

# Muon Campus AIP

## Change Request Form

CR#:DR014

1) DATE: 4/1/16

2) WBS: DR1

3) Originator: Ken Domann

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

5) Technical Description & Primary Motivation for Change: This change request adds scope for the Power Distribution Upgrade and the mitigation of an issue with deficient magnet adjuster hardware that is located throughout the Muon Campus. A previous CR transferred \$500,000 from the Beam Transport AIP to cover this new scope. In addition, existing tasks with future baseline dates were replanned to reflect the current schedule approach. This replan moved the completion of the Delivery Ring AIP from FY16 (September 2016) to FY17 (March 2017). The net effect of the CR is to increase the budget by \$329,756 with a corresponding decrease in contingency. All interface milestones affecting g-2 and Mu2e will meet original required commitments.

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

7) Assessment of Schedule Impact (Use attachments if needed): See attachments for changes to baseline dates. No impact to g-2 or Mu2e.

8) Secondary Impact & Other Comments: N/A

9) Approvals:

AIP Project Manager:

Date: 4/1/16

AIP Project Coordinator:

Date: 4/1/16

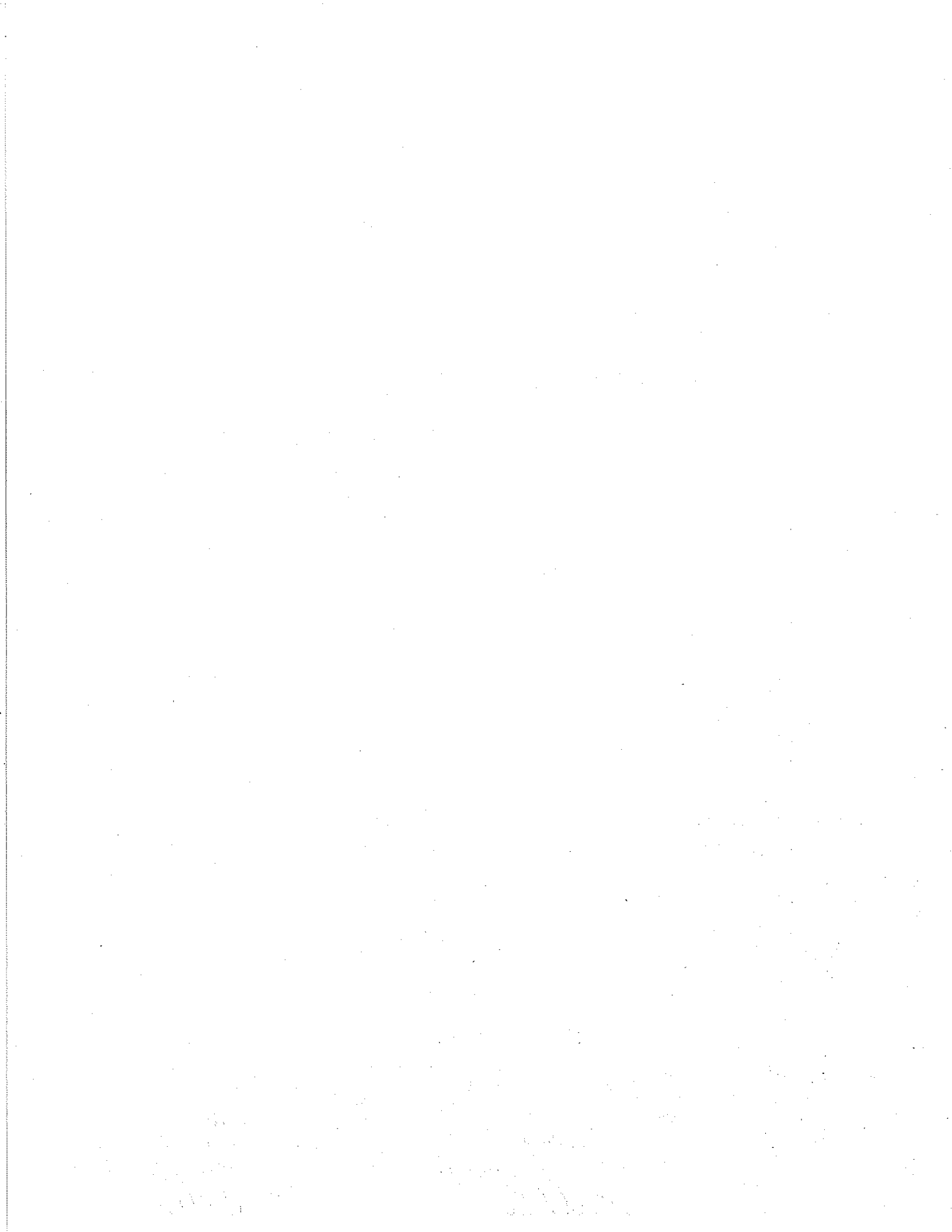
AD Div Director:

Date: 4/01/16

Directorate:

