

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

4.120.81.a Tandem Critical Device Tests

Attachment

C-A-OPM Procedures in which this Attachment is used.		
4.120.81		

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
_____	_____	_____	_____
_____	_____	_____	_____

Approved: _____ *Signature on File* _____
 Collider-Accelerator Department Chairman Date

V. Castillo

PASS SEMI-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 Test of Beam Plugs in Target Room 2

- VERIFY** Tandem Control Room (TCR) sees **Target Room 2 Beam Stops (TR2 BS)** Div A and Div B **INSERTED**

- PLACE** **Beam Plug Tester (BPT)** on any Beam Plug [BP #_____]
- EXTRACT** **BP#** _____
- VERIFY** **BP#** _____ **EXTRACTED**
- VERIFY** TCR sees **TR2 BS** Div A and Div B **EXTRACTED**

- INSERT** **BP#** _____
- VERIFY** TCR sees **TR2 BS** Div A and Div B **INSERTED**

- REMOVE** **BPT** from **BP#** _____

- Check for acceptance of Test of Beam Plugs in Target Room 2**

1.2 Test of Beam Plugs in Target Room 4

- VERIFY** Tandem Control Room (TCR) sees **Target Room 4 Beam Stops (TR4 BS)** Div A and Div B **INSERTED**

- PLACE** **Beam Plug Tester (BPT)** on any Beam Plug [BP #_____]
- EXTRACT** **BP#** _____
- VERIFY** **BP#** _____ **EXTRACTED**
- VERIFY** TCR sees **TR4 BS** Div A and Div B **EXTRACTED**

- INSERT** **BP#** _____
- VERIFY** TCR sees **TR4 BS** Div A and Div B **INSERTED**

- REMOVE** **BPT** from **BP#** _____

- Check for acceptance of Test of Beam Plugs in Target Room 4**

1.3 Test of MP6 and MP7 Beam Stops (BS)

- VERIFY** MP6 BS is **CLOSED**
- VERIFY** TCR sees MP6 BS Div A and Div B **CLOSED**

- VERIFY** MP7 BS is **CLOSED**
- VERIFY** TCR sees MP7 BS Div A and Div B **CLOSED**

- VERIFY** TCR sees **Tandem Existing Interlocks (TEI)** Div A and Div B **FAIL**

- SET** **Key Mode** switches for **MP6** and **MP7** in **ACS box** in **TCR** to **HEAVY ION**
- VERIFY** **Key Mode** switches are set to **HEAVY ION**
- VERIFY** TCR sees MP6 BS Div A and Div B **Light Ion Mode** **DISABLED**
- VERIFY** TCR sees MP7 BS Div A and Div B **Light Ion Mode** **DISABLED**

