)	0	Task Mode	Task Name	Duration	Start
1		-5	SBS Installation Schedule	264 days	Tue 9/8
2		-5	Milestones	263 days	Tue 9/8
3		-5	Post Beam Checklist - Installation Begins	0 days	Tue 9/8
4		-5	Turn Off LCW Supply to Hall (need to be coordinated with other halls)	0 days	Mon 9/21
5		-5	Turn Main LCW System Back On (coordinate with C. Jones)	0 days	Fri 10/2
6		-5	Facilities Power Upgrade Work Can Begin (inside the Hall)	0 days	Mon 11/23
7		- 5	RHRS Decommissioning Complete	0 days	Tue 2/16
8		- 5	Prepare Initial Set of Equipment Racks for Transporting to Hall (not involved in testing)	0 days	Fri 3/12
9		-5	Begin Connecting Electronics in Upstream Bunker (Collaboration)	0 days	Fri 4/9
10		- 5	Remaining Big Bite Equipment Ready to Transport to Hall	0 days	Tue 5/25
11		-5	Remaining SBS Equipment Ready to Transport to Hall	0 days	Fri 6/4
12		-5)	Connect Electronics in Big Bite Equipment Racks (Collaboration)	0 days	Mon 6/21
13		-5	Begin Connecting HCAL Electronics - Detector End (collaboration)	0 days	Fri 8/13
14		-5	Begin Connecting GeN-RP Electronic - Detector End	0 days	Fri 8/13
15		-5)	Complete Pre-Beam Checklist - Installation Complete	0 days	Thu 9/30
16		-5	Preliminaries	9 days	Tue 9/8
17		-5	Post Beam Checklist - Installation Begins	0 days	Tue 9/8
18		- 5	RADCON Survey / Hold Around Pivot	9 days	Tue 9/8
19		-5	FML Work List (maintained by FML)	117 days	Tue 9/8
20		-5	LCW Pressure Sensor	5 days	Mon 9/21
21		-5	Various Water Leak Repairs	40 days	Mon 9/28
22		-5	Hall A 2MVA Power Upgrade	20 days	Mon 11/23
23		-5	Electrical Retrofits Due to Detector Rotation	9 days	Tue 1/5

		ask Iode	Task Name	Duration	Start
24	-5	-	Relocate ODH Monitor / Alarm System	9 days	Tue 1/19
25	-	-	HVAC Retrofits Due to Detector Rotation	10 days	Mon 2/1
26	-	-	Hall A HVAC Replacement	14 days	Tue 2/16
27	-	-	LCW Heat Exchanger [scheduling postponed]	4 days	Tue 9/8
28	-	-	Lighting Replacement [scheduling postponed]	4 days	Tue 9/8
29	-	-	Replace Obsolete XL100 Honeywell Controller [scheduling postponed]	4 days	Tue 9/8
30	-	-	Fire Safety System: Smoke Removal Fans Replacement [scheduling postponed]	4 days	Tue 9/8
31	-5	-	Beam Dump Cooling Study [scheduling postponed]	4 days	Tue 9/8
32	-	-	Beam Dump Cooling Capacity Increase [scheduling postponed]	4 days	Tue 9/8
33	-5	-	Nitrogen Vaporizer for Dehumidification System [scheduling postponed]	4 days	Tue 9/8
34	-5	-	Fire Safety System: End Station Fire Detection and Suppression [scheduling postponed]	4 days	Tue 9/8
35	-	-	LCW Pressure Regulation (Hall B) [scheduling postponed]	4 days	Tue 9/8
36	-	-	LCW Upgrade (has separate detailed drawings & procedure)	34 days	Tue 9/8
37	-5	-	Shut Off LCW Entering the Hall and Drain System	4 days	Tue 9/8
38	-5	-	Remove downstream (4") section of pipe that connects to arms	5 days	Mon 9/14
39	!!! -	-	Turn Off LCW Supply to Hall (need to be coordinated with other halls)	0 days	Mon 9/21
40	-5	-	Drain System and relieve pressure Upstream of Main (8") Valves	1 day	Mon 9/21
41	-ē	-	Contact FML To Remove Pressure/Flow Sensors	1 day	Tue 9/22
42	-5	-	Remove 8" Valves	1 day	Wed 9/23
43	-5	-	Cut Off 90 Degree Elbows on 8" Lines	2 days	Thu 9/24
44	-5	-	Install New Flanges on 8" Pipes	2 days	Mon 9/28
45	-5	-	Install New 8" Valves	1 day	Wed 9/30
46	-	-	Install 8" to 4" Manifolds	2 days	Thu 10/1

)	0	Task Mode	Task Name	Duration	Start
47		-5	Turn Main LCW System Back On (coordinate with C. Jones)	0 days	Fri 10/2
48		-5	Reconnect 4" LCW Lines Going to Pivot	2 days	Mon 10/5
49		-5	Position New LCW Structure and Manifold	1 day	Wed 10/7
50		-5	Weld in 4" Line Going Down to New Manifold	2 days	Thu 10/8
51		-5	Connect New Manifold to LCW System	1 day	Mon 10/12
52		-5	Disconnect & Cap Water Lines Over the Pivot Going to RHRS	3 days	Tue 10/13
53		-5	Pressurize LCW System and Check For Leaks	1 day	Fri 10/16
54		-5	Complete Pressure Test of New Section of LCW for Engineering Checkout	3 days	Mon 10/19
55		-5	Document and Signoff on In-Service LCW System.	2 days	Thu 10/22
56		-5	Target Group Work (Target Group has details)	19 days	Tue 9/8
57		-5	Warm Up Target (PREX/CREX) [anticipated]	2 days	Tue 9/8
58		-5	Bleed Up and Open Target Chamber (PREX/CREX) [anticipated]	2 days	Mon 9/21
59		-5	Complete as Found Surveys on Target and HRS (PREX/CREX) [anticipated]	3 days	Wed 9/23
60		-5	Remove Target (PREX/CREX) [anticipated]	5 days	Mon 9/28
61		-5	Install Target (SBS) [scheduling postponed]	1 day	Tue 9/8
62		-5	Complete Startup Surveys [scheduling postponed]	1 day	Tue 9/8
63		-5	Close and Pump Down Chamber (SBS) [scheduling postponed]	1 day	Tue 9/8
64		-5	Cool Down Target (SBS) [scheduling postponed]	1 day	Tue 9/8
65		-5	Decommission RHRS & Positioning LHRS	177 days	Tue 9/8
66		-5	Bleed Up Vacuum Systems	1 day	Tue 9/8
67		-5	Bleed Up Entrance Beam Line (downstream of raster)	1 day	Tue 9/8
68		-5	Bleed Up Exit Beam Line	1 day	Tue 9/8
69		-5	Bleed Up Both Spectrometers	1 day	Tue 9/8