Date: 4/01/16

4/5/16



### Delivery Ring CR014 Schedule Changes

UID	WBS	Name	Original Base St	Original Base Fin	New Base St	New Base Fin	Comments
1	DR1	Delivery Ring AIP	10/28/13	9/29/16	10/28/13	3/29/17	
2	DR1.01	Delivery Ring Project Management	10/28/13	9/29/16	10/28/13	3/29/17	
4	DR1.01.01	Delivery Ring Milestones	10/28/13	9/29/16	10/28/13	2/23/17	
376	DR1.01.01.02	Delivery Ring Interface Milestones	4/1/14	9/29/16	4/1/14	2/23/17	New baseline dates
377	DR1.01.01.02.04	Delivery Ring AIP Complete (g-2 Interface)	9/29/16	9/29/16	2/23/17	2/23/17	New baseline dates
567	DR1.01.03	Delivery Ring Project Plan Milestones	11/1/13	9/29/16	11/1/13	3/29/17	
573	DR1.01.03.10	Magnet Construction Complete	8/11/16	8/11/16	3/29/17	3/29/17	New baseline dates
574	DR1.01.03.11	Installation Complete	9/29/16	9/29/16	11/17/16	11/17/16	New baseline dates
575	DR1.01.03.12	Project Complete	9/29/16	9/29/16	3/29/17	3/29/17	New baseline dates
35	DR1.03	Delivery Ring Electrical Infrastructure	1/7/14	7/6/16	1/7/14	1/20/17	
373	DR1.03.02	Delivery Ring Electrical Infrastructure Implementation	1/7/14	7/6/16	1/7/14	10/24/16	
65	DR1.03.02.07	Install electrical upgrades in AP-50	5/17/16	7/6/16	8/1/16	10/24/16	New baseline dates
362	DR1.03.02.13	AP-50 Electrical Infrastructure Work Completed	7/6/16	7/6/16	10/24/16	10/24/16	New baseline dates
576	DR1.03.03	Power Distribution Upgrade	4/4/16	1/20/17	4/4/16	1/20/17	
583	DR1.03.03.01	Prepare requisition for Air Cooled transformer for AP-30	4/4/16	4/8/16	4/4/16	4/8/16	New activity
582	DR1.03.03.02	Issue PO for new transformer	4/11/16	6/20/16	4/11/16	6/20/16	New activity
581	DR1.03.03.03	Receive new Transformer	6/21/16	1/20/17	6/21/16	1/20/17	New activity
580	DR1.03.03.04	Prepare requisition for 4-way sectionalizing switch for AP-30	4/4/16	4/8/16	4/4/16	4/8/16	New activity
579	DR1.03.03.05	Issue PO for new 4-way sectionalizing switch	4/11/16	6/20/16	4/11/16	6/20/16	New activity
578	DR1.03.03.06	Receive new 4-way sectionalizing switch	6/21/16	8/18/16	6/21/16	8/18/16	New activity
577	DR1.03.03.07	Install 4-way sectionalizing switch	9/6/16	10/3/16	9/6/16	10/3/16	New activity
69	DR1.05	Delivery Ring Instrumentation	11/2/15	8/1/16	11/2/15	2/23/17	
89	DR1.05.01	Instrumentation Design	11/2/15	6/29/16	11/2/15	1/24/17	
268	DR1.05.01.07	Delivery Ring BPM System Prototyping	5/31/16	6/29/16	12/19/16	1/24/17	New baseline dates
540	DR1.05.01.11	Delivery Ring BPM Acceptance test received cables	3/11/16	4/26/16	8/3/16	9/19/16	New baseline dates
546	DR1.05.01.14	Delivery Ring BPM Design Bandpass Filter (590 KHz to Operate at Rotation Frequency)	4/13/16	4/15/16	7/13/16	7/15/16	New baseline dates
547	DR1.05.01.15	Delivery Ring BPM Simulate & Prototype Bandpass Filter	4/13/16	4/15/16	7/13/16	7/15/16	New baseline dates
548	DR1.05.01.16	Delivery Ring BPM Order Components for Filter	4/18/16	4/20/16	7/18/16	7/20/16	New baseline dates
90	DR1.05.02	Instrumentation Implementation	11/2/15	8/1/16	11/2/15	2/23/17	
282	DR1.05.02.04	Delivery Ring BPM Installation	6/30/16	8/1/16	1/25/17	2/23/17	New baseline dates
280	DR1.05.02.05	Delivery Ring BPM Documentation	6/30/16	8/1/16	1/25/17	2/23/17	New baseline dates
560	DR1.05.02.08	Delivery Ring BPM Replace Input Stage Resistors for All Channels	4/13/16	4/15/16	7/12/16	7/14/16	New baseline dates
562	DR1.05.02.09	Delivery Ring BPM Remove & Add Components on Existing Transition Board	4/13/16	5/3/16	7/12/16	8/1/16	New baseline dates
563	DR1.05.02.10	Delivery Ring BPM Test Finished Transition Board	5/4/16	5/10/16	11/2/16	11/8/16	New baseline dates
275	DR1.05.02.14	Delivery Ring BLM Electronics purchases	3/9/16	5/17/16	8/10/16	10/19/16	New baseline dates
390	DR1.05.02.16	Delivery Ring Instrumentation Complete	3/11/16	3/11/16	2/23/17	2/23/17	New baseline dates
70	DR1.06	Delivery Ring PS	4/9/14	9/26/16	4/9/14	2/23/17	
73	DR1.06.01	Delivery Ring Pulsed Supplies	4/9/14	9/26/16	4/9/14	2/23/17	
86	DR1.06.01.01	Delivery Ring Septa Supplies	8/15/14	9/23/16	8/15/14	1/19/17	
99	DR1.06.01.01.03	Delivery Ring Septa PS Implementation	11/12/14	9/23/16	11/12/14	1/19/17	
558	DR1.06.01.01.03.05	Delivery Ring Septa PS Assemble & Test Controls Rack	3/1/16	5/26/16	5/2/16	7/29/16	New baseline dates

