

# NSLS-II Operations

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Beam Operations Group Leader  
NSLS-II Town Meeting  
December 9, 2016



# Topics

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- Operations Schedule
- FY17 Statistics
- Tentative Plans for Increasing Current
- Operations Calendar
- Studies and Commissioning Activities
- Major Shutdown Tasks
- Machine Status on Streaming Media



# Beam Operations Schedule

January-17							February-17							March-17							April-17						
Day	Half Shifts						Day	Half Shifts						Day	Half Shifts						Day	Half Shifts					
	0-4	4-8	8-12	12-16	16-20	20-24		0-4	4-8	8-12	12-16	16-20	20-24		0-4	4-8	8-12	12-16	16-20	20-24		0-4	4-8	8-12	12-16	16-20	20-24
1	D	D	D	D	D	D	1	O	O	O	O	O	O	1	O	O	O	O	O	O	1	O	O	O	O	O	O
2	D	D	D	D	D	D	2	O	O	O	O	O	O	2	O	O	O	O	O	O	2	O	O	O	O	O	O
3	D	D	D	D	D	D	3	O	O	O	O	O	O	3	O	O	O	O	O	O	3	O	O	O	O	O	O
4	D	D	D	D	D	D	4	O	O	C	C	C	C	4	O	O	O	O	O	O	4	O	O	O	C	C	C
5	D	D	S	S	S	S	5	C	C	C	C	C	C	5	O	O	O	O	O	O	5	C	C	O	O	O	O
6	S	S	S	S	S	S	6	C	C	O	O	O	O	6	O	O	I	I	S	S	6	O	O	O	O	O	O
7	S	S	S	S	S	S	7	O	O	O	O	O	O	7	S	S/M	M	M	M	M	7	O	O	O	O	O	O
8	S	S	S	S	S	S	8	O	O	O	O	O	O	8	M	M	M	M	M/S	S	8	O	O	C	C	C	C
9	S	S	S	O	O	O	9	O	O	O	O	O	O	9	S	S	O	O	O	O	9	C	C	C	C	C	C
10	O	O	O	O	O	O	10	O	O	O	O	O	O	10	O	O	O	O	O	O	10	C	C	O	O	O	O
11	O	O	O	O	O	O	11	O	O	O	O	O	O	11	O	O	O	O	O	O	11	O	O	O	O	O	O
12	O	O	O	O	O	O	12	O	O	O	O	O	O	12	O	O	O	O	O	O	12	O	O	O	O	O	O
13	O	O	O	O	O	O	13	O	O	I	I	S	S	13	O	O	O	O	O	O	13	O	O	O	O	O	O
14	O	O	O	O	O	O	14	S	S/M	M	M	M	M	14	O	O	O	C	C	C	14	O	O	O	S	S	S
15	O	O	C	C	C	C	15	M	M	M	M	M/S	S	15	C	C	O	O	O	O	15	S	S	S	S	S	S
16	C	C	O	O	O	O	16	S	S	O	O	O	O	16	O	O	O	O	O	O	16	S	S	S	S	S	S
17	O	O	O	O	O	O	17	O	O	O	O	O	O	17	O	O	O	O	O	O	17	S	S	D	D	D	D
18	O	O	O	O	O	O	18	O	O	O	O	O	O	18	O	O	C	C	C	C	18	D	D	D	D	D	D
19	O	O	O	O	O	O	19	O	O	O	O	O	O	19	C	C	C	C	C	C	19	D	D	D	D	D	D
20	O	O	O	O	O	O	20	O	O	O	O	O	O	20	C	C	O	O	O	O	20	D	D	D	D	D	D
21	O	O	O	O	O	O	21	O	O	O	C	C	C	21	O	O	O	O	O	O	21	D	D	D	D	D	D
22	O	O	C	C	C	C	22	C	C	O	O	O	O	22	O	O	O	O	O	O	22	D	D	D	D	D	D
23	C	C	I	I	S	S	23	O	O	O	O	O	O	23	O	O	O	O	O	O	23	D	D	D	D	D	D
24	S	S/M	M	M	M	M	24	O	O	O	O	O	O	24	O	O	O	O	O	O	24	D	D	D	D	D	D
25	M	M	M	M	M/S	S	25	O	O	C	C	C	C	25	O	O	O	O	O	O	25	D	D	D	D	D	D
26	S	S	O	O	O	O	26	C	C	C	C	C	C	26	O	O	O	O	O	O	26	D	D	D	D	D	D
27	O	O	O	O	O	O	27	C	C	O	O	O	O	27	O	O	I	I	S	S	27	D	D	D	D	D	D
28	O	O	O	O	O	O	28	O	O	O	O	O	O	28	S	S/M	M	M	M	M	28	D	D	D	D	D	D
29	O	O	O	O	O	O								29	M	M	M	M	M/S	S	29	D	D	D	D	D	D
30	O	O	O	C	C	C								30	S	S	O	O	O	O	30	D	D	D	D	D	D
31	C	C	O	O	O	O								31	O	O	O	O	O	O							
Total Hours - January						744	Total Hours - February						672	Total Hours - March						744	Total Hours - April						720
Total Days - January						31	Total Days - February						28	Total Days - March						31	Total Days - April						30
January-17							February-17							March-17							April-17						



