Technical Bulletin 97/22

Installation of alarms for automatically controlled steam and hot water boilers

MANDATORY

SUBJECT CONTACT POINT:

DEFENCE ESTATE ORGANISATION (WORKS)
MINISTRY OF DEFENCE

March 1997
Installation of alarms for automatically controlled steam and hot water boilers

INTRODUCTION

1. This Technical Bulletin is directed at Property Managers and Project Sponsors to assist them in property management. It outlines the requirements for:

   ✔ installing, siting and monitoring of boiler alarms
   ✔ having someone on site who is competent to respond to alarms and to take appropriate action.

2. Installations should be designed, installed, operated and maintained in accordance with the requirements of the relevant Statutory Regulations, British Standards and DWS Specification Number 005.

3. A risk assessment including a programme of surveys is to be established by the Property Manager/Establishment Works Consultant (EWC) in accordance with the guidance detailed in this Technical Bulletin.

4. The contents of this bulletin are MANDATORY. No work involving expenditure on any Ministry of Defence account is to be entered into without authority from the Property Manager or the appropriate Ministry of Defence officer for that location or facility.

EXCLUSIONS

5. This Technical Bulletin does NOT require the EWC to carry out a risk assessment in respect of the following:

   ✔ heating systems with open header tanks and a boiler capacity below 150kW
   ✔ unvented low temperature hot water heating systems with a boiler capacity below 44kW
   ✔ unvented hot water service systems with a boiler capacity below 15kW.
BACKGROUND

6. MOD extant documents do not offer complete guidance on the installation, siting and monitoring of boiler alarms or on the need for having someone on site who is competent to respond to alarms and to take the appropriate action.

7. The Health and Safety Executive issue a series of Guidance Notes on Plant and Machinery (PM Series). Guidance note PM5 (Automatically controlled steam and hot water boilers) includes guidance on the installation, monitoring and siting of boiler alarms. The document also includes guidance on the need for someone on site to respond to alarms and to take the appropriate action. The text in italics is directly quoted from Guidance Note PM5.

RISK ASSESSMENT

8. This Technical Bulletin requires the EWC to carry out a survey of all steam boiler installations and some hot water boiler installations. Deficiencies are to be identified to the Property Manager with respect to the guidance given in PM5. A risk assessment to minimise the risk of damage, injury or explosion due to the failure to respond to a boiler alarm is to be carried out.

STEAM BOILERS

9. Risk Assessment Criteria

Guidance Note PM5 includes the following recommendations:

a. Para 12: Where control systems are fitted which require regular manual testing (para 37) by a trained boiler attendant then that person should be on site at all times while the boiler is in operation. The attendant need not supervise the boiler continuously but should always be in a position to respond immediately to any alarms (para 50).

b. Para 13: Where control systems are fitted which have automatic testing facilities and are self monitoring (para 42), then the controls should be checked by a trained boiler attendant on a daily basis. During periods such as silent hours (night and weekends) while the boiler is in operation there should always be someone available on site who is competent to respond to alarms and take the appropriate action which at a minimum, may be to shut the boiler down safely before calling for the assistance of a trained boiler attendant.

c. Para 14: Where a boiler is started up from "cold conditions" the boiler attendant should be present at start-up and remain with the boiler until satisfied that it is operating correctly.

d. Para 37: The following tests should be carried out by a trained boiler attendant or technician familiar with the boiler controls at least once per day, preferably at start-up, or in the case of shift working at the beginning of each shift.
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(1) **Water level control**

*With the chamber drained check that the feed water is being automatically supplied to the boiler.*

(2) **Firing controls (1st low level alarm)**

*With the burner operating, check that on draining the chamber the alarm sounds and the fuel and/or air supply is cut off.*

Note: The water level control and 1st low water alarm are often in the same chamber and if so, the two will be checked simultaneously and the burner should extinguish.

(3) **Independent overriding control (2nd low level alarm)**

*With the burner operating, check that on draining the chamber the alarm sounds and the fuel and/or air supply is cut off and locked out to safety.*

e. Para 42: There are other water level control systems which are high integrity which may be considered for less frequent supervision (see para 13). High integrity controls should be fail safe and self monitoring or of dual channel design.

f. Para 50: There have been many incidents where low water alarms have sounded a warning but there have been so situated that they were not heard by the person responsible. When a boiler is not continuously supervised it is not enough to have an alarm on the boiler. **ALARMS SHOULD BE PROVIDED AT POINTS WHERE THEY CAN BE HEARD BY PERSONS WHO ARE COMPETENT TO TAKE THE APPROPRIATE ACTION.**

10. **Risk Assessment Procedure - Steam Boilers**

a. Identify all steam boilers and their location. Check that alarms are installed, maintained and operated in accordance with current guidance.

b. Check siting of alarms and ensure they can be seen and/or heard by persons who are competent to take the appropriate action. This is particularly important where boilers are run outside normal working hours and boiler operators are not in attendance. Signalling devices may need to be installed to alert other persons competent to take the appropriate action. **RADIO PAGERS ARE NOT ACCEPTABLE AS A MEANS OF ALERTING PERSONS COMPETENT TO TAKE THE APPROPRIATE ACTION IN THE EVENT OF AN ALARM.**

c. Check if the boiler can be shut down outside normal working hours or at weekends (arrangements may need to be made to provide frost protection).

d. When steam boilers are in operation, check that there is always someone available on site to respond to alarms and take the appropriate action in the event of an alarm.

e. When steam boilers are in operation, check that competent boiler operators are available to attend site.
f. Depending on the site and the operation of the boiler the appropriate action may require the services of the site security officer/caretaker to close a valve or a competent boiler operator to carry out a series of actions. The risk assessment may recommend the installation of shut down devices to allow staff that do not normally operate boilers to take the appropriate action in the event of an alarm.

g. Where the risk assessment determines the requirement for a person to be available on site, who is competent to respond to boiler alarms and take the appropriate action, a register is to be maintained by the WSM at a continuously manned location on site. The register is to include details of the duty person who is to respond to boiler alarms and how that person can be contacted.

HOT WATER BOILERS

11. Risk Assessment Procedure - Hot Water Boilers

PM5 offers no particular guidance regarding alarm monitoring for hot water boilers. The EWC is required to carry out a risk assessment in accordance with the following procedure:

a. Carry out an initial desk assessment to identify boilers with potential risk.

b. Carry out a risk assessment for each hot water boiler installation with potential risk. Factors effecting the risk level include:

- alarms and monitoring arrangements
- operating procedures including the availability of boiler operators and staff trained to take the appropriate action in the event of an alarm particularly if the boiler is operated outside normal working hours
- system capacity
- operating temperature and pressure
- location
- operating schedule
- number of people at risk
- effects of the loss of service or building.

12. Risk Control Measures

The EWC shall evaluate each risk assessment and if required advise the Property Manager of the appropriate control measures to reduce the risk to an acceptable level. Actions may include:

- the installation of remote alarms and isolating devices
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- the shutting down of boilers outside normal working hours
- the training and attendance of the person who is required to respond to alarms and take appropriate action
- the provision of a person on site to take appropriate action
- modifications to existing alarms to ensure that they can be heard by persons who are competent to take appropriate action.

STANDARDS AND REFERENCES


Bulletin Authorised By:

C T CAIN
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