## Delivery Ring CR014 Schedule Changes

UID	WBS	Name	Original Base St	Original Base Fin	New Base St	New Base Fin	Comments
106	DR1.06.01.01.03.08	Delivery Ring Septa PS AC installation	7/7/16	7/14/16	10/25/16	11/1/16	New baseline dates
104	DR1.06.01.01.03.09	Delivery Ring Septa PS Power testing	7/15/16	9/23/16	11/2/16	1/19/17	New baseline dates
557	DR1.06.01.01.03.13	Delivery Ring Septa PS HV Rack Light Link Construction	3/4/16	5/2/16	4/29/16	6/28/16	New baseline dates
391	DR1.06.01.01.03.20	Delivery Ring Septa PS Complete	8/25/16	8/25/16	1/19/17	1/19/17	New baseline dates
87	DR1.06.01.02	Inj Kicker PS	4/9/14	9/20/16	4/9/14	2/21/17	
112	DR1.06.01.02.03	Inj Kicker PS Implementation	4/9/14	9/20/16	4/9/14	2/21/17	
381	DR1.06.01.02.03.36	Inj Kicker PS Terminate Cables in Tunnel	8/11/16	9/20/16	11/1/16	12/12/16	New baseline dates
123	DR1.06.01.02.03.39	Inj Kicker PS Install in Service Building	6/30/16	7/28/16	6/30/16	10/21/16	New baseline dates
385	DR1.06.01.02.03.41	Inj Kicker PS Install Carmac Interface	5/4/16	7/28/16	8/1/16	10/24/16	New baseline dates
118	DR1.06.01.02.03.43	Inj Kicker PS Document	8/2/16	9/20/16	10/24/16	2/21/17	New baseline dates
392	DR1.06.01.02.03.44	Delivery Ring Injection PS Complete	9/20/16	9/20/16	12/12/16	12/12/16	New baseline dates
88	DR1.06.01.03	Abort Kicker PS	7/18/14	9/26/16	7/18/14	2/23/17	
148	DR1.06.01.03.02	Abort Kicker PS Implementation	10/1/14	9/26/16	10/1/14	2/23/17	
160	DR1.06.01.03.02.24	Abort Kicker PS Test Pulser & Resonant Charger (don't overlap ET with other systems) for g-2	7/11/16	8/5/16	8/15/16	9/12/16	New baseline dates
536	DR1.06.01.03.02.28	Abort Kicker Wind PFL Cables	3/7/16	3/25/16	7/18/16	8/5/16	New baseline dates
153	DR1.06.01.03.02.30	Abort Kicker PS Install Kicker Supply in Service Building	8/29/16	9/26/16	10/26/16	2/23/17	New baseline dates
382	DR1.06.01.03.02.31	Abort Kicker PS Insert Camac Interface (check M&S)	8/2/16	9/26/16	1/20/17	2/23/17	New baseline dates
149	DR1.06.01.03.02.41	Abort Kicker PS Document	7/25/16	9/26/16	8/2/16	2/23/17	New baseline dates
532	DR1.06.01.03.02.47	Abort Kicker PS Test Pulser & Resonant Charger (don't overlap ET with other systems) for Mu2e	8/1/16	8/26/16	9/28/16	10/25/16	New baseline dates
528	DR1.06.01.03.02.48	Abort Kicker PS Condition & Measure Load Resistors for Mu2e	2/12/16	3/17/16	7/5/16	8/8/16	New baseline dates
531	DR1.06.01.03.02.49	Abort Kicker PS Assemble Load, Feedthrough & Mounting Bx (don't overlap MT with other systems) for Mu2e	4/22/16	7/1/16	12/5/16	2/17/17	New baseline dates
393	DR1.06.01.03.02.50	Delivery Ring Abort Kicker PS Complete	9/26/16	9/26/16	2/23/17	2/23/17	New baseline dates
74	DR1.06.02	New DC Supplies	10/1/15	9/8/16	10/1/15	9/19/16	
228	DR1.06.02.02	New DC Supplies Implementation	10/22/15	9/8/16	10/22/15	9/19/16	
251	DR1.06.02.02.04	AP-30 Trim PS Implementation	11/5/15	9/8/16	11/5/15	9/19/16	
255	DR1.06.02.02.04.04	Fabricate AP-30 trim PS	4/19/16	7/13/16	4/28/16	7/22/16	New baseline dates
252	DR1.06.02.02.04.07	Install AP-30 trim PS	7/14/16	9/8/16	7/25/16	9/19/16	New baseline dates
363	DR1.06.02.02.04.08	AP-30 Trim PS Procurement Complete	4/18/16	4/18/16	4/27/16	4/27/16	New baseline dates
257	DR1.06.02.02.05	AP-30 Shunts Implementation	10/29/15	9/8/16	10/29/15	9/19/16	
261	DR1.06.02.02.05.10	Install shunts in AP-30	7/7/16	7/13/16	5/6/16	5/12/16	New baseline dates
365	DR1.06.02.02.05.11	AP-30 Shunt Installation Complete	7/13/16	7/13/16	5/12/16	5/12/16	New baseline dates
394	DR1.06.02.02.05.12	Delivery Ring New DC PS Complete	9/8/16	9/8/16	9/19/16	9/19/16	New baseline dates
75	DR1.07	Delivery Ring Magnets	6/2/14	8/11/16	6/2/14	3/29/17	
77	DR1.07.02	Delivery Ring Inj C Magnet (I)	6/30/14	5/18/16	6/30/14	8/2/16	
179	DR1.07.02.02	Inj C Magnet Implementation	10/22/14	5/18/16	10/22/14	8/2/16	
490	DR1.07.02.02.11	Inj C Magnet Delivered by TD	5/18/16	5/18/16	8/2/16	8/2/16	New baseline dates
366	DR1.07.02.02.12	Inj C Magnet Completed by TD	5/18/16	5/18/16	8/2/16	8/2/16	New baseline dates
79	DR1.07.03	Delivery Ring Inj Kicker Magnet Refurbishment (2 production)	6/2/14	8/3/16	6/2/14	9/22/16	
211	DR1.07.03.02	Delivery Ring Inj Kicker Magnet Implementation	11/12/15	8/3/16	11/12/15	9/22/16	
216	DR1.07.03.02.07	Delivery Ring Inj Kicker Pot magnets & final clean-up	7/11/16	7/29/16	8/29/16	9/19/16	New baseline dates