# Beam Operations Schedule

User meeting {

May-17						
Day	Half Shifts					
	0-4	4-8	8-12	12-16	16-20	20-24
1	D	D	D	D	D	D
2	D	D	D	D	D	D
3	D	D	D	D	D	D
4	D	D	D	D	D	D
5	D	D	D	D	D	D
6	D	D	D	D	D	D
7	D	D	D	D	D	D
8	D	D	D	D	D	D
9	D	D	D	D	D	D
10	D	D	D	D	D	D
11	D	D	D	D	D	D
12	D	D	D	D	D	D
13	D	D	D	D	D	D
14	D	D	D	D	D	D
15	D	D	D	D	D	D
16	D	D	D	D	D	D
17	D	D	D	D	D	D
18	D	D	S	S	S	S
19	S	S	S	S	S	S
20	S	S	S	S	S	S
21	S	S	S	S	S	S
22	S	S	S	O	O	O
23	O	O	O	O	O	O
24	O	O	O	O	O	O
25	O	O	O	O	O	O
26	O	O	O	O	O	O
27	O	O	O	O	O	O
28	O	O	O	O	O	O
29	O	O	O	O	O	O
30	O	O	I	I	S	S
31	S	S/M	M	M	M	M
Total Hours - May						744
Total Days - May						31
May-17						

Sneak peek at May and the **proposed** end of the spring shutdown.

Note that this schedule needs final approval.