)	0	Task Mode	Task Name	Duration	Start
70		-5)	Remove PREX/CREX Equipment	35 days	Mon 10/5
71		-5)	Remove Pivot Fence	1 day	Mon 10/5
72		-5	Remove Ion Chamber Near Pivot (request through SSG)	1 day	Tue 10/6
73		- 5	Disconnect Chamber From Entrance Beam Line	1 day	Wed 10/7
74		-5)	Remove Turbo Pump and Valve From Chamber	2 days	Thu 10/8
75		-5	Remove Poly-Blocks Between Chamber and Collimator	2 days	Mon 10/12
76		-5)	Remove Bellows and Valve Between Collimator and Chamber	2 days	Wed 10/14
77		-5	Disconnect Exit Beam Line and Spectrometers' Feed-Thrus	1 day	Fri 10/16
78		-5)	Disconnect Septum Wiring	3 days	Mon 10/26
79		-5	Move Septum Magnet Upstream to Clear Spectrometer Nose (~4"-6")	2 days	Thu 10/29
80		-5)	Remove Left and Ride Side Work Platforms	1 day	Mon 11/2
81		-5	Roll PREX/CREX Equipment Out to Beam Left	1 day	Tue 11/3
82		-5	Remove Sky Shine Shielding and Support Structure	2 days	Wed 11/4
83		-5)	Remove Target Chamber and Base Plate	1 day	Fri 11/6
84		-5	Remove Top Half of Septum Magnet	2 days	Mon 11/9
85		->	Remove Collimator, Concrete Shielding, and Vacuum Feed-Thrus From Bore of Septum	1 day	Wed 11/11
86		-5)	Reinstall Top Half of Septum Magnet	2 days	Thu 11/12
87		->	Remove Septum Magnet From Pivot	1 day	Mon 11/16
88		-5)	Remove Septum Magnet Base Plate	1 day	Tue 11/17
89		-5	Remove Septum Magnet Carriage	1 day	Wed 11/18
90		-5	Remove Bridge From Pivot	2 days	Thu 11/19
91		-5	Facilities Power Upgrade Work Can Begin (inside the Hall)	0 days	Mon 11/23
92		-5)	Install Work Platform Around Distribution Can	8 days	Mon 11/23

)	0	Task Mode	Task Name	Duration	Start
93		-5	Remove Right Q1 Magnet	5 days	Mon 12/7
94		-5	Cryogenic Work (has a separate detailed procedure)	168 days	Mon 9/21
95		-5	Warm Up Cryogenic System	15 days	Mon 9/21
96		-5	Disconnect RHRS From Cryogenic System	20 days	Mon 10/12
97		-5	Clean Up Cryogenic System	10 days	Mon 11/9
98		- 5	Begin Cool Down of LHRS	0 days	Tue 6/1
99		<u>_</u>	Disconnect and Label Lines Going to RHRS (above pivot)	10 days	Mon 11/23
100		<u>-5</u>	Remove Detectors From RHRS	6 days	Wed 12/9
101		- 5	Remove SAMs (LUMIs) From Exit Beam Line and Cap Opening	1 day	Thu 12/17
102		-5	Remove Bridge That Connects the Two Spectrometers	1 day	Fri 12/18
103		<u>-5</u>	Clear Floor Space and Move RHRS to ~45 Degrees	20 days	Mon 11/23
104		<u>_</u>	Remove Big Box Power Supply From RHRS	13 days	Thu 12/17
105		<u>_</u>	Request Electrician to Disconnect Main Power to Big Box PS	4 days	Thu 12/17
106		<u>-</u> 5	Disconnect Water and Magnet's Leads	2 days	Tue 1/5
107		<u>_</u>	Move (Walter's) Platform Table into Position on Inside of RHRS	0.5 days	Thu 1/7
108		<u>_</u>	Remove Shielding and Handrails From RHRS Platform	0.5 days	Thu 1/7
109		<u>-</u> 5	Remove Big Box Power Supply From RHRS Platform	1 day	Fri 1/8
110		-5	Reinstall RHRS Platform Handrails	0.5 days	Mon 1/11
111		-5	Place Big Box PS into its Original Position (behind green wall)	0.5 days	Mon 1/11
112		<u>_</u>	Remove Platform Table From the Hall (ask Walter where to put)	1 day	Tue 1/12
113		<u>_</u> 5	Request Electrician to reconnect Main Power to Big Box PS	1 day	Wed 1/13
114		- 5	Connect Magnet Leads (Big Bite) and Water to Big Box PS	2 days	Thu 1/14
115		-5	Move RHRS Pass Roll Up Door	43 days	Tue 1/5

)	0	Task Mode	Task Name	Duration	Start
116		-5	Continue Clearing Floor Space Behind Green Wall Area	13 days	Tue 1/5
117		-5	Electrical Retrofits Due to Detector Rotation	9 days	Tue 1/5
118		-5	Relocate ODH Monitor / Alarm System	9 days	Tue 1/19
119		-5	Move Small AHU (see FML work list)	10 days	Mon 2/1
120		-5	Remove Interfering Electronic Equipment Racks Behind Green Wall	4 days	Tue 1/19
121		-5	Remove Post Underneath Pivot That Interferes With RHRS Movement	10 days	Mon 1/25
122		-5	Move and Park RHRS Pass Roll Up Door	1 day	Mon 2/15
123		-5	RHRS Decommissioning Complete	0 days	Mon 2/15
124		-5	Replace Main HVAC Unit	14 days	Tue 2/16
125		-5	L-HRS & Exit Beamline Work	50 days	Mon 3/8
126		-5	Prep / LHRS Work	25 days	Mon 3/8
127		-5	Clear Floor Space Needed to Move LHRS	5 days	Mon 3/8
128		-5	Prepare Initial Set of Equipment Racks for Transporting to Hall (not involved in testing)	0 days	Fri 3/12
129		-5	Rotate L-HRS Out to ~105 for Removing Exit Beamline	1 day	Mon 3/15
130		-5	Install Upstream Electronics Bunker and Racks	9 days	Tue 3/16
131		-5	Install SBS Power Supply in Upstream Bunker	5 days	Mon 3/29
132		-5	Install Power Outlets in Upstream Bunker	10 days	Mon 3/29
133		-5	Begin Connecting Electronics in Upstream Bunker (Collaboration)	0 days	Fri 4/9
134		-5	Remove Shielding Blocks Underneath Exit Beamline	2 days	Tue 3/16
135		-5	Exit Beamline Work	50 days	Mon 3/8
136		-5	Disconnect Turbo And Instrumentation For Exit Beamline	1 day	Mon 3/8
137		-5	Remove Beamline Between Chamber and Corragated (see drawings)	2 days	Tue 3/9
138		-5	Layout Mounting Holes for Exit Beamline Tower (S&A)	2 days	Thu 3/18

