



Muon Campus AIP

Change Request Form

CR#: DR009

1) DATE: 5/11/15 2) WBS: DRI 3) Originator: Ken Domann *KAD*

4) WBS Description of Primary Affected Tasks: Delivery Ring AIP

5) Technical Description & Primary Motivation for Change: This Change Request for the Delivery Ring AIP is necessitated both by the addition of scope realized after the initial schedule was made, as well as adjusting schedule dates to better match available resources with laboratory schedules external to this AIP.

Additional scope includes:

- 1) An additional resonant charger is required to operate the abort kicker for Mu2e. Designing the power supply system revealed that one resonant charging transformer to operate both g-2 and Mu2e was not feasible.
- 2) Need for interface between Pulsed Septa power supply load cables and the magnet. 24 cables run from the power supply into the tunnel. The magnet being designed cannot accept the connection of 24 cables so an interface to transition from cable to a strip line must be built.

Activities moved to fit with external schedule constraints:

- 1) Construct the Delivery Ring abort earlier to take advantage of available riggers and crane crew. Also, it was decided to fabricate steel blocks from existing laboratory stock piles rather than purchasing new material.
- 2) Change the milestone dates for the pulsed magnetic septa magnets to align with the magnet factory's schedule.
- 3) Adjust the timing of activities involving the construction of the kicker power supplies to better align with kicker development being managed outside of this AIP. Other projects are developing kicker systems simultaneous with this AIP so several activities have to be synchronized between projects.

The change to the Delivery Ring budget is an increase of \$262,318 with a corresponding decrease in contingency.

6) Assessment of Cost Impact (Use attachments if needed): See attached.

7) Assessment of Schedule Impact (Use attachments if needed): See attached. No impact to any interface milestones.

8) Secondary Impact & Other Comments: N/A

9) Approvals:

AIP Project Manager:

Gerald Annala

Date: 5/11/2015

AIP Project Coordinator:

Mary E. ...

Date: 5/11/15

AD Div Director:

S. Nagar

Date: 5/12/15

Directorate:

