

# Notes on reviews/descope

## 2016

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- 2016-03-21:
  - MICE-UK Oversight Committee Documents 21 March 2016
  - MICE Project dashboard
  - CERN Indico page

## MICE » Governance

05 & 06 April 2016

[Overview](#) [Activity](#) [Issues](#) [Documents](#) [Wiki](#)

### MICE Project Board and Resource Loaded Schedule Review, April 2016

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## MICE Ionization-Cooling Demonstration

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### MICE-UK Cost-to-Completion Review

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Date of Cost-to-Completion Review Meeting - 26 April 2016 STFC RAL, Room CR10, R26

# Consensus outcomes

- **Excellent progress in:**
  - **Commissioning and operations;**
  - **Software and analysis;**
  - **Publication of results.**
- **Step IV science programme:**
  - **Important and must be completed:**
    - **Including operation with both LiH and LH2**
- **Cooling demonstration:**
  - **Important and should be completed.**

# STFC MICE-UK cost-to-completion

- Risks (financial, reputational, schedule) associated with recovery of SSD too large;
  - Also; timing of the long ISIS shutdown may start just as the recovered solenoid is delivered;
- Maximise scientific yield from Step IV:
  - Extend operations to Aug17 if project does not proceed to mount descoped cooling demonstration
- C2C panel recommended MICE-UK be asked to prepare proposal for the execution of the cooling demonstration that:
  - Exploits those components that are already in hand or are being manufactured:
    - Within three months

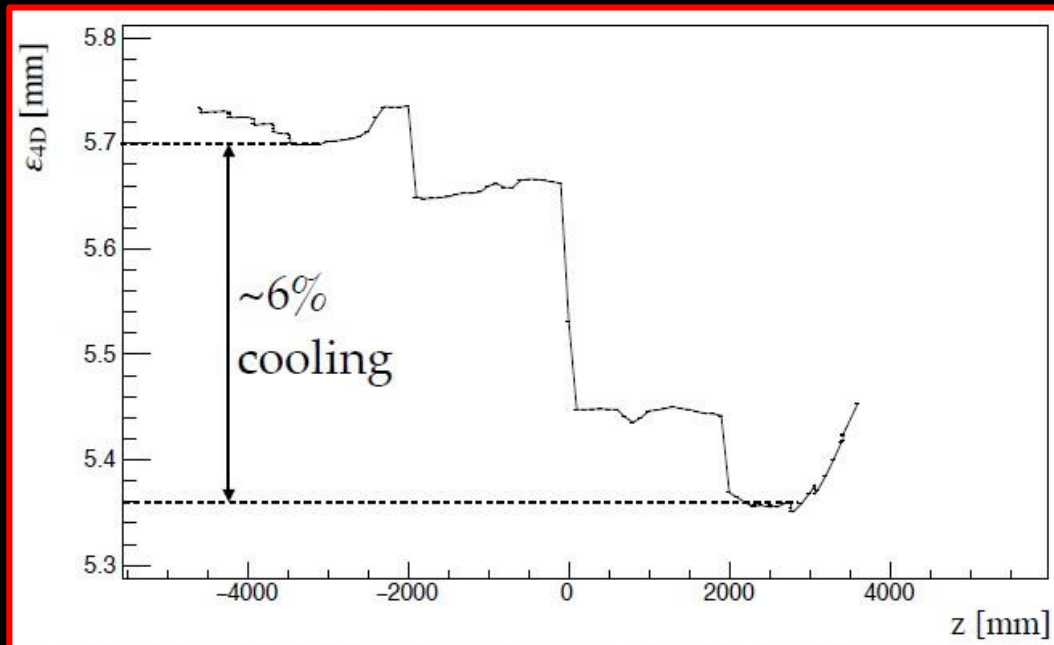
- **Integrated cost to the UK significantly lower than presented to C2C review**
- **Minimum risk:**
  - **Of further delay, cost overrun, equipment failure or reduced availability**
- **Significant data-taking before the long ISIS shutdown (around 2019)**

# Possible routes forward

- **Either:**
  - **Configuration with only one SS is shown to yield satisfactory performance**
  - **The downstream spectrometer solenoid (E-C-E only or E-C-E and M2) is shown to be stable through operation at Step IV; or**
  - **It is demonstrated that the downstream solenoid E-C-E combination can be made stable through a low-risk intervention.**

