

BEAM PERMIT
10/2/2020

LINAC Accelerator Safety Envelope (ASE) Limit

The maximum beam intensity transmitted through the LINAC Beamline is limited to:
 1.77×10^{19} protons/hr at 400 MeV

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

LINAC Beamline Operating Limits

The maximum beam intensity transmitted through the LINAC Beamline is limited to:
 3.54×10^{17} protons/hr at 400 MeV

Examples: Particles/hr = current (mA) x pulse length (μ sec) x number of pulses/hr x 6.25×10^9

#1 35 mA of beam with a pulse length of 30 μ sec at 15 Hz for one hour yields 3.54×10^{17} protons/hour
(35 mA x 30 μ sec x 54,000 pulses/hr x 6.25×10^9 = 3.54×10^{17} protons/hour)

#2 50 mA of beam with a pulse length of 30 μ sec at 5 Hz for one hour yields 1.69×10^{17} protons/hour
(50 mA x 30 μ sec x 18,000 pulses/hr x 6.25×10^9 = 1.69×10^{17} protons/hour)

Special conditions and comments:

Reviewed by Todd Sullivan 10/02/2020

Operations Department Head

Reviewed by Cheng-Yang Tan, UID:cytan Digitally signed by Cheng-Yang Tan, UID:cytan
Date: 2020.10.02 10:05:40 -05'00'

Systems Department Head

Reviewed by Maddiew Schoell 10/2/2020

Assigned RSO

Reviewed by Madelyn Schoell, UID:maddiew Digitally signed by Madelyn Schoell, UID:maddiew
Date: 2020.10.02 09:55:33 -05'00'

ES&H Radiation Physics Operations Department Head

Approved by Michael Lindgren, UID:mlindgre Digitally signed by Michael Lindgren, UID:mlindgre
Date: 2020.10.02 10:15:24 -05'00'

Accelerator Division Head

Operator Signatures

Crew Chiefs

Duff Shum 10/2/20
Mick G. Galt 10/02/2020
Michael Grogan 10/3/20
Kell 10/3/20
Donovan 14011N 7 OCT 20

Crew A

Paul Dondell 10/12/20
Anderson Petherick 10/12/20
Jay Schmitt 10-2-20
Jacques Mvolotwari

Crew B

John Brown 30 Oct 20
George Williams 10/3/20
Jamal Johnson 10/3/20
Matilda Mwaniki 10/3/2020

Crew C

Nathan Ruffatti 10/6/20
John T. Horn 10/6/20
Judith O'Neil 10/7/20
Keynety Bullcock 10/7/20
Gillardo Peay 10-7-2020

Crew D

Kenning 10/2/20
Kui P. McDonough 10/2/20
Tom 10-2-20
Jakob Schaeffer 10/5/2020

Crew E

Carol Myrner 10-2-20
Hayden Haan 10-3-20
Ashley Dietrich 10/3/20
Sara Schefelen 10/3/20
Catherine J. Watling 10/03/2020

Other

October 2, 2020

Sue McGimpsey

Area RSO

Mode of Operation Full Operation

Beam Limits	Beam Energy 400 MeV	ASE Limit 1.77 E19 protons/hr	Operating Limit 3.54 E17 protons/hr
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Critical Devices L:LVV and RFQ Low Level RF
L:LVV is a Vacuum Gate Valve

Enclosures Protected Linac and all areas downstream

Preferred Monitoring Devices* Intensity is monitored via L:RF3INT

*Other methods of monitoring intensity may be used.

Requirements

Access Devices L:LVV must be closed and RFQ Low Level RF must be OFF to access Linac.

Cool Off Period none

Special Interlocks The CDC Inputs including failure mode devices may all be found on the Safety System Status pages. No access to the Linac enclosure while the high energy (Klystron) and Marx modulator gradients are energized. Back-up devices are the ion source extractor PS AC Contactor L:AEXTSV AND L:BEXTSV The status of the RFQ low level RF is monitored in L:RFQDS1

Special Concerns Any work performed on critical devices or obtaining a critical device key requires 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 1993 "Radiation shielding assessment of the Linac high energy enclosure following the 1993 upgrade installation and low energy commissioning". The RFQ, ion source, (and former I- Cockroft-Walton) area directly north of the Linac enclosure is posted as a Radiation Area and is locked/posted to prevent access by non-Radiological Worker trained personnel. Routine access to this Radiation Area by Radiological Worker trained personnel is permitted during beam operations. Lower Level penetrations (27) must be locked with a LIN C cored padlock prior to operation. Penetrations (8) on top of the Linac Berm must be locked with PAD 118 and LIN E cored padlocks. The downstream portion of the Booster Chute (on the Booster side) must be covered and locked with a PAD 118 and LIN C cored padlocks.

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

<p>Ops. Dept. Head Approval  Cheng-Yang Tan, UID:cytan Digitally signed by Cheng-Yang Tan, UID:cytan Date: 2020.10.02 10:06:30 -05'00'</p>	<p>Assigned RSO Approval  Michael Lindgren, UID:mlindgre Digitally signed by Michael Lindgren, UID:mlindgre Date: 2020.10.02 10:15:10 -05'00'</p>
<p>Sys. Dept. Head Approval</p>	<p>AD Head Approval</p>

October 2, 2020

Area RSO

Sue McGimpsey

Operational Comments

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

October 2, 2020

Area RSO

Sue McGimpsey

Operator Signatures

Crew Chiefs

Dan Hillman 10/2/20

Phil P. Clark 10/02/2020

Michael Czyszmar 10/3/20

Kel R 10/3/20

Tom 140112 7 OCT 20

Crew A

Pat Fuchs 10/2/20

Andr Ottise 10-2-20

Greg Johnson 10-2-20

Crew B

Alan Stein 30 Oct 20

George Williams 10/3/20

Jamal Johnson 10/3/20

Matilda Mwaniki 10/3/2020

Crew C

Nathan Ruffin 10/6/20

John T. Hampson 10/6/20

Therese Bullcock 10/7/20

Jacob O'Neil 10/7/20

Jillbeth Perez 10/7/2020

Crew D

Umm 10/2/2020

Kimberly McDougall 10/2/20

Tom 10-2-20

Jacob Schaeffer 10/5/2020

Crew E

Craig 10-2-20

Hagen 10-3-20

Henry Getrin 10/3/20

Eric 10/3/20

Carley J. Watkins 10/03/2020

Other