S. Nagar

Date: 5/12/15

Delivery Ring CR009 Schedule Information

| UID | WBS | Name | Dur | Start | Finish | Comments |
|-----|--------------------|---|-------|----------|----------|--------------|
| 1 | DR1 | Delivery Ring AIP | 733 d | 10/28/13 | 9/29/16 | |
| 2 | DR1.01 | Delivery Ring Project Management | 733 d | 10/28/13 | 9/29/16 | |
| 4 | DR1.01.01 | Delivery Ring Milestones | 733 d | 10/28/13 | 9/29/16 | |
| 375 | DR1.01.01.01 | Delivery Ring Management Milestones | 733 d | 10/28/13 | 9/29/16 | |
| 455 | DR1.01.01.01.09 | Electrical Infrastructure Upgrades Complete | 0 d | 7/6/16 | 7/6/16 | New dates |
| 35 | DR1.03 | Delivery Ring Electrical Infrastructure | 565 d | 4/7/14 | 7/6/16 | |
| 373 | DR1.03.02 | Delivery Ring Electrical Infrastructure Implementation | 502 d | 7/7/14 | 7/6/16 | |
| 362 | DR1.03.02.13 | AP-50 Electrical Infrastructure Work Completed | 0 d | 7/6/16 | 7/6/16 | New dates |
| 70 | DR1.06 | Delivery Ring PS | 613 d | 4/18/14 | 9/26/16 | |
| 73 | DR1.06.01 | Delivery Ring Pulsed Supplies | 613 d | 4/18/14 | 9/26/16 | |
| 86 | DR1.06.01.01 | Delivery Ring Septa Supplies | 484 d | 9/22/14 | 8/25/16 | |
| 99 | DR1.06.01.01.03 | Delivery Ring Septa PS Implementation | 402 d | 1/23/15 | 8/25/16 | |
| 107 | DR1.06.01.01.03.06 | Delivery Ring Septa PS Move to final location | 106 d | 10/30/15 | 4/5/16 | New dates |
| 106 | DR1.06.01.01.03.07 | Delivery Ring Septa PS AC Installation | 6 d | 7/7/16 | 7/14/16 | New dates |
| 104 | DR1.06.01.01.03.08 | Delivery Ring Septa PS Power testing | 30 d | 7/15/16 | 8/25/16 | New dates |
| 102 | DR1.06.01.01.03.10 | Delivery Ring Septa PS Assemble & Test HV PS Rack | 65 d | 7/29/15 | 10/29/15 | New dates |
| 101 | DR1.06.01.01.03.11 | Delivery Ring Septa PS Assemble & Test Pulser Cabinet | 170 d | 4/8/15 | 12/10/15 | New dates |
| 522 | DR1.06.01.01.03.13 | Delivery Ring Septa Design Cable/Stripline Interface | 22 d | 10/1/15 | 10/30/15 | New activity |
| 524 | DR1.06.01.01.03.14 | Delivery Ring Septa Procure Material for Cable/Stripline Interface | 60 d | 11/2/15 | 2/2/16 | New activity |
| 523 | DR1.06.01.01.03.15 | Delivery Ring Septa Assemble Cable/Stripline Interface | 23 d | 2/3/16 | 3/4/16 | New activity |
| 391 | DR1.06.01.01.03.16 | Delivery Ring Septa PS Complete | 0 d | 8/25/16 | 8/25/16 | New dates |
| 87 | DR1.06.01.02 | Inj Kicker PS | 609 d | 4/18/14 | 9/20/16 | |
| 112 | DR1.06.01.02.03 | Inj Kicker PS Implementation | 609 d | 4/18/14 | 9/20/16 | |
| 117 | DR1.06.01.02.03.04 | Inj Kicker PS Receive Thyatron & PFL Cable & Frame | 31 d | 9/1/15 | 10/15/15 | New dates |
| 521 | DR1.06.01.02.03.05 | Inj Kicker PS Buy Thyatron from SPS for Development | 1 d | 4/1/15 | 4/1/15 | New activity |
| 413 | DR1.06.01.02.03.06 | Inj Kicker PS Award PO for Res Charging Xformer & Pts | 1 d | 7/22/15 | 7/22/15 | New dates |
| 142 | DR1.06.01.02.03.07 | Inj Kicker PS Receive Res Charging Xformer & Pts | 5 d | 11/2/15 | 11/6/15 | New dates |
| 415 | DR1.06.01.02.03.10 | Inj Kicker PS Award PO for Other Pulser Parts | 1 d | 5/12/15 | 5/12/15 | New dates |
| 417 | DR1.06.01.02.03.13 | Inj Kicker PS Award PO for Load, Feedthrough & Mounting Bx Pts | 1 d | 4/17/15 | 4/17/15 | New dates |
| 133 | DR1.06.01.02.03.27 | Inj Kicker PS Assemble Resonant Charger | 20 d | 11/9/15 | 12/8/15 | New dates |
| 132 | DR1.06.01.02.03.28 | Inj Kicker PS Assemble Pulser (don't overlap MT with other systems) | 35 d | 12/14/15 | 2/5/16 | New dates |
| 131 | DR1.06.01.02.03.29 | Inj Kicker PS Test Pulser & Resonant Charger (don't overlap ET with other systems) | 20 d | 6/2/16 | 6/29/16 | New dates |
| 129 | DR1.06.01.02.03.31 | Inj Kicker PS Assemble Load, Feedthrough & Mounting Box (don't overlap MT with other systems) | 45 d | 10/23/15 | 12/30/15 | New dates |
| 128 | DR1.06.01.02.03.32 | Inj Kicker PS Assemble Four PFL Frames & Wind | 18 d | 5/27/16 | 6/22/16 | New dates |
| 381 | DR1.06.01.02.03.34 | Inj Kicker PS Terminate Cables in Tunnel | 28 d | 8/11/16 | 9/20/16 | New dates |
| 124 | DR1.06.01.02.03.36 | Inj Kicker PS Install PFL Frames | 15 d | 6/23/16 | 7/14/16 | New dates |
| 123 | DR1.06.01.02.03.37 | Inj Kicker PS Install in Service Building | 20 d | 6/30/16 | 7/28/16 | New dates |
| 385 | DR1.06.01.02.03.39 | Inj Kicker PS Install Carmac Interface | 60 d | 5/4/16 | 7/28/16 | New dates |
| 121 | DR1.06.01.02.03.40 | Inj Kicker PS Additional HVPS for Delivery Ring Inject Kicker | 42 d | 10/1/15 | 12/1/15 | New dates |
| 118 | DR1.06.01.02.03.41 | Inj Kicker PS Document | 35 d | 8/2/16 | 9/20/16 | New dates |
| 392 | DR1.06.01.02.03.42 | Delivery Ring Injection PS Complete | 0 d | 9/20/16 | 9/20/16 | New dates |
| 88 | DR1.06.01.03 | About Kicker PS | 498 d | 10/1/14 | 9/26/16 | |
| 148 | DR1.06.01.03.02 | About Kicker PS Implementation | 498 d | 10/1/14 | 9/26/16 | |
| 171 | DR1.06.01.03.02.04 | About Kicker PS Receive Thyatron & PFL Cable & Frame | 31 d | 9/1/15 | 10/15/15 | New dates |
| 170 | DR1.06.01.03.02.07 | About Kicker PS Receive Res Charging Transformer & Pts for g-2 | 5 d | 11/2/15 | 11/6/15 | New dates |