Delivery Ring CR014 Schedule Changes

UID	WBS	Name	Original Base St	Original Base Fin	New Base St	New Base Fin	Comments
215	DR1.07.03.02.08	Delivery Ring Inj Kicker Final inspection	8/1/16	8/3/16	9/20/16	9/22/16	New baseline dates
395	DR1.07.03.02.09	Delivery Ring Inj Kicker Magnet Refurbishment Complete	8/3/16	8/3/16	9/22/16	9/22/16	New baseline dates
81	DR1.07.04	DR Mag Septa Magnets (2)	10/1/15	8/11/16	10/1/15	3/29/17	
200	DR1.07.04.02	DR Mag Septa Magnets Implementation	10/28/15	8/11/16	10/28/15	3/29/17	
495	DR1.07.04.02.05	DR Mag Septa Magnet Tool-up Complete	3/4/16	3/4/16	6/14/16	6/14/16	New baseline dates
496	DR1.07.04.02.06	DR Mag Septa Magnet Wet Stack up Complete	3/18/16	3/18/16	6/28/16	6/28/16	New baseline dates
497	DR1.07.04.02.07	DR Mag Septa Magnet Assembly Complete	4/29/16	4/29/16	12/12/16	12/12/16	New baseline dates
503	DR1.07.04.02.08	DR Mag Septa Magnet Weld 1st Magnet	4/11/16	4/11/16	11/17/16	11/17/16	New baseline dates
504	DR1.07.04.02.09	DR Mag Septa Magnet Weld 2nd Magnet	5/2/16	5/2/16	12/12/16	12/12/16	New baseline dates
505	DR1.07.04.02.10	DR Mag Septa Magnet Final Assembly	6/14/16	6/14/16	1/30/17	1/30/17	New baseline dates
498	DR1.07.04.02.11	DR Mag Septa Magnet Testing Complete	7/6/16	7/6/16	2/21/17	2/21/17	New baseline dates
499	DR1.07.04.02.12	DR Mag Septa Magnet Pulsed Septa Magnets Delivered by TD	8/11/16	8/11/16	3/29/17	3/29/17	New baseline dates
367	DR1.07.04.02.13	Delivery Ring Magnetic Septa Injection Septa Completed by TD	8/11/16	8/11/16	3/29/17	3/29/17	New baseline dates
368	DR1.07.04.02.14	Delivery Ring Magnetic Septa Abort Septum Completed by TD	8/11/16	8/11/16	3/29/17	3/29/17	New baseline dates
85	DR1.08	Delivery Ring Installation	7/18/14	9/29/16	7/18/14	12/16/16	
317	DR1.08.01	Tunnel Installation	7/18/14	9/29/16	7/18/14	12/16/16	
325	DR1.08.01.01	General Installation	10/1/15	9/29/16	10/1/15	12/16/16	
298	DR1.08.01.01.02	General Installation Implementation	10/29/15	9/29/16	10/29/15	12/16/16	
303	DR1.08.01.01.02.09	General Installation Procure Misc Parts	3/22/16	9/29/16	6/7/16	12/16/16	New baseline dates
315	DR1.08.01.01.02.11	General Installation Re-establish LCW flow - CUB to DR	3/29/16	4/25/16	9/26/16	10/21/16	New baseline dates
316	DR1.08.01.01.02.12	General Installation Oversight	3/22/16	9/29/16	6/7/16	12/16/16	New baseline dates