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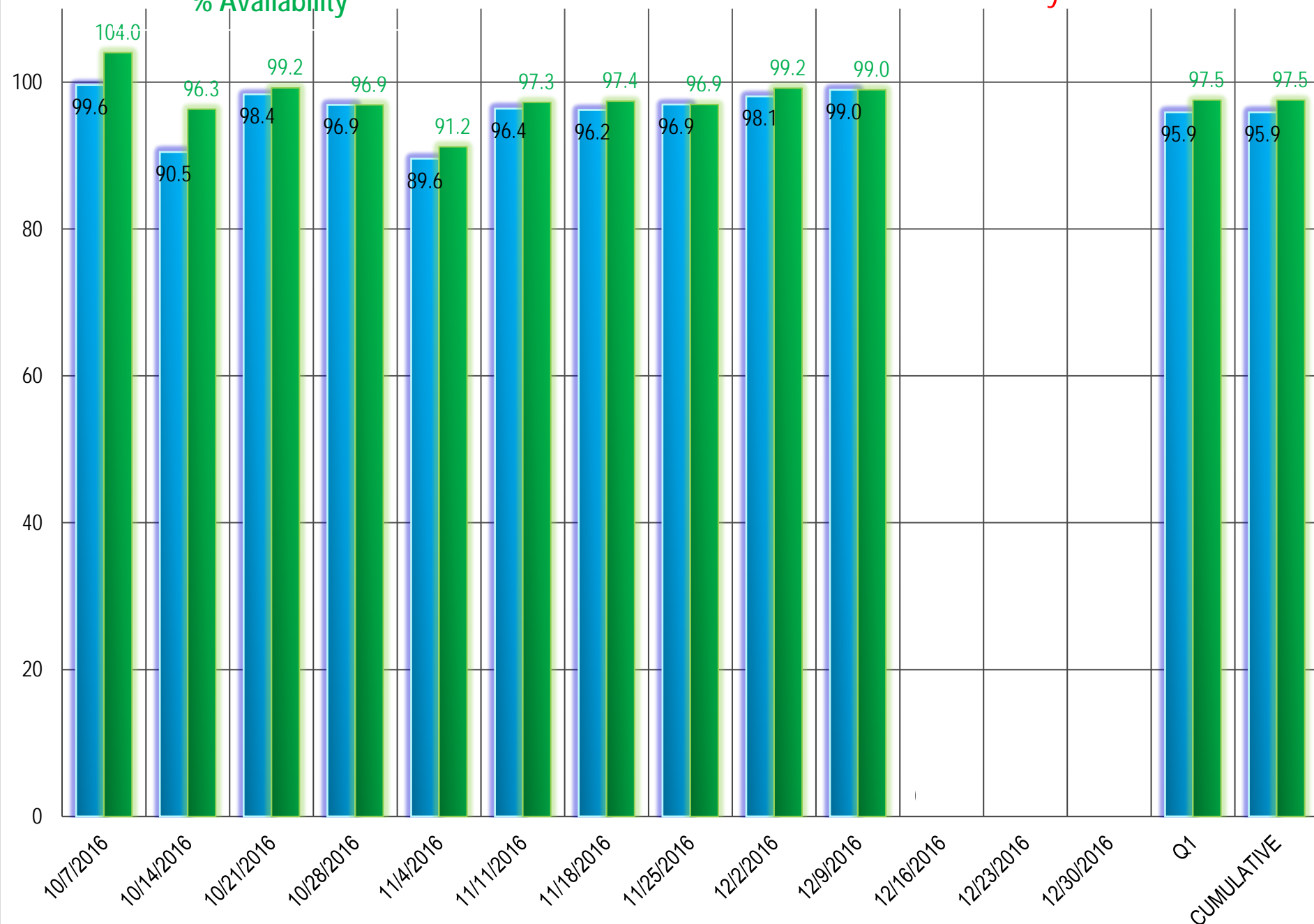
# FY 17 STATISTICS



