

Appendix 5 Example Risk Assessment for Small Scale Use of Hydrogen Supplied by a Gas Cylinder for an Experiment

Title:	Assessed By:	Date of Assessment:
--------	--------------	---------------------

Step 1 What are the hazards?	Step 2 Who might be harmed and how?	What are you already doing?	Step 3: What further action is necessary?	Step 4: How will you put the Assessment into action?
---------------------------------	--	-----------------------------	--	---

Hazard/Task or Situation	Action by whom	By when	Done
H2 cylinder store and supply pipes. Creation of a flammable atmosphere in the vicinity of the H2 cylinder store due to external ignition sources or electrostatic ignition risks leading to localised flash fire outside or localised flame / pressure effects inside in the vicinity of H2 pipework	Building regularly occupied by one member of staff Infrequent occupancy outside Operator Persons in vicinity	Well ventilated outdoor location. Fixed, secure Swagelok pipework Storage facility designed to BCGA CP4 Pipework designed to BGCA CP33 Warning signs displayed Leak testing of pipework following intrusive maintenance. Preventative maintenance and	Fit guarding to protect against impact damage from vehicles Install H2 gas detection in the building and automatic shut off outside laboratory. Set detection to as low as practical e.g. 5% of LFL

		inspection on pipework particularly cylinder connections and hoses No smoking rules				
Creation of a flammable atmosphere within air extraction around H2 equipment including exhaust duct. Possible external ignition sources from electrical equipment, electrostatic ignition sources and mechanical ignition from air exhaust fan	Low occupancy but no formal controls. Operators Persons in vicinity	High integrity pipework designed to BGCA CP33 Leak testing of pipework following intrusive maintenance. Remainder of pipework and experimental equipment operate at very low pressure which limits leakage Flow control limits the H2 exhaust H2 shut off on loss of extract flow (operator emergency procedure)	Check the sensitivity and accuracy of the low air extract flow switch – confirm detectors are set as close to design air flows as possible. Carry out routine testing on switch Consider automated shut off of H2 on low extract airflow Consider installing H2 gas detection in exhaust duct and automatic H2 shut off. Set detection as low as practicable e.g. 10% of LFL			
Step 5 Review Date:		<ul style="list-style-type: none"> Review your assessment to make sure you are still improving, or at least not sliding back. If there is a significant change in your workplace, remember to check your risk assessment and where necessary, amend it. 				