304	DR1.08.01.01.02.13	General Installation Assemble magnet stands	3/22/16	5/16/16	6/7/16	8/2/16	New baseline dates
305	DR1.08.01.01.02.14	General Installation Stake out stands	5/17/16	5/23/16	8/3/16	8/9/16	New baseline dates
306	DR1.08.01.01.02.16	General Installation Install stands	5/24/16	5/31/16	8/10/16	8/16/16	New baseline dates
307	DR1.08.01.01.02.17	General Installation Install magnets	7/21/16	8/10/16	9/9/16	9/29/16	New baseline dates
308	DR1.08.01.01.02.18	General Installation Install beam pipe & vacuum equipment	8/11/16	8/24/16	9/30/16	10/13/16	New baseline dates
311	DR1.08.01.01.02.19	General Installation Install Klinox	8/11/16	8/11/16	9/30/16	9/30/16	New baseline dates
309	DR1.08.01.01.02.20	General Installation Align magnets	8/11/16	8/24/16	9/30/16	10/13/16	New baseline dates
310	DR1.08.01.01.02.21	General Installation Leak check	8/25/16	9/29/16	10/14/16	11/17/16	New baseline dates
312	DR1.08.01.01.02.22	General Installation Make water connections	8/25/16	8/31/16	10/24/16	10/28/16	New baseline dates
584	DR1.08.01.01.02.23	Constrain vertical movements on blind	4/4/16	5/20/16	4/4/16	5/20/16	
585	DR1.08.01.01.02.23.01	Procure hardware for motion constraint	4/4/16	4/15/16	4/4/16	4/15/16	New activity
586	DR1.08.01.01.02.23.02	Install vertical motion constraints	4/18/16	5/20/16	4/18/16	5/20/16	New activity
318	DR1.08.01.02	Abort Installation	7/18/14	6/8/16	7/18/14	6/8/16	
326	DR1.08.01.02.02	Abort Installation Implementation	7/18/14	6/8/16	7/18/14	6/8/16	
330	DR1.08.01.02.02.08	Abort Installation Purchase Abort Fencing	3/21/16	4/1/16	3/18/16	3/31/16	New baseline dates
333	DR1.08.01.02.02.11	Abort Installation Install fencing	4/4/16	5/5/16	4/1/16	5/4/16	New baseline dates
338	DR1.08.02	Cable Installation	10/1/15	9/1/16	10/1/15	11/14/16	
342	DR1.08.02.02	Cable Installation Implementation	10/29/15	9/1/16	10/29/15	11/14/16	
347	DR1.08.02.02.05	Cable Installation Install cables	4/11/16	7/5/16	6/22/16	9/15/16	New baseline dates
348	DR1.08.02.02.06	Cable Installation Terminate cables	7/6/16	8/30/16	9/16/16	11/10/16	New baseline dates

### Delivery Ring CR014 Schedule Changes

UID	WBS	Name	Original Base St	Original Base Fin	New Base St	New Base Fin	Comments
349	DR1.08.02.02.07	Cable Installation Make final connections	7/8/16	9/1/16	9/20/16	11/14/16	New baseline dates
397	DR1.08.03	Delivery Ring Installation Complete	9/29/16	9/29/16	11/17/16	11/17/16	New baseline dates

