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C-A OPERATIONS PROCEDURES MANUAL

ATTACHMENT

4.120.62.a Booster Critical Device Tests

C-A-OPM Procedures in which this Attachment is used.		
4.120.62		

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
_____	_____	_____	_____
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Approved: _____ *Signature on File* _____
 Collider-Accelerator Department Chairman Date

V. Castillo

4.120.62.a Booster Critical Device Tests

PASS ANNUAL ACCEPTANCE TEST PROTOCOL

Division A Software Filename and Checksum: Title: _____ Checksum: _____

Division B Software Filename and Checksum: Title: _____ Checksum: _____

Initial testing complete:

Test Team Leader's Name (Print): _____ Life Number: _____

Test Team Leader's Name (Sign): _____ Date: ____/____/____

Acceptance test procedure complete (following repairs and retesting if required):

Test Team Leader's Name (Print): _____ Life Number: _____

Test Team Leader's Name (Sign): _____ Date: ____/____/____

Test results reviewed by:

Safety Section Head's Name (Print): _____ Life Number: _____

Safety Section Head's Name (Sign): _____ Date: ____/____/____

Test results accepted by Radiation Safety Committee:

RSC Member's Name (Print): _____ Life Number: _____

RSC Member's Name (Sign): _____ Date: ____/____/____

1.1 Setup and test of Ready Status for Booster Critical Devices: DH2, 3 and F6 Septum Power Supplies

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|--------------------------|---|--|-----------------|
| <input type="checkbox"/> | VERIFY | Power Supply DH2, 3 is | LOTO |
| <input type="checkbox"/> | VERIFY | Power Supply F6 is | LOTO |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | OFF |
| | PLACE | Bstr in Controlled access (CA) | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr in | CA |
| | CAPTURE | Booster Key Lock-Out on MCR panel H | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Booster key Lock-Out is | CAPTURED |
| | TURN ON | At encl 4521 relays: HK4 and HK5 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 relays: HK4 <input type="checkbox"/> and HK5 <input type="checkbox"/> are | ON |
| | ENABLE | Extraction with 693 key at panel H in MCR | |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | ON |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | ON |
| | TURN OFF | At encl 4521 relay HK4 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 relay HK4 is | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | OFF |
| | TURN ON | At encl 4521 relays: HK4 and HK5 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 relays: HK4 <input type="checkbox"/> and HK5 <input type="checkbox"/> are | ON |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | ON |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | ON |
| | PRESS | Extraction Disable Switch at panel H in MCR | |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | OFF |
| | TURN OFF | At encl 4521 relays: HK4 and HK5 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 relays: HK4 <input type="checkbox"/> and HK5 <input type="checkbox"/> are | OFF |
| <input type="checkbox"/> | Check for acceptance of Setup and test of Ready Status for Booster Critical Devices: DH2, 3 and F6 septum Power Supplies | | |

