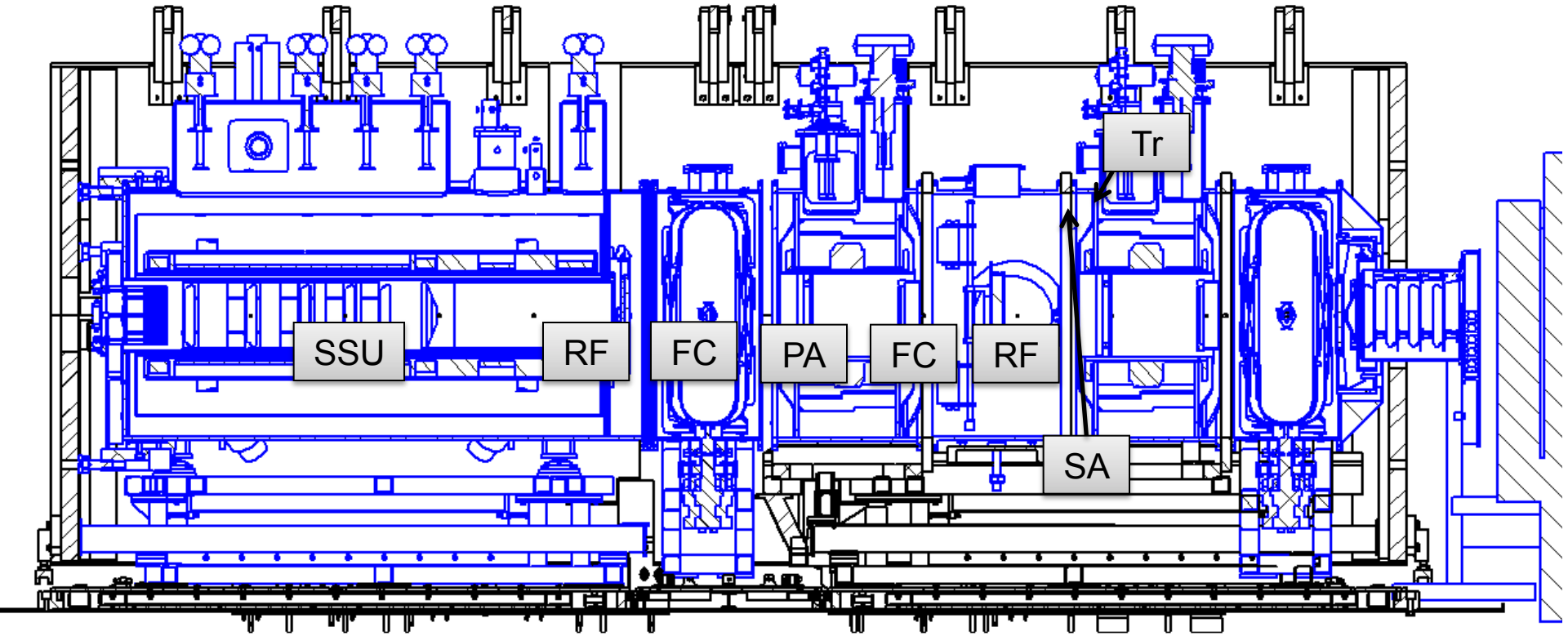
Upgrade to Demo Schedule

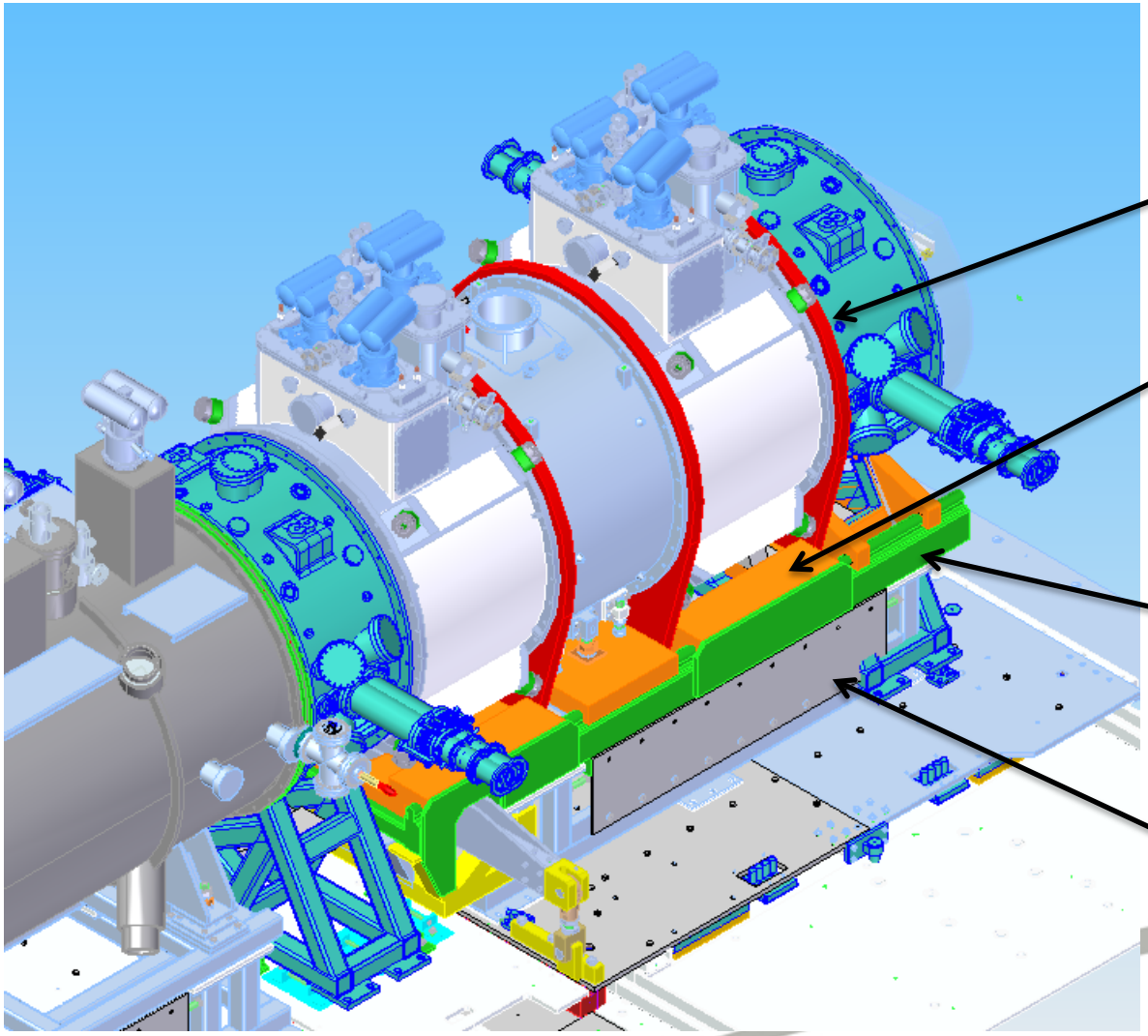
Demo Concept

- Initial Concept Based On
  - SSU, RF, FC, Primary Absorber, FC, RF, Secondary Absorber, 4 Station Tracker
  - Use current PRY (slight modifications)



