Memorandum

Michael Lindgren
Chief Accelerator Officer

Accelerator Division
P.O. Box 500, MS 306
Kirk Road and Pine Street
Batavia, Illinois 60510-5011
USA
Office: 630.840.8409
mlindgre@fnal.gov

Date: November 24, 2020

To: Todd Sullivan

From: Michael Lindgren Michael Lindgren, UID:mlindgre Digitally signed by Michael Lindgren, UID:mlindgre Date: 2020.11.24 12:50:43 -06'00'

Re: Approval for running beam to Muon Campus area

Safety documentation and procedures for restart of beam operations to the Muon Campus area are now complete and in place. Therefore, you are hereby authorized to deliver beam to Muon Campus area.

cc: Gerald Annala
Mary Convery
Paul Czarapata
Tom Kobilarcik
Eric McHugh
Maddie Schoell
Diktys Stratakis

Fermilab

ADAP-11-0001
REV. 9

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

DEPARTMENT	DATE	SIGNATURE (Department Head/Designee)	
1. Controls	11/7/20	James Patrick	Digitally signed by James Patrick Date: 2020.11.07 17:15:05 -06'00'
2. Cryogenics	N/A		
3. E/E Support	11/13/20	Chris Jensen	Digitally signed by Chris Jensen DN: cn=Chris Jensen, o, ou=Fermilab, email=cjensen@fnal.gov, c=US Date: 2020.11.13 17:13:41 -06'00'
4. RPO Manager	11/24/20	Madelyn Schoell, UID:maddiew	Digitally signed by Madelyn Schoell, UID:maddiew Date: 2020.11.24 12:17:15 -06'00'
5. LSO	N/A		
6. External Beamlines	11/6/20	Thomas R. Kobilarcik	Digitally signed by Thomas R. Kobilarcik Date: 2020.11.06 15:32:08 -06'00'
7. Instrumentation	11/19/20	Craig Drennan	Digitally signed by Craig Drennan Date: 2020.11.19 10:11:43 -06'00'
8. Interlocks	11/19/20	Randy Zifko, UID:rmzifko	Digitally signed by Randy Zifko, UID:rmzifko Date: 2020.11.19 15:23:59 -06'00'
9. Main Injector	11/9/20	Ioanis Kourbanis, UID:ioanis	Digitally signed by Ioanis Kourbanis, UID:ioanis Date: 2020.11.09 07:58:52 -06'00'
10. Mechanical Support	11/20/20	[illegible]	
11. Muon	11/20/20	Gerald Annala	Digitally signed by Gerald Annala Date: 2020.11.20 09:11:17 -06'00'
12. Operations	11/04/2020	Todd [illegible]	
13. Proton Source	N/A		
14. RF	11/11/20	John Reid, UID:jsreid	Digitally signed by John Reid, UID:jsreid Date: 2020.11.11 22:01:47 -06'00'
15. ENG Support	10/22/20	[illegible]	
16. Target Systems	11/12/20	[illegible]	
17. Shutdown Coordinator	11/6/20	Consolato Gattuso	Digitally signed by Consolato Gattuso Date: 2020.11.06 11:27:55 -06'00'

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

EES: The fan on the flourinert skid in AP-30 is broken and a floor fan has been set up. This will need to be replaced as soon as a spare fan has been delivered.
MSD: Personnel will have cleared out of the M4 line by the close of business of Monday, 23 Nov 2020.
From Jerry - flourinerk skid still had temp. fan on it, will run that way until replacement arrives. Temp. fan as effective as replacement. MSD done with work in downstream end of M4, RSO ensured closed and locked appropriately.
From Maddie - Partial Muon Campus Logic Module test complete for beam to g-2. RSO lock on D:H910 until testing complete and all other Muon Campus 13W beam to DA ARR pre-starts closed.

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The Muon Campus radiation shielding meets the requirements documented in the Feb. 7, 2017 "Muon G-2 Shielding Assessment" Oct. 2019 "Analysis of new M4 shield wall for M5 beamline operation." shielding assessment.