1.2 Setup and test of Booster Critical Devices: LTB Beam-Stop1(Ltb 1) and LTB Beam-Stop 2 (Ltb 2)

<input type="checkbox"/>	VERIFY	At end 4521 LTB Lock-Out Switch is	NO LOTO
	PLACE	Booster (Bstr) in Restricted Access (RA)	
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor Bstr in	RA
<input type="checkbox"/>	VERIFY	At MCR panel GH Ltb1 Command (Cmd) is	CLOSED
<input type="checkbox"/>	VERIFY	At MCR panel GH Ltb1 Command (Cmd) is	CLOSED
	PLACE	Bstr in Controlled Access (CA)	
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor Bstr in	CA
	RESET	Bstr gates: Laby-A, Laby-B, Emer Door, Man Lock, Plug Door, Booster Berm	
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor Bstr gates: Laby-A <input type="checkbox"/> , Laby-B <input type="checkbox"/> , Emer Door <input type="checkbox"/> , Man Lock <input type="checkbox"/> , Plug Door <input type="checkbox"/> , Booster Berm <input type="checkbox"/>	RESET
	SWEEP	Bstr	
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor Bstr	SWEEP COMPL
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor Bstr Crash <input type="checkbox"/> and Rdn Crash <input type="checkbox"/>	OK
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor Bstr Area Lights	DIMMED
<input type="checkbox"/>	VERIFY	At end 4521 relays HK2 <input type="checkbox"/> and HK3 <input type="checkbox"/> are	ON
<input type="checkbox"/>	VERIFY	At MCR Panel H DH2,3 <input type="checkbox"/> and F6 <input type="checkbox"/> ready lights are	OFF
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor Bstr Cmks: NMO 058 <input type="checkbox"/> , NMO 059 <input type="checkbox"/> and NMO 060 <input type="checkbox"/>	OK
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor 8° / 20° / H-L valve / B15 Xfmr	OK
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor Water for: D3 <input type="checkbox"/> and B6 <input type="checkbox"/>	OK
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor NSRL Ilks: Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OK
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor PASS Rhbk: Pri <input type="checkbox"/> and Rdn <input type="checkbox"/>	OK
	CLOSE	At encl 4521 bldg 914 LTB Lock-Out switch	
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor LTB Lock-Out switch	CLOSED
	HAVE	MCR Operator Open Ltb 1 and Ltb 2	
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor Ltb 1 <input type="checkbox"/> and Ltb 2 <input type="checkbox"/>	OPEN
	TRIP	Chipmunk NMO _____	
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor NMO _____	INTLK
<input type="checkbox"/>	VERIFY	MCR sees at Opto Monitor Ltb 1 <input type="checkbox"/> and Ltb 2 <input type="checkbox"/>	CLOSED
	HAVE	MCR Operator Open Ltb 1 and Ltb 2	
<input type="checkbox"/>	VERIFY	Attempt to Open Ltb 1 <input type="checkbox"/> and Ltb 2 <input type="checkbox"/>	FAIL

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|--------------------------|---------------|---|-------------------|
| | RESET | Chipmunk NMO _____ | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Chipmunk NMO _____ | RESET |
| | HAVE | MCR Operator Open Ltb 1 and Ltb 2 | |
| <input type="checkbox"/> | VERIFY | Attempt to Open Ltb 1 <input type="checkbox"/> and Ltb 2 <input type="checkbox"/> | SUCCESSFUL |

- Check for acceptance of Setup and test of Booster Critical Devices: LTB Beam-Stop1(Ltb 1) and LTB Beam-Stop 2 (Ltb 2)**

1.3 Setup and test of Booster Critical Devices: TTB Beam-Stop1(Ttb 1) and TTB Beam-Stop 2 (Ttb 2)

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|--------------------------|---------------|------------------------------------|----------------|
| <input type="checkbox"/> | VERIFY | At end 4521 TTB Lock-Out Switch is | NO LOTO |
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| | PLACE | Booster (Bstr) in Restricted Access (RA) | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr in | RA |

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|--------------------------|---------------|---|---------------|
| <input type="checkbox"/> | VERIFY | At MCR panel GH Ltb1 Command (Cmd) is | CLOSED |
| <input type="checkbox"/> | VERIFY | At MCR panel GH Ltb1 Command (Cmd) is | CLOSED |

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|--------------------------|---------------|--|-----------|
| | PLACE | Bstr in Controlled Access (CA) | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr in | CA |

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|--------------------------|---------------|---|--------------|
| | RESET | Bstr gates: Laby-A, Laby-B, Emer Door, Man Lock, Plug Door, Booster Berm | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr gates: Laby-A <input type="checkbox"/> , Laby-B <input type="checkbox"/> , Emer Door <input type="checkbox"/> , Man Lock <input type="checkbox"/> , Plug Door <input type="checkbox"/> , Booster Berm <input type="checkbox"/> | RESET |

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|--------------------------|---------------|--------------------------------------|--------------------|
| | SWEEP | Bstr | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr | SWEEP COMPL |

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|--------------------------|---------------|---|-----------|
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr Crash <input type="checkbox"/> and Rdn Crash <input type="checkbox"/> | OK |
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|--------------------------|---------------|--|---------------|
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr Area Lights | DIMMED |
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|--------------------------|---------------|--|-----------|
| <input type="checkbox"/> | VERIFY | At end 4521 relays HK2 <input type="checkbox"/> and HK3 <input type="checkbox"/> are | ON |
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|--------------------------|---------------|--|------------|
| <input type="checkbox"/> | VERIFY | At MCR Panel H DH2,3 <input type="checkbox"/> and F6 <input type="checkbox"/> ready lights are | OFF |
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|--------------------------|---------------|---|-----------|
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr Cmks: NMO 058 <input type="checkbox"/> , NMO 059 <input type="checkbox"/> and NMO 060 <input type="checkbox"/> | OK |
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|--------------------------|---------------|--|--|
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Water for: D3 <input type="checkbox"/> and B6 <input type="checkbox"/> | |
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|--------------------------|---------------|--|-----------|
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor NSRL Ilks: Div A <input type="checkbox"/> and Div B <input type="checkbox"/> | OK |
|--------------------------|---------------|--|-----------|

