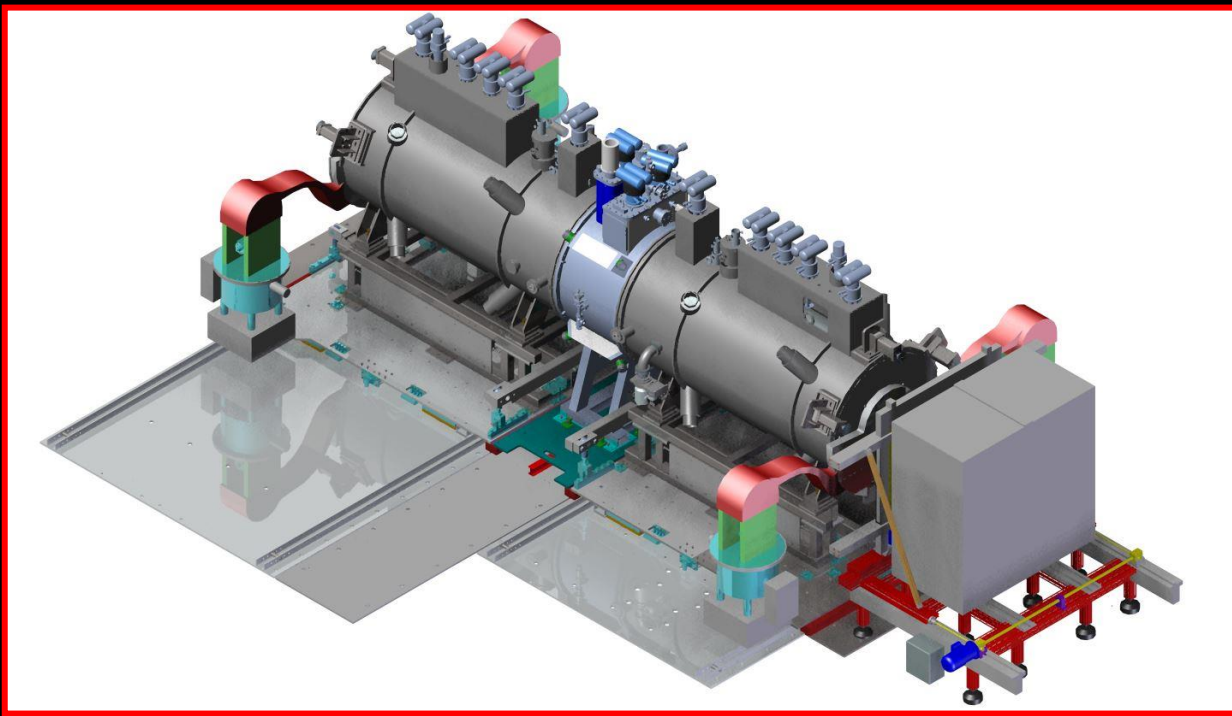


Spokesman's introduction:

