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RHIC RSC Check-off List for Heavy Ion Operation (AuAu) - FY07

- Beam in RHIC and the X-,Y-lines is inhibited unless all items on the following list are checked off.
- Beam can only be dumped in the RHIC dump areas unless special approved conditions apply (see 78).

PREREQUISITES

1. PASS functional test for RHIC Operation complete.

X-, Y-LINE REQUIREMENTS

2. Prevent Beam Transport through X and Y -line
- 2.1 (LP) SWM (psswm) W-line switching magnet p.s. LOTO.
 lock# _____ tag# _____ date _____ person _____
- 2.2 (LP) X arc (psxarc90) p.s. LOTO .
 lock# _____ tag# _____ date _____ person _____
- 2.3 (LP) Y arc (psyarc90) p.s. LOTO .
 lock# _____ tag# _____ date _____ person _____

OR

3. _____ (LP) Equivalent lockout of upstream elements. (List attached.)

PROCEDURES/CONFIGURATION

4. _____ (RASC) Operating procedure in place for complying with radiation safety limits (C-AD-OPM)
5. _____ (RASC) RHIC BLAM system configuration adjusted for proton operation. Beam current measuring devices are setup to measure proton beams.

X-AND Y-LINE ITEMS

6. _____ (LEW) Check of X- and Y-line shielding berm.
7. _____ (LEW) X- and Y-line ventilation shafts secured.
8. _____ (LEW) Survey shafts above X- and Y-line secured.
9. _____ (RCD) Thompson Road closed and posted.

WORDING FOR SIGNS

Sign-A	Tunnel Gates: Caution, Radioactive Materials Area, Controlled Area, Entry Requirements: TLD, Exit Requirements: Activation Check
Sign-B	Area Buildings: Caution, Controlled Area
Sign-C	Fence Posting: Caution, Controlled Area, Entry Requirements Posted at Gate
Sign-D	Fence Gates: Contact MCR for Entry x4662
Sign-E	Access Road at Ring Road: Controlled Area Ahead where Training Required for Access
Sign-F	Shielding: Caution, No Climbing, No Ladders
Sign-G	Roof Ladder Access: Controlled Area, TLD required. Contact Building Manager for Access
Sign-H	Radiation Barriers (Patio Blocks): Caution, Facility Boundary, Contact Liaison Engineer Before Removal"
Sign-I	Controlled Area, TLD required with Beam on. Contact MCR x4662 for Beam Status.

FENCE AND BUILDING POSTINGS

10. _____ (RCD) Barriers around Survey Shafts on collider berm outside fenced areas and 2 above X and Y lines posted as Sign-H
11. _____ (RCD) Fence gates at 2 o'clock IR posted with Sign-D.
12. _____ (RCD) Ladder cover on 2 o'clock support building posted as Sign-G.
13. _____ (RCD) Verify special posting exists on blocks at 2 o'clock IR which reads Sign-F.
14. _____ (RCD) Fence gates at 4 o'clock IR posted with Sign-D.
15. _____ (RCD) Ladder cover on 4 o'clock support building posted with Sign-G.
16. _____ (RCD) Verify fence is in place on berm above 5 o'clock (yellow) injection area with posting Sign-D.
17. _____ (RCD) Verify fence is in place on berm above 6 o'clock (blue) injection area with posting Sign-D.
18. _____ (RCD) Fence gates at 6 o'clock IR posted with Sign-D.
19. _____ (RCD) Patio block barrier exists around both VJR pipe penetrations at 6 o'clock and are posted with Sign-H.
20. _____ (RCD) Ladder covers at 6 o'clock are posted with Sign-G. NOTE: One ladder goes from WAH roof to assembly bldg. Roof.
21. _____ (RCD) Fence gate outside 7GE1 gate posted with Sign-I.
22. _____ (RCD) Patio block barrier exists around both VJR pipe penetrations at 8 o'clock with posting Sign-H.
23. _____ (RCD) South side fence gates at 8 o'clock IR posted with Sign-D.
24. _____ (RCD) Perimeter fence gates at 8 o'clock IR posted with Sign-D.
25. _____ (RCD) Ladder cover on 8 o'clock support building posted with Sign-G.
26. _____ (RCD) Fence gates at 9 o'clock beam dump posted with Sign-D.
27. _____ (RCD) Fence gates at 10 o'clock beam dump posted with Sign-D.
28. _____ (RCD) Fence gates at 10 o'clock VJR pipe penetrations posted with Sign-D.
29. _____ (RCD) Patio block barrier exists around both 10 o'clock VJR pipe penetrations and is posted with Sign-H.