Delivery Ring CR009 Schedule Information

| UID | WBS | Name | Dur | Start | Finish | Comments |
|-----|--------------------|---|-------|----------|----------|--------------|
| 162 | DR1.06.01.03.02.21 | Abort Kicker PS Assemble Resonant Charger for g-2 | 25 d | 12/21/15 | 1/29/16 | New dates |
| 161 | DR1.06.01.03.02.22 | Abort Kicker PS Assemble Pulser (don't overlap MT with other systems) | 30 d | 2/8/16 | 3/18/16 | New dates |
| 160 | DR1.06.01.03.02.23 | Abort Kicker PS Test Pulser & Resonant Charger (don't overlap ET with other systems) for g-2 | 20 d | 7/11/16 | 8/5/16 | New dates |
| 158 | DR1.06.01.03.02.25 | Abort Kicker PS Assemble Load, Feedthrough & Mounting Bx (don't overlap MT with other systems) for g-2 | 50 d | 3/7/16 | 5/13/16 | New dates |
| 157 | DR1.06.01.03.02.26 | Abort Kicker PS Assemble Four PFL Frames & Wind | 16 d | 6/29/16 | 7/15/16 | New dates |
| 155 | DR1.06.01.03.02.27 | Abort Kicker PS Install Cable Tray & AC Power | 10 d | 8/19/15 | 9/1/15 | New dates |
| 154 | DR1.06.01.03.02.28 | Abort Kicker PS Install PFL Frames | 15 d | 7/18/16 | 8/5/16 | New dates |
| 153 | DR1.06.01.03.02.29 | Abort Kicker PS Install Kicker Supply in Service Building | 20 d | 8/29/16 | 9/26/16 | New dates |
| 382 | DR1.06.01.03.02.30 | Abort Kicker PS Inset Camac Interface (check M&S) | 39 d | 8/2/16 | 9/26/16 | New dates |
| 434 | DR1.06.01.03.02.31 | Abort Kick PS Prep Req & Process PO for Additional PFLs (Wind & Instl) for DR Abort | 20 d | 5/4/15 | 6/1/15 | New dates |
| 435 | DR1.06.01.03.02.32 | Abort Kick PS Award PO for Additional PFLs (Wind & Instl) for DR Abort | 1 d | 6/2/15 | 6/2/15 | New dates |
| 152 | DR1.06.01.03.02.33 | Abort Kicker PS Receive Additional PFLs (Wind & Instl) for DR Abort | 40 d | 1/12/16 | 3/8/16 | New dates |
| 436 | DR1.06.01.03.02.34 | Abort Kicker PS Prep Req & Process PO for Additional Cable for Delivery Ring Abort load | 20 d | 5/1/15 | 5/29/15 | New dates |
| 437 | DR1.06.01.03.02.35 | Abort Kicker PS Award PO for Additional Cable for Delivery Ring Abort load | 1 d | 6/1/15 | 6/1/15 | New dates |
| 151 | DR1.06.01.03.02.36 | Abort Kicker PS Receive Additional Cable for Delivery Ring Abort load | 1 d | 1/11/16 | 1/11/16 | New dates |
| 438 | DR1.06.01.03.02.37 | Abort Kicker PS Prep Req & Process PO for Additional loads for running Mu2 | 20 d | 5/1/15 | 5/29/15 | New dates |
| 439 | DR1.06.01.03.02.38 | Abort Kicker PS Award PO for Additional loads for running Mu2 | 1 d | 6/1/15 | 6/1/15 | New dates |
| 150 | DR1.06.01.03.02.39 | Abort Kicker PS Receive Additional loads for running Mu2 | 50 d | 9/11/15 | 11/19/15 | New dates |
| 149 | DR1.06.01.03.02.40 | Abort Kicker PS Document | 45 d | 7/25/16 | 9/26/16 | New dates |
| 527 | DR1.06.01.03.02.41 | Abort Kicker Prep Req & Process PO for Res Charging Transformer & Pts for Mu2e | 10 d | 5/26/15 | 6/8/15 | New activity |
| 526 | DR1.06.01.03.02.42 | Abort Kicker Award PO for Res Charging Transformer & Pts for Mu2e | 83 d | 6/9/15 | 10/6/15 | New activity |
| 525 | DR1.06.01.03.02.43 | Abort Kicker PS Receive Res Charging Transformer & Pts for Mu2e | 5 d | 11/2/15 | 11/6/15 | New activity |
| 530 | DR1.06.01.03.02.44 | Abort Kicker PS Procure Resonant Charging Pulser Pts for Mu2e | 110 d | 5/26/15 | 10/29/15 | New activity |
| 529 | DR1.06.01.03.02.45 | Abort Kicker PS Assemble Resonant Charger for Mu2e | 25 d | 12/21/15 | 1/29/16 | New activity |
| 532 | DR1.06.01.03.02.46 | Abort Kicker PS Test Pulser & Resonant Charger (don't overlap ET with other systems) for Mu2e | 20 d | 8/1/16 | 8/26/16 | New activity |
| 528 | DR1.06.01.03.02.47 | Abort Kicker PS Condition & Measure Load Resistors for Mu2e | 25 d | 2/12/16 | 3/17/16 | New activity |
| 531 | DR1.06.01.03.02.48 | Abort Kicker PS Assemble Load, Feedthrough & Mounting Bx (don't overlap MT with other systems) for Mu2e | 50 d | 4/22/16 | 7/1/16 | New activity |
| 393 | DR1.06.01.03.02.49 | Delivery Ring Abort Kicker PS Complete | 0 d | 9/26/16 | 9/26/16 | New dates |
| 75 | DR1.07 | Delivery Ring Magnets | 522 d | 7/15/14 | 8/11/16 | |
| 77 | DR1.07.02 | Delivery Ring Inj C Magnet (1) | 463 d | 7/15/14 | 5/18/16 | |
| 179 | DR1.07.02.02 | Inj C Magnet Implementation | 307 d | 3/2/15 | 5/18/16 | |
| 482 | DR1.07.02.02.02 | Inj C Magnet New Design Complete | 0 d | 4/24/15 | 4/24/15 | New dates |
| 484 | DR1.07.02.02.03 | Inj C Magnet Design Tooling Complete | 0 d | 5/1/15 | 5/1/15 | New dates |
| 483 | DR1.07.02.02.04 | Inj C Magnet Procurement Complete | 0 d | 5/22/15 | 5/22/15 | New dates |
| 485 | DR1.07.02.02.05 | Inj C Magnet Procure Tooling | 0 d | 8/10/15 | 8/10/15 | New dates |
| 486 | DR1.07.02.02.06 | Inj C Magnet Tool-up Complete | 0 d | 8/31/15 | 8/31/15 | New dates |
| 487 | DR1.07.02.02.07 | Inj C Magnet Coil Winding Complete | 0 d | 12/23/15 | 12/23/15 | New dates |
| 520 | DR1.07.02.02.08 | Inj C Magnet Core Ready | 0 d | 9/23/15 | 9/23/15 | New activity |
| 488 | DR1.07.02.02.09 | Inj C Magnet Assembly Complete | 0 d | 1/27/16 | 1/27/16 | New dates |
| 489 | DR1.07.02.02.10 | Inj C Magnet Testing Complete | 0 d | 2/24/16 | 2/24/16 | New dates |
| 490 | DR1.07.02.02.11 | Inj C Magnet Delivered by TD | 1 d | 5/18/16 | 5/18/16 | New dates |
| 366 | DR1.07.02.02.12 | Inj C Magnet Completed by TD | 0 d | 5/18/16 | 5/18/16 | New dates |
| 79 | DR1.07.03 | Delivery Ring Inj Kicker Magnet Refurbishment (2 production) | 211 d | 10/1/15 | 8/3/16 | |
| 211 | DR1.07.03.02 | Delivery Ring Inj Kicker Magnet Implementation | 181 d | 11/12/15 | 8/3/16 | |
| 220 | DR1.07.03.02.01 | Delivery Ring Inj Kicker Project Control | 120 d | 12/3/15 | 5/25/16 | New dates |

