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Brookhaven National Laboratory National Synchrotron Light Source		Number: LS-PPS-0015	Revision: C
		Effective: 7/11/03	Page 1 of 5
Subject: <u>SDL Laser Interlock Test</u>			
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*Approval signatures on file with master copy.

[Revision/Periodic Review Log](#)

Test Reason:	Test Result:	<input type="checkbox"/> Passed	<input type="checkbox"/> Failed
	Test Type:	<input type="checkbox"/> Full	<input type="checkbox"/> Partial
Test Date:	Start Time:	Finish Time:	
Tester 1:	Assistant 1:		
Tester 2:	Assistant 2:		

PREPARATION:

Obtain system reset key (F-300) and wear shoe covers when entering the laser room.

Laser Room:

1. Press the Start Search button located on the East wall of the laser room.
Press CS-2 located on the North wall.
Exit the laser room and press the Complete Search Button.
Observe the audible warning is a minimum of 15 seconds. _____

2. Press the Laser Power Trip reset button.
Interlocked sign is illuminated _____
Laser Room secure light is illuminated on the main control box. _____
Doors light is not illuminated. _____
Laser Power Trip light out. _____

3. Open the outside door and observe:
Interlocked sign goes out. _____
Laser Room secure light goes out. _____
A Chain Fault is illuminated. _____
B Chain Fault is illuminated. _____
Laser Power Trip light is illuminated. _____
Intermittent audible alarm sounds for 5 seconds. _____

4. Press CS-2
The LED on button box does not illuminate _____
Exit the laser room.

5. Press Complete Search Button
LED on button box does illuminate _____
The interlock does not secure _____

6. Press the Start Search button located on the East wall of the laser room.
 Press CS-2 located on the North wall.
 Exit the laser room.
 Press the Complete Search Button.
 Open the door and close the door within the time-out period and press
 the Complete Search Button,

The interlock does not secure _____

The audible alarm sounds for 5 seconds _____
7. Secure the Laser room.
 Press the Access/Reset button located on the main control box.

Door Bypass #1 light illuminates. _____

 Open the outside door to the laser room

The interlock remains active _____
8. Enter the vestibule and close the door.
 Press the Access/Reset #1 button.

The led goes out. _____
9. Press the Access/Reset #2 button.

The LED on the button box lights. _____

The Door Bypass #2 light on the main box
illuminates _____

 Open the inside door and enter the laser room.
 Press the Access/Reset button inside the laser room.

The LED on the button box goes out. _____
10. Reverse steps 8 & 9 to exit the laser room.

The interlock is maintained. _____
11. From the outside of the Laser Room press the Access/Reset button
 located on the main control box.
 Open the door and hold open noting the time from when the button was
 pressed.

Interlock dumps within a maximum of 20
seconds. _____
12. Secure the laser room and enter the vestibule using the buttons.
 Once inside the vestibule press the Access/Reset button #2 and open the
 door. Hold open noting the time from when the button was pressed.

