

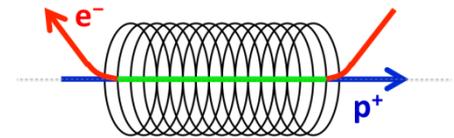
## Electron Lens Superconducting Solenoid Status



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February 14, 2012

# E-Lens Magnet, Tooling



## Magnet

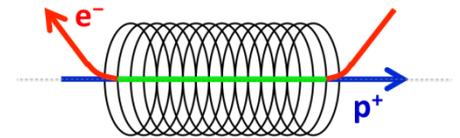
- Cold mass, cryostat drawing work continues (SP/PK/SS)
- Yoke NLE Restraint Cylinder - 1 more rework for leads (RC/SP)
- Part orders being prioritized, released; bellows, cryo valve, heat shield, etc. (SRP)

## Tooling

- Testing Top Hat assembly complete (RM/SD/DC/WM etc.)
- Cryostatting, pressure test fixture Mods in CS (PK) - supporting schedule
- Magnetic Needle Tooling - COMPLETE



# Main Solenoid Coils

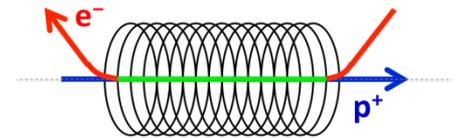


## 2<sup>nd</sup> main solenoid

- CS machining complete
- Stainless steel support machining complete

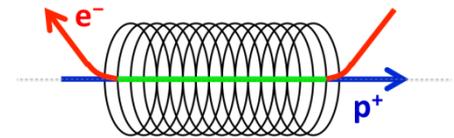


# AFF, FF Solenoid coils



- FF coil #1 - FF coil #4
  - Mods complete to ID to fit to main support tube
- AFF #3 Final electrical tests complete (DI)
- AFF #4 overwrap & cure, Final electrical tests complete (DI)

# eLens - Cold Test Assembly



## Magnet #1:

- Main solenoid, corrector coils installed in yoke
- final coil shimming needed (RC/FT/AM)
- **Wiring COMPLETE, testing underway (RM)**
- **Installation into stainless steel vessel next, then FF coil installation, then hanging on tophat**



LE

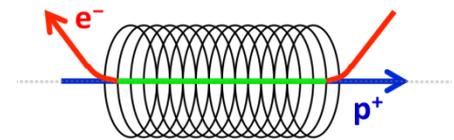
## Magnet #2:

- Wiring board assembly complete
  - Diode assembly to start ~ now
- (need copper?)**