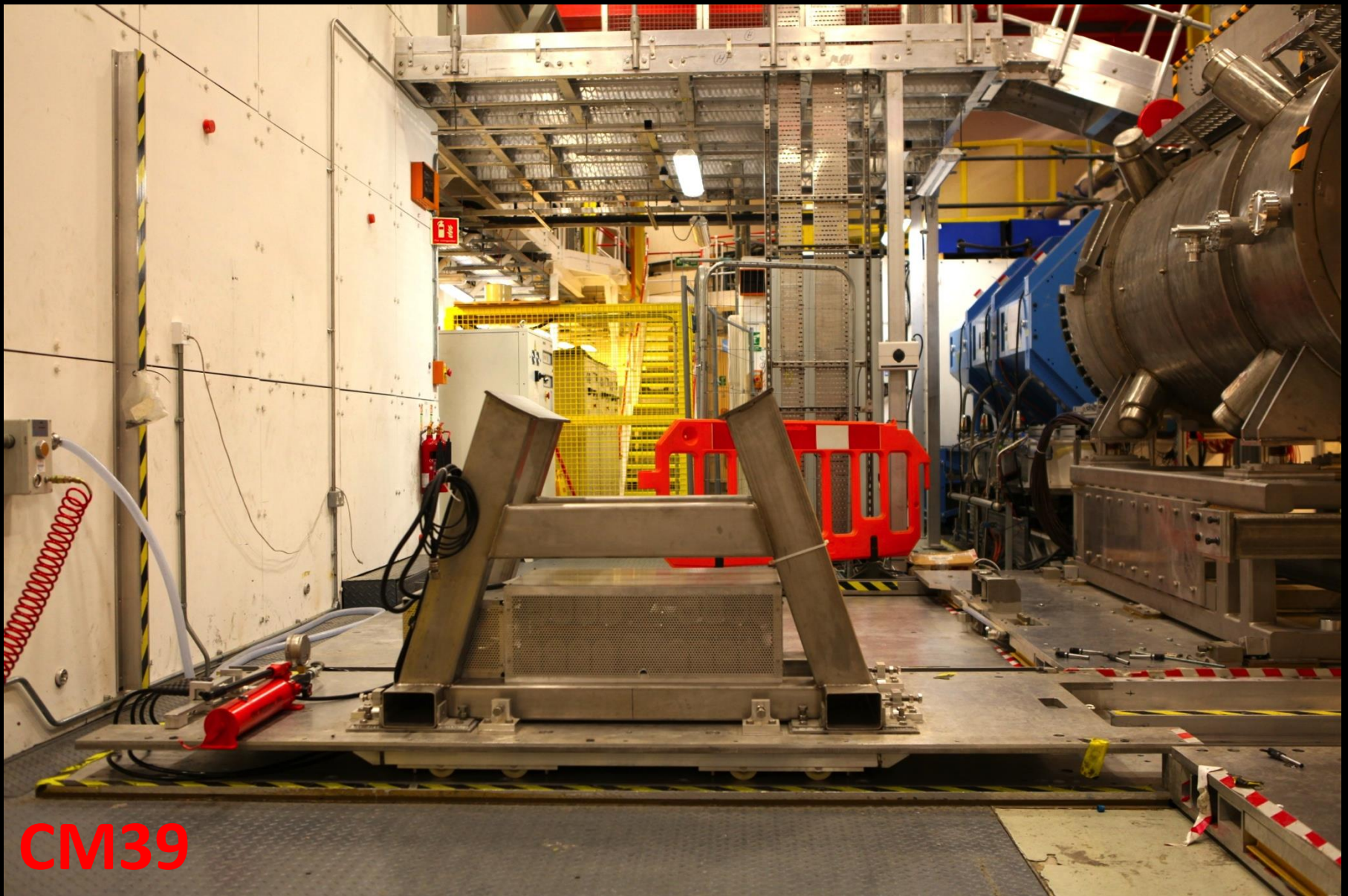
Contents:

- **Step IV progress snapshot**
- **Commissioning and operations for Step IV**
- **Publications**
- **Demonstration of ionization cooling**
- **Orientation**



