

Memorandum

Michael Lindgren
Division Head

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Date: October 29, 2019
To: Todd Sullivan
From: Michael Lindgren 
Re: Approval for Running Booster-Neutrino Beam

Safety documentation and procedures for running beam to the Booster-Neutrino area are in place. Therefore, you are hereby authorized to run beam to the Booster-Neutrino.

cc: N. Chelidze
M. Convery
P. Czarapata
T. Kobilarcik
M. Schoell
T. Sullivan

SYSTEM START-UP SIGN-OFF

The signatures below, unless noted in the comments section, indicate that the relevant systems are ready for the restart of beam operation. Indicate in the comments section any remaining work that would affect the restart of beam operations. Indicate N/A for departments that did not do any work on the system.

SYSTEM BEING SIGNED OFF: Linac NIF MTA Booster [8-GeV Line-MI-10 Region]
(Circle as Applicable) [MI-20-MI-62/Recycler] **BNB** NuMI P1-P2 Muon P3-Switchyard
Meson Primary MT MC NM FAST PIP-II _____

<u>DEPARTMENT</u>	<u>DATE</u>	<u>SIGNATURE (Department Head/Designee)</u>
1. Controls	<u>9/30/19</u>	<u>Jamal Patenaud</u>
2. Cryogenics	<u>N/A</u>	<u>N/A</u>
3. E/E Support	<u>10/9/19</u>	<u>[Signature]</u>
4. RPO Manager	<u>10/29/2019</u>	<u>Maddyn Schoell</u>
5. LSO	<u>N/A</u>	<u>N/A</u>
6. External Beamlines	<u>10/29/2019</u>	<u>Phil Laris</u>
7. Instrumentation	<u>9/30/2019</u>	<u>[Signature]</u>
8. Interlocks	<u>10/3/19</u>	<u>Russ W. Zuko</u>
9. Main Injector	<u>10/16/19</u>	<u>[Signature]</u>
10. Mechanical Support	<u>30 Sep 2019</u>	<u>M/Mong-Spina</u>
11. Muon	<u>N/A</u>	<u>N/A</u>
12. Operations	<u>10/29/19</u>	<u>[Signature]</u>
13. Proton Source	<u>N/A</u>	<u>[Signature] 10/17</u>
14. RF	<u>N/A</u>	<u>N/A</u>
15. ENG Support	<u>9/30/19</u>	<u>Paul C Garapato</u>
16. Target Systems	<u>10/25/19</u>	<u>[Signature]</u>
17. Shutdown Coordinator	<u>10/23/19</u>	<u>[Signature]</u>

Comments and special conditions (please mark comment with department # to connect comment with appropriate department):

The BNB radiation shielding meets the requirements documented in the 2002 "Shielding Assessment Document for the 8GeV Fixed Target Facility" 2004 "Addendum to the MiniBooNE Target station shielding assessment."

FINAL APPROVALS

System Department Head [Signature] Date 10/29/2019
Assigned RSO N. Chelidze Date 10/29/19
AD Division Head [Signature] Date 10/29/2019

Operator Signatures

Crew Chiefs

Crew A

Crew B

Crew C

Crew D

Crew E

Other

Running Condition Booster Neutrino

October 29, 2019

Area RSO

Nino Chelidze

Mode of Operation Beam from Cell 850 to BNB Target Station (Beam on Target)

Beam Limits	Beam Energy	ASE Limit	Operating Limit
	8 GeV	9.00 E18 protons/hr	1.62 E17 protons/hr

Critical Devices E:HV860 & BS860

Enclosures Protected MI-12A, MI-12B & MI-13

Preferred Monitoring Devices* Intensity is monitored via E:TOR860

*Other methods of monitoring intensity may be used.

Requirements

Access Devices E:HV860 & BS860 must be disabled in order to access MI-12A, MI-12B or MI-13.

Cool Off Period MI-12A & MI-12B: MI-12A Exhaust Air Monitor (G:RD1139) and MI-12B ENC Air Monitor (G:RD1153) must both be reading ≤ 400 cpm before access unless waived by RSO or designee.