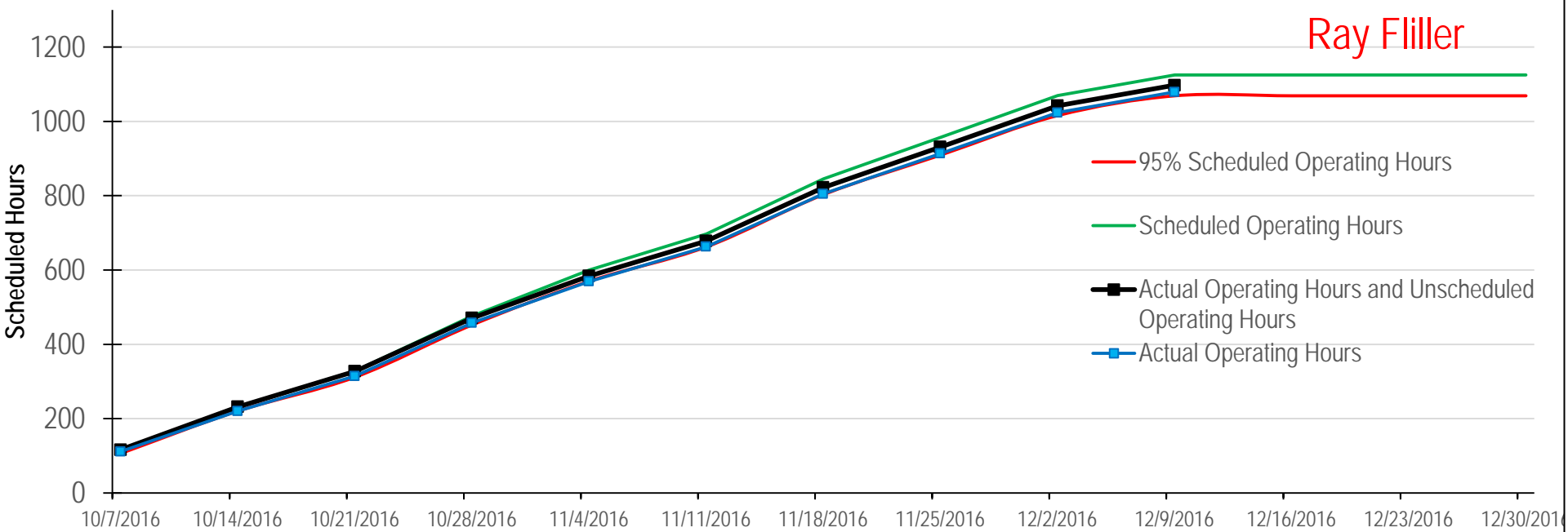
# FY17 Operations

Ray Filler

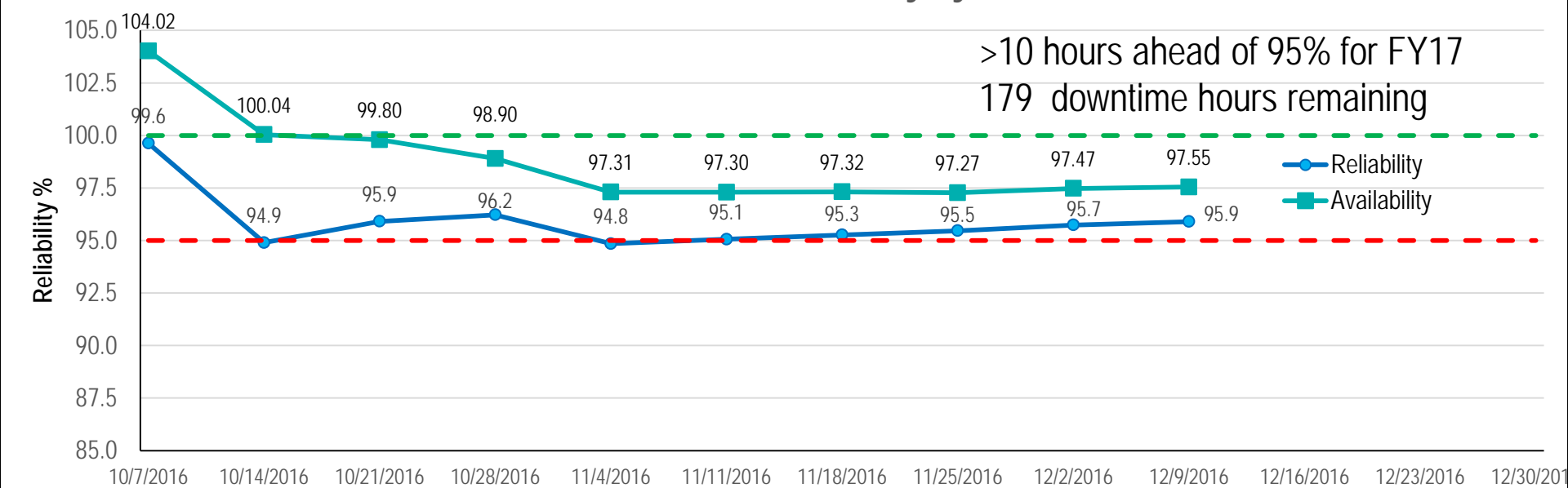
% Reliability  