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|--------------------------|---------------|--|-----------|
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor PASS Rhbk: Pri <input type="checkbox"/> and Rdn <input type="checkbox"/> | OK |
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|--------------------------|---------------|---|---------------|
| | CLOSE | At encl 4521 bldg 914 TTB Lock-Out switch | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor LTB Lock-Out switch | CLOSED |

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|--------------------------|--|--|-------------------|
| <input type="checkbox"/> | HAVE | MCR Operator Open Ttb 1 and Ttb 2 | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Ttb 1 <input type="checkbox"/> and Ttb 2 <input type="checkbox"/> | OPEN |
| <input type="checkbox"/> | TRIP | Chipmunk NMO _____ | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor NMO _____ | INTLK |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Ttb 1 <input type="checkbox"/> and Ttb 2 <input type="checkbox"/> | CLOSED |
| <input type="checkbox"/> | HAVE | MCR Operator Open Ttb 1 and Ttb 2 | |
| <input type="checkbox"/> | VERIFY | Attempt to Open Ttb 1 <input type="checkbox"/> and Ttb 2 <input type="checkbox"/> | FAIL |
| <input type="checkbox"/> | RESET | Chipmunk NMO _____ | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Chipmunk NMO _____ | RESET |
| <input type="checkbox"/> | HAVE | MCR Operator Open Ttb 1 and Ttb 2 | |
| <input type="checkbox"/> | VERIFY | Attempt to Open Ttb 1 <input type="checkbox"/> and Ttb 2 <input type="checkbox"/> | SUCCESSFUL |
| <input type="checkbox"/> | Check for acceptance of Setup and test of Booster Critical Devices: TTB Beam-Stop1(Ttb 1) and TTB Beam-Stop 2 (Ttb 2) | | |

1.4 Setup and test of Booster Critical Device DH2, 3 Power Supply under power

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|--------------------------|----------------|--|-----------------|
| <input type="checkbox"/> | PLACE | Feed forward (FF) switch in OFF position | |
| <input type="checkbox"/> | VERIFY | FF switch is in | OFF Posn |
| <input type="checkbox"/> | VERIFY | Power Supply DH2, 3 is | NO LOTO |
| <input type="checkbox"/> | VERIFY | Power Supply F6 is | NO LOTO |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | OFF |
| <input type="checkbox"/> | PLACE | Bstr in Controlled access (CA) | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr in | CA |
| <input type="checkbox"/> | CAPTURE | Booster Key Lock-Out on MCR panel H | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Booster key Lock-Out is | CAPTURED |
| <input type="checkbox"/> | TURN ON | At encl 4521 relays: HK4 and HK5 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 AGS Inlks OK Primary relay HK4 is | ON |
| <input type="checkbox"/> | VERIFY | At encl 4521 AGS Inlks OK Redundant relay HK5 is | ON |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | ON |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | ON |
| <input type="checkbox"/> | HAVE | MCR Operator turn on DH2, 3 Power supply | |
| <input type="checkbox"/> | VERIFY | DH2, 3 Power Supply is | ON |
| <input type="checkbox"/> | OPEN | At encl 4521 relay HK4 | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor AGS Inlks OK Primary | INTLK |

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|--------------------------|--|--|-------------|
| <input type="checkbox"/> | VERIFY | MCR sees DH2, 3 Power Supply | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | OFF |
| <input type="checkbox"/> | VERIFY | At encl 4521 relays HK4 is | OFF |
| <input type="checkbox"/> | VERIFY | Attempt to turn on DH2, 3 | FAIL |
| | TURN ON | At encl 4521 relays: HK4 and HK5 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 AGS Inlks OK Primary relay HK4 is | ON |
| <input type="checkbox"/> | VERIFY | At encl 4521 AGS Inlks OK Redundant relay HK5 is | ON |
| | ENABLE | Extraction with 693 key at panel H in MCR | |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | ON |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | ON |
| | PRESS | Extraction Disable Switch at panel H in MCR | |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | OFF |
| | TURN OFF | At encl 4521 relays: HK4 and HK5 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 relays: HK4 <input type="checkbox"/> and HK5 <input type="checkbox"/> are | OFF |
| <input type="checkbox"/> | Check for acceptance of Setup and test of Booster Critical Device DH2, 3 Power Supply under power | | |

