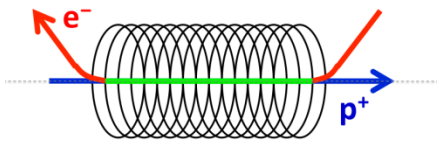
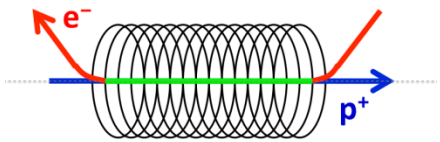


Electron Lens Superconducting Solenoid Status

Michael Anerella

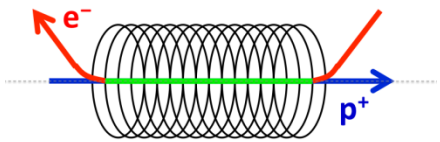
February 15, 2011

Outline

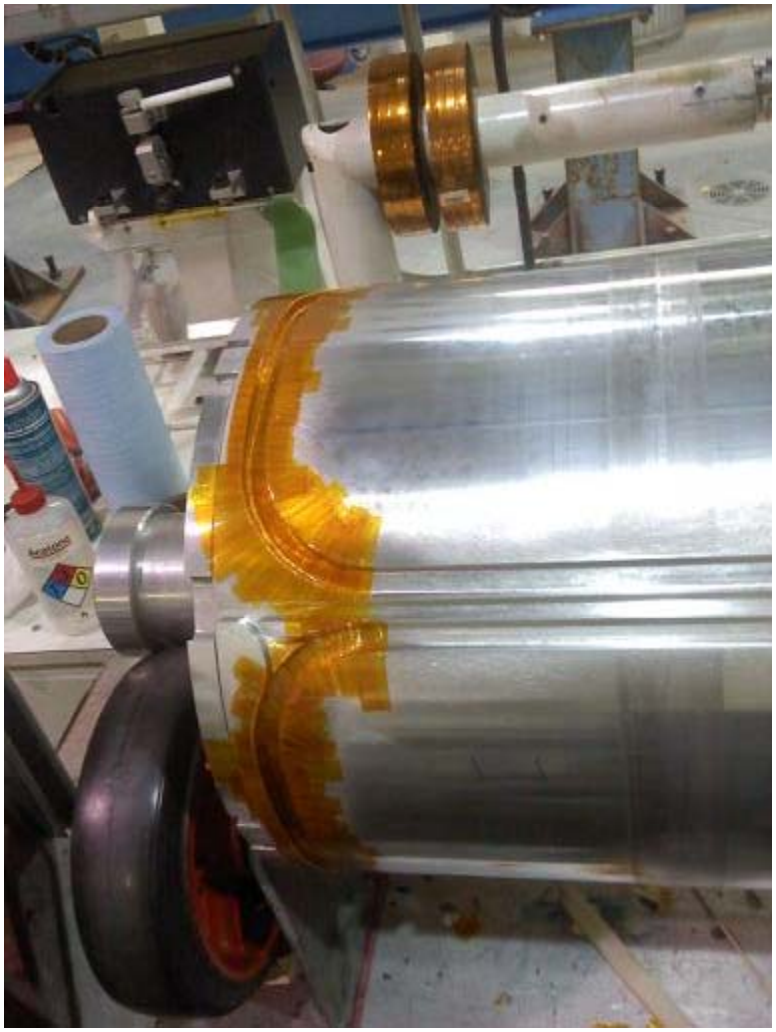


- Corrector coils
- Main solenoid coils
- Anti-Fringe field, Fringe Field coils
- Schedule

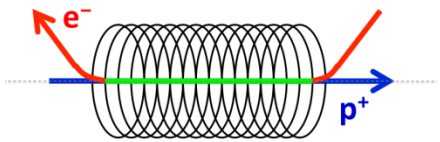
Corrector coils



- aluminum tube machining:
  - Sent back to CS for re-machining of lead slots, 1st complete
  - Winding table complete
- Coil insulation started
- Coil winding travelers released
- Assembly Drawings, parts, in progress
- creased Kapton, Nomex parts are being made
- OVEN! (AM/MA)