## Delivery Ring CR014 Material Changes

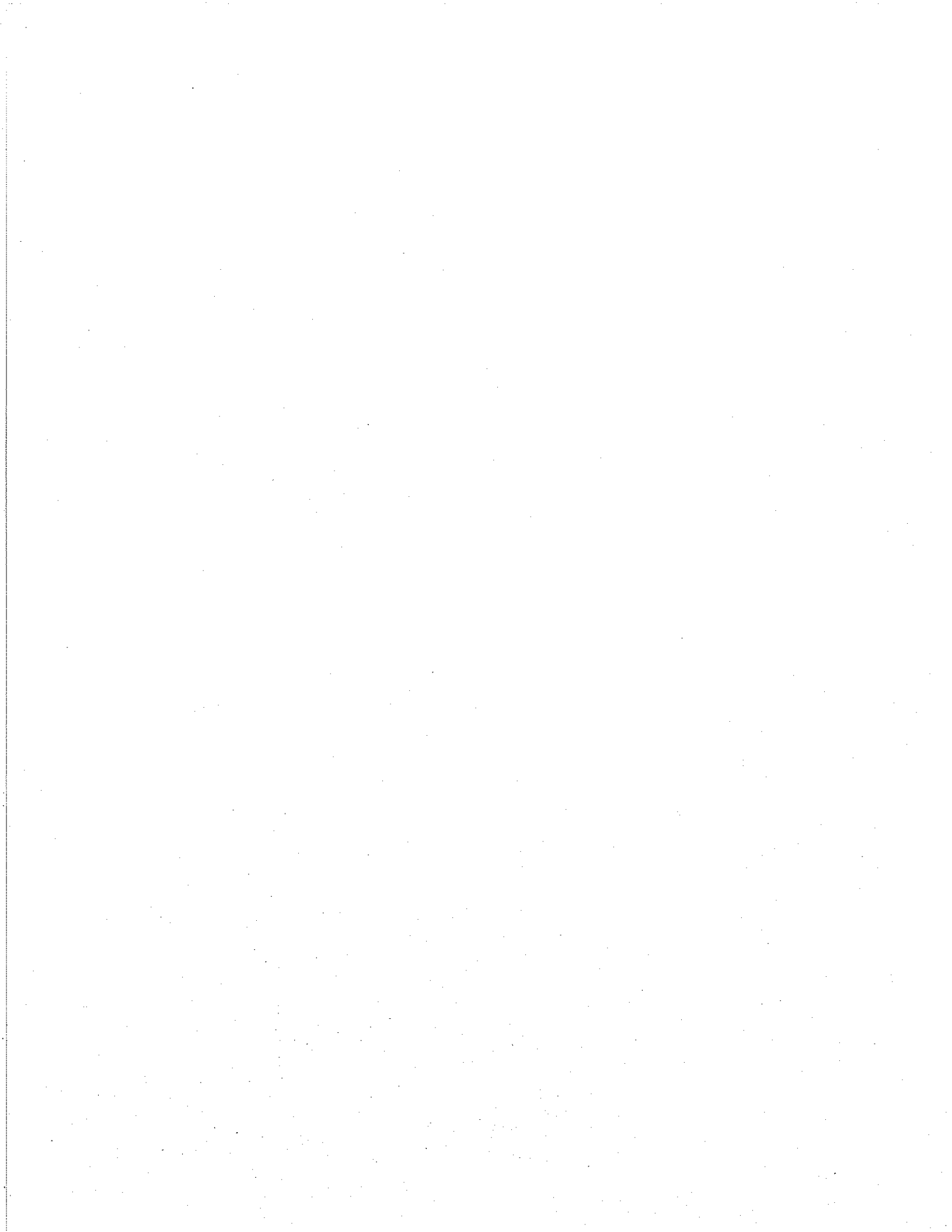
UID	WBS	Name	Start	Finish	Original M&S	New M&S	Delta	Comments
1	DR1	Delivery Ring AIP	10/28/13	3/29/17	\$3,141,980	\$3,359,130	\$217,150	
35	DR1.03	Delivery Ring Electrical Infrastructure	1/7/14	1/20/17	\$304,673	\$518,673	\$214,000	
576	DR1.03.03	Power Distribution Upgrade	4/4/16	1/20/17	\$0	\$214,000	\$214,000	
581	DR1.03.03.03	Receive new Transformer	6/21/16	1/20/17	\$0	\$110,000	\$110,000	New activity
578	DR1.03.03.06	Receive new 4-way sectionalizing switch	6/21/16	8/18/16	\$0	\$20,000	\$20,000	New activity
577	DR1.03.03.07	Install 4-way sectionalizing switch	9/6/16	10/3/16	\$0	\$84,000	\$84,000	
85	DR1.08	Delivery Ring Installation	7/18/14	12/16/16	\$362,000	\$365,150	\$3,150	
317	DR1.08.01	Tunnel Installation	7/18/14	12/16/16	\$289,730	\$292,880	\$3,150	
325	DR1.08.01.01	General Installation	9/21/15	12/16/16	\$207,310	\$210,460	\$3,150	
298	DR1.08.01.01.02	General Installation Implementations	2/1/16	12/16/16	\$207,310	\$210,460	\$3,150	
584	DR1.08.01.01.02.23	Constrain vertical movements on blind	4/4/16	5/20/16	\$0	\$3,150	\$3,150	
585	DR1.08.01.01.02.23.01	Procure hardware for motion constraint	4/4/16	4/15/16	\$0	\$3,150	\$3,150	New activity