- VERIFY** On Tandem Perimeter Display panel **Tandem Perimeter** is **NOT SET**

- SET** **TEI Test** switches **Div A** and **Div B** to **TEST**

<input type="checkbox"/>	VERIFY	TEI Test switches Div A <input type="checkbox"/> and Div B <input type="checkbox"/> are set to	TEST
<input type="checkbox"/>	VERIFY	TCR sees TEI Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	O.K.
	OPEN	MP6 BS and MP7 BS at TCR	
<input type="checkbox"/>	VERIFY	TCR sees MP6 Reach Back Timer Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	ENABLED
<input type="checkbox"/>	VERIFY	TCR sees MP7 Reach Back Timer Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	ENABLED
<input type="checkbox"/>	VERIFY	Visually MP6 BS is	OPEN
<input type="checkbox"/>	VERIFY	TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN
<input type="checkbox"/>	VERIFY	Visually MP7 BS is	OPEN
<input type="checkbox"/>	VERIFY	TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN
	CLOSE	MP6 BS	
<input type="checkbox"/>	VERIFY	Visually MP6 BS is	CLOSED
<input type="checkbox"/>	VERIFY	TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	CLOSED
	CLOSE	MP7 BS	
<input type="checkbox"/>	VERIFY	Visually MP7 BS is	CLOSED
<input type="checkbox"/>	VERIFY	TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	CLOSED
	OPEN	MP6 and MP7 BS at TCR	
<input type="checkbox"/>	VERIFY	TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN
<input type="checkbox"/>	VERIFY	TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN
	SET	TEI Test switch Div A to	OPERATION
<input type="checkbox"/>	VERIFY	TEI Test switch Div A set to	OPERATION
<input type="checkbox"/>	VERIFY	TCR sees TEI Div A	FAIL
<input type="checkbox"/>	VERIFY	TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	CLOSED
<input type="checkbox"/>	VERIFY	TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	CLOSED
	SET	TEI Test switch Div A to	TEST
<input type="checkbox"/>	VERIFY	TEI Test switches Div A <input type="checkbox"/> and Div B <input type="checkbox"/> are set to	TEST
<input type="checkbox"/>	VERIFY	TCR sees TEI Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	O.K.
	OPEN	MP6 and MP7 BS at Tandem Control Room (TCR)	
<input type="checkbox"/>	VERIFY	TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN
<input type="checkbox"/>	VERIFY	TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN
	SET	TEI Test switch Div B to	OPERATION
<input type="checkbox"/>	VERIFY	TEI Test switch Div B is set to	OPERATION
<input type="checkbox"/>	VERIFY	TCR sees TEI Div B	FAIL
<input type="checkbox"/>	VERIFY	TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	CLOSED
<input type="checkbox"/>	VERIFY	TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	CLOSED
	SET	TEI Test switches Div A and Div B to	TEST
<input type="checkbox"/>	VERIFY	TEI Test switches Div A <input type="checkbox"/> and Div B <input type="checkbox"/> are set to	TEST
<input type="checkbox"/>	VERIFY	TCR sees TEI Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	O.K.
	OPEN	MP6 and MP7 BS at TCR	
<input type="checkbox"/>	VERIFY	TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN
<input type="checkbox"/>	VERIFY	TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN

- | | | | |
|--------------------------|---|--|------------------|
| | SET | MP6 Mode Switch to Light Ion | ENABLE |
| <input type="checkbox"/> | VERIFY | TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> Light Ion | ENABLE |
| <input type="checkbox"/> | VERIFY | TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> | CLOSED |
| <input type="checkbox"/> | VERIFY | TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> | OPEN |
| | SET | MP6 Mode Switch to Heavy Ion | |
| <input type="checkbox"/> | VERIFY | TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> Light Ion | DISABLE |
| | OPEN | MP6 at TCR | |
| <input type="checkbox"/> | VERIFY | TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> | OPEN |
| <input type="checkbox"/> | VERIFY | TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> | OPEN |
| | SET | MP7 Mode Switch to Light Ion | ENABLE |
| <input type="checkbox"/> | VERIFY | TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> Light Ion | ENABLE |
| <input type="checkbox"/> | VERIFY | TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> | CLOSED |
| <input type="checkbox"/> | VERIFY | TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> | OPEN |
| | SET | MP7 Mode Switch to Heavy Ion | |
| <input type="checkbox"/> | VERIFY | TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> Light Ion | DISABLE |
| <input type="checkbox"/> | VERIFY | TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> Light Ion | DISABLE |
| | OPEN | MP7 BS at TCR | |
| <input type="checkbox"/> | VERIFY | TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> | OPEN |
| <input type="checkbox"/> | VERIFY | TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> | OPEN |
| | SET | TEI Test switches Div A and Div B to | OPERATION |
| <input type="checkbox"/> | VERIFY | TEI Test switches Div A <input type="checkbox"/> and Div B <input type="checkbox"/> are left in | OPERATION |
| | | Key Mode switches are set to | HEAVY ION |
| <input type="checkbox"/> | VERIFY | TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> Light Ion Mode | DISABLED |
| <input type="checkbox"/> | VERIFY | TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> Light Ion Mode | DISABLED |
| <input type="checkbox"/> | VERIFY | TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> | CLOSED |
| <input type="checkbox"/> | VERIFY | TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/> | CLOSED |
| <input type="checkbox"/> | Check for acceptance of Test of MP6 and MP7 Beam Stops | | |

