

*If you are using a printed copy of this procedure, and not the on-screen version, then you **MUST** make sure the dates at the bottom of the printed copy and the on-screen version match. The on-screen version of the Collider-Accelerator Department Procedure is the Official Version. Hard copies of all signed, official, C-A Operating Procedures are available by contacting the **ESSHQ Procedures Coordinator, Bldg. 911A***

C-A OPERATIONS PROCEDURES MANUAL

ATTACHMENT

4.120.62.b Booster Gate 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.b Booster Gate 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 CONDUCT Visual check on **BOOSTER** gates following Table-1, below

Gate	Micro Switch		Verify Elec Wiring OK	Verify Gate Box OK	Verify Open/Close Fctns OK	Verify all x's Corr.	Inspn OK Init.
	Verify Align OK	Verify Openn OK					
Man-Lock Inside (M-LI)	<input type="checkbox"/>	<input type="checkbox"/>					
Man-Lock Outside (M-LO)	<input type="checkbox"/>	<input type="checkbox"/>					
Booster Berm (BB)	<input type="checkbox"/>	<input type="checkbox"/>					
Labyrinth A (Laby-A)	<input type="checkbox"/>	<input type="checkbox"/>					
Labyrinth B (Laby-B)	<input type="checkbox"/>	<input type="checkbox"/>					
Emergency (Emcy)	<input type="checkbox"/>	<input type="checkbox"/>					
Plug Door (PD)	<input type="checkbox"/>	<input type="checkbox"/>					
Plug Door Fence (PDF)	<input type="checkbox"/>	<input type="checkbox"/>					

Legend: Tick = O.K. x = Problem N/A = Not Applicable

Table 1: Summary of Physical Inspection of BOOSTER Gates

- Check for acceptance of Visual check on BOOSTER gates

1.2 Test of Labyrinth A (Laby-A) gate

<input type="checkbox"/>	VERIFY	Hardware <input type="checkbox"/> , Electrical <input type="checkbox"/> at Laby-A gate is	O.K.
<input type="checkbox"/>	PLACE VERIFY	Booster in Restricted Access (RA) from MCR with 693 key and P/B At encl 4521 CA relays: CK2 <input type="checkbox"/> and DK3 <input type="checkbox"/> are	OFF
<input type="checkbox"/>	PLACE VERIFY	AGS in RA from MCR with 693 key and P/B At encl 4521 CA relay CK1 is	OFF
<input type="checkbox"/>	VERIFY	Attempt to open Laby-A with 256 key is	SUCCESSFUL
	CLOSE	Laby-A gate	
<input type="checkbox"/>	PLACE VERIFY	Booster in Controlled Access (CA) from MCR with 693 key and P/B At encl 4521 CA Relays: CK2 <input type="checkbox"/> and DK3 <input type="checkbox"/> are	ON
	OPEN	Gate Laby-A and hold open	
	HOLD	Crash glass microswitch (CGS), gate m-switch (GS) and Latch switch (LS) .	CLOSED
<input type="checkbox"/>	VERIFY	At enclosures 4525 (AGS side) and 4524 (Bstr side) Crash glass light (CGL) <input type="checkbox"/> , Gate light (GL) <input type="checkbox"/> and Latch light (LL) <input type="checkbox"/> are	ON
<input type="checkbox"/>	OPEN VERIFY SECURE	CGS CGL <input type="checkbox"/> , GL <input type="checkbox"/> and LL <input type="checkbox"/> are CGS	OFF
<input type="checkbox"/>	OPEN VERIFY	GS At encls 4524 and 4525 CGL	ON
<input type="checkbox"/>	VERIFY CLOSE	At encls 4524 and 4525 GL <input type="checkbox"/> and LL <input type="checkbox"/> GS and hold closed	OFF
<input type="checkbox"/>	OPEN VERIFY	LS At encls 4524 and 4525 CGL <input type="checkbox"/> and GL <input type="checkbox"/>	ON
<input type="checkbox"/>	VERIFY RELEASE	At encls 4524 and 4525 LL GS and LS	OFF
<input type="checkbox"/>	CLOSE VERIFY	Redundant gate microswitch (RGS) At encls 4524 and 4525 Redundant gate light (RGL) is	ON
<input type="checkbox"/>	VERIFY OPEN	At encl 4521 relay BK8 is RGS	ON
<input type="checkbox"/>	VERIFY VERIFY	At encls 4524 and 4525 RGL is At encl 4521 relay BK8 is	OFF OFF
	CLOSE	Laby-A gate	
<input type="checkbox"/>	VERIFY RESET RESET	At encls 4524, 4525 and 4527 (inside Laby-B) Not Reset light is Laby-B at encl 4527 with 705 key and P/B Laby-A at encl 4524 with 705 key	ON
<input type="checkbox"/>	VERIFY VERIFY	At encls 4524 and 4527 Reset lights are At encl 4521 relays BK3 <input type="checkbox"/> , BK10 <input type="checkbox"/> and BK12 <input type="checkbox"/> are	ON ON
<input type="checkbox"/>	OPEN VERIFY VERIFY	Laby-A At encls 4524 and 4527 Not Reset lights are At encl 4521 relays BK3 <input type="checkbox"/> , BK10 <input type="checkbox"/> and BK12 <input type="checkbox"/> are	ON OFF
	RESET	Laby-A at encl 4527 with 705 key and P/B	