Interlock dumps within a maximum of 20
seconds. _____

- | | | | | | | |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------|------------------|------------------|-------------|
| 13. | <p>Verify faults are cleared on the following lasers:</p> <p style="padding-left: 40px;">Faults are cleared on the two Yag power supplies _____</p> <p style="padding-left: 40px;">Faults are cleared on Ti Sapphire power supply _____</p> <p>Reset Laser Power Trip</p> <p>Place latch devices on the inner and outer door switches.</p> <p>Search laser room. Remove holder from switch #1.</p> | <u>Main Inner</u> | <u>Main Outer</u> | <u>Aux Inner</u> | <u>Aux Outer</u> | |
| | Interlock drops out. _____ | | | | | |
| | The A Chain Fault light is illuminated, _____ | | | | | |
| | The laser manufacturers interlock has been interrupted _____ | | | | | |
| 14. | <p>Search the laser room, remove switch #2.</p> <p style="padding-left: 40px;">The B Chain Fault light is illuminated. _____</p> <p>Reset B chain fault (press complete search button)</p> | NA | | | | |
| 15. | <p>Remove the holders from the door switches. Stand inside the laser room and open and close the door.</p> <p style="padding-left: 40px;">The door switches operate freely and each makes a "click" when door is opened _____</p> | | | | | |
| 16. | <p>Search the Laser Room.</p> <p>Press the Interlock Off button then open the Inner door and then repeat for outer door.</p> <p style="padding-left: 40px;">The interlock sign goes out when the button is pressed. _____</p> <p style="padding-left: 40px;">There is no audible warning when the door is opened. _____</p> <p>Reset laser power trip</p> | | | <u>Inner</u> | <u>Outer</u> | |
| 17. | <p>Search the laser room. Press an emergency stop</p> <p style="padding-left: 40px;">The interlock drops out. _____</p> <p style="padding-left: 40px;">The laser power is removed. _____</p> <p style="padding-left: 40px;">E-Stop light is out _____</p> <p style="padding-left: 40px;">A Chain Fault _____</p> <p style="padding-left: 40px;">B Chain Fault _____</p> <p>Reset emergency stop fault</p> | Laser Emergency Stop | | | | |
| | | <u>ES-1</u> | <u>ES-2</u> | <u>ES-3</u> | <u>ES-4</u> | <u>ES-5</u> |
| | | _____ | _____ | _____ | _____ | _____ |
| | | _____ | _____ | _____ | _____ | _____ |
| | | _____ | _____ | _____ | _____ | _____ |
| | | _____ | _____ | _____ | _____ | _____ |
| 18. | <p>With one emergency stop button pressed in, press the start search button then CS-2.</p> <p>Exit the room and press the complete search button.</p> <p style="padding-left: 40px;">The interlock does not activate. _____</p> <p>Reset the emergency stop button.</p> <p>Break Gun Security.</p> | | | | | |

- 19. Gun Hutch:
 Press the Start Search button located inside of the Gun Hutch.
 LED lights come on the button box.
 Exit the hutch, close the door, and press the Complete Search button.
 The audible warning is a minimum of 15 seconds.
 Gun Hutch Secure light is illuminated.
 A Chain Fault and B Chain Fault lights are out.
- 20. Open the Gun Hutch door.
 Gun Hutch Secure light goes out.
 A-chain fault light comes on
 B-chain fault light comes on
 The audible warning does not activate
- 21. Press the start search button.
 The check station pilot light stays on for no more than 1 minute.

 Press CS-E.
 Interlock does not activate
- 22. Press interior search buttons in order in the Gun hutch, close the door, press CS-E, note that alarm comes on, open and close door, press CS-E again. (This must all be done in less than the timeout interval noted in step 19)
 Interlock does not activate
- 23. Attempt to open the shutter with the Gun Hutch not secured,
 The shutter does not open.
- 24. Secure the Gun Hutch and secure the laser room.
 Open the shutter and reset the laser power.
 Open the Gun Hutch door.
 Laser power trips and both lasers go off.
 The warning sonolert sounds for five seconds.
- 25. Secure the gun hutch, secure the Laser room, reset the laser power, and open the Gun Hutch door.
 The laser power does not trip

26. Place switch holders on the gun hutch doors and place latch devices on the doors.

Secure the gun hutch.

Open the shutter and press an emergency stop in GUN hutch

The shutter closes.

The Gun security drops out.

Laser power trip light is on

E-Stop light cannot be reset w/o SOR key.

Gun hutch cannot be secured.

Reset Emergency stop.

Inside ES	Outside ES
_____	_____
_____	_____
_____	_____
_____	_____

27. Secure the Gun Hutch, open the shutter, and then remove the holder from switch 2.

B Chain Fault light illuminates.

Shutter closes

Laser PWR does not trip.

(Trip light is OFF)

28. Remove the holder from switch 1.

A Chain Fault light illuminates.

Shutter closes.

Laser PWR trip light comes ON

Door			
1	2	3	4
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

* * *