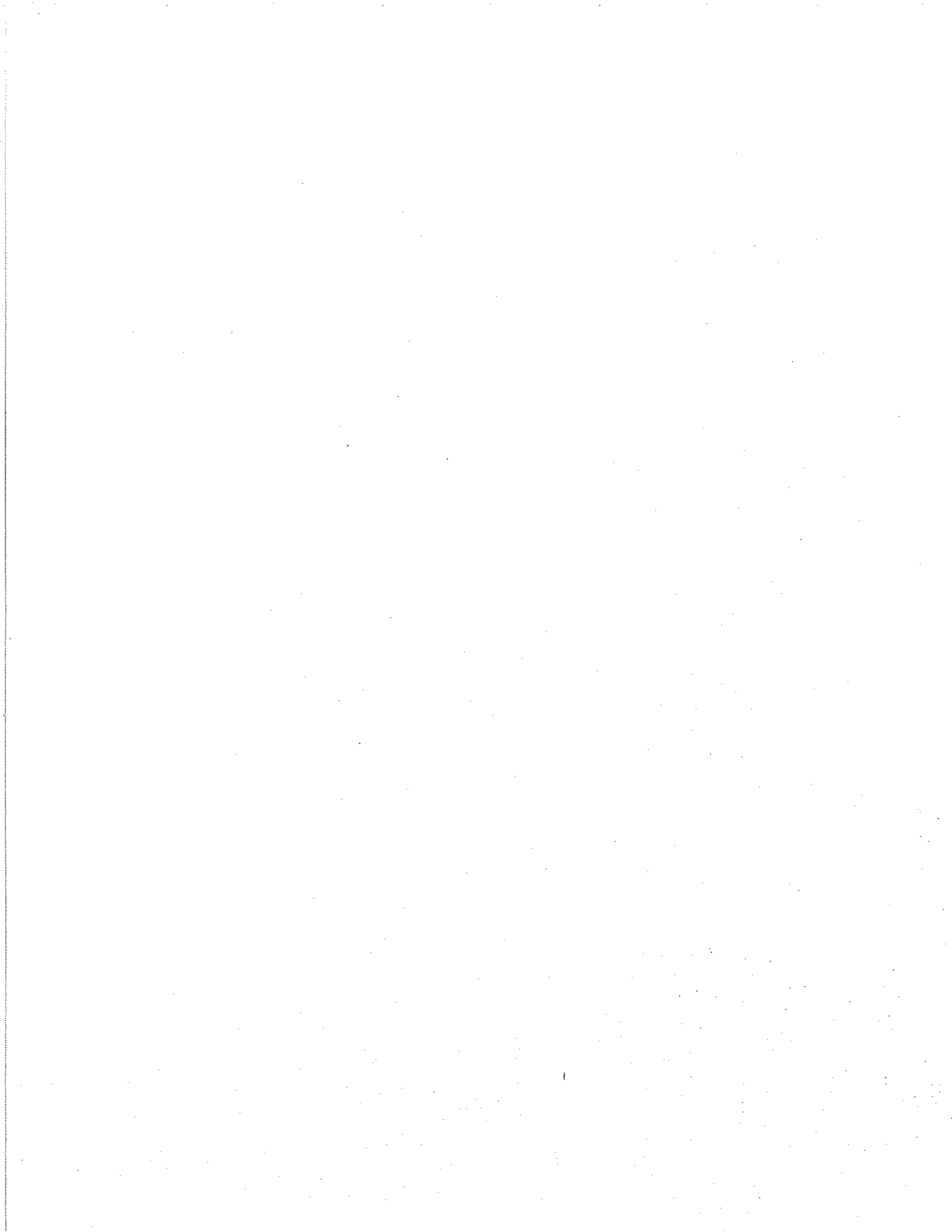
## Delivery Ring CR014 Labor Changes

UID	WBS	Name	Old Hours	New Hours	Delta Hours	Comments
1	DR1	Delivery Ring AIP	34307	34589	282	
35	DR1.03	Delivery Ring Electrical Infrastructure	814	862	48	
576	DR1.03.03	Power Distribution Upgrade	0	48	48	
583	DR1.03.03.01	Prepare requisition for Air Cooled transformer for AP-30	0	8	8	New activity
		FNAD_ELEC_DESIGN_EN	0	8	8	
580	DR1.03.03.04	Prepare requisition for 4-way sectionalizing switch for AP-30	0	8	8	New activity
		FNAD_ELEC_DESIGN_EN	0	8	8	
577	DR1.03.03.07	Install 4-way sectionalizing switch	0	32	32	New activity
		FNAD_ELEC_TASK_MNGR	0	16	16	
		FNFE_FACILITIES_MGMT	0	16	16	
85	DR1.08	Delivery Ring Installation	4562	4796	234	
317	DR1.08.01	Tunnel Installation	3894	4128	234	
325	DR1.08.01.01	General Installation	2876	3110	234	
298	DR1.08.01.01.02	General Installation Implementations	1830	2064	234	
584	DR1.08.01.01.02.23	Constrain vertical movements on blind	0	234	234	
585	DR1.08.01.01.02.23.01	Procure hardware for motion constraint	0	16	16	New activity
		FNAD_MECH_DESIGN_EN	0	16	16	
586	DR1.08.01.01.02.23.02	Install vertical motion constraints	0	218	218	New activity
		FNAD_MECH_SYSTM_TECH	0	105	105	
		FNTD_WELDER	0	105	105	
		FNAD_ENGNRING_PHYST	0	8	8	