% Availability



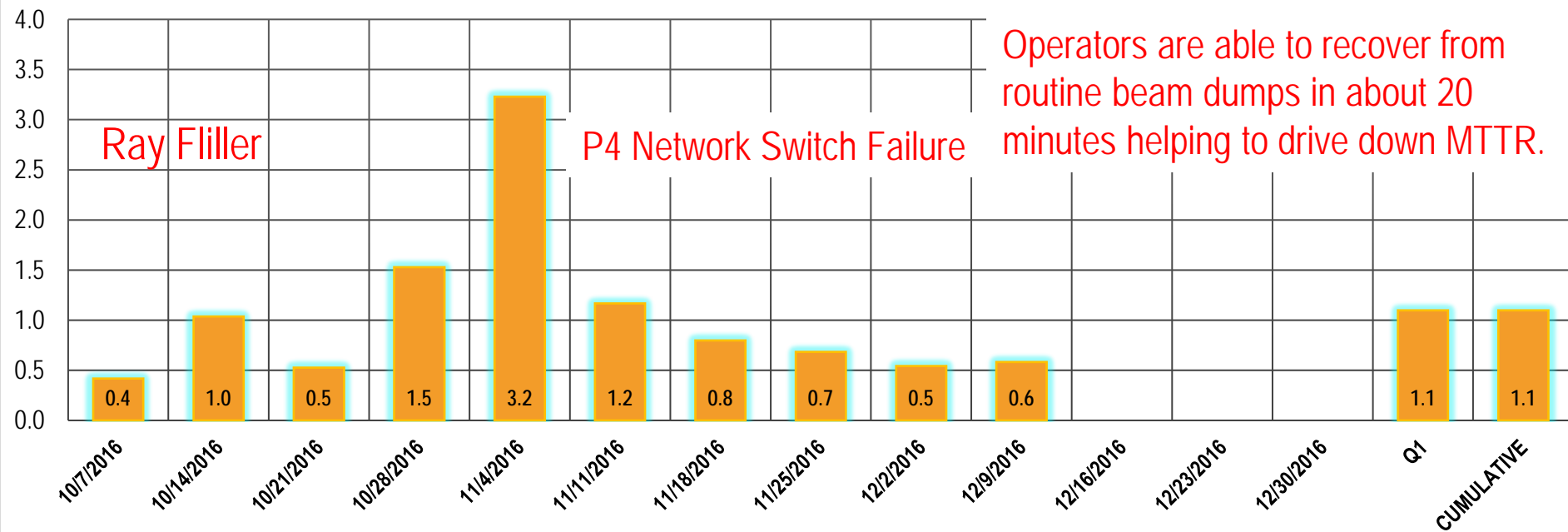
# FY17 Beam Time Delivered vs Scheduled Hours and 95% Reliability Goal



