



Schedule and Milestones

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STFC RAL

Collaboration Board Project Managers Report
30th October 2015

Schedule to Completion

- Baseline schedule created by joining the Step IV and Cooling Demonstration construction schedules
 - Data taking periods for both Step IV and Cooling Demonstration have been included.
 - UK Proposal for bridging funds from April to December has been awarded. Cost to completion review January 2016
 - Data taking period for the Cooling Demonstration has an end date of March 2018 coinciding with the end of the UK FY. Analysis and exploitation will continue for undetermined period.
- Project construction completed summer '15.
- The Step IV data taking period is “used as construction slack”

“This does mean that any slippage of the Step IV construction has an impact on data taking period”

 - Commissioning currently ongoing – previously expert electrical technical resource limited. Now limited by magnet system review.
 - Spectrometer solenoid coil lead ‘issue’.
 - Not amenable to short term fix.
 - Solutions calculated for Step IV data – reduced parameter space
 - Repair for Demonstration of Ionisation Cooling, options being evaluated.
- Hard milestone for end of data taking – 1st June 2016. – between ISIS 2016/01 & 2016/02
- Considering current status, options to use ISIS 2016/02 have been evaluated.



Tracking Milestones

Id	Milestone	Baseline Nov 2014	Nov 2015	Comment
Step IV				
1	Compressors ready for cooling channel tests	29.01.15	Complete	
2	Rack Room complete	02.02.15	Complete	
3	South Side PRY material delivered	16.03.15	Complete	
4	South side PRY complete	01.04.15	Complete	
5	North side PRY material delivered	28.04.15	Complete	
6	North side PRY complete	14.05.15	Complete	
7	MICE Step IV installation complete	02.06.15	Complete	
8	Combined magnet operational tests complete	11.08.15		Extended commissioning and remediation required
9	End of Step IV Data taking	01.06.16		
Demonstration of Ionisation Cooling				
10	PRY materials arrive	10.05.16	16.05.16	Material procured, en-route to vendor. Drawings in final iteration.
11	RF Cavities Arrive at RAL	18.05.16	16.06.15	Design
12	Step IV De-commissioning complete	22.07.16	08.07.16	
13	RF Amplifier delivered	31.08.15	08.08.16	
14	RF Amplifier #1 ready for commissioning	06.08.16	16.09.16	Delay due to contingency for iteration in commissioning of TH116.
15	RF Amplifier #2 ready for commissioning	07.11.16	10.02.17	Delay due to 14 and Step IV
16	Installation of south PRY starts	14.12.16	30.11.16	Earlier if, we stop after 2016/01
17	Installation of RF modules starts	19.01.17	25.01.17	
18	Installation of North PRY starts	01.02.17	02.02.17	
19	Cooling Demo construction complete	24.03.17	31.07.17	Delay due to 14,15 & completion of PRY
20	Cooling Demo commissioning complete	02.05.17	06.09.17	
21	End of Data taking in cooling demo config	31.03.18		

