STANDARD OPERATING PROCEDURE

SAFETY Everyone. Everywhere. Every day

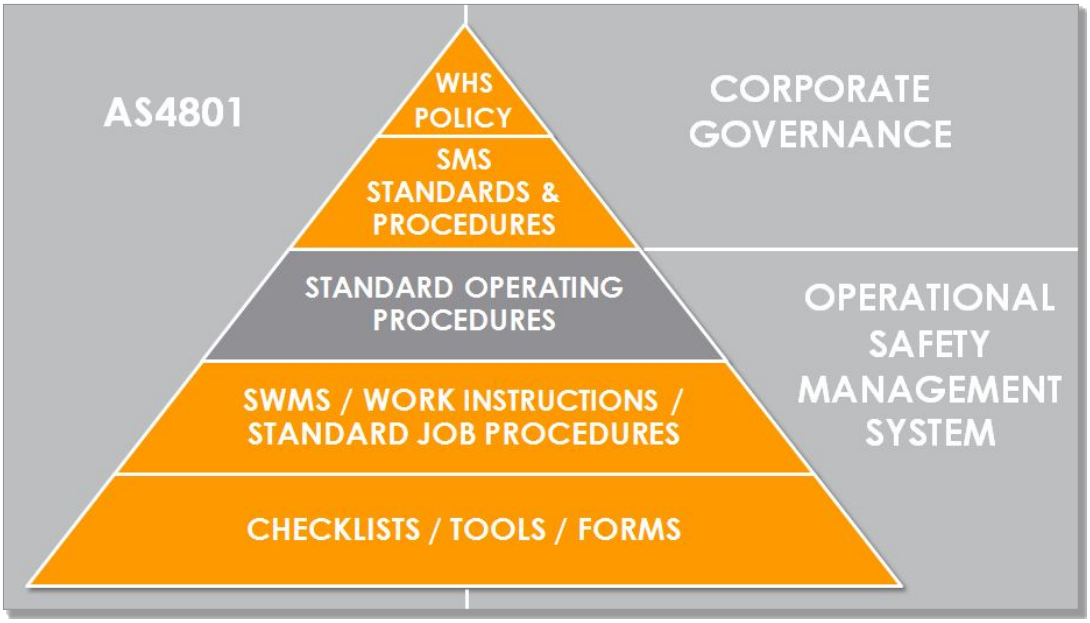
MONITORING, MEASUREMENT AND CALIBRATION

DOC ID	PRO427	VERSION	2
DOC OWNER	Tom Foster	ACTIVE DATE	20/01/2017

TABLE OF CONTENTS

1. SMS DOCUMENT HIERARCHY 2
2. PURPOSE 2
3. SCOPE 2
4. DEFINITIONS AND ACRONYMS 2
5. ROLES AND RESPONSIBILITIES 3
   - 5.1 QUU EXECUTIVE 3
   - 5.2 MANAGERS 3
   - 5.3 SUPERVISORS/PICOW 3
   - 5.4 WORKERS 3
   - 5.5 CONTRACTORS 3
6. RELATED DOCUMENTS 4
7. PROCEDURE 4
   - 7.1 OVERVIEW 4
   - 7.2 TESTING 4
   - 7.3 MAINTENANCE PROCESSES 5
   - 7.4 MAINTENANCE AND CALIBRATION RECORDS 5
8. REFERENCES 5
9. REVIEW 6
10. FURTHER INFORMATION 6

1. SMS DOCUMENT HIERARCHY



2. PURPOSE

This Standard Operating Procedure (SOP) documents Queensland Urban Utilities' (QUU) approach to the management of instruments used for measuring and monitoring safety parameters, such as gas detectors. The aim is to ensure that testing, inspection and calibration occurs at specified intervals.

3. SCOPE

This procedure applies to all QUU staff, including contractors and other persons on QUU-controlled worksites.

4. DEFINITIONS AND ACRONYMS

Bump-Testing: a qualitative function check in which a challenge gas is passed over the sensor(s) of a gas monitor at a concentration and exposure time sufficient to activate all alarm settings.

Calibration: a comparison between measurements – one of known magnitude or correctness made or set with one device and another measurement made in as similar a way as possible with a second device.

