



# Status of the MICE Project & Dashboard

**MICE Project Board**

14<sup>th</sup> November 2013

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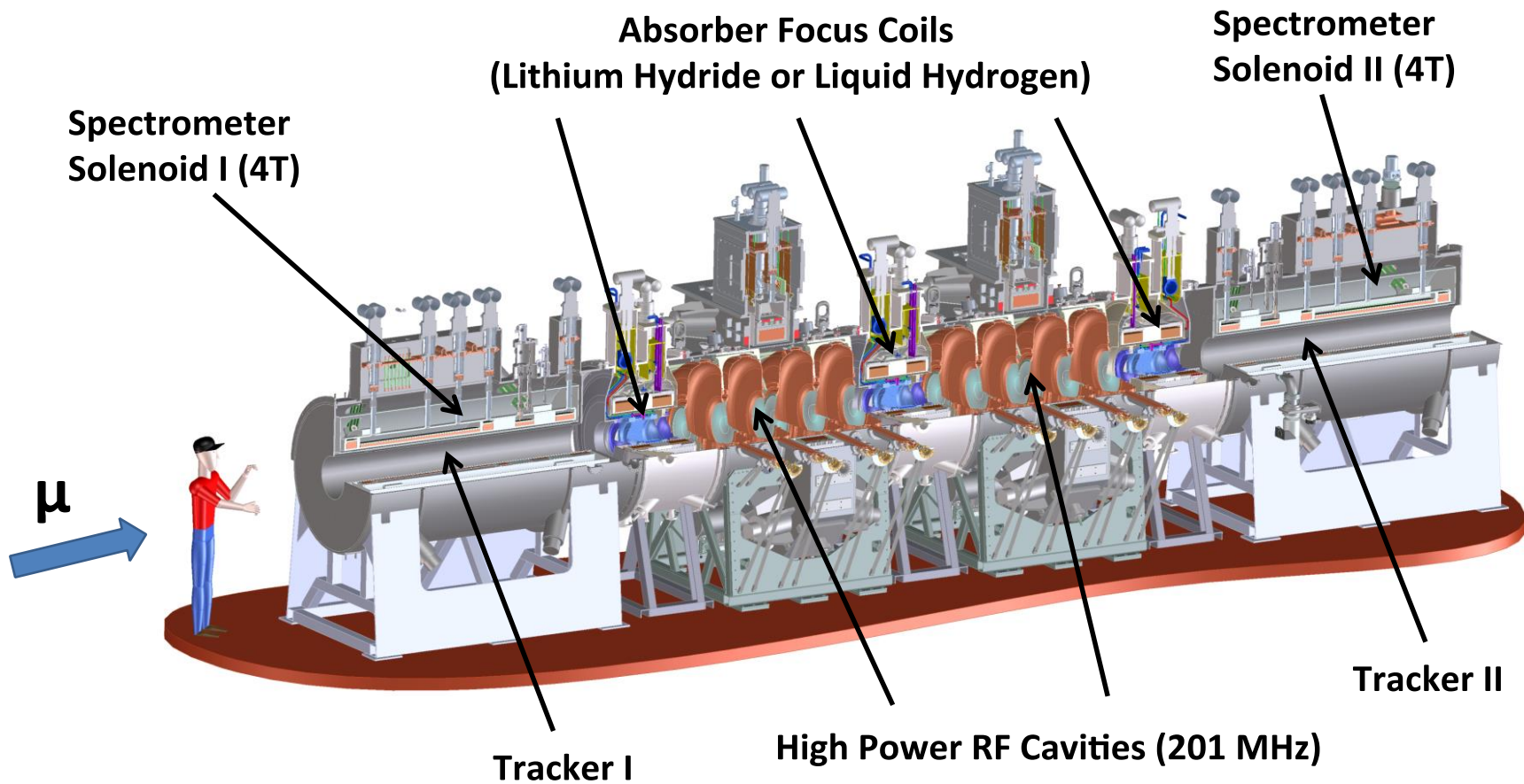


