

## Plan for 'MICE' shifts during the ISIS machine-physics period June 1, 2 & 3 2008

### **MICE shift 1, June 1<sup>st</sup> : 16:30 start**

**Parasitic operations, 50mV loss limit, ISIS control**

#### **Goals:**

1. Re-establish and study MMB instrumentation;
2. Establish Q1-Q3 operating point.
3. Establish Q4-6 operating point

#### **Preconditions:**

- Permits to operate magnet power supplies obtained;
- Beam stop in position;
- MICE Hall and DSA searched and locked.

**T<sub>0</sub> nominal start time 16.30**

Id	Task	Lead	StartTime (Estimated duration)	Predecessors
<b>First MICE shift: Date; Time</b>				
<b>Re-establish MMB operation &amp; MMB instrumentation commissioning</b>				
1	Re-establish beam loss/particle rate with D1 (400 A) & D2 (170 A) <ul style="list-style-type: none"> <li>• BC2, BM2 plots vs D2 current in run up</li> </ul>	MOM	T <sub>0</sub> (0.5h)	none
<b>Run-up of Q1-6</b>				
2	Measure rate/profiles in a number of conditions & establish Q1 – Q3 operating point	MA/KT	T <sub>0</sub> +0.5h (1.5h)	1
3	Measure rate/profiles in a number of conditions & establish Q4 – Q6 operating point.	MA/KT	T <sub>0</sub> +2.0h (1.5h)	2

**MICE shift 2, June 2<sup>nd</sup> : 18:00 start****Scan of beam loss as a function of target dip and actuation delay and radiation surveys in the MICE Hall****Goals:**

1. Measure beam loss and particle rates in MMB as a function of target actuation delay and dip depth (D1, D2) only;
  - Note: suggest run ISIS at base rate so that beam loss in excess of 50 mV for short periods is acceptable;
2. Perform radiation surveys as agreed with Paul Wright and David Findlay.
  - I. Magnets OFF, ISIS 50 pps, target dipping;
  - II. Magnets ON, ISIS 50 pps, target dipping;
  - III. Mis-steered ISIS beam, Q1-3, D1, decay solenoid on, D2 and Q4-6 off, the goal to measure shine on the north shielding wall;
    - Array of dosimeters to be mounted on north wall of DSA radiation shield.

**Preconditions:**

- Permits to operate magnet power supplies obtained;
- Beam stop in position;
- MICE Hall and DSA searched and locked.

**T<sub>0</sub> nominal start time 18.00**

Id	Task	Lead	StartTime (Estimated duration)	Predecessors
<b>Second MICE shift: Date; time</b>				
<b>Re-establish MMB operation</b>				
1	Re-establish beamloss/particle rate with D1 (400A) & D2 (170A)	MOM	T <sub>0</sub> + (0.5h)	None
<b>Beam loss and particle rate vs actuation delay and dip-depth study</b>				
2	Beam loss and particle rate vs actuation delay and dip depth (D1,D2) only	Booth	T <sub>0</sub> +0.5h (3.5h)	1
<b>Radiation surveys in MICE Hall</b>				
3	Re-establish operation of MMB to Q6	MOM	T <sub>0</sub> + 4h (0.5h)	2
4	Radiation survey 1: Magnets OFF, ISIS 50 pps, target dipping	MOM	T <sub>0</sub> + 4.5h (1h)	3
5	Radiation survey 2: Magnets On (to Q6), ISIS 50 pps, target dipping	MOM	T <sub>0</sub> +5.5h (1h)	4
6	Radiation survey 3: Mis-steered ISIS beam, Q1-3, D1, decay solenoid on, D2 and Q4-6 off.	MOM	T <sub>0</sub> +6.5h (1h)	5

**MICE shift 3, June 3<sup>rd</sup> : 18:00 start****MICE Muon Beam: commissioning with protons and pions****Goals:**

1. Overspill from above shifts – particularly radiation surveys
2. Re-establish and study MMB instrumentation;
3. Confirm, through installation of polythene, proton-to-pion ratio, and test improvement to MMB instrumentation without proton
  - Requires access to vault/DSA to mount polythene.
4. Establish operating point of Q7-Q9
5. Possible further optics studies of MICE Muon Beam

**Preconditions:**

- Permits to operate magnet power supplies obtained;
- Beam stop in position.
- MICE Hall and DSA searched and locked.

**Draft Programme:**

- To be further determined based on experience during shifts 1 and 2;

**T<sub>0</sub> nominal start time 18.00**

Id	Task	Lead	StartTime (Estimated duration)	Predecessors
<b>Third MICE shift: Date; Time</b>				
<b>Overspill</b>				
1	Overspill from previous shifts	MOM	(?)	None
<b>MMB instrumentation commissioning &amp; Proton Absorber</b>				
2	Proton absorber rate & MMB instrumentation tests <ul style="list-style-type: none"> <li>• BC2, BM2 plots vs D2 current with pion beam</li> <li>• D1,D2 proton setting for proton rates</li> </ul>	Tilley	(2.5h)	1
3	Quads with pions/MMB instrumentation as time allows.	Tilley	(1.5h+)	2
4	Remove Beamstop – precondition agree RA/MS with Health Physics in advance	MOM	(0.5h)	3
5	Measure rate/profiles in a number of conditions & establish Q7 – Q9 operating point.	MA/KT	(1.5h)	4
6	Replace Beamstop	MOM	(0.5h)	5

***Illustrative Optic Settings for MICE Shifts 1-3.***

Cases without proton absorber have been derived. (preferred to use these unless absorber required for MMB instrumentation):-

For most up to date settings, see

[http://www.isis.rl.ac.uk/accelerator/MICE/Task%20Notes%20and%20Specifications/beamline%20-%20optics/some\\_reference\\_data.htm](http://www.isis.rl.ac.uk/accelerator/MICE/Task%20Notes%20and%20Specifications/beamline%20-%20optics/some_reference_data.htm)

For cases with proton absorber, they will be posted on the above website.