



SAFETY ALERT

Part A, B & C

Subject: The Provision of Protective Equipotential Bonding to Flexible Gas Tubing Number: SA 2016/02

DIO Sponsor: Bryan Dunn (Head Engineering and Construction), SEE/DIO

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Contact: - Jeremy Obbard. SME (Gas) DIO SEE, E&C, Kingston Road, Sutton Coldfield, West Midlands, B75 7RL. Tel: 94421 3695 / 0121 311 3695.
Email: DIOSEE-EngMech1a@mod.uk

This Safety Alert is to be read by:

1. Gas Safety Manager
2. Responsible Person (Gas)
3. DIO Service Manager
4. DIO's Maintenance Management Organisations
5. Others, who may be responsible for gas infrastructure

Others who maybe interested in the content of this Safety Alert might include:

Top Level Budget Holders, Prime Contractors, Private Finance Initiatives, Public, Private Partnership and other traditionally procured contracts, Project Managers, Site Estate Authority Teams and Property Managers with responsibility for MOD projects and Property Management Works Services (including the legacy work of EWCs/WSMs), Coordinating Authorising Engineers, Heads of Establishments and site/Regional Health and Safety Advisors.

Summary:-

The main protective equipotential bonding conductor (earth bond) was connected to a section of flexible stainless steel gas tubing that resulted in a release of gas inside a property.

Protective equipotential bonding conductors shall not be connected to flexible gas tubing.

When it takes effect: Immediately

When it is due to expire: When updated or rescinded.

Aim

1. To bring to the attention of appropriate persons the potential for gas leaks to be caused by connecting electrical bonding cable clamps to flexible gas tubing.

Introduction

2. Compliance with the contents of this Alert will enable compliance with the Health & Safety at Work etc. Act 1974 and its subordinate Regulations.
3. The appropriate MOD officer shall arrange for and ensure the Maintenance Management Organisation (MMO) contractor to carry out all actions in accordance with this Alert.
4. Any work required as a result of this Safety Alert must be carried out in accordance with JSP 375 Part 2 Volume 3 – High Risk Activities on the Defence Estate.
5. On MOD Establishments occupied by United States Visiting Forces (USVF) responsibility is jointly held by USVF and DIO (USF). At base level this jointly managed organisation is to take appropriate action to implement the contents of this Alert. Where this Alert contains procedures which differ significantly from USVF practice, DIO (USF) code of practice will be issued.

Requirement

Part A.

6. DIO Service Manager and MMO Gas Safety Managers are to immediately introduce the following measures:-
 - a. Where there is reason to believe that an equipotential bonding conductor may have been attached to flexible gas tubing (e.g. due to known cases discovered elsewhere on an establishment or estate) an urgent inspection of the gas installation(s) should be undertaken by suitably qualified personnel (Gas Safe registered) to identify the presence of such connections.
 - b. During routine inspections of gas installations the presence of an equipotential bonding conductor attached to flexible tubing should be identified and rectified (see Part B).

Part B.

7. Where a equipotential bonding conductor is connected to flexible gas tubing, the MMO, on direction from DIO Service Manager, should initiate the following actions:
 - a. The installation shall be visited by a suitably qualified person (Gas Safe registered) who will:
 - i. Undertake gas leak / tightness test
 - ii. Remove the equipotential conductor connection from the flexible gas tubing.

- iii. Reinstall the equipotential conductor connection in accordance with BS 6891 (Specification for the installation and maintenance of low pressure gas installations pipework) and BS7671 (Requirements for Electrical Installations), ensuring that the connection is made to fixed rigid metallic gas pipework.
- iv. Undertake detailed visual examination of flexible tubing in vicinity of the removed conductor connection for signs of damage, deterioration or compression of tubing.
- v. Repeat gas leakage / tightness test.
- vi. If any sign of damage to flexible tubing or gas leakage is detected, replace section of flexible tubing.

8. Undertake recommissioning checks as required.

Where equipotential bonding conductors are found to be connected to flexible gas tubing, this should be reported to the RP(Gas) following rectification.

9. RP(Gas) to liaise with the Gas Safety Manager and make enquiries regarding the likelihood of other similar situations (e.g. other work carried out at the same time or by the same installer), and such installations investigated accordingly.

Part C.

10. Following inspections where subsequent remediation was required the local Gas Safety Manager will be informed of actions taken.

11. The Gas Safety Manager will notify the DIO SME(Gas) providing relevant details including;

- a. Whether gas leakage had occurred
- b. Whether damage to the flexible tubing had occurred
- c. Initial installer (if known)
- d. Actions taken

12. DIO SME(Gas) is to maintain register of findings.

Background

13. During an investigation following a reported gas escape within a property, it was discovered that a section of flexible gas tubing had been used to secure a main equipotential bonding conductor.

14. The action of the connection on the thin-wall stainless steel flexible tubing had caused a degree of crushing which led to a gas leak within the property.

15. Equipotential bonding conductors must never be connected to flexible gas tubing – the wall thickness of flexible tubing is up to 15 times thinner than conventional steel pipework. Connecting equipotential bonding conductors to this thin-wall tubing can lead to gas leakage through the following mechanisms:-

- a. Physical damage by virtue of the action of the conductor's connection. The resulting leak may be partially, or fully obstructed by the clamping arrangement under certain circumstances, making leak detection difficult or impossible.

- b. Earth leakage currents passing through the equipotential bonding conductor (particularly if the conductor has not been securely fastened).
- c. Lightning strikes passing to earth via the main equipotential bonding conductor.

16. Relevant industry requirements:

- a. **BS 7671 Requirements for Electrical Installations (IET Wiring Regs) - IET 'On-Site Guide'** –
Section 4.4 note, iv, (full BS 7671 clause reference is 544.1.2); "*The [main equipotential bond] connection must be made to hard pipework, not to soft or flexible meter connections*".

- b. **BS 6891 – Specification for the installation and maintenance of low pressure gas installations pipework-**
Clause 8.4.3.2 - "*The main protective bonding conductor (main equipotential bonding connection) shall be connected to the gas consumer's fixed rigid pipework on the outlet of any primary meter installation, if fitted*"

and;

"The main protective bonding conductor (main equipotential bonding connection) shall not be directly connected to any pliable corrugated (stainless-steel) tube or pliable connectors from the outlet of the primary meter installation."

- c. **CSST (corrugated stainless steel tubing) product trade Technical Bulletin 2**

"The corrugated stainless steel tubing portion of the gas piping system shall not be used as the point of attachment of the bonding clamp under any circumstances"

End.