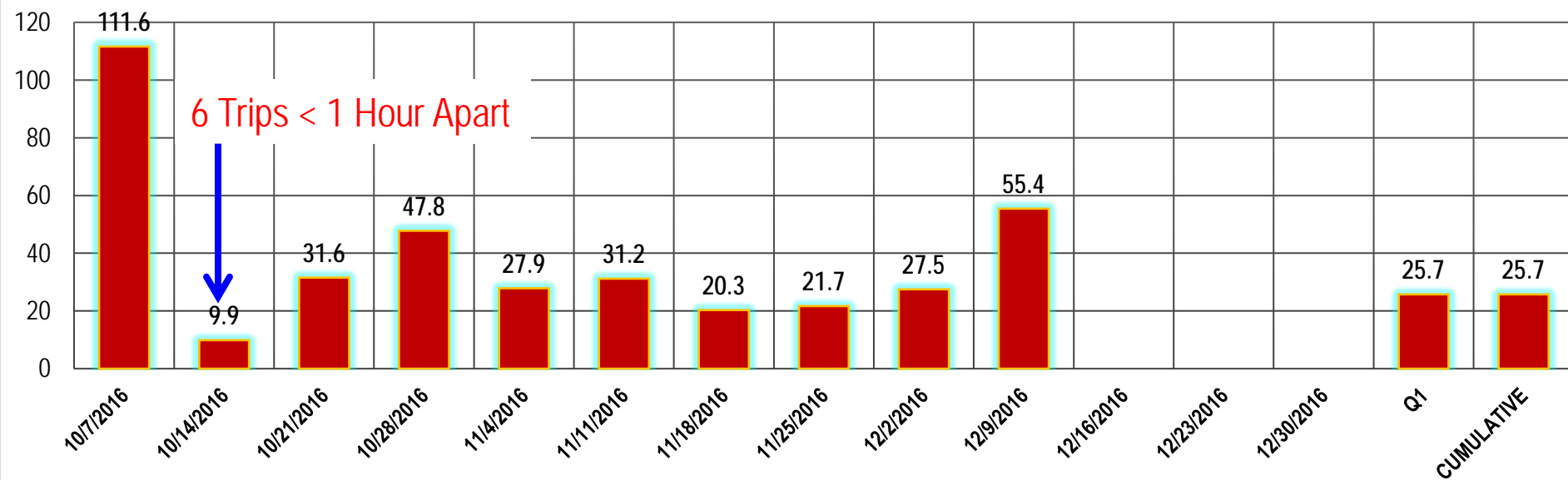
## FY17 Cumulative Reliability by Week



### FY17 Mean Time to Recovery (hours)

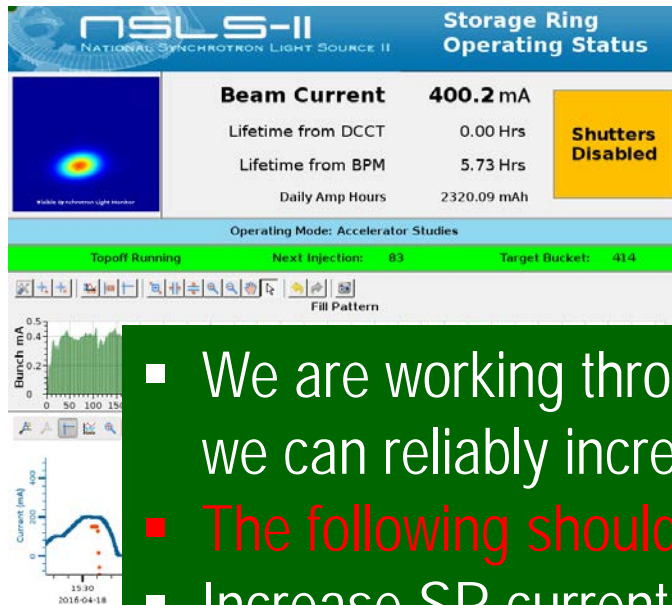


### FY17 Mean Time Between Failures (hours)





# Tentative Plans for Increasing Current



- We are working through some heating and vacuum issues before we can reliably increase SR beam current.
- The following should be considered tentative and subject to change:
- Increase SR current to 275 mA in February.
- Conduct studies with 350 mA during the summer following kicker 3 ceramic chamber replacement in May.
- Depending on the studies outcome, 350 mA in routine operations by the end of FY17.

# Operations Calendar

NSLS-II  
NATIONAL SYNCHROTRON LIGHT SOURCE II

INFORMATION PORTAL FOR NSLS 2 OPERATIONS

NSLS2 OPS Home Status Pages Submit Studies Plan Croplog News And Notes Schedule Search

### Monthly Ops Schedule

< December 2016

Mon	Tue	Wed	Thu	Fri	Sat	Sun
			Operations 1	Operations 2	Operations 3	Operations 4
Operations 5 Shutdown	Shutdown 6	Shutdown 7	Shutdown 8	Shutdown 9	Shutdown 10	Shutdown 11
Shutdown 12	Shutdown 13	Shutdown 14	Shutdown 15	Shutdown 16	Shutdown 17	Shutdown 18
Shutdown 19	Shutdown 20	Shutdown 21	Shutdown 22	Shutdown 23	Shutdown 24	Shutdown 25
Shutdown 26	Shutdown 27	Shutdown 28	Shutdown 29	Shutdown 30	Shutdown 31	

**Notes On This Calendar**

The data to generate this calendar is from Google Calendar. To access this data directly for viewing or importing into Outlook or your own Google Calendar, please use the buttons below.

