

Brookhaven National Laboratory/ Photon Sciences Directorate			
Subject:	<b>NLS-II Storage Ring Pentant 2 Radiation Safety Component Checklist</b>		
Number:	<b>PS-R-ESH-KSR-004</b>	Revision:	<b>11</b>
Effective:	<b>11/7/2016</b>	Page:	<b>1 of 5</b>
Prepared by:	<b>L. Doom</b>	Approved by:	<b>R. Chmiel</b>

**Except for the Mekometer Port (checkpoint 2701), all configurations must match the associated photograph located near the checkpoint.**

### **Inside Storage Ring Pentant 2**

#### **Check 2001 through 2012 in Cell 29 and in BST Part II: :**

- 2001.  Utility Penetration shielding at 28 ID in place and labeled
- 2002.  Dipole Shadow shield at Cell 29 Girder 4 in place, banded and labeled
- 2003.  Dipole Shadow shield at BST-B3 in place, banded and labeled
- 2004.  Dipole Shadow shield at BST-B4 in place, banded and labeled
- 2005.  Alcove Joint Shielding padlocks in place and locked (2)
- 2006.  Energy Slit shield in place, banded and labeled
- 2007.  Downstream Crotch Shield in place, banded and labeled
- 2008.  Ratchet Wall Plug (Front end) shielding at 28 BM in place and labeled
- 2009.  Utility Penetration shielding at 28 BM in place and labeled
- 2010.  Dipole Shadow shield at Cell 29 Girder 6 in place, banded and labeled
- 2011.  Lead Door Supplemental shield at 29 ID in place and labeled
- 2012.  Ratchet Wall Plug (Front end) shielding at 29 ID in place and labeled

#### **Check 2101 through 2113 at Injection Septum (Cell 30):**

- 2101.  Upstream Septum overhead shielding in place, labeled, and locked (2 locking points)
- 2102.  Midstream Septum overhead shielding in place, labeled, and locked (2 locking points)
- 2103.  Downstream Septum overhead shielding in place, labeled, and locked (2 locking points)
- 2104. Not in Use
- 2105.  Upstream Inner Curtain lead shield in place, labeled and locked
- 2106.  Downstream Inner Curtain lead shield #1 in place, labeled and locked
- 2107.  Downstream Inner Curtain lead shield #2 in place, labeled and locked
- 2108.  Upstream Outer Curtain lead shield in place, labeled and locked
- 2109.  Downstream Outer Curtain lead shield #1 in place, labeled and locked
- 2110.  Downstream Outer Curtain lead shield #2 in place, labeled and locked
- 2111.  Downstream Outer Curtain lead shield #3 in place, labeled and locked
- 2112.  Downstream Outer Curtain lead shield #4 in place, labeled and locked
- 2113.  Downstream Outer Curtain lead shield #5 in place, labeled and locked

#### **Check 2114 through 2121 in Cell 30:**

- 2114.  Utility Penetration shielding at 29 ID in place and labeled
- 2115.  Scraper shield at Cell 30 Girder 3 in place, banded and labeled

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2116.  Dipole Shadow shield at Cell 30 Girder 4 in place, banded and labeled
2117.  Ratchet Wall Plug (Front end) shielding at 29 BM in place and labeled
2118.  Utility Penetration shielding at 29 BM in place and labeled
2119.  Scraper shield at Cell 30 Girder 5 in place, banded and labeled
2120.  SLM Dipole Shadow shield at Cell 30 Girder 6 in place, banded and labeled
2121.  SLM Ratchet Wall Shield (Front end) shielding at 30 ID in place and labeled
2122.  SLM Second Mirror Assembly Shadow shield at Cell 30 in place, banded and labeled
2123.  SLM First Mirror Assembly Shadow shield at Cell 30 in place, banded and labeled
2124.  Lead Door Supplemental shield at 30 ID in place and labeled