FINAL APPROVALS

System Department Head Gerald Annala Digitally signed by Gerald Annala Date: 2020.11.24 12:51:08 -06'00' Date _____

Assigned RSO Madelyn Schoell, UID:maddiew Digitally signed by Madelyn Schoell, UID:maddiew Date: 2020.11.24 12:21:28 -06'00' Date 11/24/20

AD Division Head Michael Lindgren, UID:mlindgre Digitally signed by Michael Lindgren, UID:mlindgre Date: 2020.11.24 12:57:15 -06'00' Date 11/24/20

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ADAP-11-0001 Rev. 9

BEAM PERMIT
11/24/2020

Muon Campus Accelerator Safety Envelope (ASE) Limit

The maximum hourly beam power transmitted through Muon Campus is limited to:
1.35×10^{18} protons per hour at 8 GeV, on target
1.80×10^{14} protons per hour at 8 GeV, off target

No accelerator or beam line will transmit beam without an operational beam interlock safety system.

Muon Campus Beamline Operating Limits

The maximum beam intensity transmitted through the Muon Campus Beamline is limited to:
4.32×10^{16} protons per hour at 8 GeV, on target
3.60×10^{13} protons per hour at 8 GeV, off target

Examples: Charge/hr = number of pulses/hr x number of protons/pulse

On Target
#1 36,000 pulses per hour (10 Hz) at 1.20×10^{12} protons per pulse = 4.32×10^{16} protons per hour.
#2 54,000 pulses per hour (15 Hz) at 8.00×10^{11} protons per pulse = 4.32×10^{16} protons per hour.

Off Target
#3 36,000 pulses per hour (10 Hz) at 1.00×10^{9} protons per pulse = 3.60×10^{13} protons per hour.
#4 54,000 pulses per hour (15 Hz) at 6.67×10^{8} protons per pulse = 3.60×10^{13} protons per hour.

Special conditions and comments:

Reviewed by Todd Sullivan — Digitally signed by Todd Sullivan Date: 2020.11.24 12:58:59 -06'00'
Operations Department Head

Reviewed by Gerald Annala — Digitally signed by Gerald Annala Date: 2020.11.24 12:51:57 -06'00'
Systems Department Head

Reviewed by Madelyn Schoell, UID:maddiew — Digitally signed by Madelyn Schoell, UID:maddiew Date: 2020.11.24 12:22:06 -06'00'
Assigned RSO

Reviewed by Madelyn Schoell, UID:maddiew — Digitally signed by Madelyn Schoell, UID:maddiew Date: 2020.11.24 12:22:18 -06'00'
ESH Radiation Physics Operations Department Head

Approved by Michael Lindgren, UID:mlindgre — Digitally signed by Michael Lindgren, UID:mlindgre Date: 2020.11.24 13:01:38 -06'00'
Accelerator Division Head

Operator Signatures

Crew Chiefs	Crew A
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Crew B	Crew C
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Crew D	Crew E
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Other

_____	_____
_____	_____

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Running Condition

Muon Campus - on Target/g-2 Mode

November 24, 2020

Area RSO Maddie Schoell

Mode of Operation 8 GeV primary beam to AP-0 target, 3 GeV secondary beam to Delivery Ring & MC-1

Beam Limits

Beam Energy	ASE Limit	Operating Limit
8 GeV	1.35 E18 protons/hr	4.32 E16 protons/hr

Critical Devices I:F17B3 & M:HV100

See CDC status page for critical devices for DS enclosures (Delivery Ring, Extraction Enclosure & MC-1 Hall)

Enclosures Protected Pre-Target, Pre-Vault, Transport US/DS & Mid, Delivery Ring, Extraction Enclosure & MC-1 Hall, M4

Preferred Monitoring Devices* Intensity is monitored via M:TOR107
Intensity to the Delivery Ring Absorber is monitored via D:TORABT

*Other methods of monitoring intensity may be used.

Requirements

Access Devices To access Muon Campus enclosures, the following devices must be disabled. Pre-Target, Pre-Vault, Transport: I:F17B3 and M:HV100 (D:M1CDC). Delivery Ring: D:H812 and D:H700 (D:DELCDC). Extraction Enclosure: D:ELAM and D:V901 (D:EXTCDC). MC-1 Hall: D:V003 and D:H005 (D:MC1CDC). M4: D:H910 (D:M4CDC).

Cool Off Period There is a cool off period before accessing Pre-Vault or Pre-Target enclosures as follows: AP0 PreVault monitor (G:RD2072) must be reading $\leq$400 cpm before access is allowed unless waived by the area RSO.

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.

Access to AP0 Vault requires prior RSO approval & RCT coverage. Access to the Vault upper level requires beam off. Access to AP0 Water Cage requires beam off, RCT coverage and prior RSO approval. RCTs may obtain AP0 Vault and Water Cage keys without prior RSO approval.

Gates, Fencing and Passive Shielding Requirements There is no access to radiologically fenced areas without prior RSO approval.