Spokesman's introduction

Step IV progress snapshot



CM39

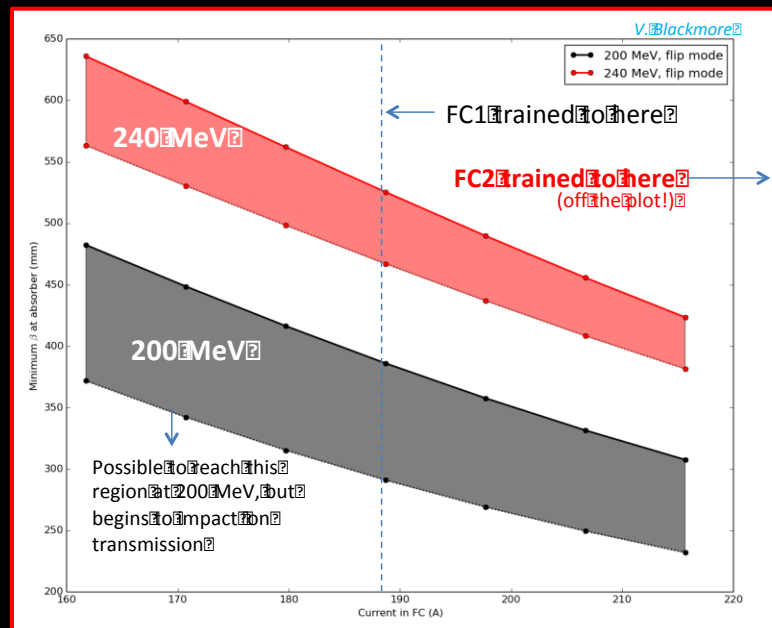
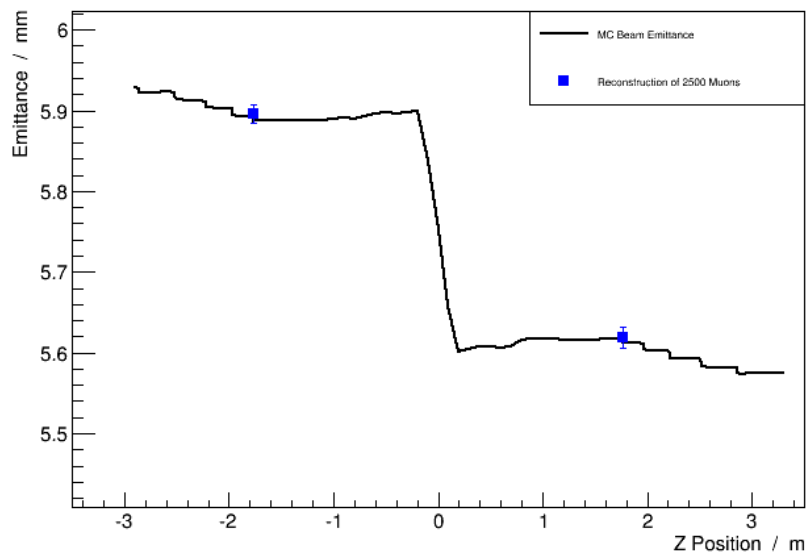
Well positioned; but a lot to do!
Final, detailing to plans this meeting.



Well positioned; but a lot to do!

Remaining “known unknown” PRY delivery.

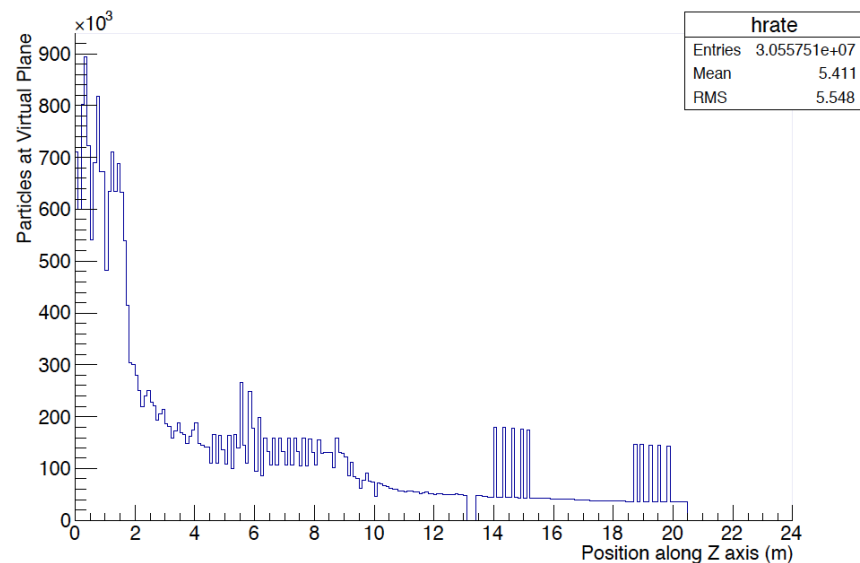
Software, computing & analysis:



