|  |  |
| --- | --- |
|  | **Audit Form** |
| **Ref: AUD:008:02** | **RE: Medical Gas Cylinders** |
| ***Issue date:*** | September 2019 | ***Revised:*** | March 2024 |
| ***Author(s):*** | National Health and Safety Function (Audit and Inspection Team) |
| **Note:** | *Auditing is an essential element of the HSE’s Occupational Safety and Health (OSH) management system and formal auditing provides an assessment of compliance. Medical gas cylinders (MGCs) for the purpose of this audit will include Medical Oxygen, Medical Air, Medical Nitrous Oxide, Entonox, Oxygen/ Carbon Dioxide mixture, Helium, Helium/ Oxygen mixture or other cylinders of medical gas.* *The aim of the audit is to measure the quality of medical gas cylinder management against the criteria of the audit tool. It has been developed around compliance with relevant elements of The British Compressed Gas Association (BGCA) Code of Practice 44 the storage of gas cylinders 2022, Health Technical Memorandum 02-01: Medical gas pipeline systems Part B Operational Management 2006 and the most up to date national and international Standards.* *This audit tool can be used as part of a formal auditing system, or as part of a self-audit process and is intended for use by:** *health and safety professionals including competent and authorised persons as described in HTM 02-01*
* *those trained to work with medical gases (cylinder gas) working in facilities, technical services and operations within the HSE*

*The scope of this audit tool applies to the safe storage and handling of medical gas cylinders only. Medical gas pipelines systems and the clinical use/administration of medical gas* *and the infrastructural elements associated with the storage of MGCs are out of the scope of this audit. For advice on these aspects the HSE HBS Estates will need to be consulted.* *Senior management should be fully committed to the concept of auditing and its effective implementation. This includes a commitment to consider audit findings and recommendations and take appropriate and timely action. All relevant employees must be informed of the purposes and benefits of auditing and co-operate fully. Relevant documentation and a representative sample of key activities are included in the audit and key personnel will be interviewed.* *The results of this OSH audit will be communicated to the relevant parties (manager(s)) as soon as possible to allow corrective action to be taken. The audit report assesses overall performance, identifies inadequacies, and makes recommendations on improvement actions. Follow-up monitoring must be established by the responsible person in the place of work.*  |

|  |  |
| --- | --- |
| **Place of Work:** |  |
| **Manager:** |  |
| **Trace Number:** |  |
| **Auditor name** *(Print)***:** | 1. | 2. |
| **Signature:** | 1. | 2. |
| **Date of Audit:** |  | **Last Audit Date:** |  |

**General Information**

|  |  |  |  |
| --- | --- | --- | --- |
| **Groups of employees who transport/work with Medical Gas Cylinders:** |  | **Yes** | **No** |
| **Technical Services** |  |  |
| **Maintenance** |  |  |
| **Porters** |  |  |
| **Caretaker** |  |  |
| **Clinical Staff** |  |  |
| **Other:**  |
| **Medical Gases in use or in Storage Area** |  | **Yes** | **No** | **N/A** |
| **a. Nitrous Oxide** |  |  |  |
| **b. Medical Oxygen** |  |  |  |
| **c. Entonox** |  |  |  |
| **d. Carbon Dioxide** |  |  |  |
| **e. Helium** |  |  |  |
| **f. Other (Name)** |  |
| **Location of Main Medical Gas Cylinder Storage Area:** |  |
| **Interviewees:** |  |

***The Audit tool has been divided into the following sections (51 Questions):***

**Section A:** Management of Gas Cylinders – 13 QUESTIONS

**Section B:** Main Storage (External) Areas – 18 QUESTIONS

**Section C:** Manifold Room- 8 QUESTIONS (not applicable for National Ambulance Service but will be relevant for other sites)

**Section D:** Ward/Department Areas – 5 QUESTIONS (not applicable for National Ambulance Service but will be relevant for other sites).