Special Interlocks The CDC Inputs including failure mode devices may all be found on the Safety System Status pages.

Special Concerns Any work performed on critical devices or obtaining a critical device key requires prior RSO approval. The 1,000 cfm fans may only be turned on once the cool-off period has elapsed and prior RSO or designee approval has been received. See Operation Comments for more information.

Gates, Fencing and Passive Shielding Requirements There is no access to radiologically fenced areas without prior RSO approval. The removable shielding is locked with a PAD 118 and a MI-12B enclosure key. MI-13 Enclosure hatch is locked with a shielding configuration control (PAD118) lock and MI-13 key.

- Shielding, fencing and posting are in accordance with the following shielding assessment documents:
1. 2002 Shielding Assessment Document for the 8GeV Fixed Target Facility,
 2. 2002 MiniBooNE Target Station Shielding Assessment,
 3. 2004 Addendum to the MiniBooNE Target Station Shielding Assessment,
 4. 2010 Post Assessment Memo - 8GeV Beamline and MiniBooNE Beam Line Nova-Era Operational Limits.

Assigned RSO approval also signifies that all necessary Interlock Tests have been completed and Removable Shielding is installed.

Ops. Dept. Head Approval <u>Todd Sullivan</u>	Assigned RSO Approval <u>N. Chelidze</u>
Sys. Dept. Head Approval <u>Thomas N. Chelidze</u>	AD Head Approval <u>Mark Zales</u>

October 29, 2019

Area RSO

Nino Chelidze

Operational Comments

MCR must be appropriately staffed according to the Accelerator Safety Envelope.

The following Beam Permit System inputs cannot be bypassed without RSO notification:

- Horn Stripline Air Pressure
- BNB Target Cave Exhaust Fan
- RAW Surge Tank Level Too High
- RAW Surge Tank Level Too Low
- MI-12A fan volume between 150-300cfm (E:12AAIR)

The MI-12 Sump Pump high level is monitored by FIRUS. If this sump alarms, contact the RSO or designee.

The following are the air monitors for MI-12A and MI-12B enclosures and service building. If any of these air monitors alarm, contact the RSO or designee.

- G:RD1139 - MI-12A Exhaust Air Monitor
- G:RD1152 - MI-12 Service Building Air
- G:RD1153 - MI-12B Enclosure Air Monitor
- G:RD1155 - MI-12 AMS3 Air Monitor
- E:12AAIR - MI-12 Enclosure Air Flow, the 200 cfm fan

All six Decay Region Wells and Pumps, along with the Retention Tank associated with Wells 3 and 6, except for Well 5, are monitored on ACNET Page device E:MINIDW with acknowledgeable alarms. If an alarm is received contact the RSO or designee.

A key to control the 1,000 cfm intake & exhaust fans for the MI-12A & MI-12B enclosure has been installed in the MCR. This key is located in the remote key-tree camera access panel in the second row, 12th position. The purpose of this key is to disable the operation of 1,000 cfm fans before beam is permitted to the Booster Neutrino area, and enable the 200 cfm exhaust fan. The interlock system monitors the status of the remote fan contactors and the two shutters for the 1,000 cfm fans via the critical device controller. With the key out or in the removable position, the 1,000 cfm fans & shutters are disabled. With the key turned in the non-removable position the 1,000 cfm fans & shutters are permitted to be on & open.

During Booster Neutrino beam operations this key **MUST** be removed from the panel and placed in a locked Crew Chief box to avoid accidental turning on of the 1,000 cfm fans. This key **may not** be returned to the key-tree nor may the 1,000 cfm fan be turned on without ensuring that MI-12A Exhaust Air Mon (G:RD1139) and MI-12B ENC Air Monitor (G:RD1153) are both reading < 400 cpm and prior RSO or designee approval is obtained. Turning the 1,000 cfm fans on during Booster Neutrino operation will disable the Booster Neutrino critical device controller, however it also provides the potential for the discharge of activated air.

October 29, 2019

Area RSO

Nino Chelidze

Operator Signatures

Crew Chiefs

Crew A

Crew B

Crew C

Crew D

Crew E

Other
