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Brookhaven National Laboratory National Synchrotron Light Source		Number: LS-PPS-0003	Revision: C
		Effective: 2/1/06	Page 1 of 4
Subject: X20A Radiological Interlock Test			
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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:

- Inform control room operator that test will be done. _____
- Turn off 'Red Tag' switch on x-ray ring interlock, and apply LOTO to X-Ray Security system. _____
- Verify that vacuum valves and water interlocks are OK on the beam lines that will be checked for Phase I beamlines or connect user interlock bypass connector. _____
1. Search the hutch
 - The overhead lights go out _____
 - The red interior light comes on _____
 - The audible alarm sounds for 13 to 15 seconds minimum _____
 - The hutch interlock sign turns on _____
 2. Open hutch door
 - The hutch interlock sign goes out _____
 3. If hutch has more than one check station, press second check station (CS-2).
 - Nothing happens _____
 - Press CS-1, exit hutch, close door, press CS-E.
 - Interlock does not activate _____
 4. Press CS-1, close hutch door and wait.
 - Hutch interior lights come on in not more than 40 seconds. _____
 - Press CS-E.
 - Interlock does not activate _____
 5. Press interior search buttons in order, close 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 internal noted in step 4)
 - Interlock does not activate _____

6. Place latch device on door locks so key can be removed. Place switch holders on door switches. Open safety shutter. Search hutch. Put hutch key in SRU and turn.

The photon Shutter "enable" light does not come on until
the end of the warning interval _____

7. The person inside presses an Emergency Stop Button.

The shutter "enable" light goes out

The ES indicator comes on

The ES latch cannot be reset unless the SOR key is turned

<u>ES1</u>	<u>ES2</u>
_____	_____
_____	_____
_____	_____

Repeat step 7 for each ES button.

8. Search hutch, put door key in SRU and turn, open safety shutter and photon shutter.

The "Beam On" sign turns ON _____

Door:			
1	2	3	4

9. Remove holder from switch 2.

RIB latch light comes on _____

Replace holder on switch 2.

RIB cannot be reset unless SOR key is turned. _____

10. Remove holder on switch 1.

Safety shutter closes _____

Photon shutter closes _____

RIA latch light comes on _____

Hutch interlock drops out _____

"Beam On" sign goes out _____

RIA can't be reset w/o SOR _____

Repeat steps 8 – 10 for each door.

11. Replace holder on switch 1. Search hutch, leave shutter closed.

Hutch Kirk key (KKH) cannot be removed from SRU unless button is pushed _____

12. Open safety shutter and photon shutter (if equipped).

KKH cannot be removed even if button is pushed _____

13. Close shutters. Turn KKH and note where solenoid unit stops rotation. Push the button and turn key just beyond this point, but not far enough to actuate "key removed" switch. Release the button and leave key in this position. Open shutter(s), remove KKH, and replace.

RIA latch light comes on _____

RIB latch light comes on _____

The safety shutter closes _____

The photon shutter closes _____

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- 14. With hutch interlocked, leave shutter(s) closed.
 - Beam line transfer key can be removed only if button on SRU is pushed _____
 - Open safety shutter. (Photon shutter remains closed)
 - Beam line transfer key can't be removed even if button is pushed _____

- 15. Close safety shutter. "Cheat" SRU as described in step 13. Open safety shutter, remove the key and replace.
 - RIA latch light comes on _____
 - RIB latch light comes on _____
 - The safety shutter closes _____
 - SPA comes on _____
 - SPA can't be reset w/o SOR _____

Reset RIA and RIB

- 16. Open photon and safety shutters, and press an emergency stop button.
 - RIA latch light comes on _____
 - RIB latch light comes on _____
 - Hutch interlock drops out _____
 - Photon shutter Closes _____
 - Safety Shutter Closes _____

- 17. Observe the photon shutter while it is opened and closed.
 - The mechanism moves freely and without hesitation _____

- 18. Open the safety shutter. Remove the Control Room Shutter Enable Key for this beam line, then replace the key.
 - The safety shutter closes _____
 - RIA latch light comes on _____
 - The "Control Room Shutter Enable" light goes out _____
 - The SPA latch comes on (after the key is back on) _____
 - The safety shutter cannot be opened _____

Reset RIA and SPA

- 19. Open the Safety Shutter.
 - At the Control Room Operator's Console, switch the shutter master enable to "Inhibit" and back to "Enable". Note: Phase I beamline.
 - The safety shutter closed _____
 - And then re-opens _____

20. One person goes to the x-ray equipment area and resets the indicators for RIAX and RIBX at SR100.
 Open the safety shutter and photon shutter.
 Remove switch holder from door switch number 2.

RIB latch light comes on _____
 RIBX "Loop Enabled" indicator goes out _____
 RIBX "Loop Disabled" indicator comes on _____

Replace switch holder.

RIBX cannot be reset _____

Reset RIB

RIBX CAN be reset
 ("Loop Enabled" indicator comes on) _____

21. Remove holder from door switch 1.

RIA latch light comes on _____
 RIAX "Loop Enabled" indicator goes out _____
 RIAX "Loop Disabled" indicator comes on _____
 The safety shutter closes _____
 The photon shutter closes _____
 RIAX cannot be reset _____

Reset RIA

RIAX CAN be reset
 ("Loop Enabled" indicator comes on) _____

22. Remove the holders from the switches. Remove the latch device from the door lock(s). Stand inside the hutch and open and close the door.

All door switches operate freely and each makes a "click" when door is opened

(Complete test for each set of door switches)

Door:			
1	2	3	4
_____	_____	_____	_____

23. Search the hutch. Locate the safety shutter associated with the beam line by tracing the beam pipe through the shield wall. Do not rely on labels on the shutter mechanism. Open the shutter.

The correct shutter opens _____
 No other shutter at that saw tooth opens or attempts to open if
 locked _____

Close the safety shutter.

The mechanism moves freely and without hesitation _____

24. Remove user interlock bypass connector (if applicable). _____

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