



Defence
Infrastructure
Organisation

Safety Alert Part A, B & C

Subject: Explosive Failure of Electric Domestic Hot Water Heater (DWH)

Number: SA 2018/04

DIO Sponsor: Bryan Dunn

Date of issue: 26 July 2018

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This Safety Alert is to be read by the following so appropriate action can be taken:

- 1. DIO Service Manager (or equivalent for non-NGEC contracts)**
- 2. DIO's Maintenance Management Organisations**
- 3. Others**

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

Prime Contractors, Private Finance Initiatives, Public-Private Partnership and other traditionally procured contracts, Infrastructure Managers and Property Managers with responsibility for MOD projects and Property Management Works Services (including the legacy work of EWCs/WSMs), Health & Safety Advisors, Accommodation Managers and providers of Alternative Living Accommodation.

When it takes effect: Immediately

When it is due to expire: When updated or rescinded.

Health and Safety

This Safety Alert does not necessarily cover all aspects of the subject matter and readers should make themselves aware of other potential issues. Readers should also not rely on DIO publications as their only means of becoming aware of safety, operational or technical issues, but they should consult widely across other media to maintain awareness.

Aim

1. To bring to the attention of appropriate persons:
 - a. an incident has occurred where a vented Domestic Hot Water (DHW) immersion heater failed explosively;
 - b. to reinforce the importance of undertaking Planned Preventive Maintenance (PPM) checks on vented DHW electrical immersion water heaters on the MOD Estate;
 - c. the need for vigilance when completing PPM tasks to identify the fitment of non-standard parts or modifications that could adversely affect safety of the heater.

Introduction

2. Compliance with the contents of this Safety Alert (SA) 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 Safety Alert.

Background

6. This Safety Alert follows the investigation of an incident whereby a water heater's thermal cut out failed to operate, causing the cylinder to become overheated and pressurised, resulting in an explosion and injury to personnel.
7. The water heater involved in the incident had been incorrectly fitted with an isolating tap on the overflow and vent pipework.

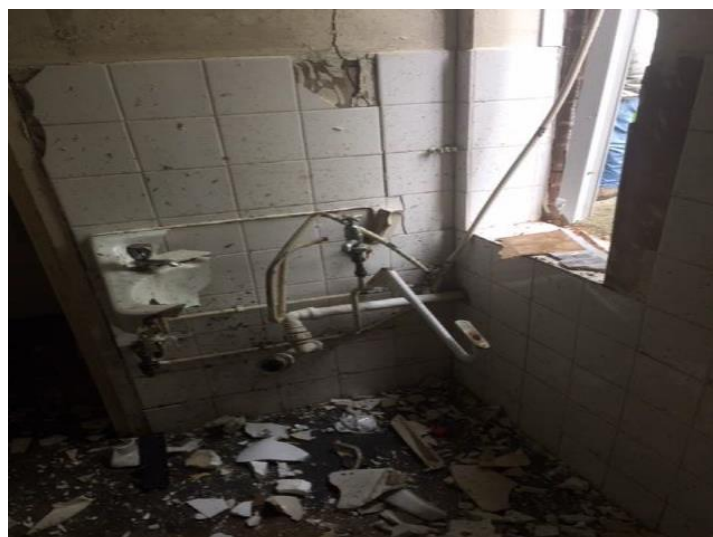


Photo1 showing the damage resulting from the exploded Domestic Water Heater

8. The investigation failed to find evidence of routine inspection and maintenance expected for a heater of this type.

9. The investigation identified that a valve had incorrectly been installed on the DHW vent pipework. The valve in the vent pipework had been closed causing temperature and pressure to build up in the DHW heater. The safety thermal cut out failed to operate resulting in the heater explosively failing.

Requirement

10. All point of use vented DHW heaters should be subject to PPM and this maintenance, inspection and testing should be kept up to date.
11. The maintenance will include, as a minimum, electrical testing, testing the operation of thermal cut-out, legionella risk assessment and temperature monitoring, internal inspection of cylinder and heating element, thorough cleaning as required to maintain hygiene and minimise scale or similar deposits to minimise legionella risk.
12. Those undertaking and assuring these activities must be vigilant to ensure that non-standard components are not fitted or unapproved modifications to the system have been made. The water heater involved in the incident had been fitted with an isolating tap, thereby closing the overflow and vent, which allowed the cylinder to pressurise upon failure of thermal cut-out.
13. Any work incurring expenditure of MOD funding requires appropriate authority from the MOD officer responsible for the establishment.

Part A

14. The MMO, on direction from the DIO Service Manager or Equivalent, shall initiate the following tasks:
 - a. identify all locations where electrical DHW heaters are installed;
 - b. confirm that they are on the asset register and are subject to an appropriate PPM schedule and the maintenance, inspection and testing is in date;
 - c. confirm that all DWH heaters are identified within the legionella assessment and management regime and are subject to routine monitoring and appropriate hygiene cleaning;
 - d. where this type of DHW heater is found, if it has not been modified, if only standard components have been fitted and it has been subject to an appropriate PPM regime, it may be left in service;
 - e. if any of the conditions above are not met the DHW heater should be taken out of service and isolated until appropriate rectification has been completed.
15. The MMO is to notify the DIO Service Manager, HoE and establishment 4Cs Duty Holder of any DHW heater isolated, and the reason for its isolation. Where defective DHW heaters are identified on an Establishment, the 4Cs risk register should be suitably annotated.
16. The MMO is to notify the DIO Service Delivery Performance Management Team, DIO SD-Perf Mgt Team (MULTIUSER) account, through their respective DIO Service Manager identifying the location, quantity and model number of electrical DHW heaters, identifying date of last inspection, maintenance and testing. The Head of Establishment should be notified where unrecorded and unmaintained electrical DHW heaters are identified. **A nil return is required from Establishments with no electrical DHW heaters of this type.**
17. The data requested at paragraphs 14 - 15 is required by 10th September 2018 and will be reviewed on the 15th September 2018.

Part B.

18. Any DWH isolated under **Part A** of this Safety Alert is not to be returned to service until it has been subject to appropriate maintenance, testing and inspection and ALL remedials completed.
19. On completion of any necessary maintenance, inspection and testing and any remedial work the DHW heater can be returned to service.

20. The MMO is to notify the DIO Service Manager, HoE and establishment 4Cs Duty Holder when any DHW heater is returned to service.

Part C.

21. The MMO is to notify the DIO Service Delivery Performance Management Team, DIO SD-Perf Mgt Team (MULTIUSER) account, through their respective DIO Service Manager of the date action detailed in **Part B** was completed.

Ends