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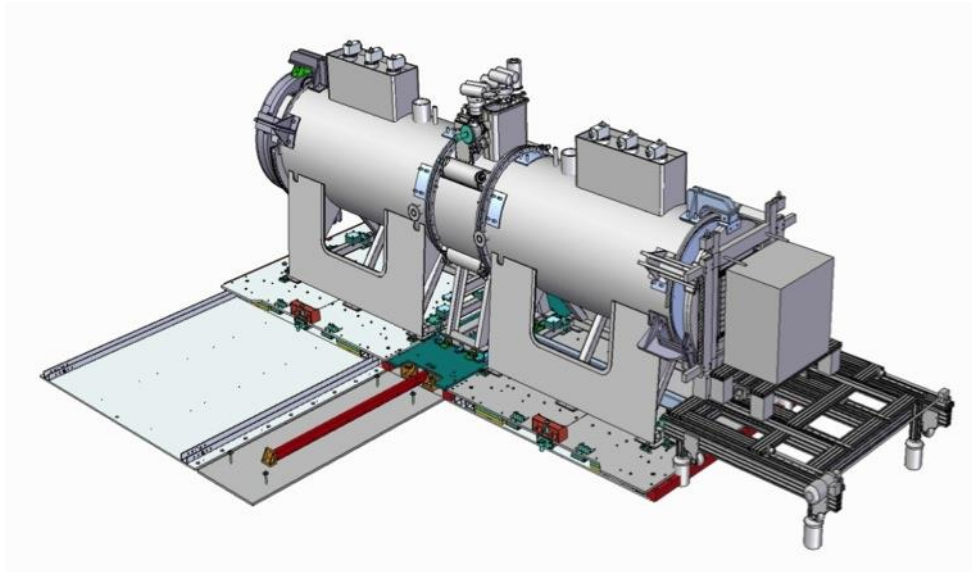
# The Construction Project



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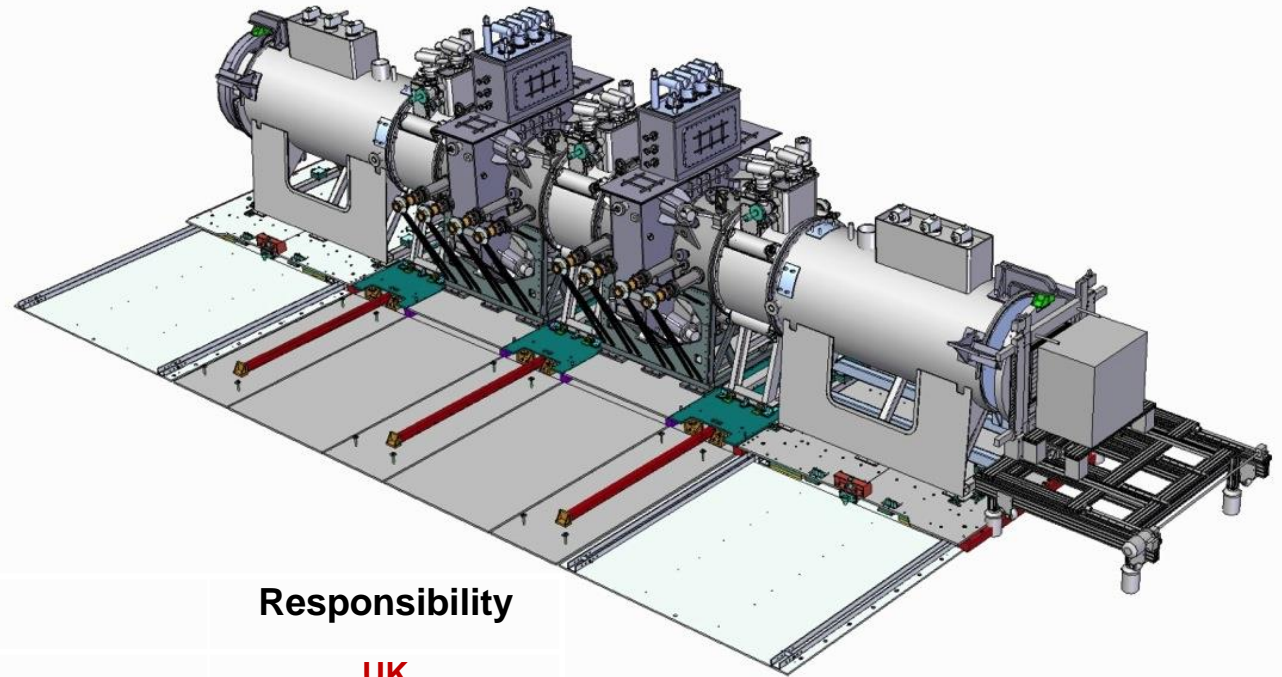
# Responsibilities for Step IV equipment