- RESET** Laby-A at encl 4524 with **705 key**
- VERIFY** At encls 4524 and 4527 **Reset** lights are **ON**
- VERIFY** At encl 4521 **CK8** (all AGS gates reset) is **ON**
- OPEN** Laby-A at encl **4524** with **705 key** and **Sim. release** from **MCR panel**
W: AGS/Booster Labyrinth button
- VERIFY** **Laby-A gate** **OPEN**
- CLOSE** **Laby-A gate**

- Check for acceptance of Test of Labyrinth A gate**

1.3 Test of Labyrinth B (Laby-B) gate

- VERIFY** Hardware , Electrical at **Laby-B** gate is **O.K.**

- PLACE** Booster in Restricted Access (**RA**) from **MCR** with **693 key** and **P/B**
- VERIFY** At encl 4521 **CA** relays: **CK2** and **DK3** are **OFF**

- PLACE** AGS in **RA** from **MCR** with **693 key** and **P/B**
- VERIFY** At encl 4521 **CA** relay **CK1** is **OFF**

- VERIFY** Attempt to **open** Laby-B with **256 key** is **SUCCESSFUL**

- CLOSE** **Laby-B gate**
- PLACE** Booster in Controlled Access (**CA**) from **MCR** with **693 key** and **P/B**
- VERIFY** At encl 4521 **CA** Relays: **CK2** and **DK3** are **ON**

- OPEN** Gate Laby-B and hold open

- HOLD** Crash glass microswitch (**CGS**), gate m-switch (**GS**) and Latch switch (**LS**)
- VERIFY** At enclosures 4527 (Bstr side) and 4526 (AGS side) Crash glass light (**CGL**) , Gate light (**GL**) and Latch light (**LL**) are **CLOSED**

- OPEN** **CGS**
- VERIFY** **CGL** , **GL** and **LL** are **OFF**
- SECURE** **CGS**
- OPEN** **GS**
- VERIFY** At encls 4526 and 4527 **CGL** **ON**
- VERIFY** At encls 4526 and 4527 **GL** and **LL** **OFF**
- CLOSE** **GS**
- OPEN** **LS**
- VERIFY** At encls 4526 and 4527 **CGL** and **GL** **ON**
- VERIFY** At encls 4526 and 4527 **LL** **OFF**
- CLOSE** **LS**

- VERIFY** At encls 4526 and 4527 Redundant gate light (**RGL**) is **ON**
- OPEN** **RGS**
- VERIFY** At encl 4521 relay **BK9** is **OFF**
- VERIFY** At encls 4526 and 4527 **CGL** , **GL** and **LL** are **ON**
- VERIFY** At encls 4526 and 4527 **RGL** is **OFF**
- CLOSE** **RGS**

- VERIFY** At encls 4526, 4527 and 4525 (inside Laby-A) **Not Reset** light is **ON**
- RESET** Laby-A at encl 4525 with **715 key** and **P/B**
- RESET** Laby-B at encl 4526 with **715 key**
- VERIFY** At encls 4525 and 4526 **Reset** lights are **ON**

- VERIFY** At encl 4521 relays **BK7** and **BK11** are **ON**
- OPEN** Laby-B
- VERIFY** At encls 4525, 4526 and 4527 **Not Reset** lights are **ON**
- VERIFY** At encl 4521 relays **BK7** and **BK11** are **OFF**
- RESET** Laby-A at encl 4525 with **715 key** and **P/B**
- RESET** Laby-B at encl 4526 with **715 key**
- VERIFY** At encls 4525 and 4526 **Reset** lights are **ON**
- VERIFY** At encl 4521 **CK8** (all AGS gates reset) is **ON**
- OPEN** Laby-B at encl **4526** with **715 key** and **Sim. release** from **MCR panel**
W: AGS/Booster Labyrinth button
- VERIFY** **Laby-B gate** **OPEN**
- CLOSE** **Laby-B gate**
- Check for acceptance of Test of Labyrinth B gate**