**Section E:** Manual Handling – 3 QUESTIONS

**Section F:** Transportation – 4 QUESTIONS

**Appendix 1 –** Quality Improvement Plan

**Appendix 2 –** Photographs

**Appendix 3 –** Document Changes

|  |  |
| --- | --- |
|  | **SECTION A: MANAGEMENT OF MEDICAL GAS CYLINDERS: All relevant Legislation covering the Safety Health and Welfare of people at Work, Code of Practice 44, The Storage of Gas Cylinders 2022, British Compressed Gas Association, & Health Technical Memorandum 02-01: Medical Gas Pipeline Systems - Part B Operational Management.** |
| A | **I** | ✓ | 1. Can managers explain the process for recording and investigating accidents, incidents and near misses in relation to medical gas cylinders?
 | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Has a risk assessment been undertaken for the safe handling and storage of medical gas cylinders within the last 12 months?
 | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Has a documented risk assessment been completed for all non-outdoor stores?
 | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Where there is a risk of occupational exposure to a medical gas (e.g. connection to a medical device, connection to a manifold system or undetected leak) have chemical agents risk assessments been completed using the HSE Chemical Agents Risk Assessment Template?
 | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Is there a system for prioritising escalated risks?
 | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Is there a documented procedure in place for the safe storage and handling of medical gas cylinders and is this procedure signed by all relevant staff?
 | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Is the provision and selection of PPE based on risk assessment?

For example:* Safety footwear
* Gloves (suitable)
* Eye protection
* High visibility vest

*Note: The relevant Medical Gas Sheet (MGDS) should be consulted during the risk assessment process, in particular to identify the correct PPE.* | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Has a training needs assessment been completed to identify relevant personnel who require medical gas training?
 | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Are relevant personnel trained on local emergency plans regarding medical gas cylinders e.g. event of suspected cylinder leak, vehicle incident, action for dealing with cylinders in event of fire as applicable?
 | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Are MGDS readily available to relevant personnel for each type of medical gas in stock (e.g. in the store and manifold room)?

*Note: Medical gas cylinders require a MGDS not a safety data sheet (SDS).* | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Is the location of the medical gas cylinder store identified in the emergency plan for the place of work?
 | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Is manual handling training undertaken by staff who transport medical gas cylinders?
 | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| A | **I** | ✓ | 1. Have manual handling risk assessments been carried out for the moving and handling of medical gas cylinders in compliance with HSE Manual Handling and People Handling Policy for all of the following groups of staff?
 | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| Technical Services |  | Maintenance |  |
| **D** | ✓ | Porters |  | Caretaker |  |
| Clinical Staff |  | Other |  |
|  | **SECTION B: MAIN STORAGE (External) AREAS: All relevant Legislation covering the Safety Health and Welfare of people at Work, Code of Practice 44, The Storage of Gas Cylinders 2022, British Compressed Gas Association.** |
| B | **I** |  | 1. Do medical gas cylinder stores allow cylinders to be stored outdoors and under cover?

*Note: A store is considered to be outdoors if the following conditions are met:** *A minimum of 30% of the perimeter is open (naturally ventilated), with no roof installed.*
* *A minimum of 50% of the perimeter is open (naturally ventilated), with a roof installed.*
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Are storage areas:

Sited at ground level? | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Are storage areas:

Segregated from other stores? | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. In relation to storage are there:
2. Metal gas cages in use

or1. Permanent buildings

or1. Combination of both
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Is the storage area adequately secured and only accessible to authorised personnel i.e.:
2. Use of secured boundary fence
3. Lockable gates
4. Lockable cage
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Does signage to the store area indicate the following:
2. UN Number
3. Name of Gas
4. Hazard Classification
5. No Smoking
6. Emergency contact details

*Please note for the purpose of this audit we are looking for these points but reference should be made to CoP 44 (incl. section 5.13) for other details that may apply to a specific area.* | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. In access to delivery and storage area safely maintained, kept clear and demarcated with no parking allowed other than for loading and unloading of cylinders?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Is there adequate lighting (for day and night time) to assist in providing a safe work environment, to allow the identification of the cylinder contents, signage and where necessary to assist with security?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Is the floor dry and level?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Does internal signage inside the gas cylinder store indicate type of gas and hazard classification in each compartment?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Are F sizes or larger cylinders each secured vertically and appropriately in order to prevent them toppling over?

*Note: Individual cylinders must be secured by adequate means e.g. chains/lashing to prevent them falling over.* | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Are small size cylinders such as C, CD, D and E sizes individually stored horizontally on shelves/racking?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Are different medical gas cylinders separated and clearly identified by signage internally within the store?