30. _____ (RCD) Ladder cover on 10 o'clock support building posted with Sign-G.
31. _____ (RCD) Fence gates at 12 o'clock IR posted with Sign-D.
32. _____ (RCD) Ladder cover on 1012 support building posted with Sign-G.
33. _____ (RCD) "Interior" fence exists around both VJR pipe penetrations at 12 o'clock.
34. _____ (RCD) Patio block barrier exists around both VJR pipe penetrations at 12 o'clock and are posted with Sign-H.
35. _____ (RCD) 5 ft. collider perimeter fence posted as Controlled Area with signs 40 ft. apart.
36. _____ (RCD) Large signs on Ring Road designating entrances into Controlled Area.
37. _____ (RCD) Signs on boundaries between C-A collider berm fence and BNL Security fence designating entrances into Controlled Areas.
38. _____ (RCD) Openings in 5 ft. collider berm perimeter fence draped with chains.
39. _____ (RCD) Posting in 1005 complex designating entrances into Controlled Area.
40. _____ (RCD) New 5 ft. fence in Thompson Road area posted as Controlled Area.

ENTRY GATES AND POSTINGS

41. _____ (LE) All RHIC gates verified as complete barriers.
42. _____ (RCD) All RHIC tunnel external access gates except 2GE1 and 10GE1 posted with Sign-A.

SHIELDING

43. _____ (LE) Shielding blocks in place at 2 o'clock IR. Vertical cracks in movable shield do not exceed 3/8". Exception permitted by designee of RSC Chair.
44. _____ (LE) Two 4 ft. high cable way labyrinths exist at 2 o'clock.
45. _____ (LE) 4 o'clock shielding in place and complete.
46. _____ (LE) 4 o'clock shield wall has no vertical cracks which exceed 3/8". (Exception permitted by RSC Chair or designee.)
47. _____ (LE) Shield blocks in place at 6 o'clock IR. Front wall has no vertical cracks which exceed 3/8" or horizontal cracks which exceed 1/4". (Exception permitted by RSC chair or designee.)

48. _____ (LE) Permanent shield wall at 8 o'clock IR has no vertical cracks which exceed 3/8". (Exception permitted by RSC chair or designee.)
49. _____ (LE) Movable shield wall at 8 o'clock IR has no horizontal cracks which exceed 1/4". (Exception permitted by RSC chair or designee.)
50. _____ (LE) Cracks between movable door and walls in PHENIX when movable door is closed do not exceed 1.5" in direction parallel to beam and 3/4" in direction perpendicular to beam. (Exception permitted by RSC chair or designee.)
51. _____ (LE) Shield blocks at 8 o'clock cover both magnet access ports. Nominal length 4 ft.; overlap with walls marked.
52. _____ (SGH or LE) Holes in PHENIX muon steel barriered.
53. _____ (LE) Shield blocks at 10 o'clock in place at magnet access port. Nominal 5 ft. thickness.
54. _____ (LE) Shield blocks in place at 12 o'clock IR.
55. _____ (LE) Shield blocks cover both magnet access ports at 12 o'clock. Nominal length 12 ft.

RADIATION MONITORING

56. _____ (LP) Chipmunks required for RHIC in place. (See attached list.)
57. _____ (SGC) Verify that chipmunks have been successfully tested in place (including the interlock function as needed).
58. _____ (LC) All removable soil samples are in place.

READINESS FOR BEAM

59. _____ (LE) Large movable shield door at PHENIX is closed and LOTOed.
lock# _____ tag# _____ date _____ person _____
60. _____ (RASC) RHIC abort system ready for beam.

BERM AND OTHER EXTERNAL AREAS

61. _____ (CAS) Thompson Road gate locked.