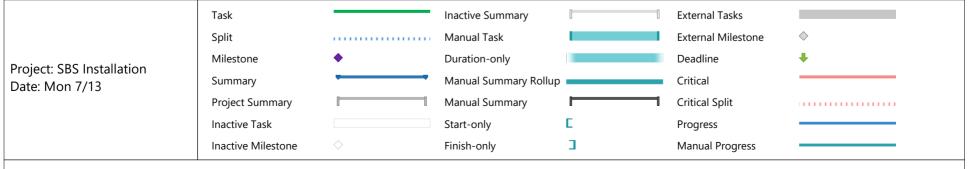
)	0	Task Mode	Task Name	Duration	Start
139		- 5	Install Exit Beamline Tower (see procedure for alignment requirements)	10 days	Mon 3/22
140		-5	Remove Old Support Infrastructure for Exit Beamline	10 days	Mon 3/22
141		-5	Install New flange for Connecting Shielded Beamline (see drawings)	2 days	Mon 4/5
142		-5	Install Turbo in New Position Along Exit Beamline (see drawings)	5 days	Mon 4/5
143		-5	Install Lower Section of Target Chamber	1 day	Mon 4/12
144		- 5	Install Isolation Valve Between Chamber and Exit Beamline	1 day	Tue 4/13
145		-5	Assemble Correctors and Shielded Beamline Subassembly	3 days	Wed 4/14
146		- 5	Install Correctors and Shielded Beamline Subassembly on Tower	1 day	Mon 4/19
147		- 5	Check Alignment of Correctors and Shielded Beamline	3 days	Tue 4/20
148		-5	Make Final Connections of Shielded Beamline: Chamber and Exit .	1 day	Fri 4/23
149		- 5	Install Temp Sensors on Correctors	4 days	Mon 4/26
150		-5	Install Upper Section of Target Chamber	1 day	Fri 4/30
151		-5	Pump Down and Leak Check Exit Beamline (ensure isolation valve is closed)	5 days	Mon 5/3
152		- 5	Complete (2A) Survey and Alignment of Correctors and Shielded Beamline	5 days	Mon 5/10
153		<u>-5</u>	Big Bite Equipment	23 days	Mon 5/10
154		- 5	Move Big Bite Tracks From Right to Left Side of Pivot (S&A new position)	5 days	Mon 5/10
155		<u>-5</u>	Install Big Bite Stand On Pivot (see procedure)	1 day	Mon 5/17
156		- 5	Survey Pivot Stand Height and Position During Motion	1 day	Tue 5/18
157		<u>-5</u>	Install Big Bite Craddle on Pivot Stand and Check Motion	1 day	Wed 5/19
158		<u>-5</u>	Install Big Bite Magnat on Pivot Stand	2 days	Thu 5/20
159		-5	Survey and Align Big Bite Magnet (2A)	1 day	Mon 5/24
160		<u>-</u> 5	Connect Power Leads To Big Bite Magnet	1 day	Tue 5/25
161		-	Connect Temp Sensors and Electronics	3 days	Wed 5/26

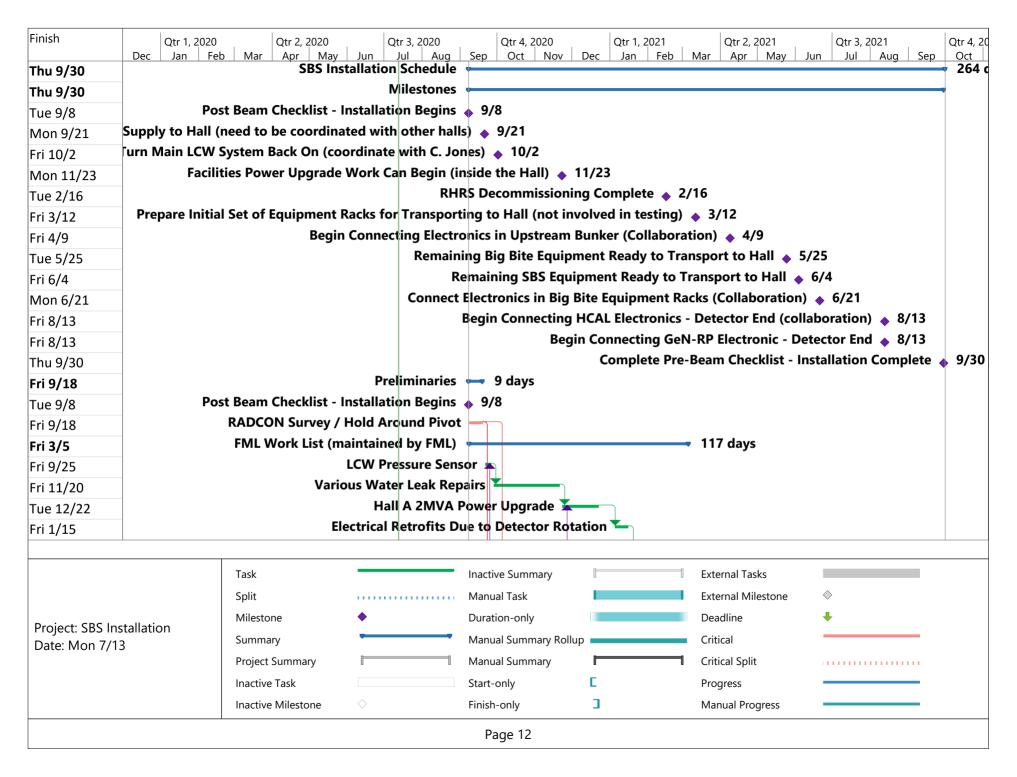
•	Task Mode	Task Name	Duration	Start
162	-5	Connect LCW	1 day	Tue 6/1
163	<u>_</u> 5	Install Guards	3 days	Wed 6/2
164	-5	Conduct Low Power Testing	1 day	Mon 6/7
165	-5	Install Sieve Plate	1 day	Tue 6/8
166	-5	Survey Sieve Plate	2 days	Wed 6/9
167	-5	Big Bite Detector Package	20 days	Mon 5/24
168	-5	Disconnect Big Bite Equipment Racks In TED (remaining)	2 days	Mon 5/24
169	-5	Remaining Big Bite Equipment Ready to Transport to Hall	0 days	Tue 5/25
170	-5	Transport Big Bite Equipment Racks To Hall	1 day	Wed 5/26
171	-5	Transport Big Bite Detectors To Hall	1 day	Thu 5/27
172	-5	Transport Big Bite Lockers and Supporting Equipment To Hall	1 day	Fri 5/28
173	-5	Install Extension on Big Bite Carriage	1 day	Fri 6/11
174	-5	Install Detector on Carriage	1 day	Mon 6/14
175	-5	Install Big Bite Electronics Shielding Hut	2 days	Tue 6/15
176	-5	Install Big Bite Equipment Racks	3 days	Thu 6/17
177	-5	Connect Electronics in Big Bite Equipment Racks (Collaboration)	0 days	Mon 6/21
178	-5	SBS Equipment	87 days	Tue 6/1
179	-5	Disassemble Counterweight Assembly In Test Lab	5 days	Tue 6/1
180	-	Disconnect Hydraulic Positioning System	1 day	Tue 6/1
181	-5	Disassemble Counterweight Steel and Weldment	1 day	Wed 6/2
182	-5	Lay Counterweight Steel Down Flat	1 day	Thu 6/3
183	-5	Disassemble Floor Plates	1 day	Fri 6/4
184	-5	Remaining SBS Equipment Ready to Transport to Hall	0 days	Fri 6/4