*Note: Signage should clearly identify the hazards, if any, of the medical gas.* | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Do medical gas stores have separate clearly identified bays for full and empty cylinders?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Is there a separate designated external storage area for defective cylinders awaiting collection by supplier?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Are medical gas cylinders stored separately from industrial and other non-medical cylinders?

*Note: Pathology gases are not classified as medical gases.* | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Are storage areas kept clean and free from debris, litter etc.?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| B | **I** |  | 1. Is there evidence of compliance with HSE National Tobacco Free Campus Policy, e.g. no cigarette butts on the ground in the vicinity of the main medical gas storage area?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
|  | **SECTION C: MANIFOLD ROOM; All relevant Legislation covering the Safety Health and Welfare of people at Work & Health Technical Memorandum 02-01: Medical Gas Pipeline Systems - Part B Operational Management.** |
| C | **I** |  | 1. Is the manifold room secured to prevent unauthorised access?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| C | **I** |  | 1. Are cylinders of the gas required for connection to the manifold system the only cylinders kept in the manifold room?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| C | **I** |  | 1. Does signage to the manifold room indicate the following:
2. UN Number
3. Name of Gas
4. Hazard Classification
5. No Smoking
6. Emergency contact details
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| C | **I** |  | 1. Is access to the manifold room safely maintained, kept clear and demarcated with no parking allowed?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| C | **I** |  | 1. Is there adequate lighting (for day and night time) to assist in providing a safe work environment?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| C | **I** |  | 1. Is the floor dry and level?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| C | **I** |  | 1. Is the manifold room kept clean and free from debris, litter etc.?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| C | **I** |  | 1. Is there evidence of compliance with HSE National Tobacco Free Campus Policy, e.g. no cigarette butts on the ground in the vicinity of the main manifold room?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
|  | **SECTION D: DEPARTMENT/WARD AREAS. Name of area visited:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| D | **I** | ✓ | 1. Has a specific risk assessment been completed for cylinders stored in a department/ward?

*Note: For guidance see current NHSF Risk Assessment Prompt Sheet Re: Safe Storage and Handling of Medical Gas Cylinders.* | **YES** | **NO** | **N/A** |  |
| **O** |  |  |  |  |
| **D** | ✓ |
| D | **I** |  | 1. Are large stationary cylinder trolleys (for continuous use of gases) in ward areas secured to a wall/structure to prevent them toppling over?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| D | **I** |  | 1. For transfer and transport of patients are appropriately designed cylinder holders used (in accordance with manufacturer’s instructions)?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| D | **I** |  | 1. For the storage of medical gas cylinders are appropriate cylinder holders used (in accordance with manufacturer’s instructions)?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| D | **I** |  | 1. Is signage to department/ward storage area in place and does it indicate the following:
2. UN Number
3. Name of Gas
4. Hazard Classification
5. No Smoking
6. Emergency contact details

*Note: For the purpose of this audit we are looking for these points but reference should be made to CoP 44 (incl. section 5.13) for other details that may apply to a specific area.* | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
|  | **SECTION E: MANUAL HANDLING: All relevant Legislation covering the Safety Health and Welfare of people at Work & Code of Practice 44, The Storage of Gas Cylinders 2022, British Compressed Gas Association.** |
| E | **I** |  | 1. Are trolleys used to transport medical gas cylinders designed for that purpose?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| E | **I** |  | 1. Are medical gas cylinders fully secured on trolleys during transport using the provided strapping, lashing, chains etc.?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| E | **I** |  | 1. Is access and egress from the storage area adequate to facilitate safe manual handling e.g. ramp?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
|  | **SECTION F: TRANSPORTATION – (Intermediate Care Vehicles; Emergency Ambulances; other vehicles, including employee cars); All relevant Legislation covering the Safety Health and Welfare of people at Work & Code of Practice 44, The Storage of Gas Cylinders 2022, British Compressed Gas Association.** |
| F | **I** |  | 1. When cylinders are transported in vehicles are they located and secured in a separate compartment to the driver?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| F | **I** |  | 1. Where medical gas cylinders are transported in vehicles, are they secured?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| F | **I** |  | 1. Is there a compressed gas plate/label on all vehicles (including private vehicles) that carry compressed gas cylinders
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |
| F | **I** |  | 1. Are Ambulance trolleys fitted with mechanisms to secure medical gas cylinders?
 | **YES** | **NO** | **N/A** |  |
| **O** | ✓ |  |  |  |
| **D** |  |