62. _____ (CAS) Fences at 2 o'clock IR have been swept and area locked including separate fenced area on pad by shield wall. Area on both sides of the FEH is roped off and posted.
63. _____ (CAS) Fences at 4 o'clock IR swept and area locked.
64. _____ (CAS) Fences at 6 o'clock berm and roof swept and area locked
65. _____ (CAS) Fences on berm at 7 & 8 o'clock scraper locations swept and area locked.
66. _____ (CAS) Fences at 8 o'clock berm and roof swept and area locked.
67. _____ (CAS) Berm fence above 9 o'clock dump swept and area locked.
68. _____ (CAS) He transfer line fences at 10 o'clock swept and locked.
69. _____ (CAS) Berm fence above 10 o'clock dump swept and area locked.
70. _____ (CAS) Fence at 12 o'clock IR swept and locked.
71. _____ (CAS) "Interior" fences around both VJR pipe penetrations at 12 o'clock swept and locked.
72. _____ (CAS) Building roofs at 2 o'clock verified not occupied, and access ladders secured and locked.
73. _____ (CAS) Building roofs at 4 o'clock verified not occupied, and access ladders secured and locked.
74. _____ (CAS) Building roofs at 6 o'clock verified not occupied, and access ladders secured and locked.
75. _____ (CAS) Building roofs at 8 o'clock verified not occupied, and access ladders secured and locked.
76. _____ (CAS) Building roofs at 10 o'clock verified not occupied, and access ladders secured and locked.
77. _____ (CAS) Building roofs at 12 o'clock verified not occupied, and access ladders secured and locked.

SPECIAL CONDITIONS

78. _____ (LP) Lockout of RHIC injection area elements to prevent transport of the beam into the sextants but allowing pre-run AtR setup (list of LOTOed devices is attached).

- 78.1 _____ (LP) Locks from critical devices of items 2 or 3 can be removed to allow beam in X- and Y-arc. The RHIC abort system (item 60) does not have to be ready for beam and therefore does not have to be checked off, provided beam transport into the RHIC arcs is prevented.
79. _____ (LP) Special Operating procedure in place for complying with radiation safety limits and soil activation limits for the above dedicated setup as well as routine AtR setup including X- and Y-arc between physics stores.

FINAL READINESS FOR PROTON BEAM

80. _____ (LP) Collider ready Proton Beam.
81. _____ (OC) Checklist complete.

When the Check-Off List is complete, the RS LOTO of items 2, 3 and 78 above may be removed.

KEY

EC	Environmental Compliance Rep., M. van Essendelf or designate
LE	Liaison Engineer, C. Pearson
LEW	D. Phillips
LP	Liaison Physicist, A. Drees or W. MacKay
LPB	C. Gardner
LPL	J. Alessi
OC	MCR Operations Coordinator
RASC	RHIC Abort System Commissioner: Leif Ahrens
RCD	Radiological Control Division
RSCC	Radiation Safety Committee chairman
SGH	Head of Security Group: J. Reich
SGC	Chipmunk tester: R. Atkins

CHIPMUNKS REQUIRED FOR PROTON BEAMS IN RHIC

Name	Location	Trip Level
NMO264	At gate 2GE2 (1002-A)	2.5
NMO265	Inside BRAHMS electronics hut	2.5
NMO250[1]	At 4GI1 near rf gate for x-rays (in tunnel)	2.5
NMO251	At gate 4GE3 (1005-S labyrinth)	2.5
NMO252	At gate 4GE2 (1004-A labyrinth)	2.5
NMO232	Inside corner of 1006-B over Y-line	2.5
NMO233	At 5GE1 in injection house 1005-E	2.5
NMO234	At 6GE3 in injection house 1007-W	2.5
NMO235	At STAR shield wall	2.5
NMO236	6ED1 labyrinth, behind STAR control room	20
NMO312	8GE2 labyrinth by collimator	2.5
NMO313	By PHENIX shield wall	2.5
NMO314	PHENIX counting house	2.5
NMO298	At gate 10GE1 (1010-A)	2.5
NMO280	At gate 12GE1 (1012-A)	2.5