

# Fermilab accelerator operations summary for FY17 – Q1

10/4/2016 – 1/2/2017

## **Executive Summary:**

During the reporting period beam was delivered to the NuMI target for NOvA and MINERvA data taking. Beam was also delivered to Switchyard 120 for recommissioning of SeaQuest and to support a program of test beam experiments at the Fermilab Test Beam Facility (FTBF), and to the BNB target for MicroBooNE data taking.

During the quarter there were periods of scheduled and unscheduled downtime. During the full reporting period,  $8.41 \times 10^{19}$  protons were delivered on target for NuMI and  $1.27 \times 10^{20}$  protons were delivered on the BNB target.

More detailed information is available in presentations at the weekly All Experimenters' Meetings. See reports on the web at

[http://www.fnal.gov/directorate/program\\_planning/all\\_experimenters\\_meetings/index.html](http://www.fnal.gov/directorate/program_planning/all_experimenters_meetings/index.html)

## **Status and Plans:**

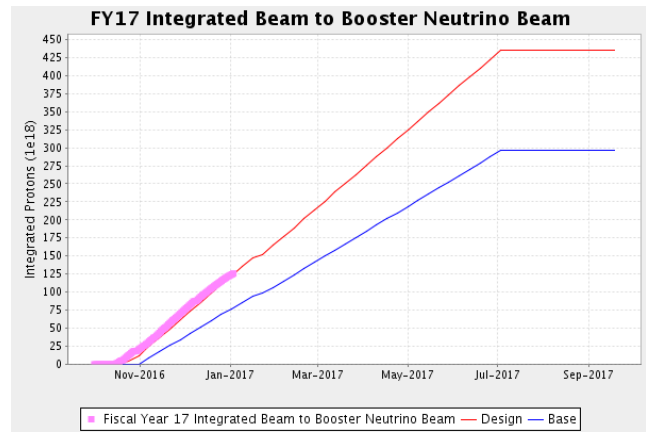
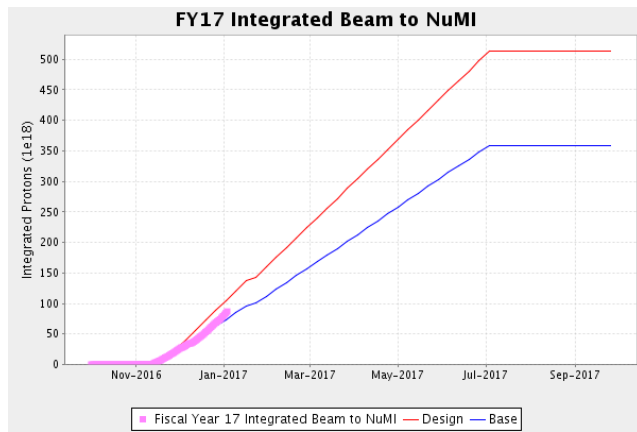
The quarter started off with continued work on accelerators at week 9 of the planned 15-week Summer shutdown. Work was progressing well. Linac and Booster finished work and began startup. BNB was receiving beam in mid-October while work continued in portions of the Main Injector. BNB operation was possible due to the reconfiguration which operationally broke the Main Injector into two parts. The Main Injector/Recycler work was complete in late October and startup began. NuMI horn position scans were performed by the end of October. Beam was extracted to the Fixed Target areas during the first week of November. NuMI began operation by mid-November and beam was available for all experiments. SeaQuest had startup issues with their data acquisition and target systems. One setback to the Fixed Target program (SeaQuest & MTest) was the repeated failure of the MI52 septa. This device is used to extract beam from the Main Injector to the Fixed Target areas. Repair of this device requires access into the Main Injector which also impacts NuMI operation. A failure on December 10<sup>th</sup> after an access to repair the septa resulted in beam off to Fixed Target experiments. It was decided to provide stable running to NuMI over the holidays and replace the septum in January 2017. Slip stacking became part of normal NuMI operation by mid-December. Operation to BNB and NuMI experiments went well over the holiday period. The quarter included such notable events as:

- Linac, Booster, Recycler and Main Injector startup
- Beam delivery to BNB and NuMI using 6+6 slip stacking

- Tuning over the holidays allowed for stable operation of over 600kW on the NuMI target
- Multiple septa failures result in Fixed Targets experiments off until January 2017.
- BNB took advantage of the Main Injector enclosure separation into two areas allowing for BNB operation while work continues in other parts of the ring.

### Performance

	Metric	Achieved
Average protons on NuMI target per week	-	$6.47 \times 10^{18}$
Integrated POT for NuMI for period	$9.54 \times 10^{19}$	$8.41 \times 10^{19}$
FY17 integrated POT for NuMI to date	<b><math>9.54 \times 10^{19}</math></b>	<b><math>8.41 \times 10^{19}</math></b>
FY17 actual NuMI uptime to date (hours)	-	1065.00
Percent Uptime (Recorded/Scheduled FY17)	-	83.0%
Average protons on BNB target per week	-	$9.79 \times 10^{18}$
Integrated POT for BNB for period	$7.99 \times 10^{19}$	$1.27 \times 10^{20}$
FY17 integrated POT for BNB to date	<b><math>7.99 \times 10^{19}</math></b>	<b><math>1.27 \times 10^{20}</math></b>
FY17 actual BNB uptime to date (hours)	-	1657.41
Percent Uptime (Recorded/Scheduled FY17)	-	94.0%



### Notes

- 1) "Metric" corresponds to the projected expected Protons-on-Target. The "Design" and "Base" profiles are respectively 125% and 87.5% of the "Metric" profile. The numbers quoted correspond to the proposed FY17 metric.
- 2) "Achieved" corresponds to the performance during the reporting period.
- 3) Percent uptime (actual/scheduled) since October 2016.