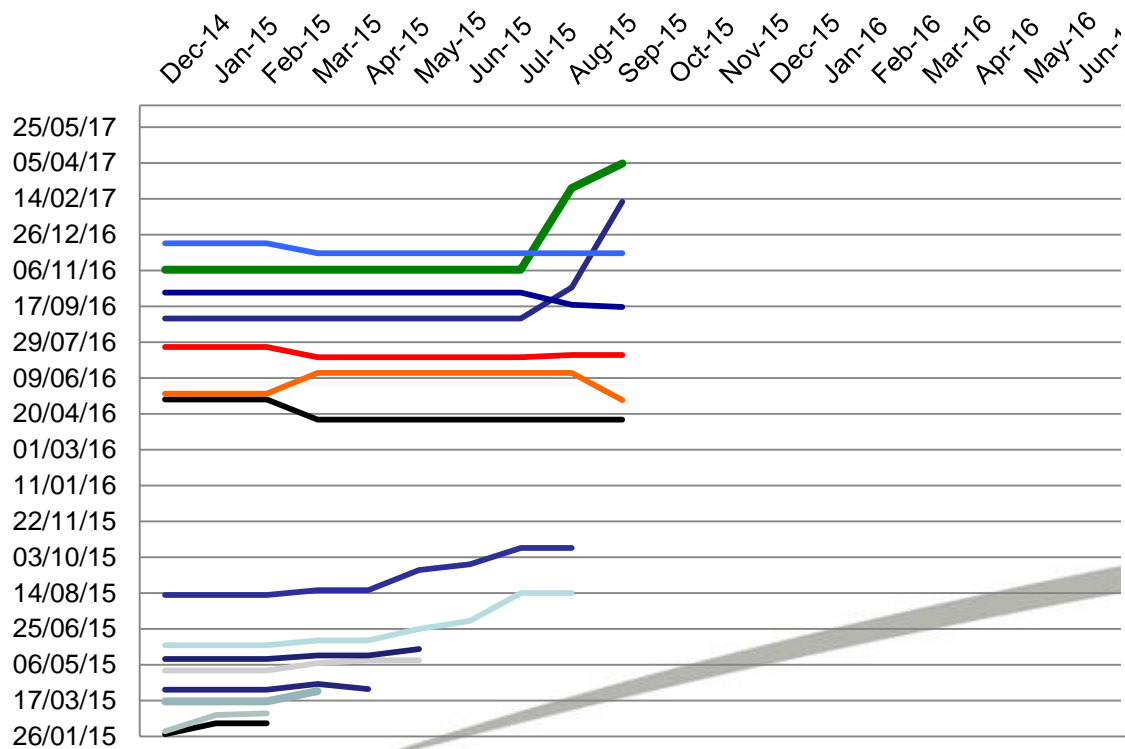


Dashboard and Slip Chart

Baseline	16/03/15	01/04/15	28/04/15	29/01/15	02/02/15	14/05/15	02/06/15	11/08/15	01/06/16	10/05/16	18/05/16	22/07/16	31/08/16	06/10/16	07/11/16	14/12/16	19/01/17	01/02/17	24/03/17	02/05/17	31/03/18
Dec-14	16/03/15	01/04/15	28/04/15	29/01/15	02/02/15	14/05/15	02/06/15	11/08/15	01/06/16	10/05/16	18/05/16	22/07/16	31/08/16	06/10/16	07/11/16	14/12/16	19/01/17	01/02/17	24/03/17	02/05/17	31/03/18
Jan-15	16/03/15	01/04/15	28/04/15	13/02/15	25/02/15	14/05/15	02/06/15	11/08/15	01/06/16	10/05/16	18/05/16	22/07/16	31/08/16	06/10/16	07/11/16	14/12/16	19/01/17	01/02/17	24/03/17	02/05/17	31/03/18
Feb-15	16/03/15	01/04/15	28/04/15	13/02/15	27/02/15	14/05/15	02/06/15	11/08/15	01/06/16	10/05/16	18/05/16	22/07/16	31/08/16	06/10/16	07/11/16	14/12/16	19/01/17	01/02/17	24/03/17	02/05/17	31/03/18
Mar-15	30/03/15	09/04/15	08/05/15			19/05/15	09/06/15	18/08/15	01/06/16	12/04/16	16/06/16	08/07/16	31/08/16	06/10/16	07/11/16	30/11/16	25/01/17	17/02/17	31/03/17	09/05/17	31/03/18
Apr-15		02/04/15	12/05/15			19/05/15	09/06/15	18/08/15	01/06/16	12/04/16	16/06/16	08/07/16	31/08/16	06/10/16	07/11/16	30/11/16	25/01/17	17/02/17	31/03/17	09/05/17	31/03/18
May-15			12/05/15			28/05/15	25/06/15	15/09/15	01/06/16	12/04/16	16/06/16	08/07/16	31/08/16	06/10/16	07/11/16	30/11/16	25/01/17	17/02/17	31/03/17	09/05/17	31/03/18
Jun-15							06/07/15	23/09/15	01/06/16	12/04/16	16/06/16	08/07/16	31/08/16	06/10/16	07/11/16	30/11/16	25/01/17	17/02/17	31/03/17	09/05/17	31/03/18
Jul-15							14/08/15	16/10/15	01/06/16	12/04/16	16/06/16	08/07/16	31/08/16	06/10/16	07/11/16	30/11/16	25/01/17	17/02/17	31/03/17	09/05/17	31/03/18
Aug-15							14/08/15	16/10/15	01/06/16	12/04/16	16/06/16	11/07/16	13/10/16	19/09/16	01/03/17	30/11/16	26/10/16	17/05/17	31/05/17	07/07/17	31/03/18
Sep-15									01/06/16	12/04/16	09/05/16	11/07/16	10/02/17	16/09/16	04/04/17	30/11/16	15/12/16	17/07/17	31/07/17	06/09/17	31/03/18
Oct-15																					
Nov-15																					
Dec-15																					
Jan-16																					