Demo Concept

SS mount frame – Rail & carriage system for devices



Connector / tie-downs (not bellows) for carriage devices

Device carriages with adjustable mounts

New top section with rails

Current lower SS frame & tie-downs

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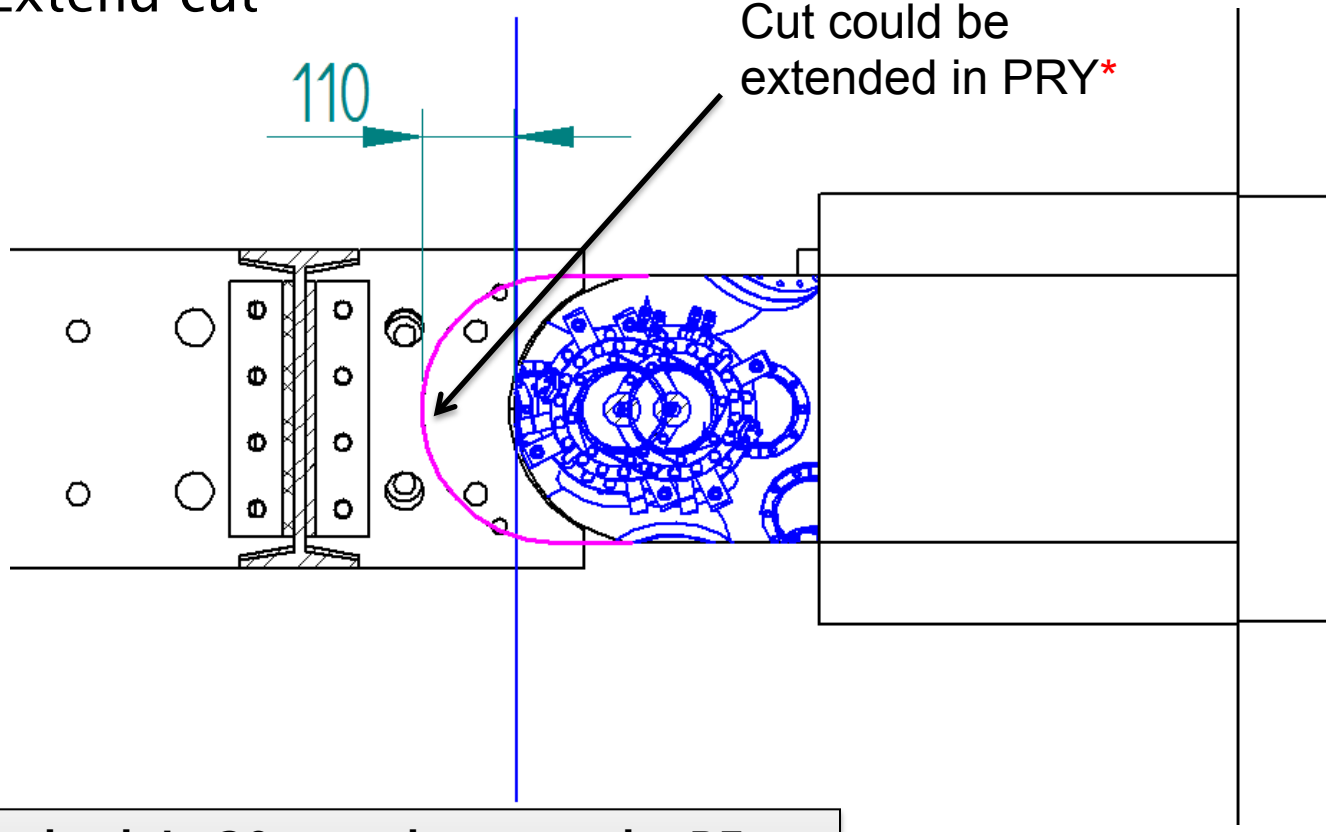
Demo Concept - Optimisation