LEL: acronym used for Lower Explosive Limit.

PICOW: acronym used for Person in Control of Workplace.

Manager: as per QUU naming conventions, the Manager who has direct responsibility for the activity being performed or the area the activity is occurring in.

Supervisor: term used for any QUU employee who acts or is appointed as a Supervisor, Coordinator or Team Leader within QUU.

SMS: acronym used for QUU's Safety Management System.

Testing: A procedure intended to establish the quality, performance, or reliability of an instrument prior to use or on a regular basis.

VOC: acronym used for Volatile Organic Compounds.

WHS: acronym used for Work Health and Safety.

Worker: employees, contractors, subcontractors, outworkers, apprentices and trainees, work experience students, volunteers and PCBUs who are individuals if they perform work for the business.

5. ROLES AND RESPONSIBILITIES

Outlined below are responsibilities specific to monitoring, measurement and calibration requirements at all QUU workplaces and controlled sites.

5.1 QUU EXECUTIVE

QUU Executive and Senior Management (CEO, ELT, General Managers – Officer and Non-Officer Appointed) are responsible for overseeing and ensuring the implementation of the requirements of this SOP and related procedures within their respective functional areas. This includes ensuring all sites have appropriate resources so that equipment can be maintained and calibrated within recommended timeframes to minimise the risk of injury or harm to workers.

5.2 MANAGERS

Managers in all operational areas and QUU worksites are responsible for ensuring the review and management of risks associated with the use of monitoring equipment. This includes:

- Providing time, budget and resources for the maintenance, calibration, inspection and testing of all applicable equipment; and
- Implementing a management system to confirm the ongoing status of testing and/or calibration of all equipment, in the area of their control, that is required to be tested or calibrated by legislation or manufacturer's direction or specifications.

5.3 SUPERVISORS/PICOW

Supervisors and PICOWs in all operational areas and QUU worksites are responsible for ensuring that they:

- Manage the system made available by the manager in the area of their control, ensuring the ongoing status of testing and/or calibration of all equipment that is required to be tested/ calibrated by legislation or manufacturer's direction;
- Assign responsibilities for calibration and testing in line with relevant qualifications and legislative requirements (e.g. assign who is responsible for field inspections and who is responsible for maintenance);
- Monitor compliance of all contractors who undertake work for or on behalf of QUU have monitoring equipment that is tested and calibrated in accordance with this SOP;
- Check that testing and calibration details are recorded and kept up to date in the maintenance register;
- Adequately train and periodically retrain workers who are testing and calibrating equipment, and maintain training records;
- Maintain equipment provided for calibration such as calibration gas and calibration instruments;
- Conduct field inspections to confirm adherence to the testing program;
- Maintain the certificates of inspection received from the person/company inspecting the equipment; and
- Ensure all workers and contractors are aware and comply with the requirements of this SOP.

5.4 WORKERS

All workers shall ensure that they:

- Follow the guidelines of this SOP and related procedures;
- Check equipment requiring calibration to ensure it is within the calibration period and tag out equipment if it is past its 'Next Test' date; and
- Report any defects with monitoring equipment immediately to their Supervisor.

5.5 CONTRACTORS

At all times when performing work on a QUU site or for/on behalf of QUU, contractors should:

- Have equipment available that is within test and calibration date; and

- Comply with the requirements of this procedure.

6. RELATED DOCUMENTS

- WHS Hazard and Risk Management Procedure (PRO363)
- Electrical Safety Management Plan (MP71)
- Electrical Testing and Tagging (MP71)
- Plant Standard Operating Procedure (PRO386)
- Confined Space SOP (PRO444)
- Confined Space and Restricted Space (SWMS2)
- LOTO SOP (PRO379)
- Radiation Safety Plan (MP72)

7. PROCEDURE

7.1 OVERVIEW

The routine maintenance of any equipment used for health and safety that requires calibration is extremely important. If equipment is not maintained properly, its reliability can be impacted, which can in turn impact on its effectiveness as a control measure against injury or illness. Instruments that may require calibration and which are needed to ensure that work can be carried out safely include, but are not limited to:

- Gas/VOC monitors used in confined spaces;
- Gas/VOC monitors used in hazardous areas;
- Laboratory monitoring equipment;
- Noise monitoring equipment;
- Radiation monitoring equipment;
- Thermal monitoring equipment;
- Force gauges;
- Laser-based measurement equipment (e.g. survey range-finders); and
- Instruments used to measure electric fields and current.