# Options under consideration [1]

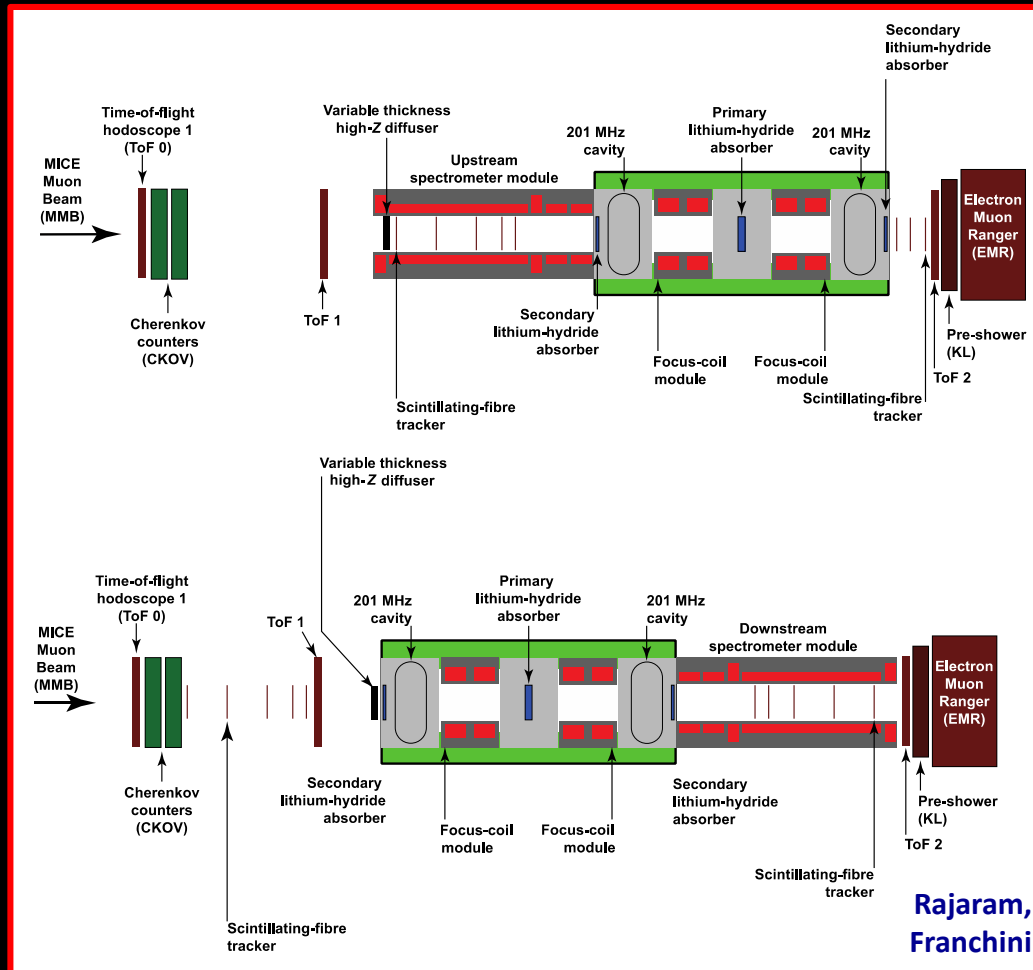
- Two-solenoid configurations:
  - SS1 is either upstream or downstream
  - Evaluation:
    - Performance, cost, schedule, risk
      - Example: rotate SSD by 180 degrees