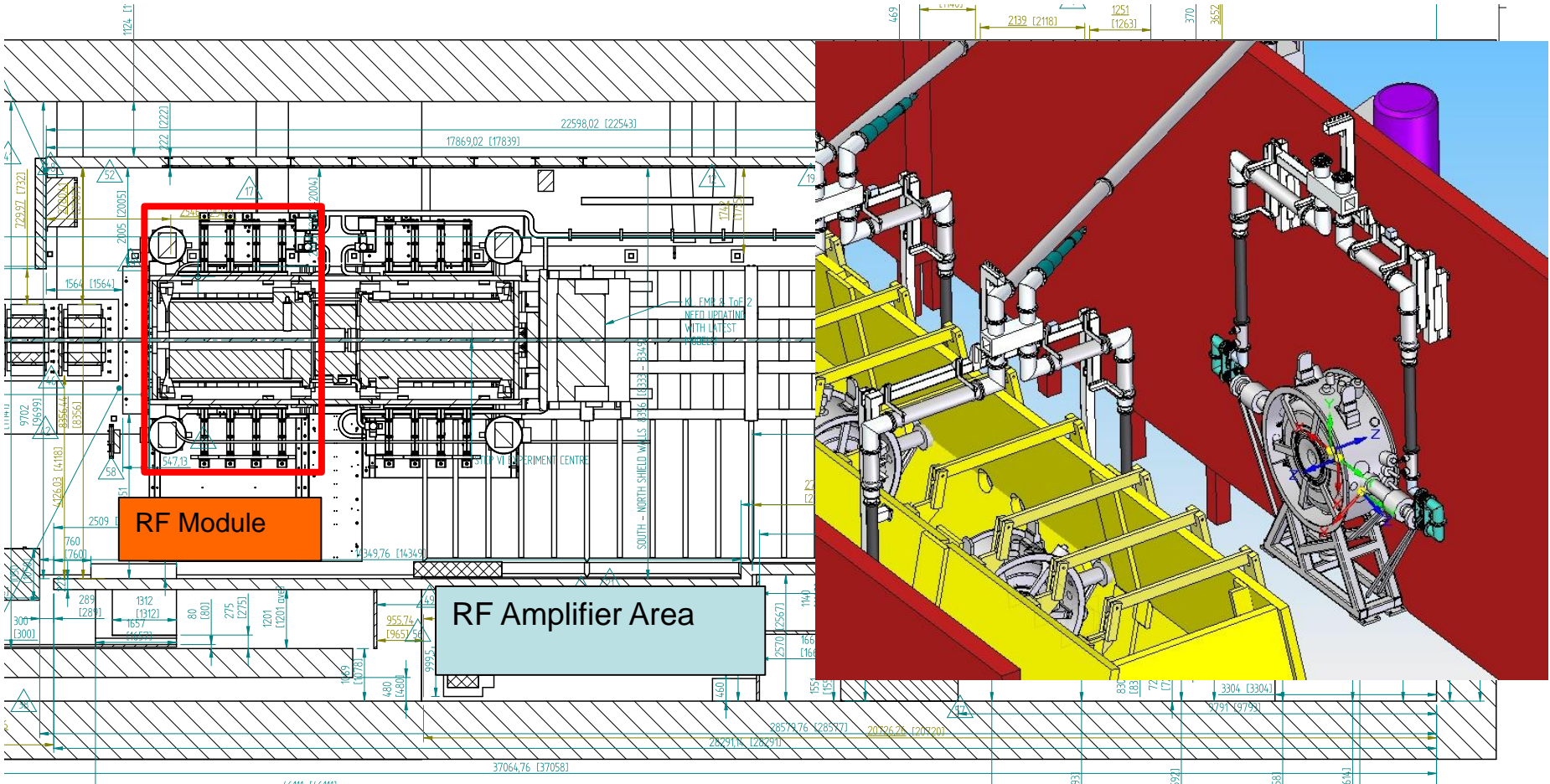
Date	No Change	Date	Reduction	Date	0-1 Month	Date	1-2 Months	Date	2-3 Months	Date	3-4 Months	Date	4+ Months	Date	Complete	Date
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MICE Milestone Slip Chart