- Possible Changes – Limitation
  - Extend cut



Putting back in 30 mm clearance the RF device could be moved a further ~ 80 mm

***Subject to engineering approval** (S Plate)

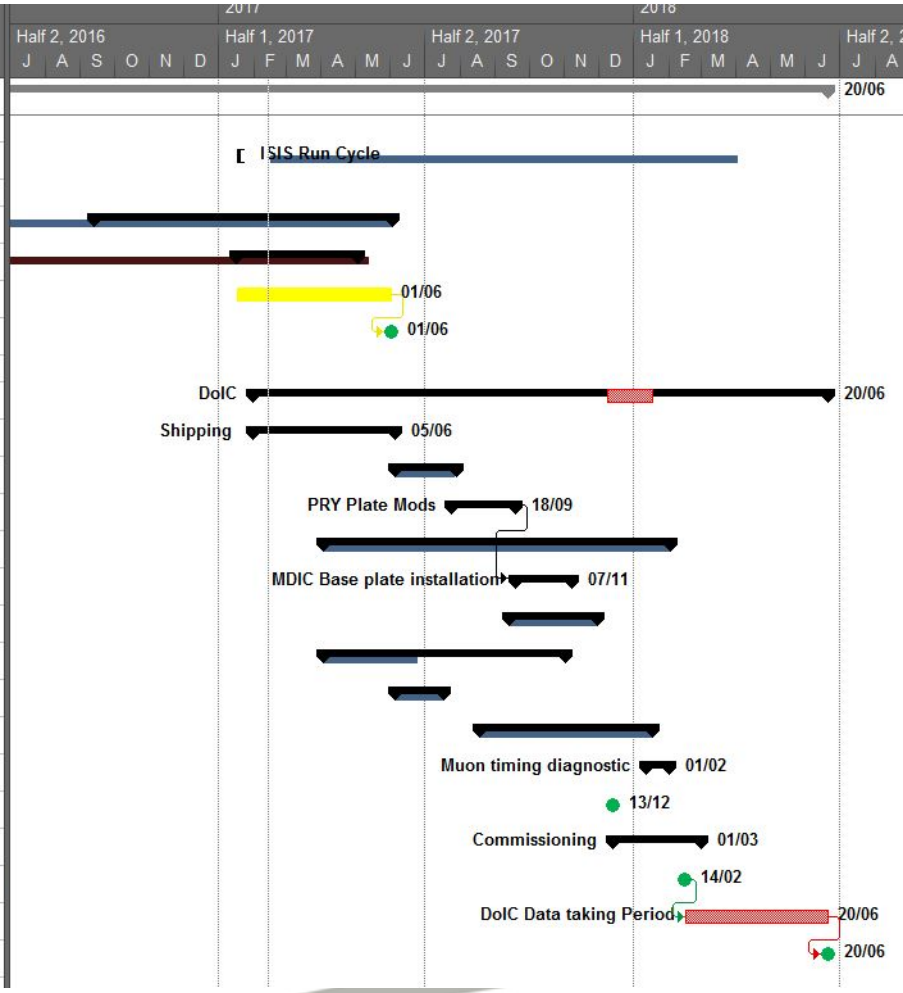
Timeline

Cavities arrive March/April 2017 - prep in R9
Step IV data - ISIS 2017/01 May 2017
De-commission Step IV
SSU stays in place and cold.
South mezzanine extension/H2 removed
Install RF power.
Install base plate for EMR/Tracker/KL/ToF2
Trial build cooling cell in R9
Install cooling cell frame & lower PRY.
Install Cooling cell & Upper PRY
Install RF modules and co-axial lines
Vacuum
Muon Timing – November/December run.
Commissioning January/February
Data - ISIS 2017/04 2018/01

Overview

GANTT CHART

	% Co	WBS	Task Name
0	2%	0	MICE_RF_Jan16th2017
1			
2	0%	1	ISIS Run Cycle
12			
13	###	2	Step IV
14	###	2.1	Hydrogen system and Absorber
24	0%	2.2	MICE Data Taking Operational Period