Shielding, fencing and posting are in accordance with the following shielding assessment documents:
Feb. 7, 2017 "Muon G-2 Shielding Assessment"
2019 "Analysis of new M4 shield wall for M5 beamline operation"

Hatches along the delivery ring and M4 hatch are filled with removable shielding blocks and are locked with Pad 118 and the enclosure enter keys.

Gate at downstream end of M4 enclosure closed and locked with PAD118 and enclosure enter key.

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

Sys. Dept. Head Approval	Todd Sullivan Digitally signed by Todd Sullivan Date: 2020.11.24 12:59:17 -06'00'	**Assigned RSO Approval**	Madelyn Schoell, UID:maddiew Digitally signed by Madelyn Schoell, UID:maddiew Date: 2020.11.24 12:45:54 -06'00'
Sys. Dept. Head Approval	Gerald Annala Digitally signed by Gerald Annala Date: 2020.11.24 12:54:41 -06'00'	**AD Head Approval**	Michael Lindgren, UID:mlindgre Digitally signed by Michael Lindgren, UID:mlindgre Date: 2020.11.24 13:03:04 -06'00'

Operational Comments

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

The access to the fenced area behind the Delivery Ring absorber in Transport DS requires the area RSO permission and the following key: Muon Campus Cleanup Absorber Xport Mini-Loop Enter key, which is locked up in MCR.

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Running Condition

Muon Campus - on Target/g-2 Mode

November 24, 2020

Area RSO Maddie Schoell

Instrument Information

All detector trips shall be documented in the E-log.
Interlocked detectors (i.e., Chipmunk, FOX, Scarecrow, TLM, etc.) in "Integrate" mode that trip will not allow a safety system reset until sufficient time has passed to keep the hourly dose rate equal to or below the trip point setting. Interlocked detectors in "Integrate" mode that trip may be reset as the safety system allows. If there are more than three (3) trips by an interlocked detector in "Integrate" mode in one hour, RSO approval is required before reset.

MUX	Type	Location	QF	R/I Mode	Trip Level	CDC	Device(s) Tripped
2-071	TLM	Muon Campus Prevault		Integrate	3000 nC/min	D:M1CDC	I:F17B3 & M:HV100
2-065	Chipmunk	AP-1 Entrance - PreTarget Access Hutch	5	Integrate	5 mrem/hr	D:M1CDC	I:F17B3 & M:HV100
2-069	Chipmunk	AP0 South Vault Wall	5	Integrate	15 mrem/hr	D:M1CDC	I:F17B3 & M:HV100
2-064	Chipmunk	AP0 South Building Wall	5	Integrate	5 mrem/hr	D:M1CDC	I:F17B3 & M:HV100
2-075	Chipmunk	Transport DS/Delivery Ring Gate	5	Rate	5 mrem/hr	D:M1CDC	I:F17B3 & M:HV100
2-080	Chipmunk	AP-10 North Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-081	Chipmunk	AP-10 A17R05	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-082	Chipmunk	AP-10 A16R07	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-083	Chipmunk	AP-10 A16R03	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-084	Chipmunk	AP-10 D:QS	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-085	Chipmunk	AP-10 D:QD	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-086	Chipmunk	AP-10 A14R03	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-087	Chipmunk	AP-10 A14R0Y	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-088	Chipmunk	AP-10 MCR SW Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-089	Chipmunk	AP-10 Bay A13 South	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-090	Chipmunk	AP-10 Bay A12 North	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
[illegible]091	Chipmunk	AP-10 A2R01	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-092	Chipmunk	AP-10 SW Rollup Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-093	Chipmunk	AP-10 South Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-096	Chipmunk	AP-30 South Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-097	Chipmunk	AP-30 S Rollup Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-098	Chipmunk	AP-30 D:H744	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-099	Chipmunk	AP-30 D:QT303	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-100	Chipmunk	AP-30 A35R07	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-101	Chipmunk	AP-30 A35R01	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-102	Chipmunk	AP-30 D:ISEP	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-103	Chipmunk	AP-30 A34R03	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-104	Chipmunk	AP-30 A33R07	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-105	Chipmunk	AP-30 A33R01	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-106	Chipmunk	AP-30 D:ELAM	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-107	Chipmunk	AP-30 D:V906	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-108	Chipmunk	AP-30 NE Rollup Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-109	Chipmunk	AP-30 North Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-112	Chipmunk	AP-50 West Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-113	Chipmunk	AP-50 A57R07	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-114	Chipmunk	AP-50 A57R01	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-115	Chipmunk	AP-50 A56R04	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-116	Chipmunk	AP-50 A55R08	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-117	Chipmunk	AP-50 A55R02 RFPA	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-118	Chipmunk	AP-50 D:SEXFV	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-119	Chipmunk	AP-50 D:VA03	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-120	Chipmunk	AP-50 A53R07	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-121	Chipmunk	AP-50 A53R01	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-122	Chipmunk	AP-50 Abort Kicker	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-123	Chipmunk	AP-50 D:ASEP	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-124	Chipmunk	AP-50 East Rollup Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-125	Chipmunk	AP-50 East Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
[illegible]-001	Chipmunk	MC-1 DS of Q023	5	Integrate	2.5 mrem/hr	D:MC1CDC	D:V003 & D:H005
[illegible]002	Chipmunk	MC-1 g-2 Ring Center	5	Integrate	2.0 mrem/hr	D:MC1CDC	D:V003 & D:H005

