



Muon Campus AIP

Change Request Form

CR#:DR010

1) DATE: 7/23/15 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 is necessitated by a correction in the estimate of labor required to wind the Pulse Forming Lines (PFLs) for the injection and abort kickers. A more careful examination of the work required resulted in the determination that more mechanical technician time would be required than what was originally estimated.

A new activity is also required to do a high voltage acceptance test of the PFL cable when it arrives. Originally it was planned that the injection kicker installation would be far along when the PFL cable arrived that the cable could be acceptance tested with that new kicker equipment. The present planning shows that the cable will arrive much earlier, so a special acceptance testing set up will be required.

Finally, some task were mistakenly loaded with AD labor. These resources have been changed to TD labor.

The Delivery Ring budget increases by \$69,263 with a corresponding decrease in contingency. There is no impact to the schedule.

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: 7/23/15

AIP Project Coordinator:

Wang

Date: 7/23/15

AD Div Director:

Date: _____

Directorate:

Date: _____

Delivery Ring CR010 Activity Information

| UID | WBS | Name | Start | Finish | Comments |
|-----|--------------------|---|----------|----------|--|
| 1 | DR1 | Delivery Ring AIP | 10/28/13 | 9/30/16 | |
| 70 | DR1.06 | Delivery Ring PS | 4/18/14 | 9/30/16 | |
| 73 | DR1.06.01 | Delivery Ring Pulsed Supplies | 4/18/14 | 9/30/16 | |
| 87 | DR1.06.01.02 | Inj Kicker PS | 4/18/14 | 9/20/16 | |
| 112 | DR1.06.01.02.03 | Inj Kicker PS Implementation | 4/18/14 | 9/20/16 | |
| 128 | DR1.06.01.02.03.32 | Inj Kicker PS Assemble Four PFL Frames & Wind | 5/27/16 | 6/22/16 | Add hours |
| 535 | DR1.06.01.02.03.43 | Inj Kicker PS Acceptance Test PFL Cable | 8/12/15 | 8/25/15 | New activity |
| 88 | DR1.06.01.03 | Abort Kicker PS | 10/1/14 | 9/30/16 | |
| 148 | DR1.06.01.03.02 | Abort Kicker PS Implementation | 10/1/14 | 9/30/16 | |
| 534 | DR1.06.01.03.02.19 | Abort Kicker PS Acceptance Test PFL Cable | 8/17/15 | 9/11/15 | New activity |
| 157 | DR1.06.01.03.02.27 | Abort Kicker PS Assemble Four PFL Frames & Wind | 6/23/16 | 7/15/16 | Add hours, convert AD labor to TD |
| 536 | DR1.06.01.03.02.28 | Abort Kicker Wind PFL Cables | 3/7/16 | 3/25/16 | New activity |
| 75 | DR1.07 | Delivery Ring Magnets | 7/15/14 | 8/11/16 | |
| 76 | DR1.07.01 | Delivery Ring Repurposed Magnets | 10/1/15 | 4/8/16 | |
| 287 | DR1.07.01.02 | Delivery Ring Repurposed Magnets Implementation | 10/1/15 | 4/8/16 | |
| 292 | DR1.07.01.02.01 | DR Repurposed Magnets Engineering oversight & preparation | 10/1/15 | 10/28/15 | Convert AD Magnet Design Engineer to AD Mechanical Design Engineer |