25	0%	2.3	End of STEP IV Operations
26			
27	0%	3	DoIC
28	0%	3.1	Shipping
36	0%	3.2	Step IV De-Commissioning
61	0%	3.3	PRY Plate Mods
65	0%	3.4	DoIC Installation
66	0%	3.4.1	MDIC Base plate installation
74	0%	3.4.2	Return Yoke
86	0%	3.4.3	Cavity preparation R9
102	0%	3.4.4	RF Power Installation
131	0%	3.4.5	Cooling cell installation
190	0%	3.4.6	Muon timing diagnostic
193	0%	3.5	DoIC installation complete
194	0%	3.6	Commissioning
200	0%	3.7	Combined magnet and operational tests complete
201	0%	3.8	DoIC Data taking Period
202	0%	3.9	End of DoIC data taking



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Step IV decommissioning

Task Name
Step IV De-Commissioning
Vacuum System
Hydrogen System and Absorber
Downstream tracker Systems
TOF, KL & EMR
SOUTH MEZZ CHANGES
Partial Return Yoke
Magnets
Step IV De-Commissioning Complete

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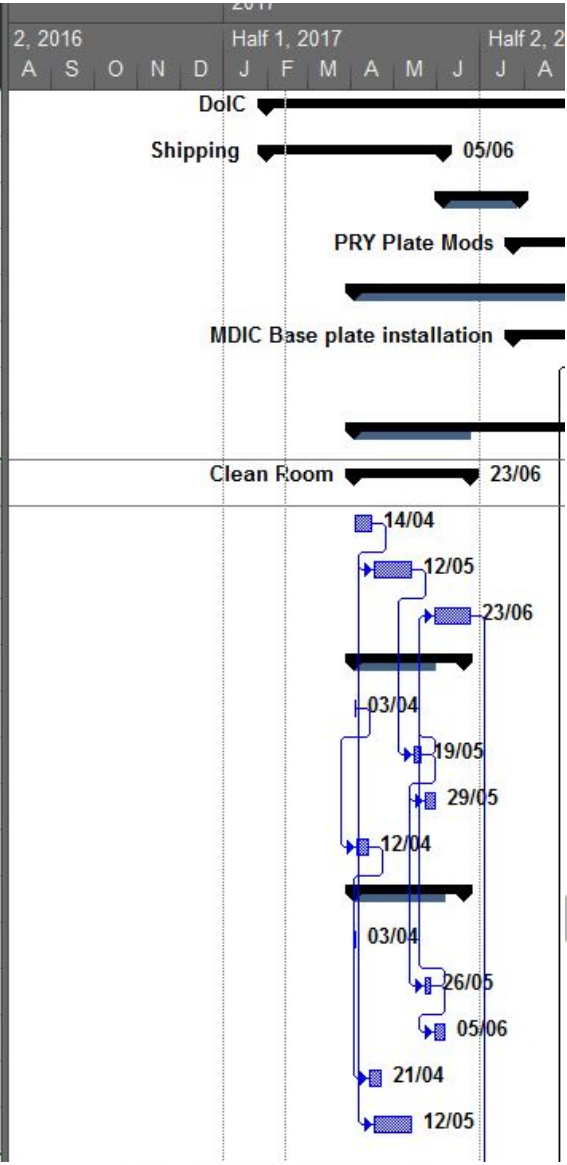
Cavities