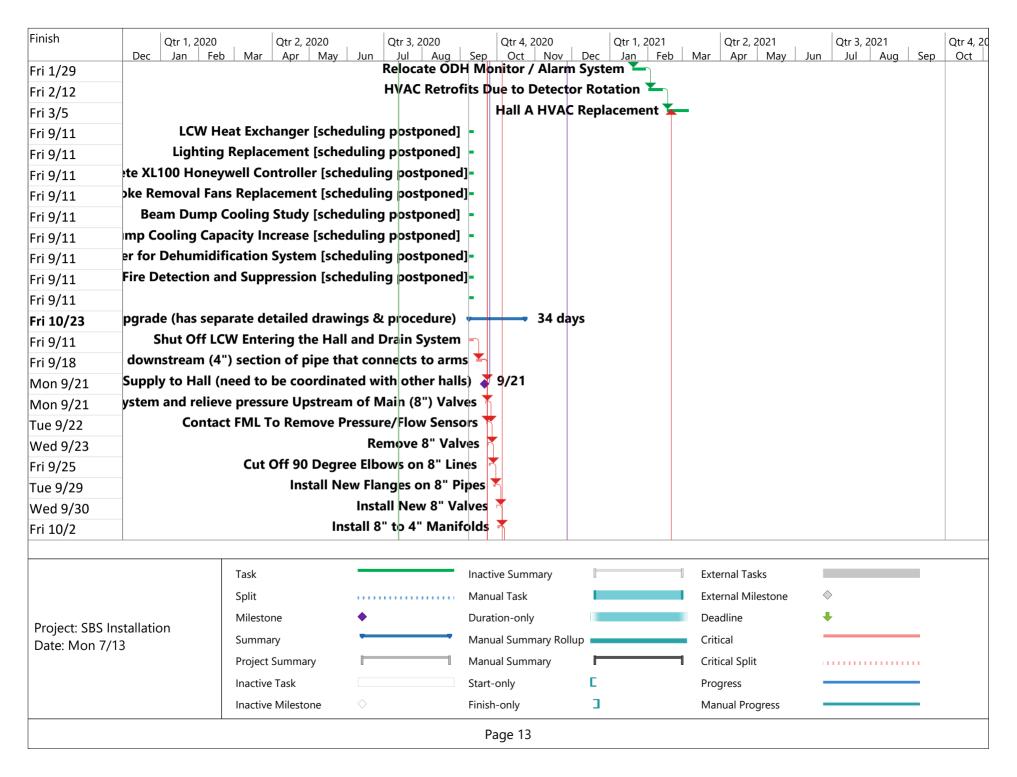
)	Task Mode	Task Name	Duration	Start
185	-5	Prep Equipment and Material For Transporting To Hall	1 day	Mon 6/7
186	-5	Transport 48D48 Magnet Steel and Counterweight To Hall A	9 days	Tue 6/8
187	5	Clear Floor Space In Test Lab Needed To Load Steel	1 day	Tue 6/8
188	5	Clear Floor Space For Delivering Steel In The Hall	1 day	Wed 6/9
189	4	Transport Magnet Steel and Counterweight Assembly To Hall	3 days	Thu 6/10
190	-	Transport Hydraulic Positioning System To Hall	2 days	Tue 6/15
191	4	Transport SBS Lockers and Remaining Equipment To Hall	2 days	Thu 6/17
192	-	Install 48D48 Magnet and Counterweight Assembly	48 days	Mon 6/21
193	-	Survey and Install SBS Floor Plates	5 days	Mon 6/21
194	-5	Install Counterweight Assembly on Floor Plates	2 days	Mon 6/28
195	-	Install Hillman Rollers	1 day	Wed 6/30
196	-5	Install Lifting Jacks and Springs	1 day	Thu 7/1
197	-5	Connect Hydraulic Hoses and Pumps	1 day	Fri 7/2
198	-5	Connect Hydraulic Electronics	2 days	Tue 7/6
199	-5	Check and Adjust Hydraulic Pumps and Controls	2 days	Thu 7/8
200	-5	Install Positioning Actuators	1 day	Mon 7/12
201	-	Connect Power and Test Acuators	2 days	Tue 7/13
202	-5	Adjust Actuators and Limit Switches	2 days	Thu 7/15
203	-	Assemble 48D48 Magnet On Weldment (see procedure)	3 days	Mon 7/19
204	4	Test SBS and Counterweight Motion and Controls	2 days	Thu 7/22
205	4	Install Field Clamps and Sieve Plates	1 day	Mon 7/26
206	5	Move SBS Into Starting Position	1 day	Tue 7/27
207	4	Survey and Align SBS (2A)	2 days	Wed 7/28