3π	6π	10π
140 MeV/c	140 MeV/c	140 MeV/c
3π	6π	10π
200 MeV/c	200 MeV/c	200 MeV/c
3π	6π	10π
240 MeV/c	240 MeV/c	240 MeV/c

Physics Block Challenge:

R. Bayes et al



Spokesman's introduction

**Commissioning and operations for
Step IV**

Commissioning:

- Distinguish several periods:
 - **Now to Feb15:**
 - “Pre-commissioning”:
 - Tracker DAQ and controls (Nov);
 - MLCR online;
 - **Mock data run:**
 - Week of 21Jan15:
 - » Important milestone;
 - » Preparations in advance!!
 - **Mar15—Jun15:**
 - **ISIS available; seek to exploit where possible**
 - Need to react to status of construction project;
 - Must be ready
 - **Jun15—Sep15:**
 - **Cooling channel commissioning:**
 - Magnet then beam line
 - **Sep15—Jun16:**
 - **Step IV data taking**
- Details in S. Boyd talk and commissioning session:
 - **Collaboration Board papers on:**
 - **Shift policy (agreed, but requested minor updates);**
 - **Commissioning plan and associated resource estimates**

Reacting to advances/delays:

- Risk is that Step IV running period may be squeezed:
 - E.g. due to delays in magnet commissioning;
- So, need to be clear of the priority of our data taking:
 - Control of systematics:
 - Implies must do commissioning, alignment and calibration
 - We have agreed the following headline programme:

Step IV:
Material properties of LH ₂ and LiH
Observation of ϵ_{\perp}^n reduction
MICE demonstration of ionization cooling:
Observation of ϵ_{\perp} reduction with re-acceleration
Observation of ϵ_{\perp} reduction and ϵ_{\parallel} evolution
Observation of ϵ_{\perp} reduction and ϵ_{\parallel} and angular momentum evolution [†]