[HTML](#) [ICAL](#) [Add To Your Google Calendar](#)

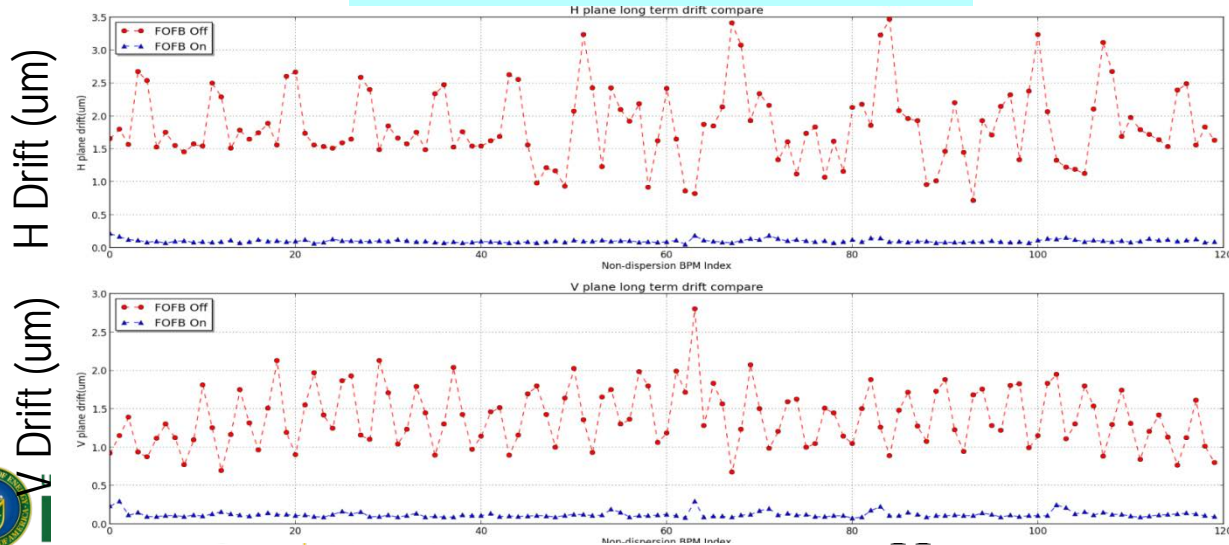
- An operations Google calendar is available here <https://nsls2ops.bnl.gov/monthly-ops-schedule/>.
- It is created usually a month in advance.
- It gives specifics about study and commissioning shifts.
- You can also access it via Outlook by clicking on the ICAL button at the bottom of the page.

# Studies and Commissioning Activities

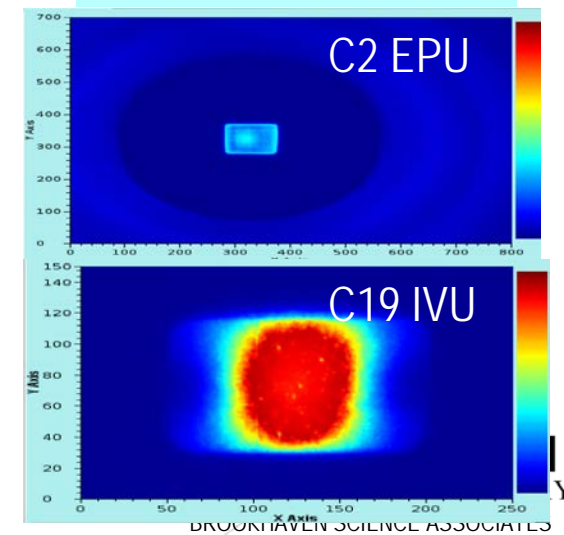
- There were 44.5 shifts devoted to commissioning and studies.
- Commissioned beamlines include: C17 3PW (XFP) , 8 BM (TES), C21 EPU (ESM), 8 DW (ISS)
- New IDs and beamlines include: C12 IVU (SMI), C19 IVU (NYX), C2 EPU (SIX)
- Beam orbit stability studies:
  - FOFB "tight mode" was developed, tested and put into operation to suppress long term drift (within 0.5  $\mu\text{m}$ )
  - We developed a method to perform ID source angle micro-tuning
  - Local bump feedforward function was tested to eliminate some straight section ID interaction
  - We developed an orbit recovery procedure using only FOFB system (tested last weekend).
- High current study:
  - We reduced the kicker 3 heating issue with a new cooling fan
  - We observed abnormal vacuum activity and heating on an injection bellows, which will be replaced during this shutdown.