- Project dashboard showing the milestone slip chart and current critical path items. <https://micewww.pp.rl.ac.uk/dashboard/>
- PRY complete
- Compressors complete
- Magnet PS racks installed RR2
- QD installed and integrated
- Earth leakage installed and tested.
- SSU & D cold and powered
- FC cold and powered
- H2 external rack installed, connection near complete.
- H2 exhaust line upgraded
- H2 window burst test passed
- H2 cooldown with Helium started.

Schedule to Completion



- During re-configuration the Upstream Spectrometer Solenoid can stay in place. We are planning to keep the magnet to at least Nitrogen temperatures to remove the need to retrain, time and cost mitigation.
- Upstream Spectrometer Solenoid PRY materials also stay in place – re-used for the Cooling Demonstration.
- RF Module test area next to SSU.
- Work for re-configuration can continue.

Schedule to completion

- Developed project to include offline testing of the RF cavities.
 - Review of the RF Project (chaired by M Palmer) has been completed Technical content was well received. Review panel considered project under-resourced particularly during commissioning phase.
 - Revised resource profile calculated including US personnel (~2FTE).
 - Work is on-going to interact with the senior management to gain significant staff uplift. Meeting with S Smith et al and received strong support to complete project. A resource estimate has now been produced and we are now moving to secure the required staff from a range of sources including STFC Labs, Universities, recruitment, contract staff and secondment.
- Critical Path for the project to completion has been identified
 - The RF Amplifier installation is a driving item due to the highly skilled resource required for much of the activity.
 - Installation of the first RF amplification system in the Hall as early as possible will enable off line testing of the RF modules and advance commissioning.
- Magnet system review outcome is critical to recovery planning for Step IV and Mice demonstration of ionisation cooling



Project Risks



Project Risks

RLSR report notes project is now rated 'RED' for risk

Recommendations from the Hydrogen System Review panel further testing and signoff required

- Upgraded exhaust pipe installed
- Spare window burst tested – failed in benign manner at 7.66bar - PASS

MICE 17 SSD connection to match coil failed post-quench

- Magnetic configurations developed to allow Step IV over reduced parameter space.
- Demonstrated magnet/power supply interaction that can result in damage
- Full system review for safe running, initial 26th Oct. In depth 23rd-24th Nov (provisional)
- Rebuild/remediation/alternate solution required for Demonstration of Ionisation Cooling.

MICE 16 FC cold and powered to required current in solenoid mode, no quenches.

MICE 18 Lithium Hydride secondary discs

- Significant cost, cannot be afforded in current FY, exploring options to expedite.
- Purchase through US to mitigate costs.
- Delivery still within allowable timescale.

MICE 8 RF expert personnel risk

- 2 key staff associated with LLRF had left, both have now been replaced
- RF build staffing



Milestones – Flat cash

Id	Milestone	Baseline Nov 2014	Nov 2015	Comment	Flat Cash To Completion (provisional)
Demonstration of Ionisation Cooling					
10	PRY materials arrive	10.05.16	16.05.16	Material procured, en-route to vendor. Drawings in final iteration.	No Change
11	RF Cavities Arrive at RAL	18.05.16	16.06.15	Design	No Change
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13	RF Amplifier #1 delivered	31.08.15	08.08.16		No Change
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Notes:

Estimates of dates for Flat Cash to Completion assume full utilisation of currently unassigned ISIS FTEs, also US manpower contribution and increased university staff allocation through cost to completion review.

Estimates are provisional, DL head of electrical resource is not available to contribute.