GANTT CHART

	% Co	WBS	Task Name
27	0%	3	DolC
28	0%	3.1	Shipping
36	0%	3.2	Step IV De-Commissioning
61	0%	3.3	PRY Plate Mods
65	0%	3.4	DolC Installation
66	0%	3.4.1	MDIC Base plate installation
74	0%	3.4.2	Return Yoke
86	0%	3.4.3	Cavity preparation R9
87	0%	3.4.3.1	Clean Room
88	0%	3.4.3.1.1	Install Clean Room R9
89	0%	3.4.3.1.2	Run Clean Room
90	0%	3.4.3.1.3	Move clean room to MICE hall and start
91	0%	3.4.3.2	Receipt and preparation of cavity #1 R9
92	0%	3.4.3.2.1	Receive cavities and inspect to specifications
93	0%	3.4.3.2.2	Install couplers
94	0%	3.4.3.2.3	Fit N type transition to input ports, VNA tests
95	0%	3.4.3.2.4	Install vacuum pumps
96	0%	3.4.3.3	Receipt and preparation of cavity #2 R9
97	0%	3.4.3.3.1	Receive cavities and inspect to specifications
98	0%	3.4.3.3.2	Install couplers
99	0%	3.4.3.3.3	Fit N type transition to input ports, VNA tests
100	0%	3.4.3.3.4	Install vacuum pumps
101	0%	3.4.3.3.5	Test assemble rail system R9