1.4 Test of Emergency (Emcy) gate

- VERIFY** Hardware , Electrical at **Emcy gate** is **O.K.**
- VERIFY** At **MCR Booster** is in **CA**
- VERIFY** At encl 4521 **CA Relays: CK2** and **DK3** are **ON**
- VERIFY** At **Emcy gate CA light (CAL)** is **ON**
- OPEN** **Emcy gate** and hold open
- HOLD** Gate m-switch (**GS**) and Redundant gate m-switch (**RGS**) . **CLOSED**
- VERIFY** At encl 4580 Gate light (**GL**) and Redundant gate light (**RGL**) are **ON**
- OPEN** **GS**
- VERIFY** **GL** is **OFF**
- VERIFY** **RGL** and **CAL** are **ON**
- CLOSE** **GS**
- OPEN** **RGS**
- VERIFY** **RGL** is **OFF**
- VERIFY** **GL** and **CAL** are **ON**
- CLOSE** **RGS**
- VERIFY** At encl 4580 **Not Reset** light is **ON**
- VERIFY** At encl 4521 **DK1** and **DK10** are **OFF**
- RESET** **Emcy gate** with **705 key**
- VERIFY** At encl 4580 **Reset** lights is **ON**
- VERIFY** At encl 4521 **DK1** and **DK10** are **ON**
- OPEN** **Emcy gate**
- VERIFY** At encl 4580 **Not Reset** light is **ON**
- VERIFY** At encl 4521 **DK10** and **DK10** are **OFF**
- Check for acceptance of Test of Emergency gate**

1.5 Test of Berm gate

<input type="checkbox"/>	VERIFY	Hardware <input type="checkbox"/> , Electrical <input type="checkbox"/> at Berm gate is	O.K.
<input type="checkbox"/>	VERIFY	At MCR Booster is in	CA
<input type="checkbox"/>	VERIFY	At encl 4521 CA Relays: CK2 <input type="checkbox"/> and DK3 <input type="checkbox"/> are	ON
	OPEN	Berm gate and hold open	
	HOLD	Gate m-switch (GS) and Redundant gate m-switch (RGS) .	CLOSED
<input type="checkbox"/>	VERIFY	At encl 4979 Gate Reset light (GRL) <input type="checkbox"/> and Redun. Gate Reset light (RGRL) <input type="checkbox"/> are	OFF
<input type="checkbox"/>	VERIFY	At encl 4521 relays FK1 <input type="checkbox"/> and FK2 <input type="checkbox"/> are	OFF
	RESET	Berm gate with 705 key	
<input type="checkbox"/>	VERIFY	At encl 4979 Gate Reset light (GRL) <input type="checkbox"/> and Redun. Gate Reset light (RGRL) <input type="checkbox"/> are	ON
<input type="checkbox"/>	VERIFY	At encl 4521 relays FK1 <input type="checkbox"/> and FK2 <input type="checkbox"/> are	ON
	OPEN	GS	
<input type="checkbox"/>	VERIFY	At encl 4979 GRL is	OFF
<input type="checkbox"/>	VERIFY	At encl 4521 relay FK1 is	OFF
	CLOSE	GS	
	OPEN	RGS	
<input type="checkbox"/>	VERIFY	At encl 4979 RGRL is	OFF
<input type="checkbox"/>	VERIFY	At encl 4521 relay FK2 is	OFF
	CLOSE	RGS	
	CLOSE	Berm gate	OFF
	RESET	Berm gate with 705 key	
<input type="checkbox"/>	VERIFY	At encl 4979 Gate Reset light (GRL) <input type="checkbox"/> and Redun. Gate Reset light (RGRL) <input type="checkbox"/> are	ON
	OPEN	Berm gate	
<input type="checkbox"/>	VERIFY	At encl 4979 Gate Reset light (GRL) <input type="checkbox"/> and Redun. Gate Reset light (RGRL) <input type="checkbox"/> are	OFF
	CLOSE	Berm gate	
<input type="checkbox"/>	Check for acceptance of Test of Berm gate		