1.5 Setup and test of Booster Critical Device F6 Power Supply under power

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|--------------------------|----------------|--|-----------------|
| | PLACE | Feed forward (FF) switch in OFF position | |
| <input type="checkbox"/> | VERIFY | FF switch is in | OFF Posn |
| <input type="checkbox"/> | VERIFY | Power Supply DH2, 3 is | NO LOTO |
| <input type="checkbox"/> | VERIFY | Power Supply F6 is | NO LOTO |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | OFF |
| | PLACE | Bstr in Controlled access (CA) | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr in | CA |
| | CAPTURE | Booster Key Lock-Out on MCR panel H | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Booster key Lock-Out is | CAPTURED |
| | TURN ON | At encl 4521 relays: HK4 and HK5 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 AGS Inlks OK Primary relay HK4 is | ON |
| <input type="checkbox"/> | VERIFY | At encl 4521 AGS Inlks OK Redundant relay HK5 is | ON |
| | ENABLE | Extraction with 693 key at panel H in MCR | |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | ON |

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|--------------------------|--|--|--------------|
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | ON |
| | HAVE | MCR Operator turn on F6 Power supply | |
| <input type="checkbox"/> | VERIFY | F6 Power Supply is | ON |
| | OPEN | At encl 4521 relay HK5 | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor AGS Inlks OK Redundant | INTLK |
| <input type="checkbox"/> | VERIFY | MCR sees F6 Power Supply | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | OFF |
| <input type="checkbox"/> | VERIFY | At encl 4521 relays HK5 is | OFF |
| <input type="checkbox"/> | VERIFY | Attempt to turn on F6 | FAIL |
| | TURN ON | At encl 4521 relays: HK4 and HK5 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 AGS Inlks OK Primary relay HK4 is | ON |
| <input type="checkbox"/> | VERIFY | At encl 4521 AGS Inlks OK Redundant relay HK5 is | ON |
| | ENABLE | Extraction with 693 key at panel H in MCR | |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | ON |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | ON |
| | PRESS | Extraction Disable Switch at panel H in MCR | |
| <input type="checkbox"/> | VERIFY | At panel H in MCR DH2, 3 ready light is | OFF |
| <input type="checkbox"/> | VERIFY | At panel H in MCR F6 ready light is | OFF |
| | TURN OFF | At encl 4521 relays: HK4 and HK5 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 relays: HK4 <input type="checkbox"/> and HK5 <input type="checkbox"/> are | OFF |
| <input type="checkbox"/> | Check for acceptance of Setup and test of Booster Critical Device F6 Power Supply under power | | |

1.6 Setup and test of Booster Main Magnet Power Supply under power

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|--------------------------|-----------------|--|----------------|
| <input type="checkbox"/> | VERIFY | Main Magnet Power Supply is | NO LOTO |
| | PLACE | Bstr in Controlled access (CA) | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr in | CA |
| <input type="checkbox"/> | VERIFY | At encl 4521 relay JK14 , Bstr Ring Magnet PSs Intlk Ok, is | ON |
| <input type="checkbox"/> | VERIFY | At encl 5012 in Bldg 930A Interlock Clear light is | ON |
| | HAVE | MCR / PS Operator turn ON Booster Main Magnet Power supply | |
| <input type="checkbox"/> | VERIFY | Booster Main Magnet Power Supply is | ON |
| | TURN OFF | At encl 4521 relay JK14 | |
| <input type="checkbox"/> | VERIFY | Booster Main Magnet Power Supply is | OFF |
| | HAVE | PS Operator open 95 Switch-I and 95 Switch-II at Rack 4965 in PS Contrl Room | |

□ **VERIFY** 95 Switch-1 □ and 95 Switch-2 □ are

OPEN |

- HAVE** PS Operator uncapture Kirk keys for 95 Sw-1 at Rack 4996 and 95 Sw-2 at Rack 4988
- VERIFY** Kirk keys for 95 Sw-1 and 95 Sw-II are **UNCAPTURED**
- VERIFY** At encl 5012 **Interlock Clear** light is **OFF**
- VERIFY** At encl 5012 **All Power Supplies Off** light is **ON**
- VERIFY** At encl 4521 relay **JK15** is **ON**
- VERIFY** **MCR** sees at Opto Monitor **Bstr Ring Magnet PSs** **OFF**
- TURN ON** At encl 4521 relay **JK14**
- VERIFY** At encl 5012 **Interlock Clear** light is **ON**
- VERIFY** At encl 5012 **All Power Supplies Off** light is **ON**
- Check for acceptance of Setup and test of Booster Main Magnet Power Supply under power**