Delivery Ring CR009 Schedule Information

| UID | WBS | Name | Dur | Start | Finish | Comments |
|-----|--------------------|--|-------|----------|---------|--------------|
| 218 | DR1.07.03.02.05 | Delivery Ring Inj Kicker Acquire potting material | 20 d | 12/3/15 | 1/5/16 | New dates |
| 81 | DR1.07.04 | DR Mag Septa Magnets (2) | 217 d | 10/1/15 | 8/11/16 | |
| 200 | DR1.07.04.02 | DR Mag Septa Magnets Implementation | 197 d | 10/28/15 | 8/11/16 | |
| 503 | DR1.07.04.02.08 | DR Mag Septa Magnet Weld 1st Magnet | 0 d | 4/11/16 | 4/11/16 | New activity |
| 504 | DR1.07.04.02.09 | DR Mag Septa Magnet Weld 2nd Magnet | 0 d | 5/2/16 | 5/2/16 | New activity |
| 505 | DR1.07.04.02.10 | DR Mag Septa Magnet Final Assembly | 0 d | 6/14/16 | 6/14/16 | New activity |
| 367 | DR1.07.04.02.13 | Delivery Ring Magnetic Septa Injection Septa Completed by TD | 0 d | 8/11/16 | 8/11/16 | New dates |
| 368 | DR1.07.04.02.14 | Delivery Ring Magnetic Septa Abort Septum Completed by TD | 0 d | 8/11/16 | 8/11/16 | New dates |
| 85 | DR1.08 | Delivery Ring Installation | 553 d | 7/18/14 | 9/29/16 | |
| 317 | DR1.08.01 | Tunnel Installation | 553 d | 7/18/14 | 9/29/16 | |
| 325 | DR1.08.01.01 | General Installation | 251 d | 10/1/15 | 9/29/16 | |
| 298 | DR1.08.01.01.02 | General Installation Implementation | 251 d | 10/1/15 | 9/29/16 | |
| 313 | DR1.08.01.01.02.15 | General Installation Install beam line to abort | 25 d | 6/9/16 | 7/14/16 | New dates |
| 318 | DR1.08.01.02 | Abort Installation | 474 d | 7/18/14 | 6/8/16 | |
| 319 | DR1.08.01.02.01 | Abort Installation Design | 111 d | 4/3/15 | 9/10/15 | |
| 320 | DR1.08.01.02.01.01 | Abort Installation Design Project Oversight | 111 d | 4/3/15 | 9/10/15 | New dates |
| 321 | DR1.08.01.02.01.02 | Abort Installation Design Engineering | 10 d | 4/3/15 | 4/16/15 | New dates |
| 322 | DR1.08.01.02.01.03 | Abort Installation Design Drawings | 10 d | 4/3/15 | 4/16/15 | New dates |
| 323 | DR1.08.01.02.01.04 | Abort Installation Design Installation Prep | 10 d | 4/3/15 | 4/16/15 | New dates |
| 324 | DR1.08.01.02.01.05 | Abort Installation Design Simulations | 10 d | 4/3/15 | 4/16/15 | New dates |
| 326 | DR1.08.01.02.02 | Abort Installation Implementation | 474 d | 7/18/14 | 6/8/16 | |
| 327 | DR1.08.01.02.02.01 | Abort Installation Implementation Project Oversight | 40 d | 9/11/15 | 11/5/15 | New dates |
| 448 | DR1.08.01.02.02.03 | Abort Installation Prep Req & Process PO for Dump Parts ** Delete ** | 1 d | 4/17/15 | 4/17/15 | Task deleted |
| 449 | DR1.08.01.02.02.04 | Abort Installation Award PO for Dump Parts ** Delete ** | 1 d | 4/17/15 | 4/17/15 | Task deleted |
| 328 | DR1.08.01.02.02.05 | Abort Installation Receive Dump Parts ** Deleted ** | 1 d | 4/20/15 | 4/20/15 | Task deleted |
| 533 | DR1.08.01.02.02.06 | Abort Installation Mfg Dump Parts | 20 d | 4/3/15 | 4/30/15 | New dates |
| 329 | DR1.08.01.02.02.07 | Abort Dump Installation T&M | 20 d | 4/3/15 | 4/30/15 | New dates |
| 330 | DR1.08.01.02.02.08 | Abort Installation Purchase Abort Fencing | 10 d | 3/21/16 | 4/1/16 | New dates |
| 331 | DR1.08.01.02.02.09 | Abort Installation Engineering | 5 d | 4/17/15 | 4/23/15 | New dates |
| 332 | DR1.08.01.02.02.10 | Abort Dump Installation Labor | 20 d | 4/3/15 | 4/30/15 | New dates |
| 333 | DR1.08.01.02.02.11 | Abort Installation Install Fencing | 24 d | 4/4/16 | 5/5/16 | New dates |
| 334 | DR1.08.01.02.02.12 | Abort Installation Dump Survey | 6 d | 8/3/15 | 8/10/15 | New dates |