1.6 Test of Man-Lock Outside (M-LO) gate

<input type="checkbox"/>	VERIFY	Hardware <input type="checkbox"/> , Electrical <input type="checkbox"/> at M-LO gate is	O.K.
	PLACE	Booster in Restricted Access (RA) from MCR with 693 key and P/B	
<input type="checkbox"/>	VERIFY	At encl 4521 CA relays: CK2 <input type="checkbox"/> and DK3 <input type="checkbox"/> are	OFF
<input type="checkbox"/>	VERIFY	At encl 4521 EK3 is	ON
<input type="checkbox"/>	VERIFY	At encl 4521 CK10 (Bstr beam safely off) is	ON
<input type="checkbox"/>	VERIFY	Attempt to open M-LO with 256 key is	SUCCESSFUL
	PLACE	Booster in CA from MCR with 693 key and P/B	
<input type="checkbox"/>	VERIFY	At MCR Booster is in	CA
<input type="checkbox"/>	VERIFY	At encl 4521 CA Relays: CK2 <input type="checkbox"/> and DK3 <input type="checkbox"/> are	ON
	OPEN	Gate M-LO and hold open	

	HOLD	Crash glass microswitch (CGS), gate m-switch (GS) and Latch switch (LS) .	CLOSED
<input type="checkbox"/>	VERIFY	At encls 4569 and 4568 Crash glass light (CGL) <input type="checkbox"/> , Gate light (GL) <input type="checkbox"/> and Latch light (LL) <input type="checkbox"/> are	ON
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK8 is	ON
	OPEN	CGS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK8 is	OFF
<input type="checkbox"/>	VERIFY	At encls 4569 and 4568 CGL is	OFF
	CLOSE	CGS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK7 is	ON
	OPEN	GS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK7 is	OFF
<input type="checkbox"/>	VERIFY	At encls 4569 and 4568 GL is	OFF
	CLOSE	GS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK13 is	ON
	OPEN	LS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK13 is	OFF
<input type="checkbox"/>	VERIFY	At encls 4569 and 4568 LL is	OFF
	CLOSE	LS	
<input type="checkbox"/>	VERIFY	At encl 4521 relays EK12 <input type="checkbox"/> and EK16 <input type="checkbox"/> are	ON
	OPEN	RGS	
<input type="checkbox"/>	VERIFY	At encl 4521 relays EK12 <input type="checkbox"/> and EK16 <input type="checkbox"/> are	OFF
<input type="checkbox"/>	VERIFY	At encls 4569 and 4568 RGL is	OFF
	CLOSE	RGS	
<input type="checkbox"/>	VERIFY	At encls 4568 and 4569 Not Reset lights are	ON
<input type="checkbox"/>	VERIFY	At encl 4521 relays EK14 <input type="checkbox"/> and EK17 <input type="checkbox"/> are	OFF
	RESET	M-LO at encl 4569 with 705 key	
<input type="checkbox"/>	VERIFY	At encls 4568 and 4569 Reset lights are	ON
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK14 <input type="checkbox"/> and EK17 <input type="checkbox"/> are	ON
	OPEN	M-LO	
<input type="checkbox"/>	VERIFY	At encls 4568 and 4569 Not Reset lights are	ON
<input type="checkbox"/>	VERIFY	At encl 4521 relays EK14 <input type="checkbox"/> and EK17 <input type="checkbox"/> are	OFF
<input type="checkbox"/>	TURN ON	At encl 4521 relay AK13 , Bstr. Swp. Compl.	
<input type="checkbox"/>	VERIFY	At encl 4521 relay AK13 is	ON
	CLOSE	M-LO	
	RESET	M-LO at encl 4569 with 705 key	
<input type="checkbox"/>	VERIFY	At encls 4568 and 4569 Reset lights are	ON
<input type="checkbox"/>	VERIFY	At encl 4521 relay JK15 (Main magnet off) is	ON
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK1 (Bstr in CA) is	ON
<input type="checkbox"/>	VERIFY	Attempt to open M-LO with 705 key and Sim release is	SUCCESSFUL
	CLOSE	M-LO	
<input type="checkbox"/>	VERIFY	Attempt to open M-LO with 705 key is	SUCCESSFUL
	CLOSE	M-LO	
<input type="checkbox"/>	Check for acceptance of Test of Man-Lock Outside (M-LO) gate		