1.7 Setup and test of Booster Vertical and Horizontal Quads Power Supplies under power

- VERIFY** **Bstr Vert and Horz Quads** Power Supplies are **NO LOTO**
- PLACE** **Bstr** in Controlled access (CA)
- VERIFY** **MCR** sees at Opto Monitor **Bstr** in **CA**
- VERIFY** At encl 4521 relay **JK14**, Bstr Ring Magnet PSs Intlk Ok, is **ON**
- HAVE** **MCR** Operator **turn on Booster Vert & Horz Quads** Power supplies **ON**
- TURN OFF** At encl 4521 relay **JK14**
- VERIFY** Booster Main Magnet Power Supply is **OFF**
- VERIFY** **MCR** sees at Opto Monitor **Bstr Ring Magnet PSs** **INTKLED**
- TURN ON** At encl 4521 relay **JK14**
- VERIFY** **MCR** sees at Opto Monitor **Bstr Ring Magnet PSs** **INTLK OK**
- Check for acceptance of Setup and test of Booster Main Magnet Power Supply under power**

1.8 Setup and test of Booster Low Field Quad Trims 1, 2, 3 and 4 Power Supplies under power

- VERIFY** **Low Field Quad Trims 1, 2, 3 and 4** Power Supplies are **NO LOTO**
- PLACE** **Bstr** in Controlled access (CA)
- VERIFY** **MCR** sees at Opto Monitor **Bstr** in **CA**
- VERIFY** At encl 4521 relay **JK14**, Bstr Main Magnet PSs Intlk Ok, is **ON**
- HAVE** **MCR** Operator **turn on** Booster Low Field Quad Trims 1, 2, 3 and 4 Power Supplies

- | | | | |
|--------------------------|---|---|-------------------|
| <input type="checkbox"/> | VERIFY | Booster Low Field Quad Trims 1, 2, 3 and 4 Power Supplies are | ON |
| | TURN OFF | At encl 4521 relay JK14 | |
| <input type="checkbox"/> | VERIFY | Booster Low Field Quad Trims 1, 2, 3 and 4 Power Supplies are | OFF |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr Ring Magnet PSs | INTKLED |
| | TURN ON | At encl 4521 relay JK14 | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr Ring Magnet PSs | INTLK OK |
| <input type="checkbox"/> | Check for acceptance of Setup and test of Booster Low Field Quad Trims 1, 2, 3 and 4 Power Supplies under power | | |
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 | | | |
| 1.9 | Setup and test of Reachback to LEBT Bs 1 & 2 (Leb 1 & Leb 2) with failure of LTB Bs 1 & 2 (Ltb 1 & Ltb 2) | | |
| | CLOSE | Water-flow switch (WFS) to Ltb 1 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 relay FK14 is | OFF |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr LTB B/S (Leb 1&2 RhbK) | FAILURE |
| | OPEN | Water-flow switch (WFS) to Ltb 1 | |
| | CLEAR | RhbK at panel D in MCR with H693 key and P/B | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr LTB B/S | OK |
| | CLOSE | Water-flow switch (WFS) to Ltb 2 | |
| <input type="checkbox"/> | VERIFY | At encl 4521 relay JK12 is | OFF |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr LTB B/S (Leb 1&2 RhbK) | FAILURE |
| | OPEN | Water-flow switch (WFS) to Ltb 2 | |
| | CLEAR | RhbK at panel D in MCR with H693 key and P/B | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr LTB B/S | OK |
| <input type="checkbox"/> | Check for acceptance of Setup and test of Reachback to LEBT Bs 1 & 2 with failure of LTB Bs 1 & 2 | | |
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 | | | |
| 1.10 | Setup and test of Reachback to 26DH2 Power Supply with failure of TTB Bs 1 & 2 (Ttb 1 & Ttb 2) | | |
| | TURN ON | At encl 4521 relays: IK2 and IK4 | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor TTB Bs 1 <input type="checkbox"/> and Bs 2 <input type="checkbox"/> | OPEN |
| | TURN OFF | At encl 4521 IK2 | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor TTB Bs 1 | CLOSED |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor TTB Bs failure & RhbK to 26DH2 | INTLK |
| <input type="checkbox"/> | VERIFY | MCR sees at panel D TTB BS failure RhbK 26DH2 light | ON |
| <input type="checkbox"/> | VERIFY | Attempt to reset rhbK with H 693 key and P/B on panel D | FAIL |
| | TURN ON | At encl 4521 IK2 and IK4 | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor TTB Bs 1 and Bs 2 | CLOSED |
| <input type="checkbox"/> | VERIFY | Attempt to reset rhbK with H 693 key and P/B on panel D | SUCCESSFUL |
| <input type="checkbox"/> | Check for acceptance of Setup and test of Reachback to 26DH2 Power Supply with failure of TTB Bs 1 & 2 (Ttb 1 & Ttb 2) | | |