1.4 Test of Reachback

	OPEN	MP6 and MP7 BS at Tandem Control Room (TCR)	
<input type="checkbox"/>	VERIFY	TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN
<input type="checkbox"/>	VERIFY	TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN
	OPEN	Fuses F10 and F11	
<input type="checkbox"/>	VERIFY	Fuses F10 and F11 are	OPEN
	CLOSE	MP6 and MP7 BS at TCR	
<input type="checkbox"/>	VERIFY	MP6 BS is	CLOSED
<input type="checkbox"/>	VERIFY	TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN
<input type="checkbox"/>	VERIFY	MP7 BS is	CLOSED
<input type="checkbox"/>	VERIFY	TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	OPEN
<input type="checkbox"/>	VERIFY	TCR sees MP6 Reachback	ENABLED
<input type="checkbox"/>	VERIFY	At MP6 NII Preaccel PS Interlock	ON
<input type="checkbox"/>	VERIFY	TCR sees MP7 Reachback	ENABLED
<input type="checkbox"/>	VERIFY	At MP7 NII Preaccel PS Interlock	ON
	CLOSE	Fuses F10 and F11	
<input type="checkbox"/>	VERIFY	Fuses F10 and F11 are	CLOSED
<input type="checkbox"/>	VERIFY	MP6 BS is	CLOSED
<input type="checkbox"/>	VERIFY	TCR sees MP6 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	CLOSED
<input type="checkbox"/>	VERIFY	TCR sees MP6 Reachback	DISABLED
<input type="checkbox"/>	VERIFY	At MP6 NII Preaccel PS Interlock	OFF
<input type="checkbox"/>	VERIFY	MP7 BS is	CLOSED
<input type="checkbox"/>	VERIFY	TCR sees MP7 BS Div A <input type="checkbox"/> and Div B <input type="checkbox"/>	CLOSED
<input type="checkbox"/>	VERIFY	TCR sees MP7 Reachback	DISABLED
<input type="checkbox"/>	VERIFY	At MP7 NII Preaccel PS Interlock	OFF
<input type="checkbox"/>	Check for acceptance of Test of MP6 and MP7 Reachback		

1.5 Test of 12MW040 IN

<input type="checkbox"/>	VERIFY	12MW040 is	OUT
<input type="checkbox"/>	VERIFY	TCR sees 12MW040	OUT
	INSERT	12MW040 at Tandem Control Room (TCR)	
<input type="checkbox"/>	VERIFY	12MW040 is	INSERTED
<input type="checkbox"/>	VERIFY	TCR sees 12MW040	INSERTED
	EXTRACT	12MW040 at Tandem Control Room (TCR)	
<input type="checkbox"/>	VERIFY	TCR sees 12MW040	OUT
<input type="checkbox"/>	Check for acceptance of Test of 12MW040		

1.6 Test of Div A RIS Unit for Power Supply C, 11DH1, and Div B RIS Unit for Power Supply D, 11DH2

- | | | | |
|--------------------------|---|---|-----------------|
| <input type="checkbox"/> | RUN | Div A RIS unit for Power Supply A above (~108A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | Div A RIS unit is above (~ _____A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | TCR sees RIS Comp Div A | FAIL |
| | | | |
| <input type="checkbox"/> | RUN | Div A RIS unit below (~101A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | Div A RIS unit is below (~ _____A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | TCR sees RIS Comp Div A | O.K. |
| | | | |
| <input type="checkbox"/> | RUN | Div A RIS unit at (~105A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | Div A RIS unit at (~ _____A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | TCR sees RIS Comp Div A | O.K. |
| | | | |
| <input type="checkbox"/> | RUN | Div B RIS unit for Power Supply E above (~107A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | Div B RIS unit is above (~ _____A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | TCR sees RIS Comp Div B | FAIL |
| | | | |
| <input type="checkbox"/> | RUN | Div B RIS unit below (~104A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | Div B RIS unit is below (~ _____A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | TCR sees RIS Comp Div B | O.K. |
| | | | |
| <input type="checkbox"/> | RUN | Div B RIS unit at (~105A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | Div B RIS unit at (~ _____A) | SETPOINT |
| <input type="checkbox"/> | VERIFY | TCR sees RIS Comp Div B | O.K. |
| | | | |
| <input type="checkbox"/> | VERIFY | TCR sees RIS Comp Div A <input type="checkbox"/> and RIS Comp Div B <input type="checkbox"/> | O.K. |
| | | | |
| <input type="checkbox"/> | Check for acceptance of Test of Div A RIS Unit for Power Supply C, 11DH1, and Div B RIS Unit for Power Supply D, 11DH2 | | |

END OF TEST PROCEDURE

TTL: Sign for completion of initial testing: _____

Date: ____/____/____

TTL: Sign for completion of final testing: _____

Date: ____/____/____