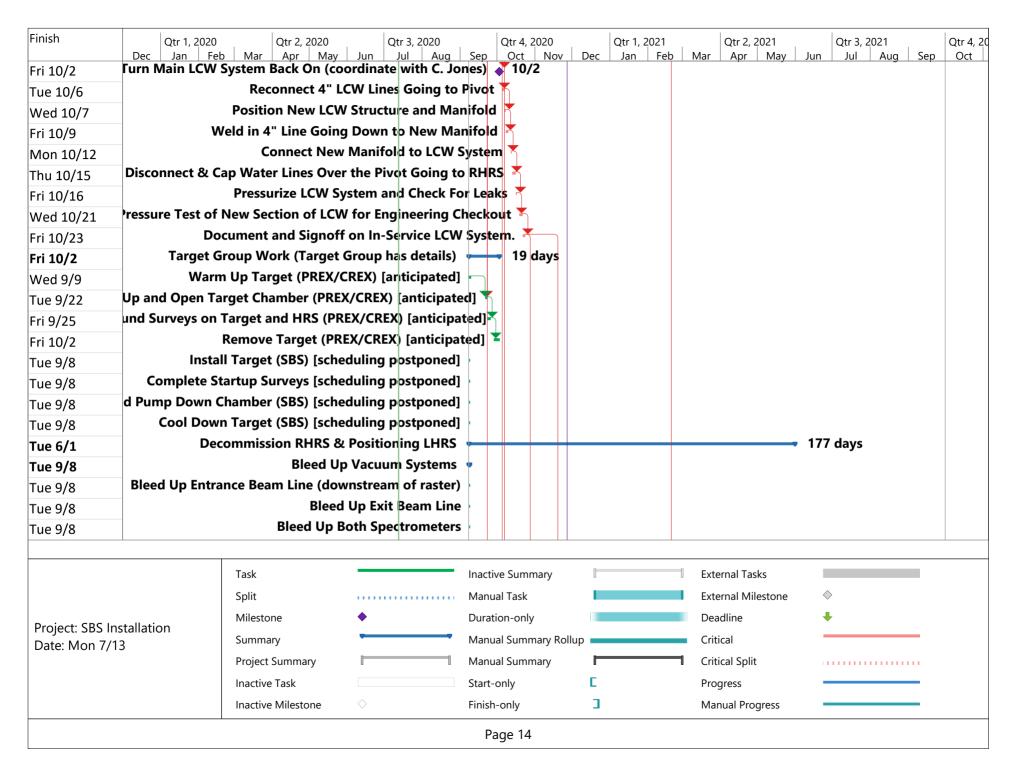
)	Task Mode	Task Name	Duration	Start
208	-5	Connect LCW to SBS	3 days	Fri 7/30
209	-5	Connect Power Leads To Magnet	2 days	Wed 8/4
210	-5	Connect Temp Sensors and Electronics	3 days	Fri 8/6
211	-5	Install Guards	7 days	Wed 8/11
212	-5	Conduct Low Power Testing	1 day	Fri 8/20
213	-5	Interface FSD Interlocks	1 day	Mon 8/23
214	-5	Final Survey and Alignment of SBS (2B)	3 days	Tue 8/24
215	-5	Transport and Install GeN-RP Detector	48 days	Tue 7/27
216	-5	Transport Detector Parts to Hall	2 days	Tue 7/27
217	-5	Assemble Detector Parts Inside Hall	7 days	Thu 7/29
218	-5	Install Detector on SBS Magnet	5 days	Mon 8/9
219	-5	Begin Connecting GeN-RP Electronic - Detector End	0 days	Fri 8/13
220	-5	Connect GeN-RP Electronics and Testing	34 days	Mon 8/16
221	-5	Transport and Install HCAL	48 days	Tue 7/27
222	-5	Layout HCAL Floor Plates	1 day	Tue 7/27
223	-5	Disassemble HCAL Electronics In Test Lab	1 day	Wed 7/28
224	-5	Disassemble HCAL Sub-Assemblies In Test Lab	1 day	Thu 7/29
225	-5	Transport Electronic Rack To Hall	2 days	Fri 7/30
226	-5	Transport Sub-Assemblies To Hall	2 days	Tue 8/3
227	-5	Install HCAL Frame/Support Structure	1 day	Thu 8/5
228	-5	Install HCAL Modules on Support Structure	1 day	Fri 8/6
229	-5	Install Lead Wall	1 day	Mon 8/9
230	-5	Install Work Access Platform	1 day	Tue 8/10