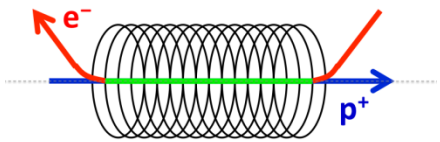


Main Solenoid Coils



- Gantry tested, ready to use
- Main support tube received and inspected
- CS Machining in process, completion ~ 2/23
- Insulated Superconductor shipped to BNL (partial qty)
- Assembly drawing, parts drawings – underway (LR)
- Parts work order released to CS

AFF, FF Solenoid coils



- AFF conductor is "drop-offs" from main solenoid so delivery is the same
- AFF support hub
  - Machining of 2 hubs and flanges finished (FT)
  - Insulation of hubs is underway (TVW)
- Assembly drawing completed
- Winding machine upgrade
  - installation compete (RC)
  - Payout motor/clutch/etc. need installation (AM/RC)
  - Still need software completion (PJ)
- FF work to follow AFF

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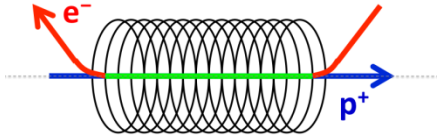
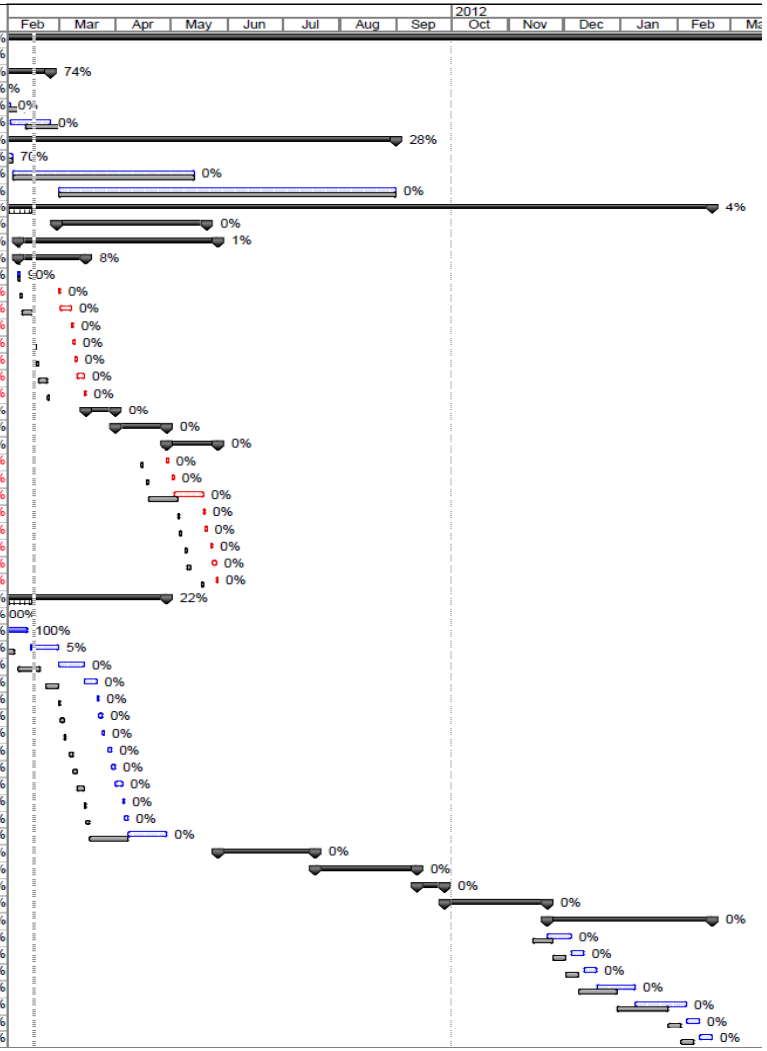
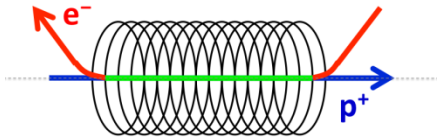
Latest schedule p.1



