

<b>1</b>	<b>TITLE</b>
1.1	Procedure for the approval of the MICE Step IV experiment to admit muons
<b>2</b>	<b>SCOPE</b>
2.1.1	This document describes the procedure that must be followed for gaining approval to:
2.1.2	Admit muons to the experiment for the first time
2.1.3	Admit muons to the experiment for the first time after a change of configuration, such as changing the absorbers, modifying shielding, the addition of any new experimental equipment and the temporary de-commissioning of the liquid hydrogen system
2.1.4	Admit muons following any changes to key safety-related hardware or software, such as re-configuring or re-wiring interlocks
<b>3</b>	<b>RESPONSIBILITIES</b>
3.1	The Group Leader in Matters of Safety (GLIMOS) will be responsible for implementing the approval procedure once it has been initiated by the MICE Experimental Co-ordinator
<b>4</b>	<b>EQUIPMENT DESCRIPTION</b>
4.1	The MICE Step IV experiment is described as <i>all of the equipment</i> bounded by building R5.2, rack rooms one and two, the liquid hydrogen control room, the local control room, the entire R5.2 exterior roof installation and the hydrogen vent system on the exterior of the South wall of R5.2. The equipment includes experimental apparatus as well as all items of stairways, galleries, safety and interlock equipment, shielding and means of access. It also includes the MICE target and pion transport beamline, which is situated in the ISIS synchrotron.
<b>5</b>	<b>PROCEDURE</b>
5.1	The GLIMOS shall initiate the approval procedure by organising a briefing for members of a preliminary tour party. The briefing shall describe the purpose of the MICE Step IV experiment, its layout, operation and maintenance of installed equipment. It should also reference any relevant method statements and risk assessments. The briefing shall also define the sign-off requirements for operation.
5.2	The Instrument Operations Group Leader shall ensure that a preliminary safety tour is arranged. The preliminary safety tour party will comprise: Engineering Project Manager; Experimental Co-ordinator; Group Leader in Matters of Safety; Experimental Hall Manager; ISIS Facility Safety Officer; Instrumentation Operations Group Leader; ISIS Operations Group Leader; Head of Health Physics and specialists co-opted where necessary

5.3	The preliminary safety tour will:
5.3.1	- confirm the use for which the experiment is to be approved
5.3.2	- inspect the experiment (which need not be complete) for residual hazards
5.3.3	- review draft risk assessments and local procedures
5.3.4	- identify equipment that has to meet statutory requirements, for example, pressure systems, PUWER/LOLA equipment and local exhaust ventilation
5.3.5	- generate and agree an action plan for the above before the final safety tour
5.3.6	<p>On successful completion of the preliminary safety tour, the Instrument Operations Group Leader shall ensure that the RPS, RPA, MICE Experimental Co-ordinator and Head of Heath Physics meet to agree radiation survey protocols (including criteria for shielding performance) and to sign off the local rules.</p> <p>Also on completion of the preliminary safety tour, the Instrument Operations Group Leader shall ensure that the MICE GLIMOS, MICE Experimental Co-ordinator and ISIS accelerator Division Head meet to agree the process for measuring the magnetic field conditions around the experiment</p>
5.4	The Instrument Operations Group Leader shall ensure that the action plan is communicated to all interested parties, including the members of the final safety tour.
5.5	Additional tours may be arranged if the preliminary safety tour party deems it necessary.
5.6	<p>On completion of the actions stated in the action plan, the final safety tour shall be undertaken. The final safety tour party shall comprise: ISIS Head of Safety; Head of the Experimental Operations Division, MICE experimental Co-ordinator; ISIS Facility Safety Officer; Instrument Operations Group leader; ISIS Operations Group Leader and RAL RPA</p>
5.7	The final safety tour will:
5.7.1	- inspect the experiment, which must be complete, as defined in 5.3.1, for residual hazards.
5.7.2	- review risk assessments, local procedures and local rules.
5.7.3	- ensure that adequate service and maintenance manuals have been provided or are being produced
5.7.4	-ensure that all applicable statutory requirements have been fulfilled
5.7.5	- ensure that the action plan, agreed at the preliminary safety tour has been implemented as agreed
5.7.6	- generate an action plan for any minor works required, and a timescale for their implementation
5.8	A demonstration of a challenge to the beamline interlocks causing the MICE target to withdraw from the ISIS beam must be witnessed by the Head of ISIS Safety; Head of Experimental Operations and the RAL RPA. The guardline by-pass, installed to enable the ISIS accelerator to run

<p>5.9</p> <p>5.10</p>	<p>before individual beamline interlock systems have been installed must be removed before this test can take place. The MICE target Beam Protection System (BPS) must be confirmed to be connected and its functional test referenced</p> <p>Subject to satisfactory completion of the final safety tour, the interlock test and the tabulated sign-off sheets, the beam shutter may be opened for a radiation survey and a magnetic field survey to be carried out</p> <p>Upon satisfactory completion of the radiation survey and magnetic field survey, the ISIS Head of safety may sign approval for the experiment to be used as agreed at the preliminary safety tour</p>
<b>RELATED DOCUMENTATION</b>	
<p>6.1</p> <p>6.1.1</p> <p>6.1.2</p> <p>6.1.3</p> <p>6.1.4</p> <p>6.1.5</p> <p>6.2</p> <p>6.2.1</p> <p>6.2.2</p> <p>6.2.3</p> <p>6.2.4</p> <p>6.2.5</p> <p>6.2.6</p> <p>6.2.7</p> <p>6.2.8</p>	<p><u>Preliminary Safety Tour</u></p> <p>Draft Operational risk assessments</p> <p>Draft local procedures</p> <p>Draft local rules</p> <p>ISIS MCR Briefing sheet</p> <p>Action plan</p> <p><u>Final Safety Tour</u></p> <p>Supporting documentation for PPS and other electrical systems</p> <p>Operational risk assessments and local procedures</p> <p>Service and maintenance manuals and/or documents</p> <p>Local rules</p> <p>List of Competent Persons</p> <p>Test certificates and statutory written schemes of inspection</p> <p>Completed action plan from the preliminary safety tour</p> <p>Sign off sheet(s)</p>

## SIGN-OFF SHEET FOR.....

Task	Ref	Resp. person	Signature	Date
The radiation shielding is adequate for a radiation survey to be carried out		STFC RPA		
The stray magnetic field is measured to be within acceptable limits and the partial return yoke is complete		GLIMOS		
An experiment briefing has been given to the preliminary tour party		Run Co-ordinator		
Key safety-related systems have been identified and maintenance schedules exist. PUWER/LOLA equipment and pressure systems have been entered onto a statutory register		GLIMOS/Hall Manager		
The beam shutter mechanism, its cabling and limit switches, has been tested and documented		GLIMOS		
The PPS system and other electrical safety installations are operational, have been tested and documented		Electrical engineering Group Leader		
The beamline PPS has been connected to the accelerator guardlines and the interface tested		Run Co-ordinator		
A functional PPS check has been completed and documented		Run co-ordinator		
Shielding, safety barriers, notices and competent person lists are in position		Hall Manager		
Appropriate shielding locks are fitted and any keys stored with MCR in high security keypress		GLIMOS		
Local rules have been written and are displayed at the experiment		GLIMOS		
A review and revision if necessary of the Operational risk assessments has been completed		GLIMOS		
ISIS crew members have been briefed on the operation of the experiment		GLIMOS		
Risk assessments for an <i>specific</i> subsystems have been completed, ie liquid hydrogen delivery system		GLIMOS		
Local procedures for <i>specific</i> subsystems have been written		Run Co-ordinator		



