GUIDANCE NOTE – GN 7
SAFE USE OF MERCURY WATER MANOMETERS

2018 Edition

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Commissioning Specialists Association

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Introduction

In the Commissioning industry mercury is often used in instruments such as thermometers and water manometers.

Provided the Mercury is contained within the instrument there is no danger to either the user or the environment.

The major risks in using such instruments lie in dealing with breakages and the resulting spillage of Mercury.

This Guidance Note gives advice associated with the use, transportation and repair of Mercury Water Manometers.

Risk Assessment Hierarchy of Control

Risks should be reduced to the lowest reasonably practicable level by taking preventative measures, in order of priority. This is what is meant by a hierarchy of control. The top priority when considering the hierarchy of control is **Elimination** where re-designing the job/task or substitution of a product/substance so that the hazard is removed or eliminated should be considered.

This means that the use of mercury manometers should be avoided where possible as nowadays digital monometers are available and these should be considered in the first instance to lower the risk.

Mercury Exposure

Mercury is a silvery white metal with a bluish tinge, and is liquid at room temperatures, melting at -38°C. It is poisonous in all its forms, more so than arsenic and cadmium.

Mercury may enter the body through the skin and as a vapour. The earliest signs of Mercury intoxication include a fine tremor of the fingers and mental changes a combination of anxiety and aggression known as mercurial erethism. One of the earliest signs is deterioration of handwriting. There is also evidence that exposure to even low levels of Mercury can damage the kidneys.

Usually the harmful effects of Mercury poisoning are seen after long term exposure to Mercury vapour, which is readily given off by the liquid metal, for example after a spillage or breakage of equipment.

Mercury has a slight vapour pressure even at room temperatures. If a sufficient quantity of the liquid is exposed in a closed room at normal temperatures, the

concentration of the Mercury vapour in the air may rise to more than the current occupation exposure safety standard.

Current workplace exposure limit – HSE EH40/2005 Long-term exposure limit (8hr TWA reference period)

COSHH Risk Assessment

Where Mercury instruments are transported, used on site, or repaired, a risk assessment should be carried out as required by the COSHH Regulations.

The assessment should cover not only the risks associated with normal use, transportation and repair but should also include the risks associated with emergency situations such as spillages.

Manometer User Instructions

Employers should ensure that engineers using Mercury manometers receive adequate training in their use and the safety procedures required in the event of spillage.

Transportation of Instruments

When transporting equipment containing Mercury care should be taken that the instruments are suitably boxed and protected against damage. Water Manometers contain a relatively large quantity of Mercury and procedures should be in place to ensure as far as reasonably practicable, that no damage or spillage of Mercury occurs in transit. The following procedure is suggested as the basis for production of instructions for staff transporting Mercury water manometers:-
(1) Before transporting the instrument make sure all the manometer valves are closed.

(2) Check the manometer box for signs of Mercury leakage. If any signs of leakage are visible, take the instrument out of service and mark as defective. Make arrangements to decontaminate the manometer box using a suitable Mercury spillage kit.

(3) Always transport the instrument in the horizontal or upright position secured to minimise risk of moving. Never carry this instrument upside down

4) During winter months do not leave the instruments in any location where the temperature could fall below freezing. This includes leaving in any vehicle overnight. The residual water in the manometer plastic or glass body can freeze, cracking the manometer and resulting in loss of Mercury.

(5) After instrument usage ensure that all the manometer valves are in the closed position.

Repair of Manometers or Replenishment of Mercury Charge

Care should be taken during the repair of manometers or replenishment of the Mercury charge. Ensure that the operative is wearing the correct PPE (Personal Protective Equipment). This would normally include vapour mask, goggles and rubber gloves. The work should be carried out in a well ventilated space and on a non pervious surface or suitable plastic tray to contain any accidental Mercury spillage.

Mercury Spillage Clean Up Kits

Each Commissioning Engineer using liquid Mercury or equipment containing liquid Mercury should have easy quick access to a kit for the collection and disposal of spilled Mercury.

A kit should also be kept wherever manometers are stored, repaired or the mercury charge is replenished.

The following companies supply spillage kits:-

Mercury Safety Products Ltd
Tel: 01159213833
info@mercurysafety.co.uk
http://www.mercurysafety.com/

Yellow Shield Ltd
Tel: 0800 032 4280
sales@yellowshield.co.uk
https://www.yellowshield.co.uk/

If a Spillage Occurs:

1. Segregate area to prevent people walking on the spill and to prevent unnecessary exposure.

2. Wear rubber gloves.

3. Gather as much mercury as possible.

The actual method used will depend on the contents of the particular spillage kit and may involve using brush, plastic shovel, wooden spatula; Mercury spill collector which incorporates a foam pad; large syringe; or hand operated vacuum pump device. Use the adhesive tape to collect as many small droplets as possible.

4. Mercury can find its way into cracks and crevices and be difficult to retrieve. In these circumstances, sprinkling the area with zinc powder to amalgamate and thus ‘neutralise’ the Mercury is the best way forward.

5. Place all retrieved Mercury, gloves and contaminated equipment in the kit waste container. Seal the container and complete the label with details of the spillage.

Mark the container SPECIAL WASTE – MERCURY FOR DISPOSAL.

6. Wash your hands thoroughly.

7. Ensure the area of the spillage is well ventilated.

8. Arrange for disposal of the waste container.

Mercury is defined as Special Waste and collection and disposal must be arranged via a licensed Waste Carrier. The Environment Agency can advise on suitable local Carriers.

9. Arrange to replace the used items from the spillage kit as soon as possible

Notes:-

(a) Vacuum cleaners must never be used to clear up Mercury spillages, as they spread the mercury vapour widely, will not be able to be cleaned after use and will have to be discarded as Special Waste.

(b) Mercury or Mercury waste must under no circumstances be put into drains, site skips or domestic refuse.

(c) The Environment Agency can be contacted at:
https://www.gov.uk/government/organisations/environment-agency
E-mail: - enquiries@environment-agency.gov.uk
Telephone (24 hour service)
0800 80 70 60