Delivery Ring CR010 Resource Changes

| UID | WBS | Name | Old Hours | New Hours | Delta Hours | Comments |
|-----|--------------------|---|-----------|-----------|-------------|--------------|
| 1 | DR1 | Delivery Ring AIP | 29952 | 30667 | 715 | |
| 70 | DR1.06 | Delivery Ring PS | 16290 | 17005 | 715 | |
| 73 | DR1.06.01 | Delivery Ring Pulsed Supplies | 14440 | 15155 | 715 | |
| 87 | DR1.06.01.02 | Inj Kicker PS | 5022 | 5157 | 135 | |
| 112 | DR1.06.01.02.03 | Inj Kicker PS Implementation | 4334 | 4469 | 135 | |
| 128 | DR1.06.01.02.03.32 | Inj Kicker PS Assemble Four PFL Frames & Wind | 120 | 240 | 120 | |
| | | FNTD_MECH_ASMBY_TECH | 100 | 220 | 120 | |
| 535 | DR1.06.01.02.03.43 | Inj Kicker PS Acceptance Test PFL Cable | 0 | 15 | 15 | New activity |
| | | FNAD_ELEC_TECH | 0 | 15 | 15 | |
| 88 | DR1.06.01.03 | Abort Kicker PS | 5632 | 6212 | 580 | |
| 148 | DR1.06.01.03.02 | Abort Kicker PS Implementation | 4944 | 5524 | 580 | |
| 534 | DR1.06.01.03.02.19 | Abort Kicker PS Acceptance Test PFL Cable | 0 | 36 | 36 | New activity |
| | | FNAD_ELEC_TECH | 0 | 36 | 36 | |
| 157 | DR1.06.01.03.02.27 | Abort Kicker PS Assemble Four PFL Frames & Wind | 120 | 404 | 284 | |
| | | FNAD_MECH_SYSTEM_TECH | 100 | 0 | -100 | |
| | | FNAD_MECH_TECH_MNGR | 20 | 0 | -20 | |
| | | FNTD_MECH_ASMBY_TECH | 0 | 384 | 384 | |
| | | FNTD_MECH_TECH_MNGR | 0 | 20 | 20 | |
| 536 | DR1.06.01.03.02.28 | Abort Kicker Wind PFL Cables | 0 | 260 | 260 | New activity |
| | | FNTD_MECH_ASMBY_TECH | 0 | 260 | 260 | |
| 75 | DR1.07 | Delivery Ring Magnets | 667 | 667 | 0 | |
| 76 | DR1.07.01 | Delivery Ring Repurposed Magnets | 100 | 100 | 0 | |
| 287 | DR1.07.01.02 | Delivery Ring Repurposed Magnets Implementation | 65 | 65 | 0 | |
| 292 | DR1.07.01.02.01 | DR Repurposed Magnets Engineering oversight & preparation | 25 | 25 | 0 | |
| | | FNAD_MAGNT_DESIGN_EN | 10 | 0 | -10 | |
| | | FNAD_MECH_DESIGN_EN | 0 | 10 | 10 | |

Delivery Ring Project Plan Milestones

| Delivery Ring | | | | | | | |
|-----------------|--|---------|---------|--------|---------|----------|--|
| WBS | Name | Start | Finish | % Comp | Base St | Base Fin | |
| DR1.01.01.02 | Delivery Ring Project Plan Milestones | 11/1/13 | 9/30/16 | 0% | 11/1/13 | 9/29/16 | |
| DR1.01.01.02.01 | Start Project | 11/1/13 | 11/1/13 | 100% | 11/1/13 | 11/1/13 | |
| DR1.01.01.02.05 | Begin Disassembly of Accumulator | 5/1/14 | 5/1/14 | 100% | 5/1/14 | 5/1/14 | |
| DR1.01.01.02.06 | Controls Links to Ring Buildings Established | 9/9/14 | 9/9/14 | 100% | 6/30/14 | 6/30/14 | |
| DR1.01.01.02.08 | Collider Equipment Removal Complete | 3/20/15 | 3/20/15 | 100% | 3/20/15 | 3/20/15 | |
| DR1.01.01.02.09 | Electrical Infrastructure Upgrades Complete | 7/6/16 | 7/6/16 | 0% | 1/29/16 | 1/29/16 | |
| DR1.01.01.02.10 | Magnet Construction Complete | 8/11/16 | 8/11/16 | 0% | 8/11/16 | 8/11/16 | |
| DR1.01.01.02.11 | Installation Complete | 9/29/16 | 9/29/16 | 0% | 9/29/16 | 9/29/16 | |
| DR1.01.01.02.12 | Project Complete | 9/30/16 | 9/30/16 | 0% | 9/29/16 | 9/29/16 | |

Delivery Ring Pre CR010 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 |

Delivery Ring Post CR010 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 | 535,764.96 | 439,270.07 | 0.00 | 1,205,552.93 |
| A1304.06.01.03 Abort Kicker Power Supply | Scheduled | 0.00 | 0.00 | 83,910.98 | 507,491.84 | 719,341.96 | 0.00 | 1,310,744.78 |
| 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 | 2,366,526.21 | 3,707,368.36 | 0.00 | 7,462,449.82 |