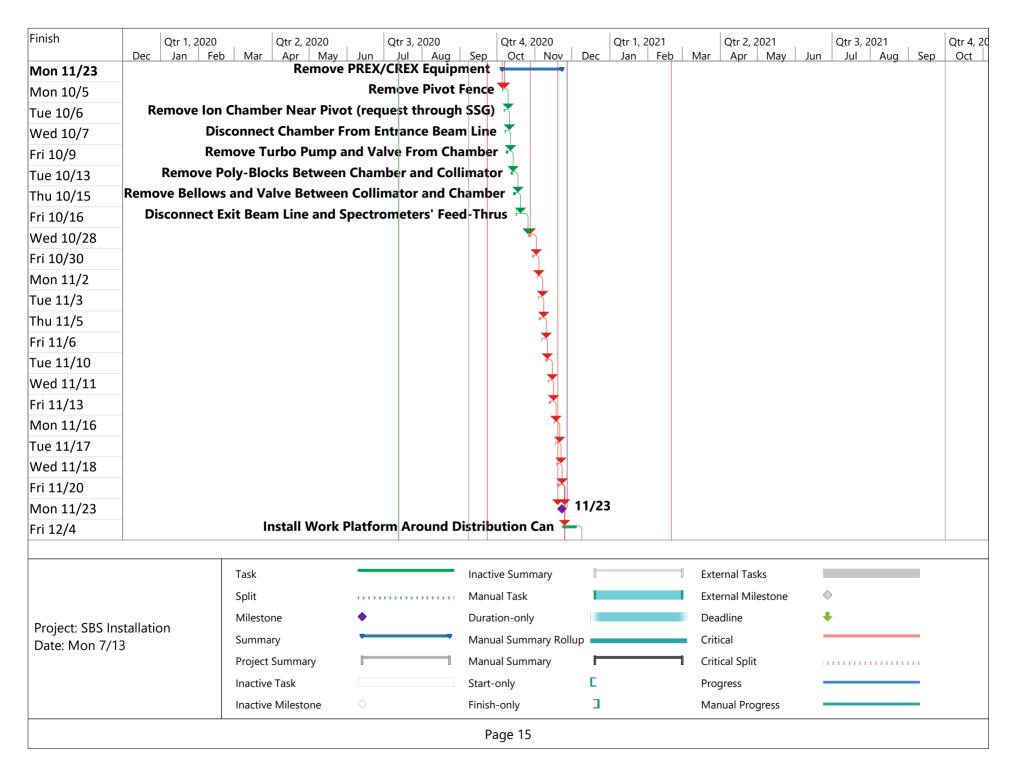
)	0	Task Mode	Task Name	Duration	Start
231		-5	Install HCAL Equipment Racks Shielding Hut (local)	1 day	Wed 8/11
232		-5	Install HCAL Equipment Racks (local)	2 days	Thu 8/12
233		-5	Begin Connecting HCAL Electronics - Detector End (collaboration)	0 days	Fri 8/13
234		-5	Connect HCAL Electronics and Testing	34 days	Mon 8/16
235		-5	Final Preparations	87 days	Tue 6/1
236		-5	Cooldown L-HRS	29 days	Tue 6/1
237		-5	Check for Proper Function on All Temp. Sensor (BB, SBS, and Correctors)	10 days	Fri 8/27
238		-5	Make Sure Proper Ion Chamber are Installed	2 days	Fri 8/27
239		-5	Check FSD Interfaces	3 days	Tue 8/31
240		-5	Final Pumpdown and Leak Check Entrance Beamline	5 days	Fri 8/27
241		-5	Final Pumpdown and Leak Check Exit Beamline	5 days	Fri 9/3
242		-5	Final Pumpdown and Leak Check L-HRS	5 days	Fri 9/3
243		-5	Final Pumpdown and Leak Check of Target Chamber (Target Group)	3 days	Fri 9/10
244		-5	Final Survey and Align All SBS Equipment (2B)	5 days	Fri 9/10
245		-5	Dial In The Cryo System	5 days	Wed 9/15
246		-5	Test All Magnets and Power Supplies To Full Current	15 days	Fri 9/10
247		-5	Remove Excessive Equipment From Hall	10 days	Fri 9/17
248		-5	Complete Pre-Beam Checklist - Installation Complete	0 days	Thu 9/30