1.7 Test of Man-Lock Inside (M-LI) gate

<input type="checkbox"/>	VERIFY	Hardware <input type="checkbox"/> , Electrical <input type="checkbox"/> at M-LI gate is	O.K.
<input type="checkbox"/>	VERIFY	At MCR Booster is in	CA
<input type="checkbox"/>	VERIFY	At encl 4521 CA Relays: CK2 <input type="checkbox"/> and DK3 <input type="checkbox"/> are	ON
	OPEN	Gate M-LI and hold open	
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK4 is	ON
	OPEN	CGS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK4 is	OFF
<input type="checkbox"/>	VERIFY	At encls 4581 and 4582 CGL is	OFF
	CLOSE	CGS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK5 is	ON
	OPEN	GS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK5 is	OFF
<input type="checkbox"/>	VERIFY	At encls 4581 and 4582 GL is	OFF
	CLOSE	GS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK11 is	ON
	OPEN	LS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay EK11 is	OFF
<input type="checkbox"/>	VERIFY	At encls 4581 and 4582 LL is	OFF
	CLOSE	LS	
	CLOSE	M-LI	
<input type="checkbox"/>	Check for acceptance of Test of Man-Lock Inside (M-LI) gate		

1.8 Test of Plug Door (PD) gate

<input type="checkbox"/>	VERIFY	Hardware <input type="checkbox"/> , Electrical <input type="checkbox"/> at PD gate is	O.K.
	PLACE	Booster in Restricted Access (RA) from MCR with 693 key and P/B	
<input type="checkbox"/>	VERIFY	At encl 4521 CA Relays: CK2 <input type="checkbox"/> and DK3 <input type="checkbox"/> are	OFF
	HAVE	MCR operator open PD gate to release gate micro-switches	
	HOLD	Gate m-switch (GS) and Redundant gate switch (RGS) .	CLOSED
	PLACE	Booster in CA	
<input type="checkbox"/>	VERIFY	At encl 5005 Controlled Access light (CAL) <input type="checkbox"/> , Gate Light (GL) <input type="checkbox"/> and Redundant Gate light (RGL) <input type="checkbox"/> are	ON
	OPEN	GS	
<input type="checkbox"/>	VERIFY	At encl 5005 CAL is	ON
<input type="checkbox"/>	VERIFY	At encl 5005 GL and RGL are	OFF
	CLOSE	GS	
<input type="checkbox"/>	VERIFY	At encl 4521 Relay DK5 is	ON
	OPEN	RGS	
<input type="checkbox"/>	VERIFY	At encl 4521 Relay DK5 is	OFF
<input type="checkbox"/>	VERIFY	At encl 5005 CAL <input type="checkbox"/> and GL <input type="checkbox"/>	ON
<input type="checkbox"/>	VERIFY	At encl 5005 RGL	OFF
	CLOSE	RGS	

	HOLD	GS and RGS .	CLOSED
<input type="checkbox"/>	VERIFY	At encl 5005 Not Reset light is	ON
<input type="checkbox"/>	VERIFY	At encl 4521 Relay DK7 is	OFF
	RESET	PD at encl 5005 with 705 key	
<input type="checkbox"/>	VERIFY	At encl 5005 Reset light is	ON
<input type="checkbox"/>	VERIFY	At encl 4521 relay DK7 is	ON
	OPEN	GS and hold open	
<input type="checkbox"/>	VERIFY	At encl 5005 Not Reset light is	ON
	CLOSE	GS	
<input type="checkbox"/>	VERIFY	Man-Lock Outside gate is	CLOSED
<input type="checkbox"/>	VERIFY	At encl 4521 GS relay EK7 is	ON
	HAVE	MCR Operator Open PD gate fully (if required)	
	HAVE	MCR Operator Close PD gate (if required)	
<input type="checkbox"/>	VERIFY	(If required closed) PD gate is	CLOSED
<input type="checkbox"/>	Check for acceptance of Test of Plug Door (PD) gate		

1.9 Test of Plug Door Fence (PDF) gate

<input type="checkbox"/>	VERIFY	Hardware <input type="checkbox"/> , Electrical <input type="checkbox"/> at PDF gate is	O.K.
<input type="checkbox"/>	VERIFY	At MCR Booster is in	RA
<input type="checkbox"/>	VERIFY	At encl 4521 RA relay EK3 is	ON
	OPEN	PDF gate and hold open	
	HOLD	Crash m-switch (CS) and gate m-switch (GS) .	CLOSED
<input type="checkbox"/>	VERIFY	At encl 4521 relay DK8 is	ON
	OPEN	GS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay DK8 is	OFF
	CLOSE	GS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay DK8 is	ON
	OPEN	CS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay DK8 is	OFF
	CLOSE	CS	
<input type="checkbox"/>	VERIFY	At encl 4521 relay DK8 is	ON
	CLOSE	PDF gate	
<input type="checkbox"/>	Check for acceptance of Test of PDF gate		

END OF TEST PROCEDURE

TTL: Sign for completion of initial testing: _____

Date: ____/____/____

TTL: Sign for completion of final testing: _____

Date: ____/____/____