Sub-system	Responsibility
Spectrometer solenoid #1	US
Spectrometer solenoid #2	US
Fibre tracker #1 + #2	Japan, UK, US
Focus coil #1	UK
LH <sub>2</sub> system A	UK
Lithium hydride	US
LH <sub>2</sub> absorber	Japan
Diffuser	UK
Virostek plate & TOF cage assy	UK, US
Substation upgrade	UK
EMR	Geneva
<i>(Radiation shutter</i>	<i>UK)</i>
AFC Moving platform #1	UK
SS platforms Installation	UK
Partial Return Yoke	UK, US



# Responsibilities for Step VI equipment



## Sub-system

## Responsibility

Focus coil #2 and #3

UK

LH<sub>2</sub> system B and C

UK

LH<sub>2</sub> absorbers #2 and #3

Japan

RFCC modules [magnets/RF hardware]

US

RF power system

UK

AFC moving platforms #2 and #3

UK

RFCC moving platforms #2 and #3

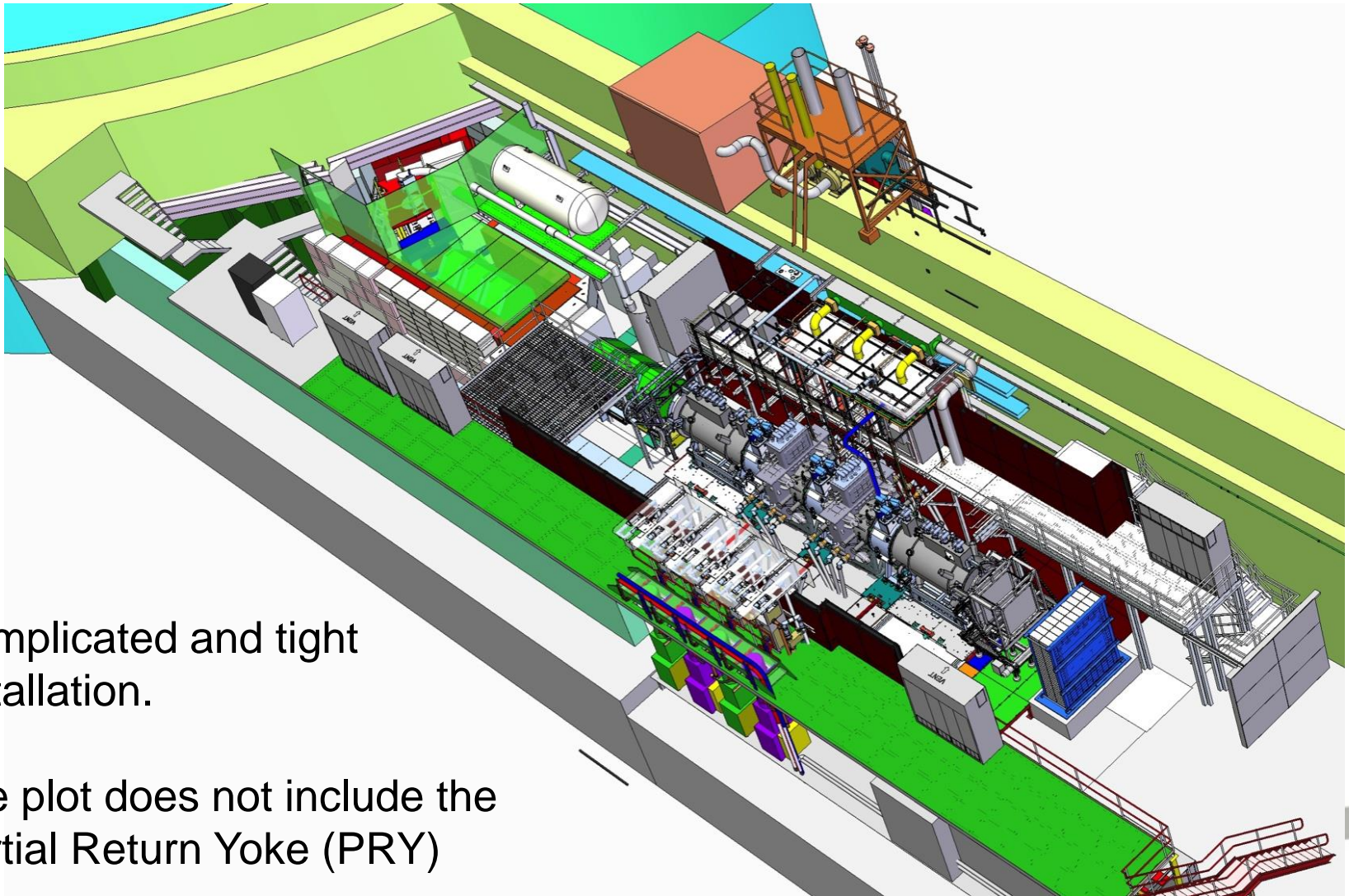
UK

Partial Return Yoke

UK, US



# Infrastructure



Complicated and tight installation.

The plot does not include the Partial Return Yoke (PRY)



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# Update and Deliveries



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# Update

- Spectrometer Solenoid #2 fully tested to acceptance criteria
  - Full mapping carried out by the CERN team
  - Magnet delivered to RAL.
- Spectrometer Solenoid #1 has required some intervention.
  - Vacuum leak
  - HTS lead burnt out
  - Thermal intercepts at the warm end of the HTS leads.
  - Delivery to RAL May 14
- Focus Coil #1 attained the 200meV/c current, 188A, but without stable operation.
  - Focus Coil #2 is now at RAL and currently being cooled.
  - Training cycles with #2 will lead discussion and decision making.
- RF amplifier
  - Successful operation to 2MW attained.
  - Amplifier and control systems currently being installed in the hall
  - TIARA milestone
- Decay Solenoid