## Delivery Ring Pre CR014 CAP

CTC		FY12	FY13	FY14	FY15	FY16	FY17	Cumulative
DR1.01.02.02	Delivery Ring Project Management Oversight - FY14	Scheduled	0.00	0.00	202,519.42	0.00	0.00	202,519.42
DR1.01.02.03	Delivery Ring Project Management Oversight - FY15	Scheduled	0.00	0.00	5,745.92	172,223.05	0.00	177,968.96
DR1.01.02.04	Delivery Ring Project Management Oversight - FY16	Scheduled	0.00	0.00	0.00	5,306.01	194,104.53	199,410.53
DR1.02	Collider Equipment Removal & Configuration	Scheduled	0.00	0.00	284,664.11	55,662.49	0.00	340,326.60
DR1.03	Delivery Ring Electrical Infrastructure	Scheduled	0.00	0.00	184,257.84	231,245.75	80,618.31	496,121.90
DR1.04	Delivery Ring Controls	Scheduled	0.00	0.00	337,819.33	57,692.73	2,231.79	397,743.85
DR1.05	Delivery Ring Instrumentation	Scheduled	0.00	0.00	0.00	0.00	277,431.59	277,431.59
DR1.06.01.01	Septa Supplies	Scheduled	0.00	0.00	8,821.22	685,282.98	357,171.37	1,051,275.57
DR1.06.01.02	Inj Kicker Power Supply	Scheduled	0.00	0.00	230,517.90	535,764.96	435,132.72	1,201,415.58
DR1.06.01.03	Abort Kicker Power Supply	Scheduled	0.00	0.00	83,910.98	507,491.84	711,627.79	1,303,030.61
DR1.06.02	New DC Supplies	Scheduled	0.00	0.00	0.00	0.00	384,903.25	384,903.25
DR1.07.01	Delivery Ring Repurposed Magnets	Scheduled	0.00	0.00	0.00	0.00	15,690.01	15,690.01
DR1.07.02	Delivery Ring Inj C Magnet	Scheduled	0.00	0.00	8,322.95	7,741.38	252,725.88	268,790.21
DR1.07.03	Delivery Ring Inj Kicker Magnet Refurbishment	Scheduled	0.00	0.00	1,497.74	0.00	85,156.03	86,653.77
DR1.07.04	Delivery Ring Magnetic Septa Magnets (1 spare)	Scheduled	0.00	0.00	0.00	0.00	394,401.44	394,401.44
DR1.08.01	Tunnel Installation	Scheduled	0.00	0.00	40,477.84	145,057.51	614,894.31	800,429.66
DR1.08.02	Cable Installation	Scheduled	0.00	0.00	0.00	0.00	176,098.55	176,098.55
	Grand Total	Scheduled	0.00	0.00	1,388,555.25	2,403,468.70	3,982,187.57	7,774,211.52



## Delivery Ring Post CR014 CAP

CTC	FY13	FY14	FY15	FY16	FY17	Cumulative	
DR1.01.02.02 Delivery Ring Project Management Oversight - FY14	Scheduled	0.00	202,519.42	0.00	0.00	0.00	202,519.42
DR1.01.02.03 Delivery Ring Project Management Oversight - FY15	Scheduled	0.00	5,745.92	172,223.05	0.00	0.00	177,968.96
DR1.01.02.04 Delivery Ring Project Management Oversight - FY16	Scheduled	0.00	0.00	5,306.01	194,104.53	0.00	199,410.53
DR1.02 Collider Equipment Removal & Configuration	Scheduled	0.00	284,664.11	55,662.49	0.00	0.00	340,326.60
DR1.03 Delivery Ring Electrical Infrastructure	Scheduled	0.00	184,257.84	231,245.75	281,514.16	83,765.74	780,783.49
DR1.04 Delivery Ring Controls	Scheduled	0.00	337,819.33	57,692.73	2,231.79	0.00	397,743.85
DR1.05 Delivery Ring Instrumentation	Scheduled	0.00	0.00	0.00	258,199.67	19,845.37	278,045.03
DR1.06.01.01 Septa Supplies	Scheduled	0.00	8,821.22	685,282.98	323,305.54	34,949.54	1,052,359.27
DR1.06.01.02 Inj Kicker Power Supply	Scheduled	0.00	230,517.90	535,764.96	419,309.65	16,242.65	1,201,835.17
DR1.06.01.03 Abort Kicker Power Supply	Scheduled	0.00	83,910.98	507,491.84	693,673.06	18,348.73	1,303,424.61
DR1.06.02 New DC Supplies	Scheduled	0.00	0.00	0.00	384,903.25	0.00	384,903.25
DR1.07.01 Delivery Ring Repurposed Magnets	Scheduled	0.00	0.00	0.00	15,690.01	0.00	15,690.01
DR1.07.02 Delivery Ring Inj C Magnet	Scheduled	0.00	8,322.95	7,741.38	252,725.88	0.00	268,790.21
DR1.07.03 Delivery Ring Inj Kicker Magnet Refurbishment	Scheduled	0.00	1,497.74	0.00	85,156.03	0.00	86,653.77
DR1.07.04 Delivery Ring Magnetic Septa Magnets (1 spare)	Scheduled	0.00	0.00	0.00	1,704.31	399,765.42	401,469.73
DR1.08.01 Tunnel Installation	Scheduled	0.00	40,477.84	145,057.51	543,621.97	106,598.18	835,755.50
DR1.08.02 Cable Installation	Scheduled	0.00	0.00	0.00	168,803.16	7,484.47	176,287.63
Grand Total	Scheduled	0.00	1,388,555.25	2,403,468.70	3,624,943.01	687,000.10	8,103,967.06