**Check 2201 through 2209 in Cell 1:**

2201.  Utility Penetration shielding at 30 ID in place and labeled
2202.  Scraper shield at Cell 1 Girder 3 in place, banded and labeled
2203.  Dipole Shadow shield at Cell 1 Girder 4 in place, banded and labeled
2204.  Ratchet Wall Plug (Front end) shielding at 30BM in place and labeled
2205.  Utility Penetration shielding at 30 BM in place and labeled
2206.  Scraper shield at Cell 1 Girder 5 in place, banded and labeled
2207.  Dipole Shadow shield at Cell 1 Girder 6 in place, banded and labeled
2208.  Ratchet Wall Plug (Front end) shielding at 1 ID in place and labeled
2209.  Lead Door Supplemental shield at 1 ID in place and labeled

**Check 2301 through 2316 in Cell 2:**

2301.  Utility Penetration shielding at 1 ID in place and labeled
2302.  Vacuum flange and blank off at Cell 2 between Girder 2 and 3 in place and labeled
2303.  Dipole chamber mounting brackets at Cell 2 Girder 3 in place and labeled
2304.  Vacuum Absorber at Cell 2 between Girder 3 and 4 in place and labeled
2305.  Dipole Shadow shield at Cell 2 Girder 4 in place, banded and labeled
2306.  Ratchet Wall Plug (Front end) shielding at 1 BM in place and labeled
2307.  Utility Penetration shielding at 1 BM in place and labeled
2308.  Dipole Shadow shield at Cell 2 Girder 6 in place, banded and labeled
2309.  Front End Fixed Aperture Mask at 2ID in place and labeled
2310.  Front End Burn Through Device #1 at 2ID in place and labeled
2311.  Front End Collimator #1 shielding at 2ID in place and labeled
2312.  Reserved for future use.
2313.  Front End Collimator #2 shielding at 2ID in place and labeled

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2314.  Safety Shutter #1 shielding at 2ID in place and labeled
2315.  Safety Shutter #2 shielding at 2ID in place and labeled
2316.  Ratchet Wall Collimator shielding at 2ID in place and labeled (This verifies Burn Through Device #2 in ratchet wall is present)

**Check 2401 through 2406 in Cell 3:**

2401.  Utility Penetration shielding at 2 ID in place and labeled
2402.  Vacuum flange and blank off at Cell 3 between Girder 2 and 3 in place and labeled
2403.  Dipole chamber mounting brackets at Cell 3 Girder 3 in place and labeled
2404.  Vacuum Absorber at Cell 3 between Girder 3 and 4 in place and labeled
2405.  Dipole Shadow shield at Cell 3 Girder 4 in place, banded and labeled
2406.  Ratchet Wall Plug (Front end) shielding at 2BM in place and labeled
2407.  Utility Penetration shielding at 2BM in place and labeled
2408.  Dipole Shadow shield at Cell 3 Girder 6 in place, banded and labeled
2409.  Front End Fixed Aperture Mask at 3ID in place and labeled
2410.  Front End Burn through Device #1 at 3ID in place and labeled
2411.  Front End Collimator #1 shielding at 3ID in place and labeled
2412.  Reserved for future use
2413.  Front End Collimator #2 shielding at 3ID in place and labeled
2414.  Safety Shutter #1 shielding at 3ID in place and labeled
2415.  Safety Shutter #2 shielding at 3ID in place and labeled
2416.  Ratchet Wall Collimator shielding at 3ID in place and labeled (This verifies Burn through Device #2 in ratchet wall is present)

**Check 2501 through 2516 in Cell 4:**

2501.  Utility Penetration shielding at 3 ID in place and labeled
2502.  Vacuum flange and blank off at Cell 4 between Girder 2 and 3 in place and labeled
2503.  Dipole chamber mounting brackets at Cell 4 Girder 3 in place and labeled
2504.  Vacuum Absorber at Cell 4 between Girder 3 and 4 in place and labeled
2505.  Dipole Shadow shield at Cell 4 Girder 4 in place, banded and labeled
2506.  Ratchet Wall Plug (Front end) shielding at 3 BM in place and labeled
2507.  Utility Penetration shielding at 3 BM in place and labeled
2508.  Dipole Shadow shield at Cell 4 Girder 6 in place, banded and labeled
2509.  Front End Fixed Aperture Mask at 4ID in place and labeled
2510.  Front End Burn through Device #1 at 4ID in place and labeled
2511.  Front End Collimator #1 shielding at 4ID in place and labeled
2512.  Front End Burn through Device #2 at 4ID in place and labeled