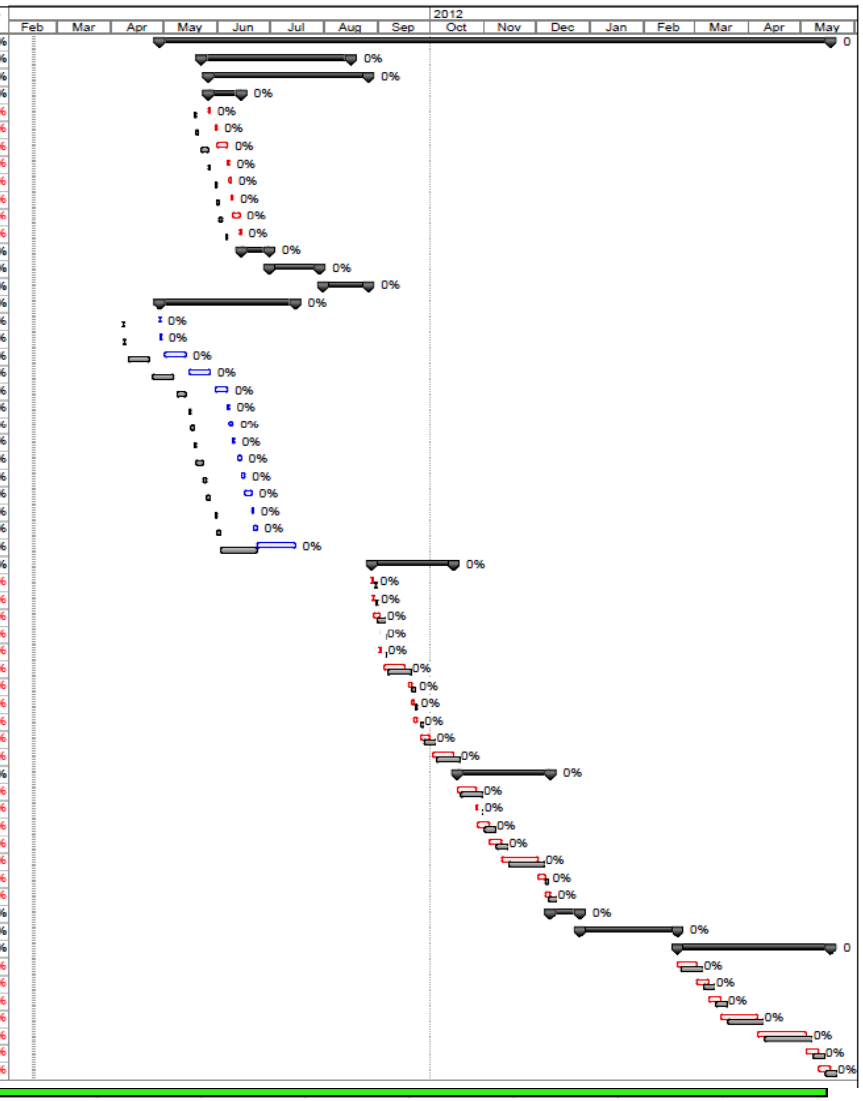
ID		Task Name	Duration	Baseline Start	Baseline Finish	Actual Start	Actual Finish	% Complete
1		**electron lens solenoid**	**542.5 days**	**4/5/10**	**5/22/12**	**4/5/10**	**NA**	**23%**
2	✓	Preliminary Design	80 days	4/5/10	7/27/10	4/5/10	7/27/10	100%
3		**Final Design**	**143.75 days**	**7/28/10**	**3/4/11**	**7/28/10**	**NA**	**74%**
4		Coils	118.75 days	7/28/10	1/27/11	7/28/10	NA	90%
5		Cold Masses	10 days	1/28/11	2/10/11	NA	NA	0%
6		Magnets	15 days	2/11/11	3/4/11	NA	NA	0%
7		**Fabrication / Procurement**	**276 days**	**7/28/10**	**8/31/11**	**7/28/10**	**NA**	**28%**
8		Coils	130 days	7/28/10	2/3/11	7/28/10	NA	70%
9		Cold Masses	70 days	2/4/11	5/13/11	NA	NA	0%
10		Magnets	130 days	3/1/11	8/31/11	NA	NA	0%
11		**Magnet #1**	**277.5 days**	**1/21/11**	**2/10/12**	**1/24/11**	**NA**	**4%**
12		**Solenoid Coil Assembly**	**60 days**	**2/7/11**	**5/2/11**	**2/28/11**	**NA**	**0%**
42		**Fringe Field Solenoid Coils**	**78 days**	**2/7/11**	**5/18/11**	**2/7/11**	**NA**	**1%**
43		**AFF Coil #1**	**26 days**	**2/7/11**	**2/23/11**	**2/7/11**	**NA**	**8%**
44		insulate hub	1 day	2/7/11	2/7/11	2/7/11	NA	90%
45		splice, insulate start lead / ins	1 day	2/8/11	2/8/11	3/1/11	NA	0%
46		wind 24 layers	4 days	2/9/11	2/14/11	NA	NA	0%
47		splice, insulate exiting lead	1 day	2/15/11	2/15/11	NA	NA	0%
48		cure	1 day	2/16/11	2/16/11	NA	NA	0%
49		overwrap / cure	1 day	2/17/11	2/17/11	NA	NA	0%
50		machine OD	2 days	2/18/11	2/22/11	NA	NA	0%
51		electrical tests	1 day	2/23/11	2/23/11	NA	NA	0%
52		**AFF Coil #2**	**12 days**	**2/24/11**	**3/11/11**	**NA**	**NA**	**0%**
61		**FF Coil #1**	**20 days**	**3/14/11**	**4/14/11**	**NA**	**NA**	**0%**
70		**FF Coil #2**	**20 days**	**4/15/11**	**5/18/11**	**NA**	**NA**	**0%**
71		insulate hub	1 day	4/15/11	4/15/11	NA	NA	0%
72		splice, insulate start lead / ins	1 day	4/18/11	4/18/11	NA	NA	0%
73		wind 70 layers	12 days	4/19/11	5/4/11	NA	NA	0%
74		splice, insulate exiting lead	1 day	5/5/11	5/5/11	NA	NA	0%