1.11 Setup and test of HEBT –TTB Crossover

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|--------------------------|--|---|------------------|
| | RESET | AGS / HEBT gate from Linac side at encl M14A24A2 with 705 key | |
| <input type="checkbox"/> | VERIFY | At encl M14A24A2 Reset light is | ON |
| <input type="checkbox"/> | VERIFY | MCR sees at W-Panel AGS / HEBT Not Reset light is | OFF |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto monitor AGS / HEBT gate is | RESET |
| | | | |
| | RESET | N322 gate from Linac side at encl 5032 with 705 key | |
| <input type="checkbox"/> | VERIFY | At encl 5032 Reset light is | ON |
| <input type="checkbox"/> | VERIFY | MCR sees at W-Panel N322 gate Not Reset light is | OFF |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto monitor N322 gate is | RESET |
| | | | |
| | RESET | LINAC / HEBT gate from Linac side at encl 5114 with 705 key | |
| <input type="checkbox"/> | VERIFY | At encl 5114 Reset light is | ON |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto monitor Linac U/S HEBT for TTB operation is | RESET |
| | | | |
| | OPEN | LINAC / HEBT gate with Push button at end 5114 | |
| <input type="checkbox"/> | VERIFY | At encl 5114 Reset light is | OFF |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto monitor Linac U/S HEBT for TTB operation is | NOT RESET |
| | | | |
| <input type="checkbox"/> | Check for acceptance of Setup and test of HEBT –TTB Crossover | | |

1.12 Test of Booster B6 Shutter Opens before TTB and LTB Beam stops can be opened with NSRL in Mode 17

- | | | | |
|--------------------------|---------------|---|-----------------|
| | PLACE | Bstr in Controlled Access (CA) | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor Bstr in | CA |
| | CLOSE | At encl 4521 bldg 914 LTB Lock-Out switch | |
| <input type="checkbox"/> | VERIFY | MCR sees at Opto Monitor LTB Lock-Out switch | CLOSED |
| | | | |
| | SET | Critical Device Switch (CDS) for | NSRL |
| <input type="checkbox"/> | VERIFY | CDS is set for | NSRL |
| | | | |
| | PLACE | PEER 27 in Controlled Access (CA), Mode 16 | |
| <input type="checkbox"/> | VERIFY | PEER 27 is in CA | MODE 16 |
| | | | |
| | FORCE | Sweep of Zone NSRL-Z3 | |
| <input type="checkbox"/> | VERIFY | MCR sees Zone NSRL-Z3 | SWEPT |
| | RESET | Gates BGI2 | |
| <input type="checkbox"/> | VERIFY | MCR sees Gates BGI2 | RESET |
| | | | |
| | PLACE | PEER 27 in Controlled Access (XA), Mode 17 | |
| <input type="checkbox"/> | VERIFY | PEER 27 is in XA | MODE 17 |
| | | | |
| | After | 30 secs | |
| <input type="checkbox"/> | VERIFY | MCR sees: Z1PCD=Z2PCD: D6AC <input type="checkbox"/> D6DC <input type="checkbox"/> NSRL | |
| | | B/P <input type="checkbox"/> | DISABLED |
| <input type="checkbox"/> | VERIFY | MCR sees: Z3PCD=Z1RBCD=Z2RBCD: TTB <input type="checkbox"/> LTB <input type="checkbox"/> | |
| | | BSB6 <input type="checkbox"/> | ENABLED |

END OF TEST PROCEDURE

TTL: Sign for completion of initial testing: _____

Date: ____/____/____

TTL: Sign for completion of final testing: _____

Date: ____/____/____