NLE

# schedule p.1

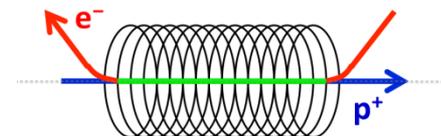


ID	Task Name	Duration	Baseline Start	Baseline Finish	Actual Start	Actual Finish	% Complete	Predecess	2013											
									Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1	<b>electron lens solenoid</b>	<b>672 days</b>	<b>4/5/10</b>	<b>5/22/12</b>	4/8/10	NA	68%													59%
2	Preliminary Design	80 days	4/5/10	7/27/10	4/5/10	7/27/10	100%													
3	<b>Final Design</b>	<b>143.75 days</b>	<b>7/28/10</b>	<b>3/4/11</b>	7/28/10	NA	74%	2												
7	<b>Fabrication / Procurement</b>	<b>276 days</b>	<b>7/28/10</b>	<b>8/31/11</b>	7/28/10	NA	28%	2												
11	<b>Magnet #1</b>	<b>431.5 days</b>	<b>1/21/11</b>	<b>2/10/12</b>	1/24/11	NA	71%													71%
12	<b>Solenoid Coil Assembly</b>	<b>142 days</b>	<b>2/7/11</b>	<b>5/2/11</b>	2/7/11	NA	88%	7, 88 + 131												
49	<b>Fringe Field Solenoid Coils</b>	<b>199 days</b>	<b>2/7/11</b>	<b>5/18/11</b>	2/7/11	NA	88%													
50	<b>AFF Coil #1</b>	<b>12 days</b>	<b>2/7/11</b>	<b>2/23/11</b>	2/7/11	2/23/11	100%													
58	<b>AFF Coil #2</b>	<b>138 days</b>	<b>2/24/11</b>	<b>3/11/11</b>	2/24/11	3/11/11	100%													
68	<b>FF Coil #1</b>	<b>129 days</b>	<b>3/14/11</b>	<b>4/14/11</b>	3/14/11	4/14/11	100%													
79	<b>FF Coil #2</b>	<b>179 days</b>	<b>4/15/11</b>	<b>5/18/11</b>	4/15/11	5/18/11	100%													
90	<b>Block Corrector Coils</b>	<b>152 days</b>	<b>1/21/11</b>	<b>4/7/11</b>	1/24/11	NA	88%	7, 88 + 120												
107	<b>Yoke Assembly</b>	<b>93 days</b>	<b>5/19/11</b>	<b>7/8/11</b>	5/19/11	NA	88%	12, 80												
108	install AFF coils onto support tube	0.5 days	5/19/11	5/19/11	5/19/11	5/19/11	100%	67												
109	wait for CS parts	39 days	NA	NA	10/14/11	12/13/11	100%	108												
110	prepare main solenoid leads	3 days	NA	NA	12/13/11	12/16/11	100%	109												
111	assemble main solenoid and corrector	1 day	5/19/11	5/19/11	12/16/11	12/19/11	100%	110												
112	install coils into yoke	1 day	5/20/11	5/25/11	12/19/11	12/20/11	100%	111												
113	corrector polarity checks	1 day	NA	NA	1/3/12	1/3/12	100%	112												
114	install wiring board	9 days	5/25/11	5/25/11	1/4/12	1/17/12	100%	113												
115	wire main solenoid leads (22), vt's (150), d	17 days	5/26/11	6/9/11	1/19/12	2/10/12	100%	114												
116	wire AFF leads (4), vt's (12)	2 days	6/10/11	6/13/11	2/13/12	2/14/12	100%	115												
117	test, install NLE bus	1 day	NA	NA	NA	NA	0%	116												
118	install yoke into helium vessel	2 days	NA	NA	NA	NA	0%	117												
119	install FF coils	1 day	6/14/11	6/14/11	NA	NA	0%	118												
120	wire FF leads (4), vt's (12)	2 days	6/15/11	6/16/11	NA	NA	0%	119												
121	electrical tests	3 days	6/17/11	6/23/11	NA	NA	0%	120												
122	final magnetic / polarity tests	3 days	6/24/11	7/8/11	NA	NA	0%	121												
123	<b>Vertical Cold Test</b>	<b>39.5 days</b>	<b>7/11/11</b>	<b>9/2/11</b>	NA	NA	0%	12, 107												
124	wiring stand instl and test	9 days	7/11/11	7/21/11	NA	NA	0%													
125	install in dewar	0.5 days	7/22/11	7/22/11	NA	NA	0%	124												
126	300K elect test & integ. field msmt	5 days	7/22/11	7/29/11	NA	NA	0%	125												
127	cool down to 4.5K	5 days	7/29/11	8/5/11	NA	NA	0%	126												
128	4.5K elect, heater, quench, DC loop	15 days	8/5/11	8/26/11	NA	NA	0%	127												
129	warmup	2 days	8/26/11	8/30/11	NA	NA	0%	128												
130	remove from dewar, test fixture	3 days	8/30/11	9/2/11	NA	NA	0%	129												
131	<b>Cold Mass Assembly</b>	<b>11 days</b>	<b>9/2/11</b>	<b>9/19/11</b>	NA	NA	0%	7, 123												
136	<b>Magnet Assembly</b>	<b>40 days</b>	<b>9/19/11</b>	<b>11/14/11</b>	NA	NA	0%	131												
154	<b>Final Magnet Test</b>	<b>64 days</b>	<b>11/14/11</b>	<b>2/10/12</b>	NA	NA	0%	138												