Delivery Ring AIP CR009 Labor Changes

| UID | WBS | Name | New Hours | Old Hours | Delta | Comments |
|-----|--------------------|---|-----------|-----------|-------|----------------------|
| 1 | DR1 | Delivery Ring AIP | 29886 | 27566 | 2386 | |
| 70 | DR1.06 | Delivery Ring PS | 16290 | 14530 | 1760 | |
| 73 | DR1.06.01 | Delivery Ring Pulsed Supplies | 14440 | 12680 | 1760 | |
| 86 | DR1.06.01.01 | Delivery Ring Septa Supplies | 3786 | 3086 | 700 | |
| 99 | DR1.06.01.01.03 | Delivery Ring Septa PS Implementation | 3557 | 2857 | 700 | |
| 522 | DR1.06.01.01.03.13 | Delivery Ring Septa Design Cable/Stripline Interface | 48 | 0 | 48 | New task |
| | | | | | | FNAD_MECH_ASMBY_TECH |
| 524 | DR1.06.01.01.03.14 | Delivery Ring Septa Procure Material for Cable/Stripline Interface | 12 | 0 | 12 | New task |
| | | | | | | FNAD_MECH_ASMBY_TECH |
| 523 | DR1.06.01.01.03.15 | Delivery Ring Septa Assemble Cable/Stripline Interface | 640 | 0 | 640 | New task |
| | | | | | | FNAD_MECH_ASMBY_TECH |
| 88 | DR1.06.01.03 | Abort Kicker PS | 5632 | 4572 | 1060 | |
| 148 | DR1.06.01.03.02 | Abort Kicker PS Implementation | 4944 | 3884 | 1060 | |
| 527 | DR1.06.01.03.02.41 | Abort Kicker Prep Req & Process PO for Res Charging Transformer & Pts for Muze | 16 | 0 | 16 | New Task |
| | | | | | | FNAD_ELTN_DESIGN_EN |
| 530 | DR1.06.01.03.02.44 | Abort Kicker PS Procure Resonant Charging Pulser Pts for Muze | 16 | 0 | 16 | New Task |
| | | | | | | FNAD_ELEC_DESIGN_EN |
| 529 | DR1.06.01.03.02.45 | Abort Kicker PS Assemble Resonant Charger for Muze | 312 | 0 | 312 | New Task |
| | | | | | | FNAD_ELEC_TECH |
| | | | 208 | 0 | 208 | |
| | | | 104 | 0 | 104 | |
| | | | 176 | 0 | 176 | New Task |
| 532 | DR1.06.01.03.02.46 | Abort Kicker PS Test Pulser & Resonant Charger (don't overlap ET with other systems) for Muze | 104 | 0 | 104 | |
| | | | 64 | 0 | 64 | |
| | | | 8 | 0 | 8 | |
| 528 | DR1.06.01.03.02.47 | Abort Kicker PS Condition & Measure Load Resistors for Muze | 64 | 0 | 64 | New Task |
| | | | 40 | 0 | 40 | |
| | | | 8 | 0 | 8 | |
| | | | 16 | 0 | 16 | |
| 531 | DR1.06.01.03.02.48 | Abort Kicker PS Assemble Load, Feedthrough & Mounting Bx (don't overlap MT with other systems) for Muze | 476 | 0 | 476 | New Task |
| | | | 325 | 0 | 325 | |
| | | | 73 | 0 | 73 | |
| | | | 78 | 0 | 78 | |
| 85 | DR1.08 | Delivery Ring Installation | 4496 | 3936 | 626 | |
| 317 | DR1.08.01 | Tunnel Installation | 3828 | 3268 | 626 | |
| 318 | DR1.08.01.02 | Abort Installation | 1512 | 952 | 626 | |
| 326 | DR1.08.01.02.02 | Abort Installation Implementation | 1372 | 812 | 626 | |
| 533 | DR1.08.01.02.02.06 | Abort Installation Mfg Dump Parts | 626 | 0 | 626 | New task |
| | | | | | | FNAD_MECH_ASMBY_TECH |

Delivery Ring CR009 Material Changes

| UID | WBS | Name | Start | Finish | Original M&S | New M&S | Delta | Comments |
