV 5.5-pass energy, 10.6 GeV 5-pass energy.
- Hall-A** Continuation of DVCS/GMp experiments.
- Hall-C** 12 GeV project commissioning and demonstration of key performance parameters.
- Hall-D** First Glue-X experiment production runs.

The trip rate will remain in the 5→10 trips/h range as the gradient margin will likely be used to lower the C100 gradients for improved reliability of the C100 cryomodules.

CEBAF 2014 and Beyond

[Status](#) | [CEBAF Run Periods](#) | [CEBAF SAD Plans](#) | [LERF Run Periods](#) | [Group Plans](#) | [CEBAF Commissioning Goals](#) | [Fiscal Years](#) | [Calendar Years](#) | [Weekly Costs](#)

[LSD](#) | [HCO](#) | [AccI](#) | [AccII](#) | [Fall2014](#) | [Spring2015](#) | [Fall2015](#) | [Spring2016](#) | [Fall2016](#) | [Spring2017](#) | [Fall2017](#) | [Spring2018](#)

CEBAF Fall 2016 Beam Operations

Index	Name	Task Description	Start	End	Effort	Aug 2016			Sep 2016			Oct 2016			Nov 2016			Dec 2016					
						01	08	15	22	29	05	12	19	26	03	10	17	24	31	07	14	21	28
9	12GeV Out Years		Sat 10-01	Mon 12-19	1.0																		
9.1	Physics Period III: Physics dri...		Sat 10-01	Thu 12-22	1.0																		
9.1.1	Machine restoration	CEBAF 5.5pass E=12GeV Power...	Sat 10-01	Sat 10-08	1.0																		
9.1.2	Fall 2016 Physics	2.2GeV/linac...	Sat 10-08	Wed 11-23	0.0																		
9.1.3	Thanksgiving Break: No Beam OP...	CEBAF@2K RF/Magnets OFF Powe...	Wed 11-23	Mon 11-28	0.0																		
9.1.4	Restore beam		Mon 11-28	Wed 11-30	0.0																		
9.1.5	Fall 2016 Physics(cont)	2.1GeV/linac...	Wed 11-30	Thu 12-22	0.0																		
14	Hall-A NPES Schedule		Thu 02-04	Thu 12-21	0.0																		
14.3	Exp: DVCS Pass-1	1-pass beam...	Sat 10-08	Sun 10-09	0.0																		
14.4	Exp: DVCS Pass-3	3-pass beam...	Sun 10-09	Tue 10-11	0.0																		
14.5	Exp: DVCS Pass-4	3-pass beam...	Tue 10-11	Sun 10-30	0.0																		
14.6	Exp: DVCS Pass-5	5-pass beam...	Sun 10-30	Wed 11-23	0.0																		
14.7	Exp: GMP Pass-1	1-pass beam...	Wed 11-30	Sat 12-03	0.0																		
14.8	Exp: GMP Pass-3	3-pass beam...	Sat 12-03	Wed 12-07	0.0																		
14.9	Exp: GMP Pass-4	4-pass beam...	Wed 12-07	Tue 12-13	0.0																		
16	Hall-C NPES Schedule		Mon 05-16	Thu 12-21	0.0																		
16.2	Spectrometer Checkout	Passes 1,3...	Tue 12-06	Thu 12-22	0.0																		
17	Hall-D NPES Schedule		Thu 02-04	Sun 04-09	0.0																		
17.3	GlueX Production	Pass 5.5 beam...	Sat 10-08	Thu 12-22	0.0																		
19	Cryogenic Tasks		Mon 09-30	Fri 12-23	0.0																		
19.34	Transition to 2K/2K pumpdowns	Unstable cryo configuration ...	Tue 09-06	Tue 09-20	0.0																		
19.35	Stable 2K cryogenics, both linacs	Both CHLs ON...	Tue 09-20	Fri 12-23	0.0																		

- 1 Review of Spring/Summer 2016 Operations
- 2 2016Fall Overview
- 3 Issues/Questions

- What Shutdown tasks are likely to bleed into the Transition/Restoration/BeamOps period?
- Are there changes to the schedule that will improve reliability during Fall2016 Operations?
- What is the scheduling process?
 - ▶ What changes in the process would help group planning?
 - ▶ What changes are needed to align with the reliability goals?