7.2 TESTING

Each piece of equipment should be labelled to allow for easy identification. Each time a piece of equipment is inspected / calibrated; a tag must be placed on it, indicating the inspection / calibration date and next review date.

Persons testing/calibrating equipment must be confirmed to:

- Be competent in the use of the equipment and relevant instruments involved in the testing/calibration;
- Understand the testing/calibration procedure;
- Understand the concepts of traceability of measurement; and
- Be aware of the importance of checking or calibration.

Operational Checks

Some instruments, such as gas detectors and sound level meters, are required to be checked/tested prior to use. This testing should be performed prior to using the instrument and as per the manufacturer's instructions, using the prescribed calibration gas or instrument.

Checking is different to calibration. Checking is done to determine if an instrument is functioning correctly and continuing to provide reliable and consistent measurement results, or if an adjustment

and/or recalibration is required. QUU operators of measuring devices are to carry out basic checks on the measuring device instruments (e.g. bump-testing of gas detectors).

In addition, a visual inspection of the equipment may be required, including:

- Checking the apparatus for abnormal conditions such as malfunctions, alarms, non-zero readings etc.;
- Ensuring that the detector is free from obstructions or coatings that could interfere with the gas or vapour reaching the sensing element, and ensuring that the sample drawn is correct for sample-draw system; and
- For sample-draw systems, inspecting flow lines and fittings. Cracked, pitted, bent or otherwise damaged or deteriorated flow lines or fittings should be replaced with those recommended by the manufacturer.

Gas Detection Apparatus

Gas monitors used for the purpose of atmospheric monitoring within a confined space must be maintained and used in accordance with the manufacturer's instructions and warnings.

Gas detection apparatus (personal or static) must be:

- Regularly inspected for possible malfunctions, damage or other deterioration in accordance with QUU's **Confined Space Entry SOP (PRO444)** and **SWMS2**; and
- Calibrated in accordance with the manufacturer's instructions, using the recommended test kits/equipment.

Detectors capable of detecting several different gases should be calibrated to the gas for which they are least sensitive. Detectors used to measure LEL should be calibrated for the flammable substance under investigation. Where a mixture of flammable substances occurs, the LEL of the mixture may not be known precisely and care is required to provide for the substance with the lowest LEL.

Note: If the status of a measuring device is not known, it should be checked prior to operation.

7.3 MAINTENANCE PROCESSES

Maintenance of equipment and/or instrumentation must be carried out in accordance with manufacturers' instructions/recommendations. In many instances, calibration will be required annually, but it may be every six months or two years for some equipment. Some instruments will require calibration by a National Association of Testing Authorities (NATA) accredited provider.

Instruments that are found not to be in correct working order or are faulty should be tagged as 'Out of Service' until they have been repaired.

7.4 MAINTENANCE AND CALIBRATION RECORDS

Records need to be kept for all required maintenance, calibration and repair activities.

Records of any calibration/inspection must kept in a central location (e.g. QUU's online Document Management System) within the area of responsibility for the equipment (e.g. Mechanical & Engineering, Bunya Street, Eagle Farm) for a minimum of five years after the life expiration of the piece of equipment.

The documented history of calibrations and checks form part of QUU's quality records. These quality records need to be maintained to confirm the reliability of all measuring instruments.

8. REFERENCES

The following references contain information used in the preparation and development of this SOP:

- Queensland Work Health and Safety Act 2011
- Queensland Work Health and Safety Regulations 2011
- Queensland Confined Spaces Code of Practice 2011

9. REVIEW

The Monitoring, Measurement and Calibration SOP is to be reviewed every 3 years or earlier if:

- There is an identified risk to business;
- A significant safety or serious injury event occurs;
- Incident investigation or audit results show that application of the standard fails to deliver the required outcomes;
- There are changes in associated legislation; or
- There is evidence that the standard is not having a positive impact on safety-related KPIs.

10. FURTHER INFORMATION

For further information, contact your Health and Safety Representative or the QUU Safety Team.