Brookhaven National Laboratory National Synchrotron Light Source	**Number:** LS-PPS-0011	**Revision:** A
	Effective: 4/4/02	**Page** 1 of 3

Subject: **X23A2 Radiological Interlock Test**

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*Approval signatures on file with master copy.

Test Reason:	Test Result: ☐ Passed ☐ Failed	
	Test Type: ☐ Full ☐ 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 satisfied on the beam lines that will be checked. _____

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. Press CS-1, close hutch door and wait.
   Hutch interior lights come on in not more than 20 seconds _____

   Press CS-E.
   Interlock does not activate _____
4. 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 interval noted in step 3)

   Interlock does not activate _____
5. Search hutch, one person remains inside. Put hutch key in SRU and turn.
   The Photon Shutter "enable" light does not come on until the end of the warning interval _____

6. The person inside presses an Emergency Stop Button.

   The photon shutter "enable" light goes out _____
   The ES indicator comes on _____
   The ES latch cannot be reset unless the SOR key is turned _____

7. Place latch device on door lock so key can be removed. Place switch holders on door switches. Search hutch, put door key in SRU and turn, open safety shutter and photon shutter.

   The "Beam On" sign turns ON _____
   _____

   Remove holder from switch 2.

   RIB latch light comes on _____

8. Replace holder on switch 2.

   RIB cannot be reset unless SOR key is turned. _____

9. 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 _____

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

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

11. Open safety shutter and photon shutter.

    KKH cannot be removed even if button is pushed _____

12. 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 shutters, remove KKH, and replace.

    RIA latch light comes on _____
    RIB latch light comes on _____
    The safety shutter closes _____
    The photon shutter closes _____

13. With hutch interlocked, leave shutter(s) closed.

    Beam line transfer key can be removed only if button on SRU is pushed _____

    Open photon shutter.

    Beam line transfer key can't be removed even if button is pushed _____

14. Close photon shutter. "Cheat" SRU as described in step 12. Open photon shutter, remove the key and replace.

RIA latch light comes on _____
RIB latch light comes on _____
The photon shutter closes _____
SPA comes on _____
SPA can't be reset w/o SOR _____

Reset RIA and RIB

15. Open photon and safety shutter. Press an emergency stop button.

RIA latch light comes on _____
RIB latch light comes on _____
Hutch interlock drops out _____
ES indicator comes on _____
Safety Shutter Closes _____
Photon Shutter Closes _____

16. Observe the photon shutter while it is opened and closed.

The mechanism moves freely and without hesitation _____

17. 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) _____

18. 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 (if equipped) _____
RIAX cannot be reset _____

Reset RIA

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

19. 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.

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

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