- Discussion through operations and physics sessions

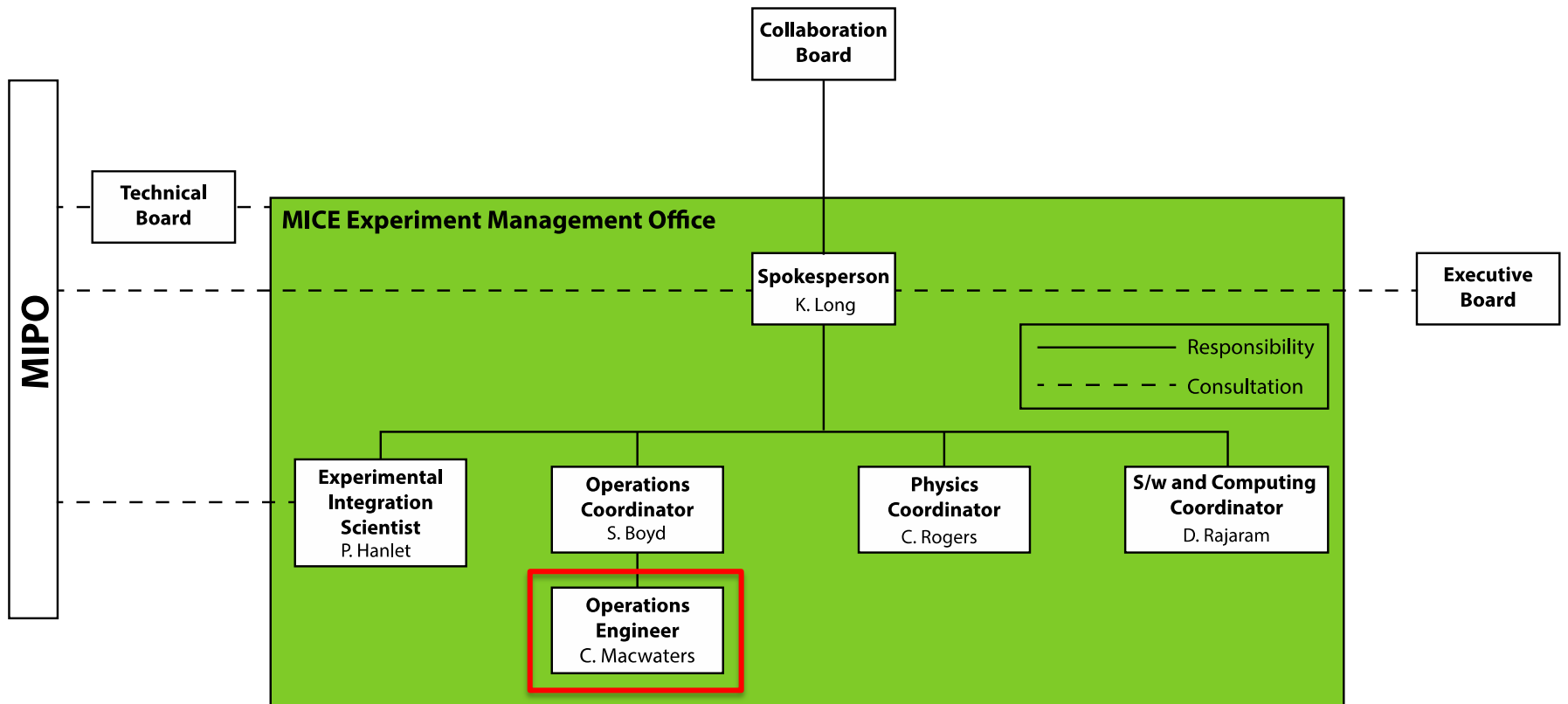
Spokesman's introduction

Organisation update

Organisation: some changes:

- **Physics Coordinator:**
 - **Victoria Blackmore standing down to take on new responsibilities:**
 - **A great job over a number of years:**
 - Two papers (MICE's first!) down and two to go!
 - **Chris Rogers is taking over**
- **S/w&C Coordinator:**
 - **Durga Rajaram taking over from CR**
- **MAUS Coordinator:**
 - **Adam Dobbs taking over from DR**
- **Tracker and Global Coordinator:**
 - **Please contact Adam, Durga or me if you'd like to volunteer!**

MICE Experiment Management Team



Spokesman's introduction

Publications

Upcoming publications:

- **Step I:**
 - **Electron Muon Ranger: performance in the MICE Muon Beam**
 - **Ready for “wise persons”;**
 - Blackmore & Drelsma et al
 - **Measurement of the pion contamination in the MICE Muon Beam**
 - **Almost ready for “wise persons”**
 - Blackmore & Orestano, Nugent, Soler
- **Step IV:**
 - **Technical/first beam paper:**
 - **Section headings will be presented by C. Rogers**
- **Ionization cooling demonstration (aka Step 3pi/2):**
 - **Documentation of design following rebaselining in November:**
 - **Blackmore, Pasternak, Rogers & engineering and analysis teams**
- **Technical:**
 - **Target:**
 - **Booth & target team;**
 - **EMR:**
 - **Kharadzhov, Drelsma & EMR team**
 - **Tracker software:**
 - **Dobbs & tracker s/w team**
 - **MAUS:**
 - **Rajaram & MAUS team**
- **Did I forget any ...**

Spokesman's introduction

Demonstration of ionization cooling

Reprise: 1 slide from August DOE debrief:

VC 22Aug14

Going forward; my view:

- Support preparation of document as requested in the DOE by 15Sep14:
 - Initial “good enough) analysis of Step 3pi/2;
 - Initial analysis of cost/schedule/risk;
- The revised plan is further developed and “put before” the collaboration at its next meeting (24-28Oct 2014):
 - By this time the necessary detailed studies to assess the level of performance will have been done carefully and the collaboration will have had time to deliberate;
- The next international review of the project (Nov 2014):
 - Resource Loaded Schedule Review panel; and the
 - MICE Project Board
- will then review the consensual revised plan and present to the Funding Agency Committee their recommendations
 - If we do our work properly I would anticipate that the recommendations will be in line with the our analysis