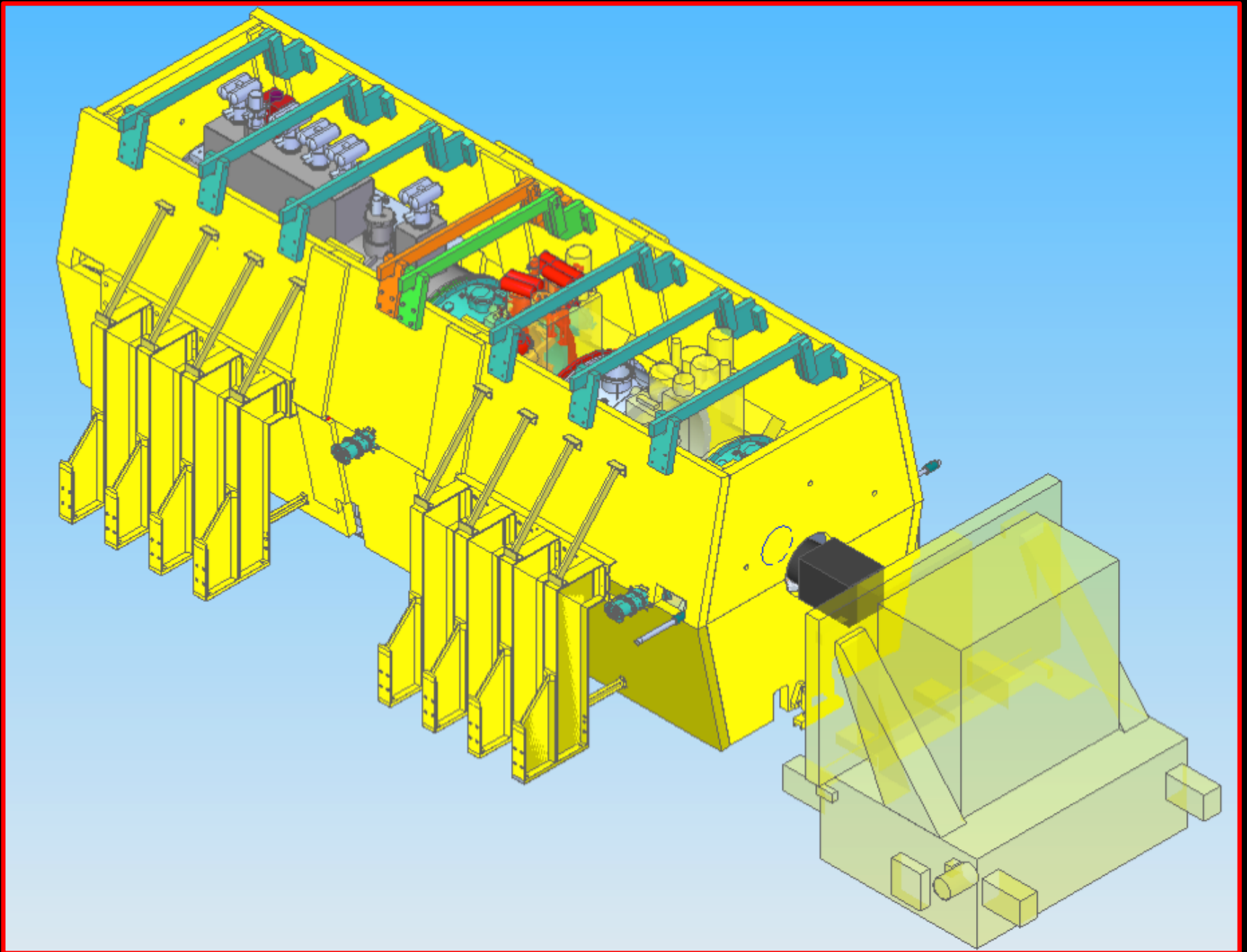
- Investigation of stabilisation vs doing nothing:
  - Cost, schedule, risk