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2513.  Front End Collimator #2 shielding at 4ID in place and labeled
2514.  Safety Shutter #1 shielding at 4ID in place and labeled
2515.  Safety Shutter #2 shielding at 4ID in place and labeled
2516.  Ratchet Wall Collimator shielding at 4ID in place and labeled (This verifies Burn through Device #3 in ratchet wall is present)

### **Outside Storage Ring Tunnel Pentant 2**

#### **Check 2601 through 2631 along the storage ring outer wall**

2601.  Utility Penetration shielding at 28 ID in place and labeled (inside hutch)
2602. N/A Fixed concrete blocks (2) at 28 BM in place (blocks cannot be accessed)
2603.  Ratchet Wall Plug (Front end) shielding at 28 BM in place, banded and labeled
2604.  Utility Penetration shielding at 28 BM in place and labeled
2605.  Ratchet Corner Shield at 29 ID place and labeled
2606.  Ratchet Wall Plug (Front end) shielding at 29 ID in place, banded and labeled (inside hutch)
2607.  Utility Penetration shielding at 29 ID in place and labeled
2608.  Fixed concrete blocks (2) at 29 BM in place and labeled
2609.  Ratchet Wall Plug (Front end) shielding at 29 BM in place, banded and labeled
2610.  Utility Penetration shielding at 29 BM in place and labeled
2611.  Ratchet Wall Plug (Front end) shielding at 30 ID in place, banded and labeled (inside SLM hutch)
2612.  Utility Penetration shielding at 30 ID in place and labeled (inside SLM hutch)
2613. N/A Fixed concrete blocks (2) at 30 BM in place (blocks cannot be accessed)
2614.  Ratchet Wall Plug (Front end) shielding at 30 BM in place, banded and labeled
2615.  Utility Penetration shielding at 30 BM in place and labeled
2616.  Ratchet Wall Plug (Front end) shielding at 1 ID in place, banded and labeled
2617.  Utility Penetration a shielding t 1 ID in place and labeled
2618.  Fixed concrete blocks (4) at 1 BM in place and labeled
2619.  Ratchet Wall Plug (Front end) shielding at 1 BM in place, banded and labeled
2620.  Utility Penetration shielding at 1 BM in place and labeled
2621.  Ratchet Wall Plug (Front end) shielding at 2 ID in place, banded and labeled
2622.  Utility Penetration shielding at 2 ID in place and labeled
2623.  Fixed concrete blocks (2) at 2 BM in place and labeled
2624.  Ratchet Wall Plug (Front end) shielding at 2 BM in place, banded and labeled
2625.  Utility Penetration shielding at 2 BM in place and labeled

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2626.  Ratchet Wall Collimator shielding at 3ID in place, banded and labeled (inside hutch) this also insures Burn through Device #2 in ratchet wall is present

2627.  Utility Penetration shielding at 3 ID in place and labeled (inside hutch)

2628.  Fixed concrete blocks (2) at 3 BM in place and labeled (inside hutch)

2629.  Ratchet Wall Plug (Front end) shielding at 3 BM in place, banded and labeled

2630.  Utility Penetration shielding at 3 BM in place and labeled

2631.  Ratchet Wall Collimator shielding at 4ID in place, banded and labeled (inside hutch) this also insures Burn through Device #3 in ratchet wall is present

**Check 2701 on the Storage Ring Mezzanine at Cell 2**

2701.  Mekometer port cover plate labeled and shielding padlocked (below cover plate)

**Check 2801 in Service Building 2:**

2801.  Fixed concrete blocks (8) in place and labeled

Prepared by:

11/4/2016

Approved by:

10/28/2016

**X** Lewis Doom Jr.

Lewis Doom  
Storage Ring Engineer  
Signed by: Doom, Lewis

**X** Robert Chmiel

Robert Chmiel  
Safety Officer  
Signed by: Chmiel, Robert

Inspected by

Print Name Lewis Doom Jr

Signature: *Lewis Doom Jr* Date: 11/3/2017

**\*\*\*\*\*Removal of any shielding or opening of any locks listed on this checklist requires posting an approved Photon Sciences Safety System Work Permit \*\*\*\*\***