**Summary**

|  |  |
| --- | --- |
| **Total Number of Questions** | 51 |
| **Number of not applicable questions** |  |
| **Number of questions answered** | 51 - = |
| **Total Number of No Marked Questions** |  |
| **Total Number of Quality Improvements** |  |

|  |  |  |
| --- | --- | --- |
| **Auditor name** *(Print)***:** | 1. | 2. |
| **Signature:** | 1. | 2. |
| **Date of audit:** |  |

**Appendix 1 - Quality Improvement Plan**

| **Section No** | **Question No** | **Area of Non Compliance** | **Corrective Action to be taken** | **Responsible Person** | **Timeframe** | **Review of implementation of Action** |
| --- | --- | --- | --- | --- | --- | --- |
| **SECTION A: Management of Gas Cylinders** |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **A** |  |  |  |  |  |  |
| **SECTION B: Main Storage (External) Areas** |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **B** |  |  |  |  |  |  |
| **SECTION C: Manifold Room** |
| **C** |  |  |  |  |  |  |
| **C** |  |  |  |  |  |  |
| **C** |  |  |  |  |  |  |
| **C** |  |  |  |  |  |  |
| **C** |  |  |  |  |  |  |
| **C** |  |  |  |  |  |  |
| **C** |  |  |  |  |  |  |
| **C** |  |  |  |  |  |  |
| **SECTION D: Ward/Department Areas** |
| **D** |  |  |  |  |  |  |
| **D** |  |  |  |  |  |  |
| **D** |  |  |  |  |  |  |
| **D** |  |  |  |  |  |  |
| **D** |  |  |  |  |  |  |
| **SECTION E: Manual Handling** |
| **E** |  |  |  |  |  |  |
| **E** |  |  |  |  |  |  |
| **E** |  |  |  |  |  |  |
| **SECTION F: Transportation** |
| **F** |  |  |  |  |  |  |
| **F** |  |  |  |  |  |  |
| **F** |  |  |  |  |  |  |
| **F** |  |  |  |  |  |  |

**Appendix 2: Photographs**

**\*Note: The section for photographs is for anyone using the audit tool for recording good or hazardous observations as referenced in the report.**

**Appendix 3**

**Document Changes**

|  |  |
| --- | --- |
| **Superseded Document** | **Medical Gas Cylinders Audit Tool (September 2021) Ref: AUD:008:01** |
| **Changes to Ref: AUD:008:01** | * **Front Page:** (1) Note: Second, third and fourth paragraphs reworded. Final paragraph (Covid -19 guidelines) removed.

Wording changed from *“Location”* to *“Place of Work”.** **Page 2**: removed words Hospital/ Service Manager.

Amended to Date of Audit. Groups of employees amended to include Caretaker.Deleted Primary Care Building and Person responsible for the management of the primary care building.Deleted Fleet Manager.Added word Medical to Gases in use or in Storage Area.* **Page 3** amended numbers to include extra questions added to audit tool.
* **Section A**: Heading: Updated to Code of Practice 44 2022 and legislation wording changed to All relevant Legislation covering the Safety Health and Welfare of people at Work.

Q1 removed. Q2 & Q3 new questions Q4, Q5, Q6, Q7, Q8, Q9, reworded to align with Ref: PS: 048:00 and COP 44 2022.Q4 word hazard changed to riskQ10 reworded to place of work Q12 reworded and added sections for  Caretaker & Maintenance.* **Section B**: Heading: Updated to Code of Practice 44 2022 and legislation wording changed to All relevant Legislation covering the Safety Health and Welfare of people at Work.

Q1 Q6,Q8, Q12, Q13, Q14, Q15 reworded to align with COP 44 & Ref: PS:048:00Q16 new question added.Q17 note added.* **Section C**: Heading: Legislation wording changed to “*All relevant Legislation covering the Safety Health and Welfare of people at Work.”*
* **Section D:** Q1 added to include risk assessment for all non-outdoor storage as per updated COP 2022.

 Q6 removed question.* **Section E**: Heading: Legislation wording changed to “*All relevant Legislation covering the Safety Health and Welfare of people at Work.”*

Q1 & Q2 reworded to align with wording in RAP. * **Section F:** Q3 new question.
* **Appendix 3**: Document Changes added.
 |