Guimei Wang

## FOFB effect on orbit long term drift



## New ID commissioning



# Major Shutdown Tasks

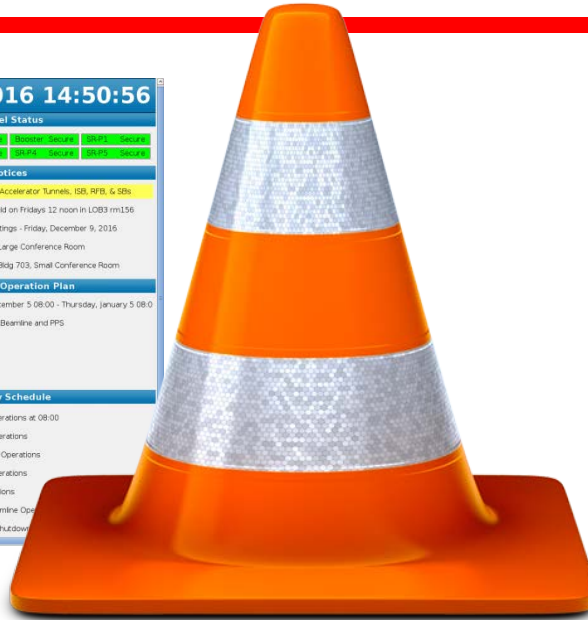
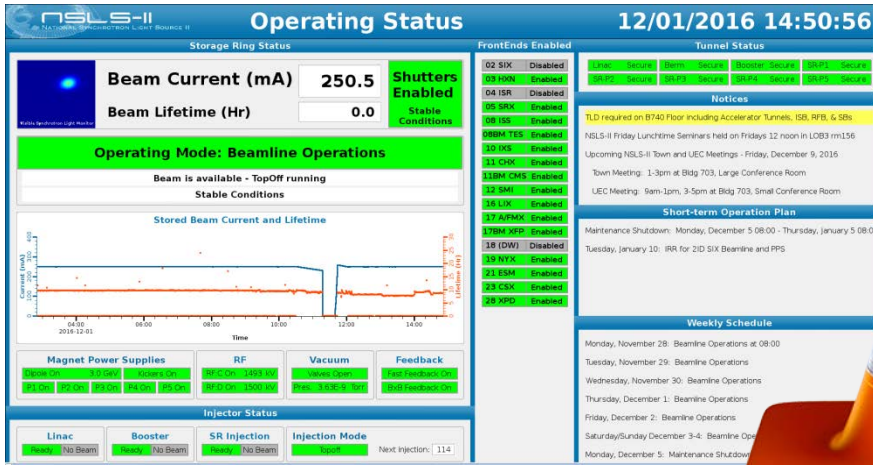
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- Substation shutdown for circuit breaker maintenance (P2 and Injection area) on Sat 12/10
- Replace linac klystron 2 with a refurbished tube (formerly klystron 1)
- C19 NYX IVU water/vacuum leak investigation/repair
- Replace the overheating SR bellows in the injection straight
- Install ESM EPU in C21
- Install SST EPU (C7) vacuum chamber
- Install 3PW in C6
- Install BMM (C6 BM) and SST (C7 ID) ratchet wall collimators, exit pipe, BMPS, GV1
- Install BMM FE stands and mirror
- Resurvey SRX (C5 ID)
- Many PPS certifications and reach back tests

Greg Fries



# Machine Status on Streaming Media



- Although we encourage staff and users to access the streaming video on their desktops, the hardware vendor advises us that there is a limit on the number of simultaneous users (status screens alone put us beyond the limit).
- Gary Weiner has provided instructions in an e-mail for changing the configuration of VLC as a remedy for this limitation.
- Gary is also investigating alternate hardware for the video source as well as receivers at the large monitors and Ed Zeitler is looking into enhancing the audio stream.
- Please contact Gary ([weiner1@bnl.gov](mailto:weiner1@bnl.gov)) for these instructions

# Closing Remarks

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A strong start to FY17 operations has put on track to meet our goals.  
Effective use of our study and commissioning time helped us to achieve successful completion of many important activities.  
We will carefully push the SR current up with a tentative goal of 350 mA in routine operations by the end of FY17.  
The (short) winter shutdown is in full swing and we expect to accomplish many tasks with careful planning.  
We encourage users and staff to take advantage of the communication tools that have been established.

-Thank you-

-Questions-