75		cure	1 day	5/6/11	5/6/11	NA	NA	0%
76		overwrap / cure	1 day	5/9/11	5/9/11	NA	NA	0%
77		machine OD	2 days	5/10/11	5/11/11	NA	NA	0%
78		electrical tests	1 day	5/18/11	5/18/11	NA	NA	0%
79		**Block Corrector Coils**	**68 days**	**1/21/11**	**4/7/11**	**1/24/11**	**NA**	**22%**
80	✓	deburr / clean tube	0.5 days	1/21/11	1/21/11	1/24/11	1/24/11	100%
81	✓	return to CS for rework	14 days	NA	NA	1/25/11	2/11/11	100%
82		insulate 0.5m/2.5m grooves (20 bl	10 days	1/24/11	2/4/11	2/14/11	NA	5%
83		wind 4 layer 0.5m coil blocks (20)	10 days	2/7/11	2/18/11	NA	NA	0%
84		stabilize / insulate 40 leads	5 days	2/22/11	2/28/11	NA	NA	0%
85		electrical tests	1 day	3/1/11	3/1/11	NA	NA	0%
86		wind 1 layer 2.5m coil blocks (4)	2 days	3/2/11	3/3/11	NA	NA	0%
87		stabilize / insulate 8 leads	1 day	3/4/11	3/4/11	NA	NA	0%
88		electrical tests	2 days	3/7/11	3/8/11	NA	NA	0%
89		kevlar wrap / cure	2 days	3/9/11	3/10/11	NA	NA	0%
90		strip / wrap / prep for cure	2 days	3/11/11	3/14/11	NA	NA	0%
91		final cure	1 day	3/15/11	3/15/11	NA	NA	0%
92		electrical tests	2 days	3/16/11	3/17/11	NA	NA	0%
93		magnetic measurements	15 days	3/18/11	4/7/11	NA	NA	0%
94		**Yoke Assembly**	**35 days**	**5/19/11**	**7/8/11**	**NA**	**NA**	**0%**
106		**Vertical Cold Test**	**39.5 days**	**7/11/11**	**9/2/11**	**NA**	**NA**	**0%**
114		**Cold Mass Assembly**	**11 days**	**9/2/11**	**9/19/11**	**NA**	**NA**	**0%**
119		**Magnet Assembly**	**40 days**	**9/19/11**	**11/14/11**	**NA**	**NA**	**0%**
137		**Final Magnet Test**	**64 days**	**11/14/11**	**2/10/12**	**NA**	**NA**	**0%**
138		power supply, helium connections	9 days	11/14/11	11/25/11	NA	NA	0%
139		300K elect test & integ. field msmt	5 days	11/25/11	12/2/11	NA	NA	0%
140		cooldown	5 days	12/2/11	12/9/11	NA	NA	0%
141		4.5K elect, heater, quench, DC loc	15 days	12/9/11	12/30/11	NA	NA	0%
142		magnetic measurements	20 days	12/30/11	1/27/12	NA	NA	0%
143		warmup	5 days	1/27/12	2/3/12	NA	NA	0%
144		disconnect electrical, plumbing	5 days	2/3/12	2/10/12	NA	NA	0%



