

Running the BNL Collider Accelerator Complex during the COVID19 Pandemic

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Abstract

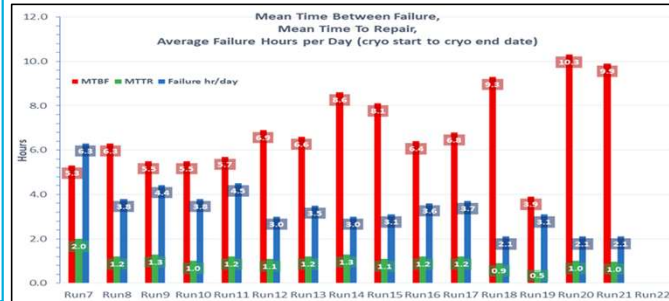
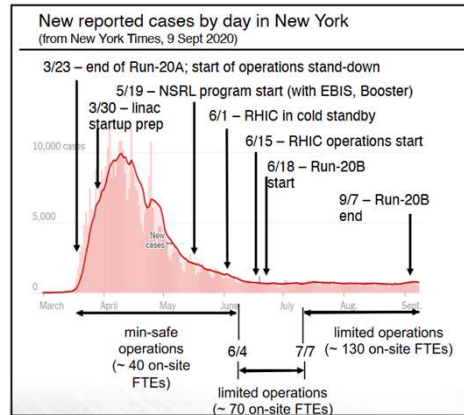
After the initial response to the COVID pandemic, there was a concentrated response from the lab at multiple levels to restructure, where possible, in the interest in safety. Because of this response, many new practices were established to ensure smooth operation and safety. The establishment of a task force, reduced staff on site, reduced interaction between those on site, masks, gloves, and available hand sanitizer are some examples of immediate restructuring that lasted the year of running under COVID19. There were some challenges with continuing to run including a two-month initial downtime, running during the summer, and maintenance periods adjusted to allow for more remote access. Despite this, the percentage of time spent in failure was relatively low, relevant luminosity projections were met, and all goals for the run lasting between Dec. 2019 and Sept. 2020 were reached.

Established Practices

- Lab Wide Practices**
- Establishment of a task force to keep lab personnel informed on relevant information including infection and self-quarantining numbers, direction to telework resources, information on distancing and mask requirements, and eventually vaccination rates.
 - Mask requirements that evolved with the pandemic
 - Social distancing requests
 - Transition to telework when feasible
 - Resources for vaccination information and locations
 - Designation of essential and non-essential personnel with non-essential personnel kept off-site
- Group and Department Practices**
- Communication via Microsoft Teams with staff offsite for both setup work and addressing failures. Teams chats were established for each project/group.
 - Staffing limitations inside MCR and MCR kitchen, mask, distancing and cleaning rules established that continued through FY21 including rules around using group transportation.
 - A new schedule for operations set up in only 12 hour shifts with no overlap in order to reduce staff interacting with each other.

Results from FY20 and FY21

- All goals were reached for the STAR experiment for the RHIC program
- NSRL and BLIP ran with little interruption



Challenges During the Run

- Issues around bringing in offsite personnel for failures while working around the essential personnel designation.
- Multiple failures due to running during the summer for Run20 after the minsafe shutdown. Running during the summer causes many heat related problems for magnets across the complex. Summer running also brought increased risk of storms and power dips across the site.
- The remote access system largely depends on keys taken from MCR, with these restricted due to limited staff allowed in MCR most accesses for maintenance required sweeps to be lost for work to be done. This meant many sweeps were required on maintenance days which can slow recovery time.
- Communication via teams with staff offsite presented some difficulty especially with involved setup work. It also resulted in less documentation in easily accessible areas such as e-logs.
- At times, access to cleaning supplies such as hand sanitizer were difficult to find on site.

Beam Energy (GeV/nucleon)	$\sqrt{s_{NN}}$ (GeV)	Run Time	Number Events Requested (Recorded)	Date Collected
13.5	27	24 days	(560 M)	Run-18
9.8	19.6	36 days	400 M (582 M)	Run-19
7.3	14.6	60 days	300 M (324 M)	Run-19
5.75	11.5	54 days	230 M (235 M)	Run-20
4.59	9.2	102 days	160 M (162 M)	Run-20+20b
31.2	7.7 (FXT)	0.5+1.1 days	100 M (50M + 112 M)	Run-19+20
19.5	6.2 (FXT)	1.4 days	100 M (118 M)	Run-20
13.5	5.2 (FXT)	1.0 days	100 M (103 M)	Run-20
9.8	4.5 (FXT)	0.9 days	100 M (108 M)	Run-20
7.3	3.9 (FXT)	1.1 days	100 M (117 M)	Run-20
5.75	3.5 (FXT)	0.9 days	100 M (116 M)	Run-20
4.59	3.2 (FXT)	2.0 days	100 M (200 M)	Run-19
3.85	3.0 (FXT)	4.6 days	100 M (259 M)	Run-18
3.85	7.7	11-20 weeks	100 M (97.7+3.2M)	Run-21+20
3.85	3 (FXT)	3 days	300 M (309 M)	Run-21
44.5	9.2 (FXT)	0.5 days	50 M (53.9 M)	Run-21
70	11.5 (FXT)	0.5 days	50 M (51.7 M)	Run-21
100	13.7 (FXT)	0.5 days	50 M (52.5 M)	Run-21
100 (Oxygen)	200	1 week	400 M (402 M) 200 M Central (212 M)	Run-21
8.55 (8.65)	17.1 (17.3)	2.5 weeks	250 M (256 M)	Run-21
3.85	3 (FXT)	3 weeks	2 B (1795 M + 309 M)	Run-21

References

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