Note: QF only included for chipmmunks

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Running Condition

Muon Campus - on Target/g-2 Mode

November 24, 2020

Area RSO Maddie Schoell

Operator Signatures

Crew Chiefs	Crew A

Crew B	Crew C

Crew D	Crew E

Other

Fermilab

Running Condition

Muon Campus - off Target/Mu2e Mode

November 24, 2020

Area RSO Maddie Schoell

Mode of Operation 8 GeV primary beam around AP-0 target, through Delivery Ring to DA

Beam Limits

Beam Energy	ASE Limit	Operating Limit
8 GeV	1.80 E14 protons/hr	3.60 E13 protons/hr

Critical Devices I:F17B3 & M:HV100

See CDC status page for critical devices for DS enclosures (Delivery Ring & Extraction Enclosure)

Enclosures Protected Pre-Target, Pre-Vault, Transport US/DS & Mid & Delivery Ring, Extraction, M4

Preferred Monitoring Devices* Intensity is monitored via D:TOR704
Intensity to the Delivery Ring Absorber is monitored via D:TORABT

*Other methods of monitoring intensity may be used.

Requirements

Access Devices To access Muon Campus enclosures, the following devices must be disabled. Pre-Target, Pre-Vault, Transport: I:F17B3 and M:HV100 (D:M1CDC). Delivery Ring: D:H812 and D:H700 (D:DELCDC). Extraction Enclosure: D:ELAM and D:V901 (D:EXTCDC). MC-1 Hall: D:V003 and D:H005 (D:MC1CDC). M4: D:H910 (D:M4CDC).

Cool Off Period There is a cool off period before accessing Pre-Vault or Pre-Target enclosures as follows: AP0 PreVault monitor (G:RD2072) must be reading < 400 cpm before access is allowed unless waived by the area RSO.

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.

Access to AP0 Vault requires prior RSO approval & RCT coverage. Access to the Vault upper level requires beam off. Access to AP0 Water Cage requires beam off, RCT coverage and prior RSO approval. RCTs may obtain AP0 Vault and Water Cage keys without prior RSO approval.

Gates, Fencing and Passive Shielding Requirements There is no access to radiologically fenced areas without prior RSO approval.

Shielding, fencing and posting are in accordance with the following shielding assessment documents:
Feb. 7, 2017 "Muon G-2 Shielding Assessment"
2019 "Analysis of new M4 shield wall for M5 beamline operation"

Hatches along the delivery ring and M4 hatch are filled with removable shielding blocks and are locked with Pad 118 and the enclosure enter keys.

Gate at downstream end of M4 enclosure closed and locked with PAD118 and enclosure enter key.

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

Sys. Dept. Head Approval Todd Sullivan Digitally signed by Todd Sullivan Date: 2020.11.24 14:05:02 -06'00'

Assigned RSO Approval Madelyn Schoell, UID:maddiew Digitally signed by Madelyn Schoell, UID:maddiew Date: 2020.11.24 13:54:23 -06'00'

Sys. Dept. Head Approval Gerald Annala Digitally signed by Gerald Annala Date: 2020.11.24 13:59:50 -06'00'

AD Head Approval Michael Lindgren, UID:mlindgre Digitally signed by Michael Lindgren, UID:mlindgre Date: 2020.11.24 14:13:43 -06'00'

Operational Comments

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

The access to the fenced area behind the Delivery Ring absorber in Transport DS requires the area RSO permission and the following key: Muon Campus Cleanup Absorber Xport Mini-Loop Enter key, which is locked up in MCR.