Latest schedule p.2



ID	Task Name	Duration	Baseline Start	Baseline Finish	Actual Start	Actual Finish	% Complete
145	**Magnet #2**	**273.5 days**	**4/8/11**	**5/22/12**	**NA**	**NA**	**0%**
146	**Solenoid Coil Assembly**	**60 days**	**5/3/11**	**7/27/11**	**NA**	**NA**	**0%**
176	**Fringe Field Solenoid Coils**	**64 days**	**5/19/11**	**8/30/11**	**NA**	**NA**	**0%**
177	**AFF Coil #1**	**12 days**	**5/19/11**	**6/6/11**	**NA**	**NA**	**0%**
178	insulate hub	1 day	5/19/11	5/19/11	NA	NA	0%
179	splice, insulate start lead / ins	1 day	5/20/11	5/20/11	NA	NA	0%
180	wind 24 layers	4 days	5/23/11	5/26/11	NA	NA	0%
181	splice, insulate exiting lead	1 day	5/27/11	5/27/11	NA	NA	0%
182	cure	1 day	5/31/11	5/31/11	NA	NA	0%
183	overwrap / cure	1 day	6/1/11	6/1/11	NA	NA	0%
184	machine OD	2 days	6/2/11	6/3/11	NA	NA	0%
185	electrical tests	1 day	6/6/11	6/6/11	NA	NA	0%
186	**AFF Coil #2**	**12 days**	**6/7/11**	**6/22/11**	**NA**	**NA**	**0%**
195	**FF Coil #1**	**20 days**	**6/23/11**	**7/27/11**	**NA**	**NA**	**0%**
204	**FF Coil #2**	**20 days**	**7/28/11**	**8/30/11**	**NA**	**NA**	**0%**
213	**Block Corrector Coils**	**54 days**	**4/8/11**	**6/23/11**	**NA**	**NA**	**0%**
214	deburr / clean tube	0.5 days	4/8/11	4/8/11	NA	NA	0%
215	form pushers	0.5 days	4/8/11	4/8/11	NA	NA	0%
216	insulate 0.5m/2.5m grooves (20 bl	10 days	4/11/11	4/22/11	NA	NA	0%
217	wind 4 layer 0.5m coil blocks (20)	10 days	4/25/11	5/6/11	NA	NA	0%
218	stabilize / insulate 40 leads	5 days	5/9/11	5/13/11	NA	NA	0%
219	electrical tests	1 day	5/16/11	5/16/11	NA	NA	0%
220	wind 1 layer 2.5m coil blocks (4)	2 days	5/17/11	5/18/11	NA	NA	0%
221	stabilize / insulate 8 leads	1 day	5/19/11	5/19/11	NA	NA	0%
222	electrical tests	2 days	5/20/11	5/23/11	NA	NA	0%
223	kevlar wrap / cure	2 days	5/24/11	5/25/11	NA	NA	0%
224	strip / wrap / prep for cure	2 days	5/26/11	5/27/11	NA	NA	0%
225	final cure	1 day	5/31/11	5/31/11	NA	NA	0%
226	electrical tests	2 days	6/1/11	6/2/11	NA	NA	0%
227	magnetic measurements	15 days	6/3/11	6/23/11	NA	NA	0%