# Options under consideration [2]

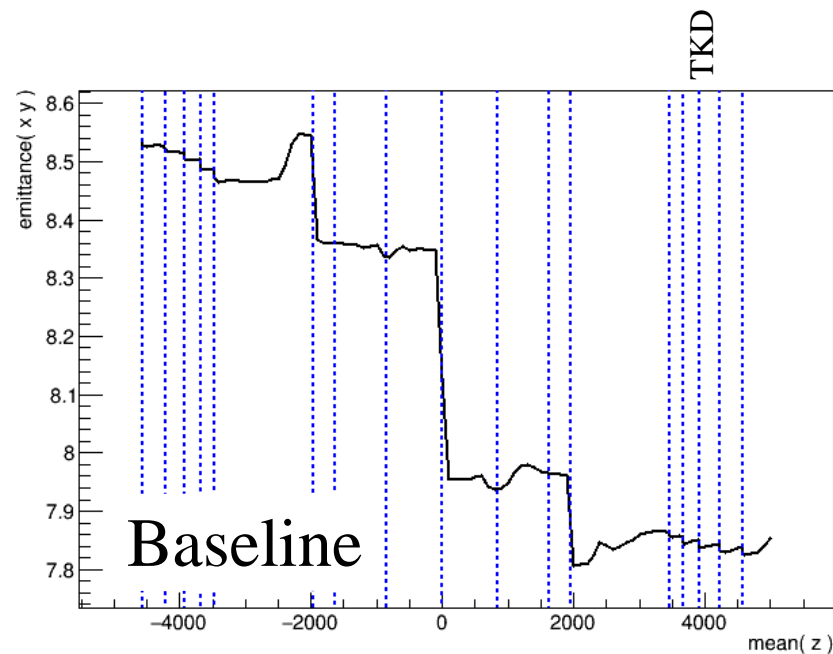
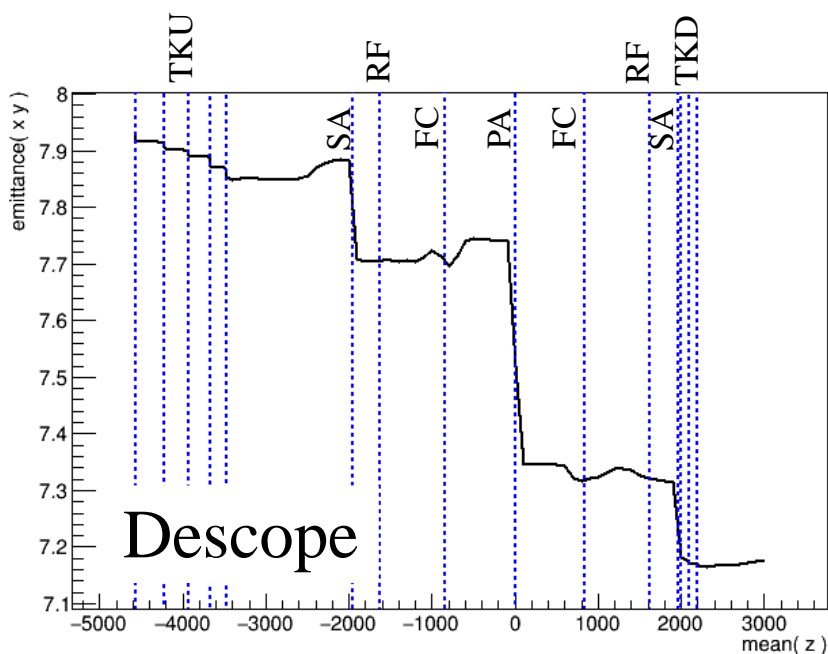
- Use only one spectrometer solenoid:
  - Two "generic" possibilities







# “Option A”: solenoid upstream



- Initial estimate of performance:

- Cooling effect: 8% at emittance of 7.9 mm;

- Comparable to baseline

- Transmission 85% vs 91% of baseline:

- Issue is systematic error:

- Believe that effect of modest decrease in transmission can be understood and systematic error can be kept under control

# Indicative risk, cost and schedule estimate

Whyte, Grant, et al

- **Risk reduction:**
  - **Do not assume use of SSD;**
    - All magnets will have been commissioned in the Step IV lattice for which the inter-magnet coupling is larger than in the descoped cooling demo configuration
  - **Hall refit significantly simplified;**
  - **RF system commissioning significantly ahead of requirement**
  - **Spares (solenoid and RF amplifier):**
    - Enhanced “availability” in operation
- **Schedule:**
  - **Initial estimate indicates that reconfiguration and commissioning completes such that data-taking for physics can start Mar18; significantly in advance of the long ISIS shutdown**
- **Cost:**

(£k)	2016/17	2017/18	2018/19	2019/20	Total
Core programme (operation of Step IV to August 2017)	2797.0	1754.2	389.5	149.3	<b>5089.0</b>
Incremental cost of delivering the cooling demonstration	480.5	1498.1	1643.9	0.0	<b>3622.4</b>
<b>Total</b>	<b>3277.5</b>	<b>3252.3</b>	<b>2033.4</b>	<b>149.3</b>	<b>8711.4</b>

# International perspective

- **Demonstration of ionization cooling:**
  - **Seminal measurement; unlocks high-brightness muon beams for particle physics;**
- **Ionization cooling requires by energy loss *and* acceleration**
  - **Demonstration of ionization cooling therefore requires the beam to be accelerated.**
- **Initial evaluation indicates that:**
  - **There is a cost-effective, low-risk programme by which a quantitatively-compelling demonstration can be delivered with equipment that is already available or that is already being manufactured;**
- **Step IV:**
  - **Study of the material properties that determine the ionization-cooling effect.**
- **Delivering the seminal demonstration of ionization cooling in this manner will maximise the scientific return on the substantial investments made in MICE by the STFC and its international partners.**

# Where we are today

- STFC Executive Board meets today:
  - No information from the Board yet
- Timescale has slipped from that to which we were working on 05May16:
  - Review status of preparation of options today
  - Postpone collaboration decision point (was set for tomorrow) to a point to be defined in response to the outcome of the STFC Executive Board's deliberations