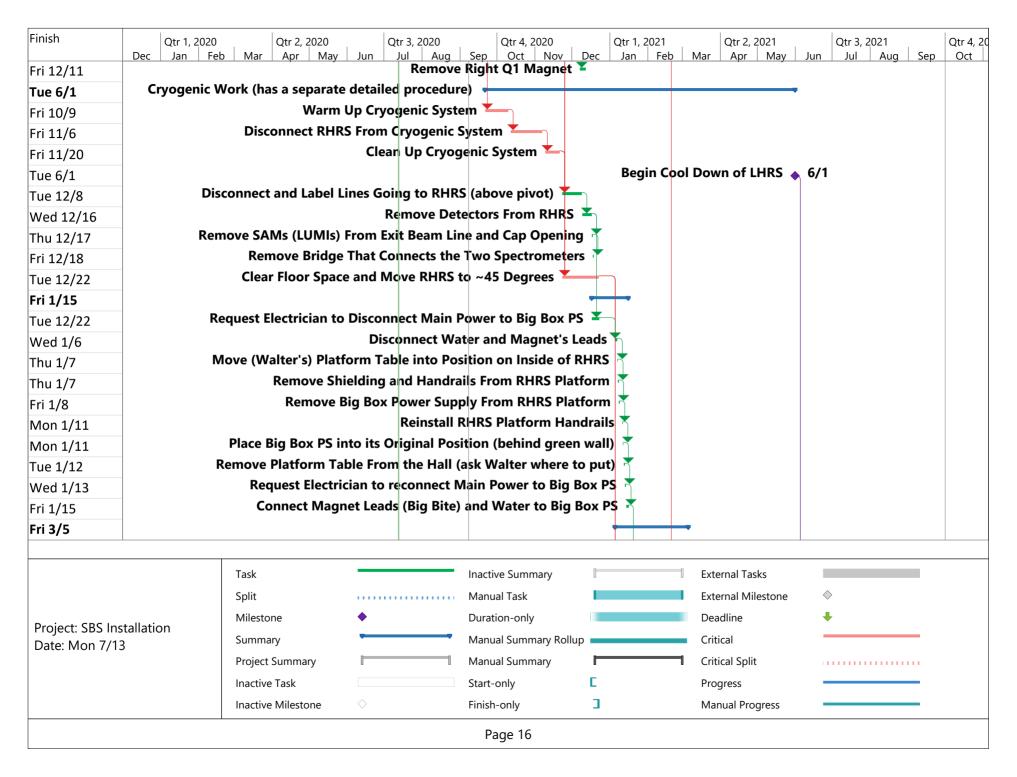


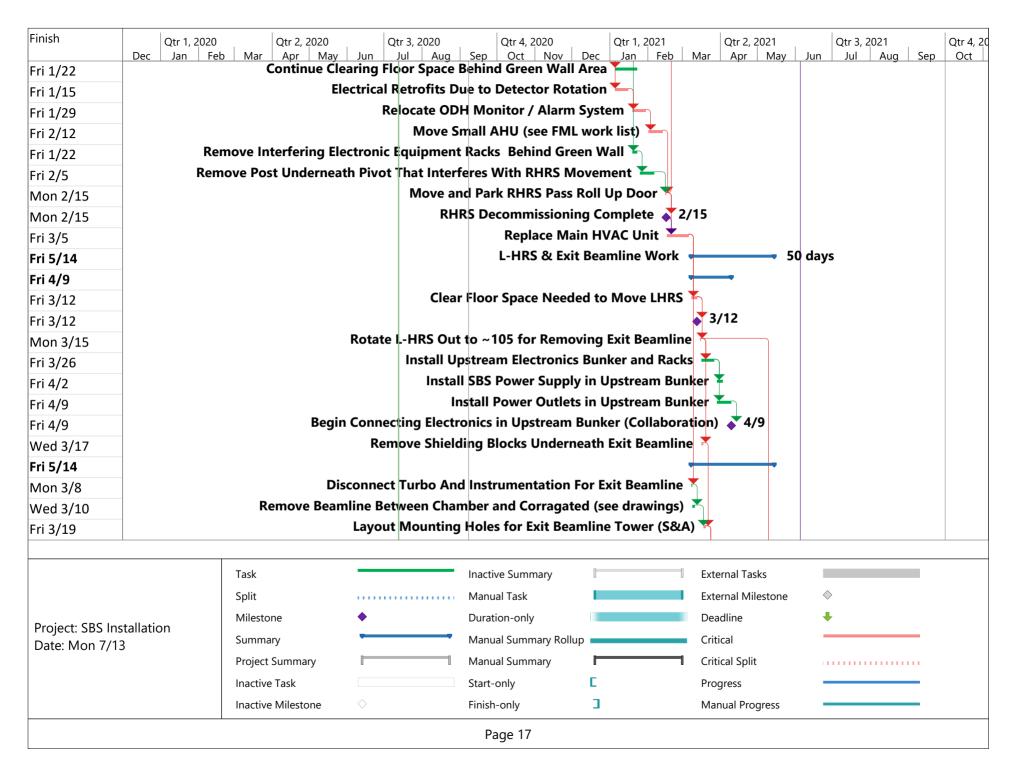


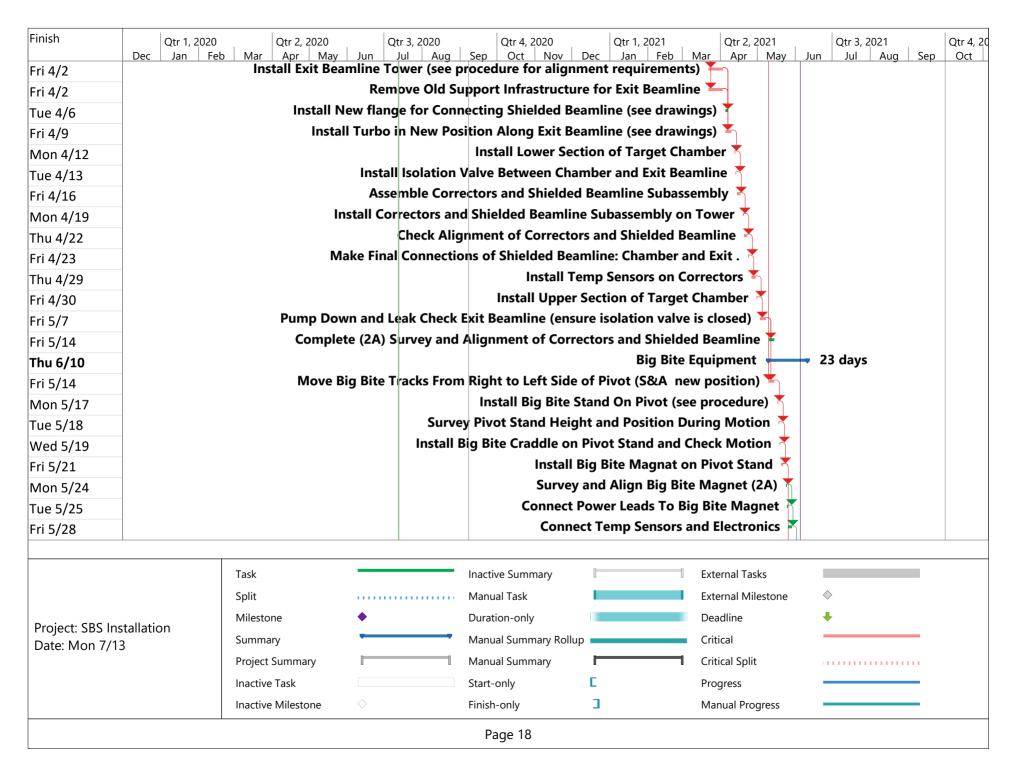


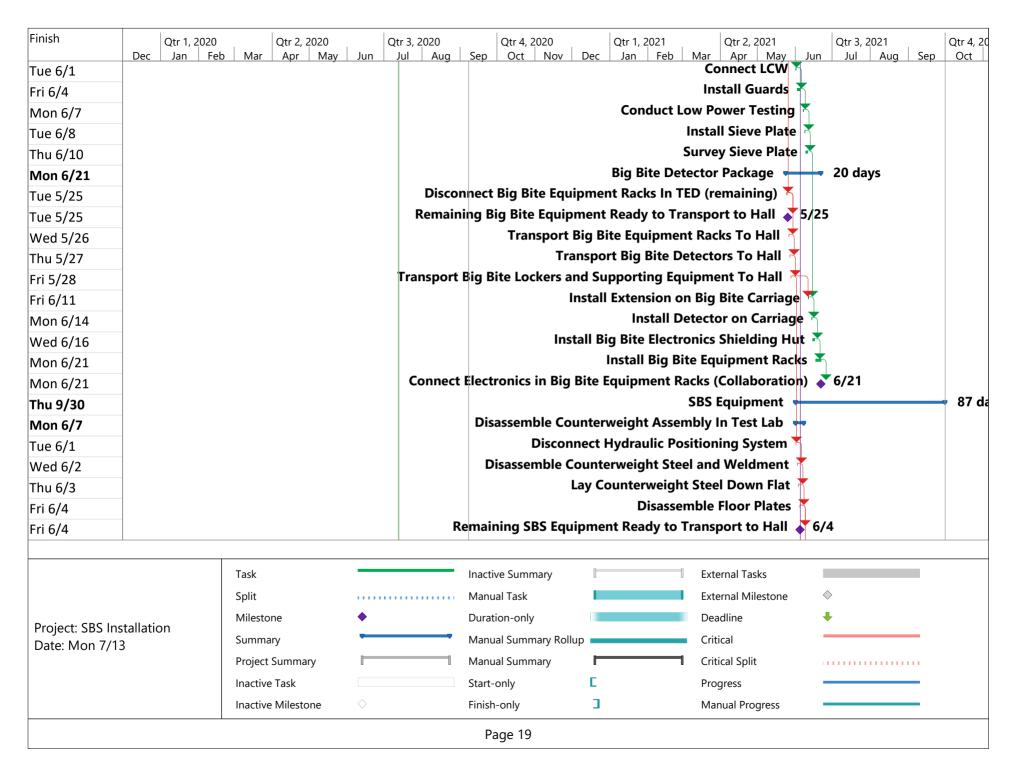


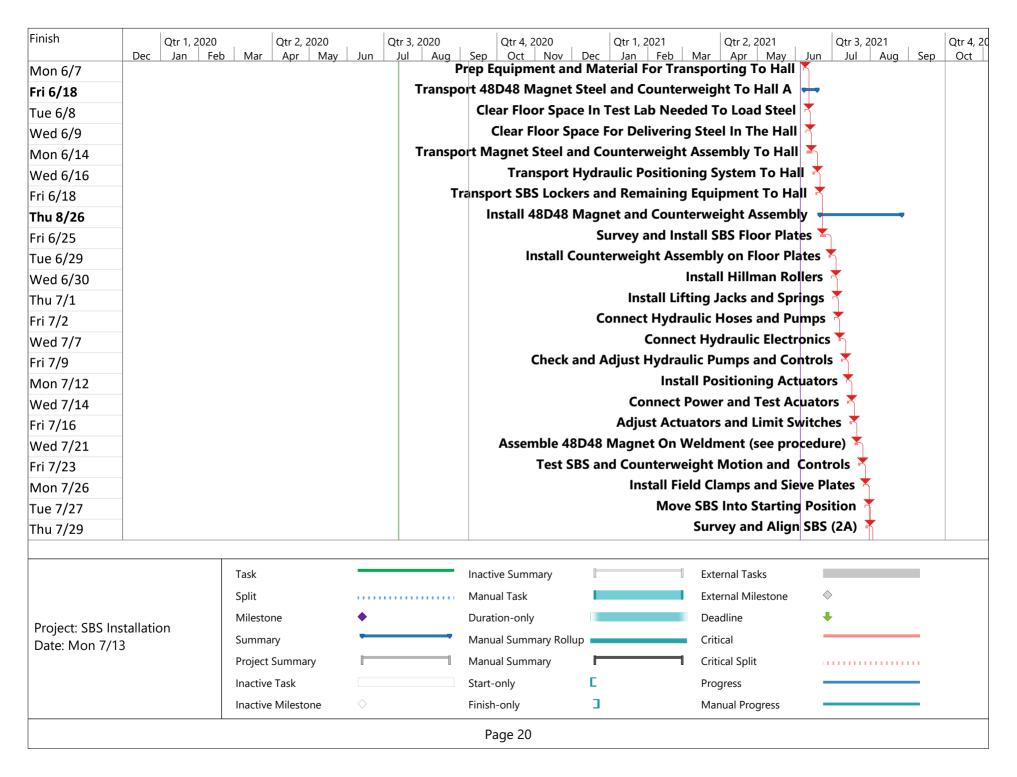


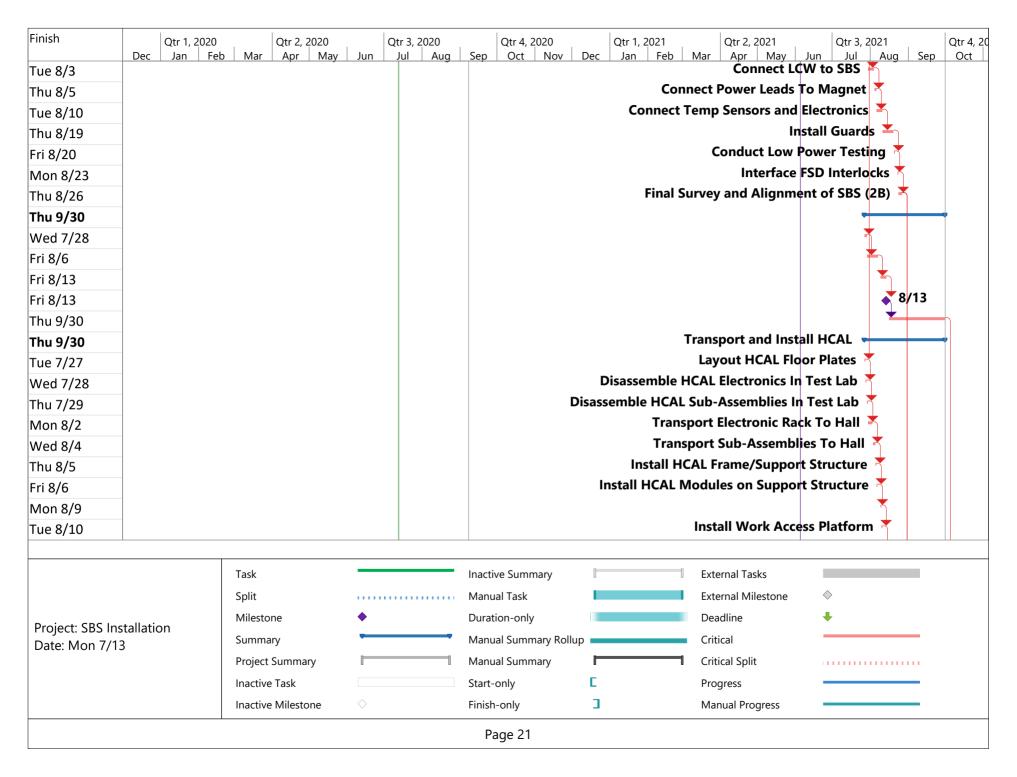












Finish	Qtr 1, 2020
	Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct
Wed 8/11	Install HCAL Equipment Racks Shielding Hut (local)
Fri 8/13	Install HCAL Equipment Racks (local) 🔻
Fri 8/13	Begin Connecting HCAL Electronics - Detector End (collaboration) 💉 8/13
Thu 9/30	Connect HCAL Electronics and Testing
Thu 9/30	Final Preparations • 87
Mon 7/12	Cooldown L-HRS —
Thu 9/9	Check for Proper Function on All Temp. Sensor (BB, SBS, and Correctors)
Mon 8/30	Make Sure Proper Ion Chamber are Installed
Thu 9/2	Check FSD Interfaces
Thu 9/2	Final Pumpdown and Leak Check Entrance Beamline 📥
Thu 9/9	Final Pumpdown and Leak Check Exit Beamline 🕇
Thu 9/9	Final Pumpdown and Leak Check L-HRS 📥
Tue 9/14	Final Pumpdown and Leak Check of Target Chamber (Target Group)
Thu 9/16	Final Survey and Align All SBS Equipment (2B)
Tue 9/21	Dial In The Cryo System
Thu 9/30	Test All Magnets and Power Supplies To Full Current
Thu 9/30	Remove Excessive Equipment From Hall
Thu 9/30	Complete Pre-Beam Checklist - Installation Complete 79/3