228	**Yoke Assembly**	**35 days**	**8/31/11**	**10/18/11**	**NA**	**NA**	**0%**
229	install AFF coils onto support tube	0.5 days	8/31/11	8/31/11	NA	NA	0%
230	install corrector coil assembly	0.5 days	8/31/11	8/31/11	NA	NA	0%
231	install yoke, outer support shell	3.5 days	9/1/11	9/6/11	NA	NA	0%
232	install NLE bus	0.25 days	9/6/11	9/6/11	NA	NA	0%
233	install wiring boards (2)	0.25 days	9/6/11	9/6/11	NA	NA	0%
234	wire main solenoid leads (22), vt's	10 days	9/7/11	9/20/11	NA	NA	0%
235	wire AFF leads (4), vt's (3)	2 days	9/21/11	9/22/11	NA	NA	0%
236	install FF coils	1 day	9/23/11	9/23/11	NA	NA	0%
237	wire FF leads (4), vt's (3)	2 days	9/26/11	9/27/11	NA	NA	0%
238	electrical tests	5 days	9/28/11	10/4/11	NA	NA	0%
239	magnetic / polarity tests	10 days	10/5/11	10/18/11	NA	NA	0%
240	**Vertical Cold Test**	**39.5 days**	**10/19/11**	**12/13/11**	**NA**	**NA**	**0%**
241	wiring stand instl and test	9 days	10/19/11	10/31/11	NA	NA	0%
242	install in dewar	0.5 days	11/1/11	11/1/11	NA	NA	0%
243	300K elect test & integ. field msmt	5 days	11/1/11	11/8/11	NA	NA	0%
244	cool down to 4.5K	5 days	11/8/11	11/15/11	NA	NA	0%
245	4.5K elect, heater, quench, DC loc	15 days	11/15/11	12/6/11	NA	NA	0%
246	warmup	2 days	12/6/11	12/8/11	NA	NA	0%
247	remove from dewar, test fixture	3 days	12/8/11	12/13/11	NA	NA	0%
248	**Cold Mass Assembly**	**11 days**	**12/13/11**	**12/28/11**	**NA**	**NA**	**0%**
253	**Magnet Assembly**	**40 days**	**12/28/11**	**2/22/12**	**NA**	**NA**	**0%**
271	**Final Magnet Test**	**64 days**	**2/22/12**	**5/22/12**	**NA**	**NA**	**0%**
272	power supply, helium connections	9 days	2/22/12	3/6/12	NA	NA	0%
273	300K elect test & integ. field msmt	5 days	3/6/12	3/13/12	NA	NA	0%
274	cooldown	5 days	3/13/12	3/20/12	NA	NA	0%
275	4.5K elect, heater, quench, DC loc	15 days	3/20/12	4/10/12	NA	NA	0%
276	magnetic measurements	20 days	4/10/12	5/8/12	NA	NA	0%
277	warmup	5 days	5/8/12	5/15/12	NA	NA	0%
278	disconnect electrical, plumbing	5 days	5/15/12	5/22/12	NA	NA	0%



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