|-----|--------------------|---|----------|----------|--------------|-------------|-----------|--------------|
| 1 | DR1 | Delivery Ring AIP | 10/28/13 | 9/29/16 | \$3,101,932 | \$3,122,075 | \$20,143 | |
| 70 | DR1.06 | Delivery Ring PS | 4/18/14 | 9/26/16 | \$1,448,400 | \$1,513,623 | \$65,223 | |
| 73 | DR1.06.01 | Delivery Ring Pulsed Supplies | 4/18/14 | 9/26/16 | \$1,306,500 | \$1,371,723 | \$65,223 | |
| 86 | DR1.06.01.01 | Delivery Ring Septa Supplies | 9/22/14 | 8/25/16 | \$341,000 | \$349,500 | \$8,500 | |
| 99 | DR1.06.01.01.03 | Delivery Ring Septa PS Implementation | 1/23/15 | 8/25/16 | \$161,000 | \$169,500 | \$8,500 | |
| 524 | DR1.06.01.01.03.14 | Delivery Ring Septa Procure Material for Cable/Stripline Interface | 11/2/15 | 2/2/16 | \$0 | \$8,500 | \$8,500 | New task |
| 87 | DR1.06.01.02 | Inj Kicker PS | 4/18/14 | 9/20/16 | \$494,100 | \$511,923 | \$17,823 | |
| 112 | DR1.06.01.02.03 | Inj Kicker PS Implementation | 4/18/14 | 9/20/16 | \$480,100 | \$497,923 | \$17,823 | |
| 521 | DR1.06.01.02.03.05 | Inj Kicker PS Buy Thyatron from SPS for Development | 4/1/15 | 4/1/15 | \$0 | \$17,823 | \$17,823 | New task |
| 88 | DR1.06.01.03 | Abort Kicker PS | 10/1/14 | 9/26/16 | \$471,400 | \$510,300 | \$38,900 | |
| 148 | DR1.06.01.03.02 | Abort Kicker PS Implementation | 10/1/14 | 9/26/16 | \$471,400 | \$510,300 | \$38,900 | |
| 525 | DR1.06.01.03.02.43 | Abort Kicker PS Receive Res Charging Transformer & Pts for MuZe | 11/2/15 | 11/6/15 | \$0 | \$31,300 | \$31,300 | New task |
| 530 | DR1.06.01.03.02.44 | Abort Kicker PS Procure Resonant Charging Pulser Pts for MuZe | 5/26/15 | 10/29/15 | \$0 | \$5,600 | \$5,600 | New task |
| 529 | DR1.06.01.03.02.45 | Abort Kicker PS Assemble Resonant Charger for MuZe | 12/21/15 | 1/29/16 | \$0 | \$500 | \$500 | New task |
| 532 | DR1.06.01.03.02.46 | Abort Kicker PS Test Pulser & Resonant Charger (don't overlap ET with other | 8/1/16 | 8/26/16 | \$0 | \$1,000 | \$1,000 | New task |
| 531 | DR1.06.01.03.02.48 | Abort Kicker PS Assemble Load, Feedthrough & Mounting Bx (don't overlap | 4/22/16 | 7/1/16 | \$0 | \$500 | \$500 | New task |
| 85 | DR1.08 | Delivery Ring Installation | 7/18/14 | 10/18/16 | \$407,080 | \$362,000 | -\$45,080 | |
| 317 | DR1.08.01 | Tunnel Installation | 7/18/14 | 10/18/16 | \$334,810 | \$289,730 | -\$45,080 | |
| 318 | DR1.08.01.02 | Abort Installation | 7/18/14 | 8/10/16 | \$127,500 | \$82,420 | -\$45,080 | |
| 326 | DR1.08.01.02.02 | Abort Installation Implementation | 7/18/14 | 8/10/16 | \$127,500 | \$82,420 | -\$45,080 | |
| 328 | DR1.08.01.02.02.05 | Abort Installation Receive Dump Parts ** Deleted ** | 5/11/16 | 6/22/16 | \$33,300 | \$0 | -\$33,300 | Task deleted |
| 329 | DR1.08.01.02.02.07 | Abort Dump Installation T&M | 4/3/15 | 4/30/15 | \$58,000 | \$46,220 | -\$11,780 | |