  - Unfortunately a lead failure has occurred
  - Repair plans for the next ISIS shutdown.
  - Hardware interlocks implemented.
- Field Mitigation
  - Design review carried out in August.
  - Agreement to install the partial return yoke.
  - Design almost complete



# EMR



- The EMR (Electron Muon Ranger) arrived from UNIGE in September.
  - No issues during the installation in the MICE hall.
  - Commissioning runs were completed during October utilising weekend operations.
- 
- *Solenoid model and PRY model*



# RF



- Amplifier successfully tested to 2MW at DL
- Amplifier, control and power shipped to RAL
- Installation in the hall to complete TIARA milestone
  
- 6 tonnes of RF equipment shipped from UMISS arrived in October
- Co-ax, dummy loads and other hardware for the Steps V and VI
- Equipment for the TIARA project have been extracted and the remainder will be stored.



# Spectrometer Solenoids



- Upstream Spectrometer Solenoid was delivered to RAL in early October
- The magnet is now situated in the R9 hall.
- The tracker detector can now be installed into the bore of the magnet.
- An external company has been employed to carry out all lifting and movement operations.



# Spectrometer Solenoids



- Downstream Spectrometer Solenoid fully assembled with the shield installed.
- Some issue with thermal intercepts at the HTS leads.
- Issues have been addressed and the magnet is being re-cooled.
- Intended delivery of the magnet to RAL is May 14



# Focus Coils



- The second Focus Coil arrived at RAL in October.
- #2 is now in the place of #1 and currently cooling.
- Magnet training plan running from late November.
- Training cycles with #2 will lead discussion and decision making.
- Liquid Hydrogen Absorber will have a fit check.