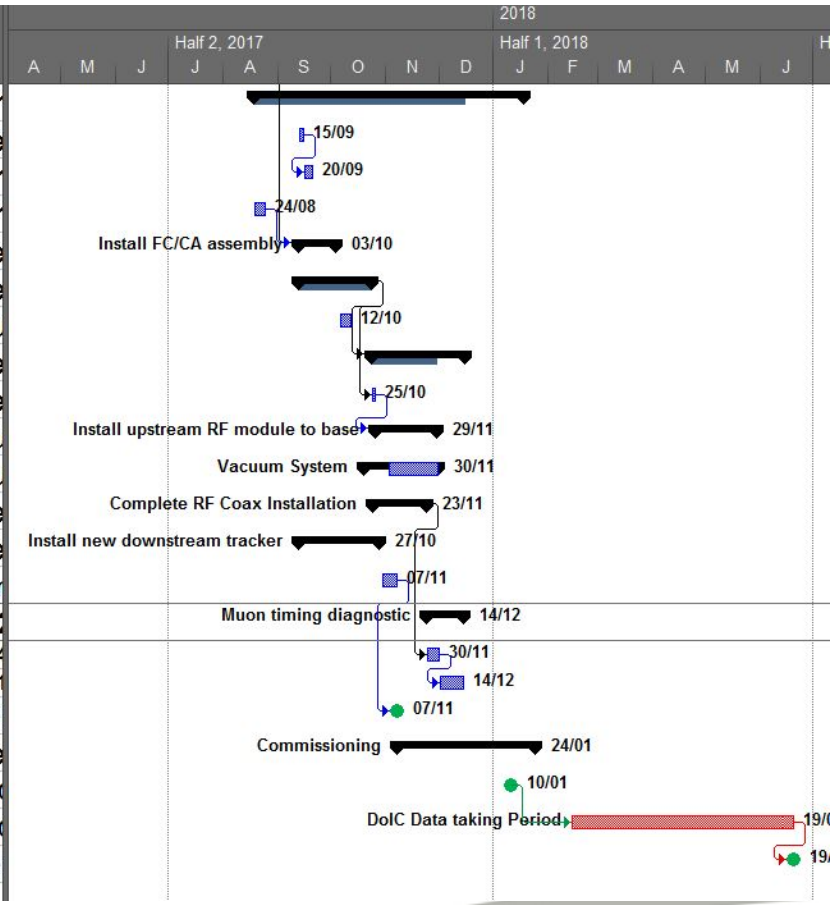
Base Plates

- SS translation stage ‘re-purposed’ for EMR/KL/ToF2/ DSTracker
- Min 1 month installation.
- Possible to omit – downstream cavity would then be very difficult to access/service.
- Short run period – may be acceptable to omit.

Cooling Cell

GANTT CHART

	% Cor	WBS	Task Name	Start
131	0%	3.4.5	Cooling cell installation	Fri
132	0%	3.4.5.1	Install cooling cell support frame to floor	Tue
133	0%	3.4.5.2	Install rail system to support frame	Fri
134	0%	3.4.5.3	Assemble FC/Central absorber sub-module	Fri
135	0%	3.4.5.4	Install FC/CA assembly	Tue
138	0%	3.4.5.5	Install downstream RF module to rail system	Tue
156	0%	3.4.5.6	Network analyser test downstream RF module	Thu
157	0%	3.4.5.7	Install upstream RF module	Tue
158	0%	3.4.5.7.1	Install upstream RF module base	Tue
159	0%	3.4.5.7.2	Install upstream RF module to base	Thu
171	0%	3.4.5.8	Vacuum System	Thu
176	0%	3.4.5.9	Complete RF Coax Installation	Tue
185	0%	3.4.5.10	Install new downstream tracker	Tue
189	0%	3.4.5.11	Re-install TOF2, KL & EMR	Mon
190	0%	3.4.6	Muon timing diagnostic	Fri
191	0%	3.4.6.1	Install Muon timing diagnostic	Fri 24
192	0%	3.4.6.2	Test Muon timing diagnostic no RF	Fri 01
193	0%	3.5	DoIC installation complete	Tue
194	0%	3.6	Commissioning	Tue
200	0%	3.7	Combined magnet and operational tests complete	Wed
201	0%	3.8	DoIC Data taking Period	Wed
202	0%	3.9	End of DoIC data taking	Tue



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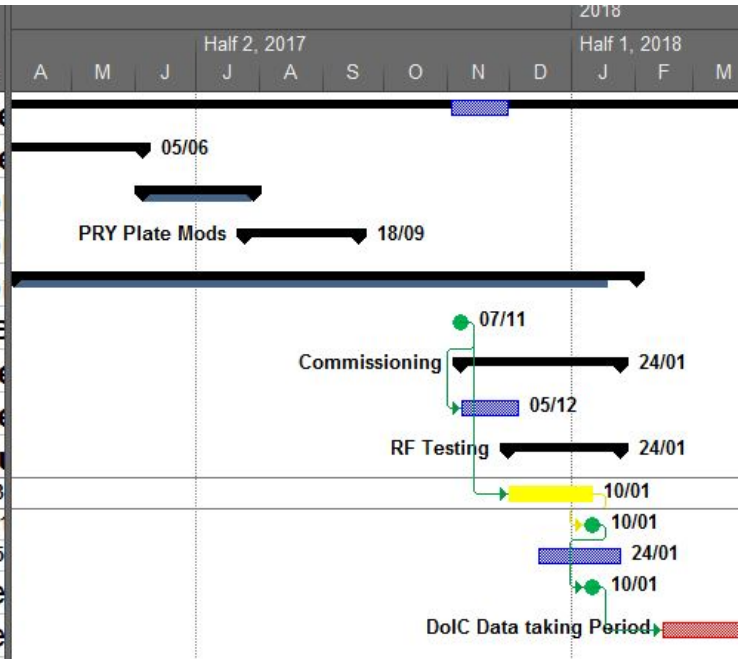
Commissioning