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Demonstration of ionization cooling:

- From MAP response to DOE recommendations:

This report has been generated in response to the Technical and Management Review of the US Muon Accelerator Program conducted by the US Department of Energy Office of High Energy Physics on August 12–14, 2014. As stated in the review charge, the review was carried out...

in response to the US Particle Physics Project Prioritization Panel (P5) Report¹ which recommended to:

Reassess the Muon Accelerator Program (MAP). Incorporate into the GARD program the MAP activities that are of general importance to accelerator R&D, and consult with international partners on the early termination of MICE.

In particular, the panel recommends to "realign activities in accelerator R&D with the P5 strategic plan. Redirect muon collider R&D and consult with international partners on the early termination of the MICE muon cooling R&D facility."

A key outcome of the review was the action item:

Present to DOE a detailed plan for Step $3\pi/2$ by 15 September 2014.

- My view:

- Move away from (ugly) Step $3\pi/2$ nomenclature

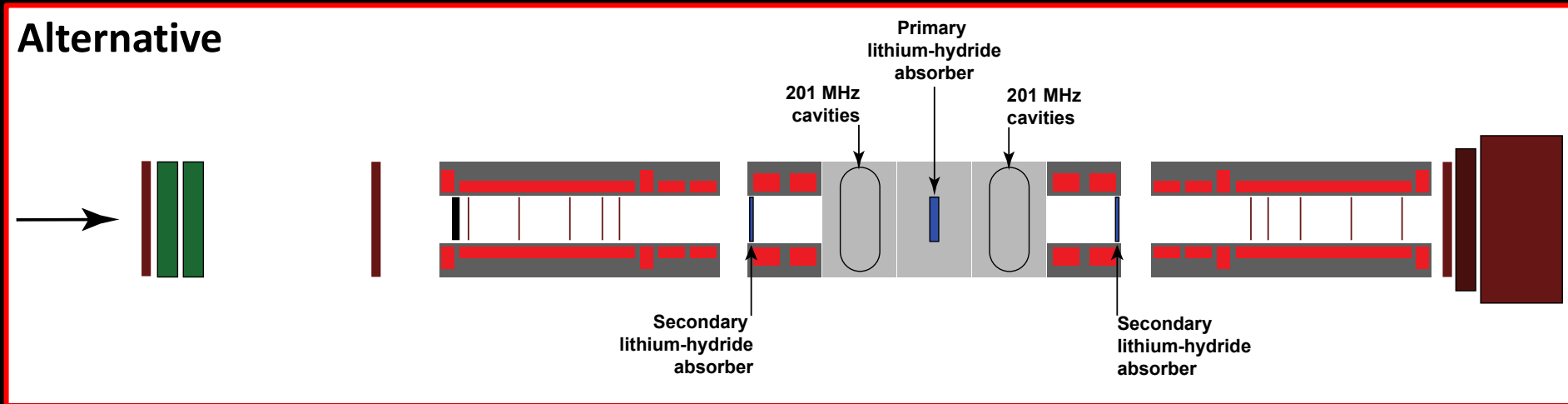
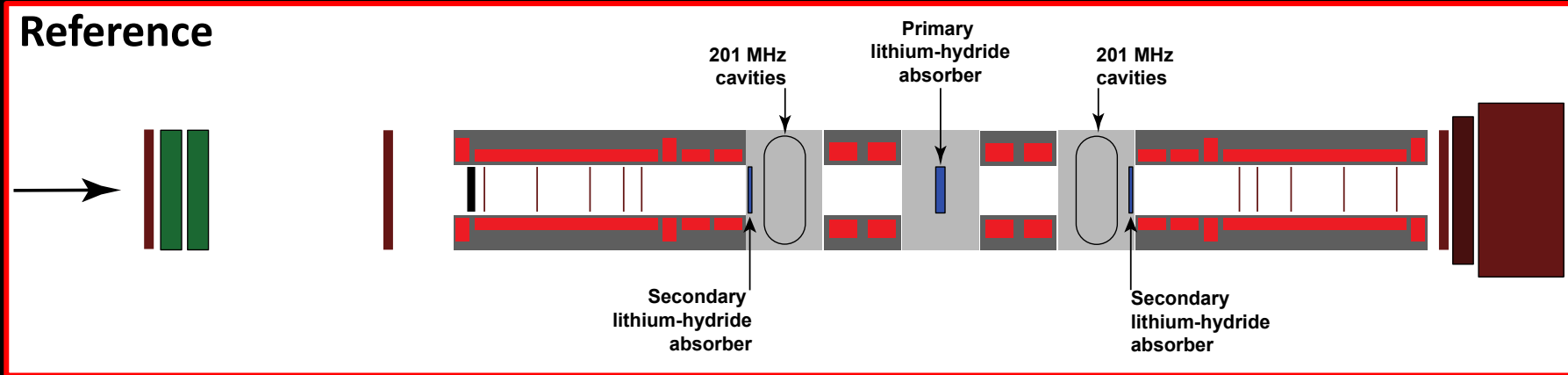
- Clever(?) but now unhelpful