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# **Schedule Drivers and Risk**



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# Schedule Drivers, Risk and Opportunity

- The targeted completion date for the Step IV configuration is Jan 2015
  - Partial return yoke and field mitigation work driving the schedule
  - Slack has been created giving the opportunity to spend additional time on the quality of the magnets
  - Spectrometer Solenoid arrival at RAL May 2014
  - ISIS user run March 2015
- The baseline delivery of the RFCC magnets are March 2018 and September 2019 leading to a Step VI completion of May 2020.
  - Option of utilising the MTA prototype bring RFCC#2 delivery back to July 2018
  - If this option is taken Step VI would be operational 2019
- With a construction project such as MICE there will be many items at risk.
  - Field Mitigation reduced operational risk
    - Manufacture, delivery and Installation.
    - Solenoids can not be powered until field mitigation is complete
  - Operation of the magnet lattice
    - Extended time to gain nominal operational currents
    - Operational personnel / LHe supply and availability
    - Stress on the magnets – lifetime
  - Operational team
    - Staff have been brought into the project
    - RF, Cryo and Vacuum
    - Interaction with the ISIS operational team
- Looking forward to the Step VI operation we have an opportunity
  - If testing is completed successfully, take advantage of the MTA prototype magnet
  - Reduce Step VI operation timescale by at least 1 year.





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# **Response to recommendation – Project Dashboard**



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	Baseline Date	1	2	3	4	5	6	7	8	9	10	11	12	13
<b>Step IV Top Level Milestones</b>														
SS#1 Mechanically installed in MICE Hall	02/12/13	02/12/13												
AFC installed in R9 ready for field mapping	10/12/13	10/12/13												
Downstream Solenoid arrives at RAL	03/01/14	06/09/14												
SS#2 Mechanically installed in MICE Hall	13/01/14	13/01/14												
AFC#1 ready for installation in MICE Hall	16/01/14	16/01/14												
West Mezz build Complete - milestone	04/02/14	04/02/14												
South side yoke material delivered	15/04/14	15/04/14												
Rack Room 2 BBG work Complete	23/04/14	23/04/14												
South side return yoke installation complete	04/06/14	04/06/14												
Compressor services Complete	30/06/14	30/06/14												
North side yoke material delivered	15/07/14	15/07/14												
Compressors ready for Cooling channels tests	04/09/14	04/09/14												
Rack Room Complete	12/09/14	12/09/14												
North side return yoke installation complete	17/10/14	17/10/14												
Combined magnet operational tests complete	30/01/15	30/01/15												
MICE step IV installation complete	30/01/15	30/01/15												
<b>Step V Top Level Milestones</b>														
LH2 absorber #2 at RAL (KEK)	28/09/12	28/09/12												
AFC#2 ready for installation in MICE Hall	28/10/13	28/10/13												
Amplifier#2 installation complete	26/08/14	26/08/14												
Cavity & RFCC module #1 delivered to RAL	03/01/17	06/09/17												
MICE step V installation complete	26/06/17	26/06/17												
<b>Step VI Top Level Milestones</b>														
Amplifier system #3 Delivered	26/11/15	26/11/15												
Amplifier system #4 Delivered	28/11/17	28/11/17												
FC module #3 at RAL	02/04/18	02/04/18												
Cavity & RFCC module #2 delivered to RAL	26/07/18	06/09/18												
AFC#3 ready for installation in MICE Hall	19/07/18	19/07/18												
Amplifier#3 installation complete	10/12/15	10/12/15												
Amplifier#4 installation complete	08/12/17	08/12/17												
MICE step VI installation complete	03/04/19	03/04/19												

Change since last update	Reduction	Date	No Change	Date	1 - 2 weeks	Date	2 - 4 Weeks	Date	1 - 2 months	3+ months	6+ months	Complete	Date
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