	WBS	Task Name	Start
27	3	DoIC	Tue
28	3.1	Shipping	Tue
36	3.2	Step IV De-Commissioning	Mo
61	3.3	PRY Plate Mods	Mo
65	3.4	DoIC Installation	Mo
193	3.5	DoIC installation complete	Tue
194	3.6	Commissioning	Tue
195	3.6.1	Cooling Channel magnet Commissioning	Tue
196	3.6.2	RF Testing	Thu
197	3.6.2.1	Test and condition cavities, with B field, 1MW	Thu 3
198	3.6.2.2	RF cavity testing with B field complete	Wed 1
199	3.6.2.3	Test Muon Timing	Fri 15
200	3.7	Combined magnet and operational tests complete	We
201	3.8	DoIC Data taking Period	We

ANTT CHART



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Work package		2016/17		2017/18		2018/19		2019/20		Total			
Id	Name	Fraction	£k	Fraction	£k	Fraction	£k	Fraction	£k	Fraction	£k		
1	***Project management and project office***												
	STFC-PPD			1.20	105.33	0.40	35.64					1.60	140.97
	STFC-TD			0.53	58.62	0.18	19.83					0.70	78.45
	Imperial-Physics					0.30	26.74					0.30	26.74
	Strathclyde					***0.67***	***69.58***					***0.67***	***69.58***
2	*Mechanical integration*												
	STFC-TD			1.25	54.99	0.42	16.70					1.67	71.69
3	***Electrical Integration***												
	STFC-TD			2.83	169.99	1.07	65.67					3.89	235.66
4	***Magnets***												
5	*Hydrogn Delivery System*												
	STFC-TD			0.80	32.23	0.35	14.54					1.15	46.77
6	*RF power*												
	STFC-ASTEC			***1.70***	***90.50***	***0.37***	***21.39***					***2.07***	***111.89***
	STFC-ISIS			1.00	57.47	0.33	19.44					1.33	76.91
	STFC-TD			***2.35***	***125.46***	***0.78***	***42.45***					***3.13***	***167.90***
7	*Vacuum*												
	STFC-PPD			0.38	21.55	0.17	9.72					0.54	31.27
8	*Magnetic Mitigation*												
9	*Software and computing*												
10	***Operations and analysis***												
	STFC-ISIS			1.50	118.70	0.67	53.55					2.17	172.25
	STFC-PPD			0.53	31.98	0.23	14.43					0.76	46.41
	STFC-TD			***0.75***	***74.99***	***0.33***	***33.83***					***1.08***	***108.82***
	Staff sub-totals			*14.80*	*941.80*	*6.26*	*443.50*					*21.06*	*1385.30*
	Staff totals			***14.80***	***941.80***	***6.26***	***443.50***					***21.06***	***1385.30***
Non-staff cost summary													
MICE-UK													
1	*Project management and project office*				50.45		40.91						91.36
2	*Mechanical integration*				211.61		15.00						226.61
3	*Electrical Integration*				55.30		10.30						65.60
4	*Magnets*				5.00								5.00
5	***Hydrogn Delivery System***				***20.30***								***20.30***
6	*RF power*				238.30		10.00						248.30
7	*Vacuum*				70.60		15.45						86.05
8	*Magnetic Mitigation*												
9	*Software and computing*												
10	*Operations and analysis*				109.40		44.88						154.27
	Non-staff sub-totals				*760.95*		*136.54*						*897.49*
	Non-staff totals				**760.95**		**136.54**						**897.49**
Total staff and non-staff by work package													
MICE-UK													
1	Project management and project office				214.40		192.70						407.10
2	Mechanical integration				266.60		31.70						298.30
3	Electrical Integration				225.29		75.97						301.26
4	Magnets				5.00								5.00
5	Hydrogn Delivery System				52.53		14.54						67.07
6	RF power				511.72		93.27						605.00
7	Vacuum				92.14		25.17						117.32
8	Magnetic Mitigation												
9	Software and computing												
10	Operations and analysis				335.07		146.68						481.75
	Sub-totals				*1702.75*		*580.04*						*2282.79*
Grand totals					**1702.75**		**580.04**						**2282.79**

Cost

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Cost

In round numbers:

STFC	£1.4M
Non-staff	£800k
Electrical	£220k
RF	£250k
Mechanical	£90k
University extension	£800k.

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Discussion/Provocation

- Liquid H2:
  - ISIS 2017/01 only
  - H2 system removed June 2017 – never to return?
- SSU stays cold and trained.
- FC in R9 performs cryogenically.
- Extends past end of US program.
- Timetable for engineering very tight – not clear agreement on detail is close.
- Requires 2 full time mechanical technicians.