Delivery Ring Pre CR009 CAP

| Control Account | Results | FY12 | FY13 | FY14 | FY15 | FY16 | FY17 | Cumulative |
|--|-----------|------|------|--------------|--------------|--------------|------|--------------|
| A1304.01.02.02 Delivery Ring Proj Mgmt OS - FY14 | Scheduled | 0.00 | 0.00 | 202,519.42 | 0.00 | 0.00 | 0.00 | 202,519.42 |
| A1304.01.02.03 Delivery Ring Project Management Oversight - FY15 | Scheduled | 0.00 | 0.00 | 5,745.92 | 172,223.05 | 0.00 | 0.00 | 177,968.96 |
| A1304.01.02.04 Delivery Ring Project Management Oversight - FY16 | Scheduled | 0.00 | 0.00 | 0.00 | 5,306.01 | 195,501.07 | 0.00 | 200,807.08 |
| A1304.02 Collider Equipment Removal & Configuration | Scheduled | 0.00 | 0.00 | 284,664.11 | 55,662.49 | 0.00 | 0.00 | 340,326.60 |
| A1304.03 Delivery Ring Electrical Infrastructure | Scheduled | 0.00 | 0.00 | 184,257.84 | 231,245.75 | 81,883.71 | 0.00 | 497,387.30 |
| A1304.04 Delivery Ring Controls | Scheduled | 0.00 | 0.00 | 337,819.33 | 57,692.73 | 2,612.25 | 0.00 | 398,124.31 |
| A1304.05 Delivery Ring Instrumentation | Scheduled | 0.00 | 0.00 | 0.00 | 0.00 | 197,414.49 | 0.00 | 197,414.49 |
| A1304.06.01.01 Septa Supplies | Scheduled | 0.00 | 0.00 | 8,821.22 | 633,869.97 | 70,037.84 | 0.00 | 712,729.03 |
| A1304.06.01.02 Inj Kicker Power Supply | Scheduled | 0.00 | 0.00 | 230,517.90 | 667,584.61 | 267,728.15 | 0.00 | 1,165,830.66 |
| A1304.06.01.03 Abort Kicker Power Supply | Scheduled | 0.00 | 0.00 | 83,910.98 | 572,642.20 | 436,599.59 | 0.00 | 1,093,152.77 |
| A1304.06.02 New DC Supplies | Scheduled | 0.00 | 0.00 | 0.00 | 0.00 | 391,266.10 | 0.00 | 391,266.10 |
| A1304.07.01 Delivery Ring Repurposed Magnets | Scheduled | 0.00 | 0.00 | 0.00 | 0.00 | 15,735.71 | 0.00 | 15,735.71 |
| A1304.07.02 Delivery Ring Inj C Magnet | Scheduled | 0.00 | 0.00 | 8,322.95 | 7,741.38 | 253,876.76 | 0.00 | 269,941.09 |
| A1304.07.03 Delivery Ring Inj Kicker Magnet Refurbishment | Scheduled | 0.00 | 0.00 | 1,497.74 | 0.00 | 86,075.79 | 0.00 | 87,573.53 |
| A1304.07.04 Delivery Ring Magnetic Septa Magnets (1 spare) | Scheduled | 0.00 | 0.00 | 0.00 | 0.00 | 396,176.95 | 0.00 | 396,176.95 |
| A1304.08.01 Tunnel Installation | Scheduled | 0.00 | 0.00 | 40,477.84 | 0.00 | 763,942.83 | 0.00 | 804,420.67 |
| A1304.08.02 Cable Installation | Scheduled | 0.00 | 0.00 | 0.00 | 0.00 | 179,494.91 | 0.00 | 179,494.91 |
| Grand Total | Scheduled | 0.00 | 0.00 | 1,388,555.25 | 2,403,968.18 | 3,338,346.14 | 0.00 | 7,130,869.58 |