Fermilab

Running Condition

Muon Campus - off Target/Mu2e Mode

November 24, 2020

Area RSO Maddie Schoell

Instrument Information

All detector trips shall be documented in the E-log.
Interlocked detectors (i.e., Chipmunk, FOX, Scarecrow, TLM, etc.) in "Integrate" mode that trip will not allow a safety system reset until sufficient time has passed to keep the hourly dose rate equal to or below the trip point setting. Interlocked detectors in "Integrate" mode that trip may be reset as the safety system allows. If there are more than three (3) trips by an interlocked detector in "Integrate" mode in one hour, RSO approval is required before reset.

MUX	Type	Location	QF	R/I Mode	Trip Level	CDC	Device(s) Tripped
2-071	TLM	Muon Campus Prevault		Integrate	3000 nC/min	D:M1CDC	I:F17B3 & M:HV100
2-065	Chipmunk	AP-1 Entrance - PreTarget Access Hutch	5	Integrate	5 mrem/hr	D:M1CDC	I:F17B3 & M:HV100
2-069	Chipmunk	AP0 South Vault Wall	5	Integrate	15 mrem/hr	D:M1CDC	I:F17B3 & M:HV100
2-064	Chipmunk	AP0 South Building Wall	5	Integrate	5 mrem/hr	D:M1CDC	I:F17B3 & M:HV100
2-075	Chipmunk	Transport DS/Delivery Ring Gate	5	Rate	5 mrem/hr	D:M1CDC	I:F17B3 & M:HV100
2-080	Chipmunk	AP-10 North Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-081	Chipmunk	AP-10 A17R05	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-082	Chipmunk	AP-10 A16R07	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-083	Chipmunk	AP-10 A16R03	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-084	Chipmunk	AP-10 D:QS	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-085	Chipmunk	AP-10 D:QD	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-086	Chipmunk	AP-10 A14R03	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-087	Chipmunk	AP-10 A14R0Y	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-088	Chipmunk	AP-10 MCR SW Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-089	Chipmunk	AP-10 Bay A13 South	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-090	Chipmunk	AP-10 Bay A12 North	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
[illegible]091	Chipmunk	AP-10 A2R01	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-092	Chipmunk	AP-10 SW Rollup Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-093	Chipmunk	AP-10 South Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-096	Chipmunk	AP-30 South Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-097	Chipmunk	AP-30 S Rollup Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-098	Chipmunk	AP-30 D:H744	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-099	Chipmunk	AP-30 D:QT303	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-100	Chipmunk	AP-30 A35R07	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-101	Chipmunk	AP-30 A35R01	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-102	Chipmunk	AP-30 D:ISEP	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-103	Chipmunk	AP-30 A34R03	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-104	Chipmunk	AP-30 A33R07	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-105	Chipmunk	AP-30 A33R01	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-106	Chipmunk	AP-30 D:ELAM	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-107	Chipmunk	AP-30 D:V906	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-108	Chipmunk	AP-30 NE Rollup Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-109	Chipmunk	AP-30 North Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-112	Chipmunk	AP-50 West Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-113	Chipmunk	AP-50 A57R07	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-114	Chipmunk	AP-50 A57R01	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-115	Chipmunk	AP-50 A56R04	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-116	Chipmunk	AP-50 A55R08	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-117	Chipmunk	AP-50 A55R02 RFPA	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-118	Chipmunk	AP-50 D:SEXFV	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-119	Chipmunk	AP-50 D:VA03	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-120	Chipmunk	AP-50 A53R07	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-121	Chipmunk	AP-50 A53R01	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-122	Chipmunk	AP-50 Abort Kicker	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-123	Chipmunk	AP-50 D:ASEP	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-124	Chipmunk	AP-50 East Rollup Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
2-125	Chipmunk	AP-50 East Door	5	Integrate	2.5 mrem/hr	D:DELCDC	D:H812 (g-2) or D:H700 (Mu2e) & BS707
[illegible]-019	Chipmunk	M4 7 foot drop Gate	5	Integrate	1.0 mrem/hr	D:M4CDC	D:H910
[illegible]003	Chipmunk	MC-1 Hall Extraction Stub Gate	5	Rate	2.5 mrem/hr	D:M4CDC	D:H910

Note: QF only included for chipmmunks

Fermilab

Running Condition

Muon Campus - off Target/Mu2e Mode

November 24, 2020

Area RSO Maddie Schoell

Operator Signatures

Crew Chiefs	Crew A

Crew B	Crew C

Crew D	Crew E

Other