- Catchy:

- » MICE demonstration of ionization cooling

- It's what we're here for!

Ionization cooling with reacceleration:



- Central absorber:
 - LiH;
 - LH2 could be considered as “upgrade”
- Two single cavity modules, like the one in operation in the MTA
 - 10 MV/m; nominal 12 MV/m from two 2MW amplifiers
- Impressive effort led by V.Blackmore, J.Pasternak, C.Rogers, P.Snopok

Preliminary conclusions, checks and balances:

- Reconfiguration is capable of demonstrating ionization cooling [with reacceleration];
- Currents required in FC need to be assessed:
 - **Important practical consequence:**
 - FC#2 will be used for Step IV [see J. Cobbs talk]
 - FC#1 repair by TESLA:
 - Must fit MICE timescale;
 - Must not increase risk that we have only on FC (i.e. FC#2) when we need two!
 - » **Decision path identified**
- Comparison of MAUS results with ICOOL and G4BeamLine underway (P. Snopok):
 - **First iteration done for response to DOE**

Risk reduction:

- **Principal benefit:**
 - **Do not have to complete RFCC:**
 - Cryostating of CC;
 - Assembly of RFCC module; integration of 4 cavities
- **Additional benefits:**
 - **PRY “modest” extension of Step IV PRY:**
 - Do not have to modify South Mezzanine;
 - **Do not need additional LH2 gas panel:**
 - Do not need to shield “vertical” bulge in magnetic field to protect LH2 gas panel;
 - **Civil modifications to roadway and Hall door to accept RFCC not needed**
- **Experiment’s impact:**
 - **Expedited demonstration of ionization cooling [with reacceleration] will unlock further progress**

Present schedule analysis:

Construction and Commissioning (taking ALL slack in the schedule)

- Step IV Construction complete – 25th May 2015
- Step IV Commissioning complete – 3rd August 2015
- Step IV De-commissioning start – 2nd June 2016
- Step 3 π /2 Construction complete – 27th March 2017
- Step 3 π /2 Commissioning complete – 3rd May 2017

Data-taking periods (taking ALL slack in the schedule)

- Step IV data taking – 3rd August 2015 to 2nd June 2016
- Step 3 π /2 data-taking period – 3rd May 2017 to 31st March 2018 (end of the UK financial year)

• Comment:

- Critical to stay focused on delivery of Step IV while pushing forward on demonstration of ionization cooling [with reacceleration]

• Step IV; PRY and commissioning:

- Procurement issues imply that PRY will be installed starting in March 2015:

- This means we must commission as much as possible before the PRY installation begins

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Spokesman's introduction

Orientation

Orientation:

- Ionization cooling demonstration extended discussion:
 - Tuesday afternoon, session before CB
- Academic training (today!):
 - The MICE Measurement Programme (C. Rogers)
 - RF power and resonators 101 (K. Ronald)