Delivery Ring Post CR009 CAP

| Control Account | | FY12 | FY13 | FY14 | FY15 | FY16 | FY17 | Cumulative |
|--|-----------|------|------|--------------|--------------|--------------|------|--------------|
| A1304.01.02.02 Delivery Ring Project Management Oversight - FY14 | Scheduled | 0.00 | 0.00 | 202,519.42 | 0.00 | 0.00 | 0.00 | 202,519.42 |
| A1304.01.02.03 Delivery Ring Project Management Oversight - FY15 | Scheduled | 0.00 | 0.00 | 5,745.92 | 172,223.05 | 0.00 | 0.00 | 177,968.96 |
| A1304.01.02.04 Delivery Ring Project Management Oversight - FY16 | Scheduled | 0.00 | 0.00 | 0.00 | 5,306.01 | 195,501.07 | 0.00 | 200,807.08 |
| A1304.02 Collider Equipment Removal & Configuration | Scheduled | 0.00 | 0.00 | 284,664.11 | 55,662.49 | 0.00 | 0.00 | 340,326.60 |
| A1304.03 Delivery Ring Electrical Infrastructure | Scheduled | 0.00 | 0.00 | 184,257.84 | 231,245.75 | 81,883.71 | 0.00 | 497,387.30 |
| A1304.04 Delivery Ring Controls | Scheduled | 0.00 | 0.00 | 337,819.33 | 57,692.73 | 2,612.25 | 0.00 | 398,124.31 |
| A1304.05 Delivery Ring Instrumentation | Scheduled | 0.00 | 0.00 | 0.00 | 0.00 | 197,414.49 | 0.00 | 197,414.49 |
| A1304.06.01.01 Septa Supplies | Scheduled | 0.00 | 0.00 | 8,821.22 | 648,340.49 | 132,729.64 | 0.00 | 789,891.35 |
| A1304.06.01.02 Inj Kicker Power Supply | Scheduled | 0.00 | 0.00 | 230,517.90 | 534,288.21 | 427,864.92 | 0.00 | 1,192,671.04 |
| A1304.06.01.03 Abort Kicker Power Supply | Scheduled | 0.00 | 0.00 | 83,910.98 | 503,947.65 | 666,505.24 | 0.00 | 1,254,363.87 |
| A1304.06.02 New DC Supplies | Scheduled | 0.00 | 0.00 | 0.00 | 0.00 | 391,266.10 | 0.00 | 391,266.10 |
| A1304.07.01 Delivery Ring Repurposed Magnets | Scheduled | 0.00 | 0.00 | 0.00 | 0.00 | 15,735.71 | 0.00 | 15,735.71 |
| A1304.07.02 Delivery Ring Inj C Magnet | Scheduled | 0.00 | 0.00 | 8,322.95 | 7,741.38 | 253,876.76 | 0.00 | 269,941.09 |
| A1304.07.03 Delivery Ring Inj Kicker Magnet Refurbishment | Scheduled | 0.00 | 0.00 | 1,497.74 | 0.00 | 86,075.79 | 0.00 | 87,573.53 |
| A1304.07.04 Delivery Ring Magnetic Septa Magnets (1 spare) | Scheduled | 0.00 | 0.00 | 0.00 | 0.00 | 396,176.95 | 0.00 | 396,176.95 |
| A1304.08.01 Tunnel Installation | Scheduled | 0.00 | 0.00 | 40,477.84 | 145,057.51 | 615,988.95 | 0.00 | 801,524.30 |
| A1304.08.02 Cable Installation | Scheduled | 0.00 | 0.00 | 0.00 | 0.00 | 179,494.91 | 0.00 | 179,494.91 |
| Grand Total | Scheduled | 0.00 | 0.00 | 1,388,555.25 | 2,361,505.27 | 3,643,126.49 | 0.00 | 7,393,187.01 |