SAFETY ALERT

Medical Air Plant – Risks associated with critical component failure

Number: SA 08/08

Property Directorate Sponsor: Mr P Meakin  Date of issue: 15 December 2008

Contact if different from Property Directorate: C.J.Walker, Construction Support Team, (9)4421 2412

Who Should Read this: CEstOs, Top Level Budget Holders, MOD Project Managers, MMOs, DCRE, IPTLs for PFI/PPP and traditionally procured contracts, DDEMs, DEFMs, DEPMs, Property Managers/Site Estate Representatives, Coordinating Authorising Engineers, Authorising Engineers (Mechanical) and Authorised Persons (Mechanical).

When it takes effect: Immediately  When it is due to expire: 15 December 2009

Document Aim: To avoid unnecessary risks associated with Medical Air Plant known critical component failures.

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<th>Problem</th>
<th>Risks associated with critical component failure.</th>
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<td>Failure of a Central Control Unit, Printed Circuit Board and Motor Control Unit resulting in the loss of medical air compressors for over 24 hours, requiring a hospital to use an emergency reserve manifold.</td>
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<td>Scope</td>
<td>Locations where Medical Air compressor Equipment could fail to supply Medical Air.</td>
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<td>Risk</td>
<td>Running out of Medical Air.</td>
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<td>Action</td>
<td>Review locally held spares and emergency gas reserves for medical air plant whose compressors cannot be manually operated in the event of a single component failure such as the central control unit.</td>
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1. Requirement:

- Addressees of this Safety Alert are to bring its contents to the attention of any Service/Civilian personnel, Maintenance Management Organisations and Operators that use Medical Air Compressors in order to make them aware of the Alert issued by Department of Health Estates and Facilities. (Annex A)

- Users and Maintenance Management Organisations are to ensure that action is taken at the earliest opportunity to review medical air plant including compressors. The review is to identify:
  
  - Whether the equipment is capable of being operated in manual control in the event of a Central Control Unit failure, or an emergency and that this manual operating mode is functional.
  
  - The need for critical spares to be available locally and for repairs to be completed within an acceptable time.
  
  - The correct spares necessary are available and can be installed within an acceptable time.
  
  - That the Healthcare providers are satisfied that a sufficient quantity of emergency reserve air is available and that further supplies of medical air are available if required.

2. Background:

- The Department of Health have experienced a situation where Medical Air Compressors have failed to operate because of Central Control Unit, Printed Circuit Board and motor control unit fault. One failure disabled manual operation of the medical air plant control panel and therefore manual operation of the compressors.

- The Department of Health have issued an “Estates & Facilities Alert” see Annex A.

3. Introduction:

- COMPLIANCE WITH THE CONTENTS OF THIS ALERT WILL ENABLE COMPLIANCE WITH THE HEALTH AND SAFETY AT WORK ACT 1974 AND ITS SUBORDINATE REGULATIONS.

- The appropriate MOD officer shall arrange for the Service/Civilian personnel, Maintenance Management Organisations (MMO), contractor to carry out all actions in accordance with this Alert.

- On MOD Establishments occupied by United States Visiting Forces (USVF) responsibility is jointly held by USVF and DE (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 DE (USF) code of practice will be issued.

ANNEX A: Department of Health “Estates & Facilities Alert.”
ANNEX A:

Estates & Facilities Alert

Ref. DH 2008/06
Gateway Ref. 10395

For:
- IMMEDIATE ACTION
- ACTION ✓
- INFORMATION
- UPDATE

Issued: 13/08/2008
Action underway by: 01/09/08
Action completed by: 30/09/08

Section

Equipment: Medical Air Plant

Problem:
Risks associated with critical component failure

Action:
A review of locally held spares and emergency gas reserves should be carried out for medical air plant whose compressors cannot be manually operated in the event of the failure of a single component such as the central control unit.

Action by:
Chief Executive/Board Member with special responsibility for health and safety, in accordance with local procedures, should ensure that this alert is brought to the attention of appropriate staff which may include:
- Liaison Officers
- Risk Managers
- Health & Safety Officers/Advisors
- Clinical Governance Leads
- Estates Managers
- Nurse Directors
- Designated Medical/Nursing Officer
- Directors of Public Health
- Independent Health and Social Care Providers – Private Clinics,
- Directors of Mental Health
- Clinical Directors

CONTACTS:
Enquiries should quote reference number DH 2008/06 and be addressed to:

Defects & Failures
Department of Health
Estates & Facilities Division 3N12
Quarry House
Quarry Hill
Leeds
LS2 7UE
ian.rowland@dh.gsi.gov.uk

Enquiries regarding specific medical air plant should be addressed to the supplier, manufacturer or the maintenance service provider/contractor.

This Alert is on our web site: http://www.dh.gov.uk
1. **PROBLEM:** Medical Air Plant – risks associated with critical component failure

1. Two incidents have been reported involving failure of 4-bar medical air plant due to a fault in the central control unit (CCU), printed circuit board (PCB) and motor control unit (MCU) PCB with fuses. This resulted in the loss of all three medical air compressors for over 24 hours, requiring the hospital to use the emergency reserve manifold (ERM) and secure sufficient replacement medical air cylinders to meet demand.

2. The CCU failure disabled manual operation of the medical air plant control panel and therefore manual operation of the compressors. To operate the compressors manually would have required a totally separate power supply being installed.

3. The medical air plant was restored to normal operation by replacing the CCU PCB and software, and replacing the MCU PCB and fuses, all of which had to be supplied and installed by the manufacturer.

4. Investigation into the cause of the failure(s) was inconclusive.

5. Department of Health, Health technical Memorandum (HTM) 02-01 Part A advises:

   **Plant control unit:**

   7.62 The plant control unit should have a separate power supply for each compressor, controlled by a separate sub-circuit.

   7.63 The unit should allow either manual selection of duty/standby for each of the compressors or have an automatic sequence selection with a means for manual override. The unit should ensure that two or more compressors do not start simultaneously when power is applied.

   The CCU PCB and software provides the function of ensuring that two or more compressors do not start simultaneously.

6. Although the medical air plant is deemed to comply with DH HTM 02-01 and the DH Model Engineering Specification C11, these incidents highlight the need for healthcare providers to be aware that the hand operation function is not available when the CCU fails. Healthcare providers should know the duration of the ERM under normal demand and the need for critical spares to be available within a reasonable time.

2. **ACTION:**

1. The Medical Air Plant should be assessed for the need of the following spares to be available locally:
   - Central Control Unit PCBs
   - Motor Control Unit PCBs and fuses
   - Central Control Units Printed Circuit Board software

2. Checks should be carried out to confirm that spare units and software will function as intended in the event of a failure or loss of the CCU and that these are available and can be installed within a reasonable time.
2. ACTION CONTINUED:

3. Tests should be carried out to determine the capacity of the ERM under normal demand and that further supplies of medical air can be provided if required.

4. Where suppliers or contractors, providing maintenance services under contract, are to hold spares, healthcare providers should be satisfied that the correct components will be available within an acceptable time.

3. REFERENCES

1. Department of Health, Health Technical Memorandum 02-01 Medical gas pipeline systems, Part A Design, installation, validation and verification