#1 cold Test  
3/5-4/27

#1 Assembly  
complete  
7/12/12

# schedule p.2



ID	Task Name	Duration	Baseline Start	Baseline Finish	Actual Start	Actual Finish	% Complete	Predecessors	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
162	Magnet #2	546 days	4/8/11	5/22/12	10/1/10	NA	64%									
163	Solenoid Coil Assembly	108 days	5/3/11	7/27/11	8/16/11	NA	81%									
201	Fringe Field Solenoid Coils	112 days	5/19/11	8/30/11	8/2/11	NA	88%									
240	Block Corrector Coils	274 days	4/8/11	6/23/11	10/1/10	NA	88%									
255	Yoke Assembly	36.25 days	8/31/11	10/18/11	NA	NA	0% (240, 168)									
257	install AFF coils onto support tube	0.5 days	8/31/11	8/31/11	NA	NA	0%									
258	prepare main solenoid leads	3 days	9/1/11	9/6/11	NA	NA	0% (257)									
259	assemble main solenoid and corrector	0.5 days	9/6/11	9/6/11	NA	NA	0% (258)									
260	install coils into yoke	1 day	9/6/11	9/6/11	NA	NA	0% (259)									
261	install NLE bus	0.25 days	9/7/11	9/20/11	NA	NA	0% (260)									
262	install wiring board	1 day	9/21/11	9/22/11	NA	NA	0% (261)									
263	wire main solenoid leads (22), vt's (150), di	15 days	9/23/11	9/23/11	NA	NA	0% (262)									
264	wire AFF leads (4), vt's (12)	2 days	9/26/11	9/27/11	NA	NA	0% (263)									
265	install yoke into helium vessel	2 days	NA	NA	NA	NA	0% (264)									
266	install FF coils	1 day	9/28/11	10/4/11	NA	NA	0% (265)									
267	wire FF leads (4), vt's (12)	2 days	10/5/11	10/18/11	NA	NA	0% (266)									
268	electrical tests	5 days	NA	NA	NA	NA	0% (267)									
269	magnetic / polarity tests	3 days	NA	NA	NA	NA	0% (268)									
270	Vertical Cold Test	39.5 days	10/19/11	12/13/11	NA	NA	0% (266, 128)									
271	wiring stand instl and test	9 days	10/19/11	10/31/11	NA	NA	0%									
272	install in dewar	0.5 days	11/1/11	11/1/11	NA	NA	0% (271)									
273	300 K elect test & integ. field msmt	5 days	11/1/11	11/8/11	NA	NA	0% (272)									
274	cool down to 4.5K	5 days	11/8/11	11/15/11	NA	NA	0% (273)									
275	4.5K elect, heater, quench, DC loop warmup	15 days	11/15/11	12/6/11	NA	NA	0% (274)									
276	remove from dewar, test fixture	2 days	12/6/11	12/8/11	NA	NA	0% (275)									
277		3 days	12/8/11	12/13/11	NA	NA	0% (276)									
278	Cold Mass Assembly	11 days	12/13/11	12/28/11	NA	NA	0% (270)									
279	install / weld end volumes	4 days	12/13/11	12/19/11	NA	NA	0%									
280	install / weld port closures	3 days	12/19/11	12/22/11	NA	NA	0% (279)									
281	pressure / leak check	3 days	12/22/11	12/27/11	NA	NA	0% (280)									
282	cut test port closures	1 day	12/27/11	12/28/11	NA	NA	0% (281)									
283	Magnet Assembly	40 days	12/28/11	2/22/12	NA	NA	0% (278)									
284	install CM insulating blankets	2 days	12/28/11	12/30/11	NA	NA	0%									
285	install outer heat shield	3 days	12/30/11	1/4/12	NA	NA	0% (284)									
286	install magnet insulating blankets	2 days	1/4/12	1/6/12	NA	NA	0% (285)									
287	install LE vacuum vessel sleeve, tower, He	2 days	1/6/12	1/10/12	NA	NA	0% (286)									
288	connect gas cooled leads (6)	3 days	1/10/12	1/13/12	NA	NA	0% (287)									
289	connect copper corrector leads (24)	3 days	1/13/12	1/18/12	NA	NA	0% (288)									
290	connect instrumentation wires	4 days	1/18/12	1/24/12	NA	NA	0% (289)									
291	electrical tests	2 days	1/24/12	1/26/12	NA	NA	0% (290)									
292	install cold mass into vacuum vessel	2 days	1/26/12	1/30/12	NA	NA	0% (291)									
293	install posts	1 day	1/30/12	1/31/12	NA	NA	0% (292)									
294	install inner heat shield	1 day	1/31/12	2/1/12	NA	NA	0% (293)									
295	install inner vacuum vessel	1 day	2/1/12	2/2/12	NA	NA	0% (294)									
296	install vacuum vessel end plates	2 days	2/2/12	2/6/12	NA	NA	0% (295)									
297	install cryo valve, helium lines	5 days	2/6/12	2/13/12	NA	NA	0% (296)									
298	connect NLE instrumentation wires	2 days	2/13/12	2/15/12	NA	NA	0% (297)									
299	electrical tests	2 days	2/15/12	2/17/12	NA	NA	0% (298)									
300	vacuum leak check testing	3 days	2/17/12	2/22/12	NA	NA	0% (299)									
301	Final Magnet Test	64 days	2/22/12	5/22/12	NA	NA	0% (288)									

Cold test is on critical path (4/27-6/22)

#2 Projected Assembly complete 9/5/12