EEMUA 138 Edition 2 imprint 05-2015 (and earlier) Amendments and Addenda

The following amendments and addenda are issued under the authority of the EEMUA On line Analysers Committee which has responsibility for the maintenance of this publication. They are being carried through into the digital edition and are provided here for reference for those readers who have a paper copy.

3.7.4 Ventilation Fan Requirements (Page 16)

The forced ventilation equipment should be mounted outside the building and should be suitably protected. Ventilation should be by means of a centrifugal or axial fan. Motors positioned in the duct should be suitable for Zone 2 operation. Dual ventilation fan systems should be considered to minimise trips of non-certified equipment on ventilation failure and to ensure continued dilution of leaks of flammable, toxic and asphyxiant materials in the event of failure of one fan. To facilitate maintenance, fans should be fitted in parallel with non-return valves and have suitable means of mechanical isolation. The internal house power supplies to the fan motors should be independent of each other.

3.7.7 Safety Monitors and Alarms (Page 17)

Uninterrupted Power Supplies (UPS) should be used for all of the shutdown system including gas detectors or a fail-safe indication (normally powered lamp) provided outside the entrance to the analyser house.

3.7.7.1 Ventilation Failure (Page 17)

Where equipment other than that suitable for Zone 1 or Zone 2 operation (i.e. general purpose) is used, the low flow detection should initiate the following trip functions.

- Immediately isolate non certified equipment.
- Immediately isolate wall sockets.

3.7.7.6 Alarms (Page 20)

The alarms marked * should be displayed outside the entrance doors and also be transmitted to a permanently manned control room, either individually or as a common alarm.

Appendix 2 Determination of Sample Probe Lengths

A2.1 Introduction (Page 36)

As noted on the drawing for a typical analyser sampling probe, care has to be taken to ensure the probe cannot fail due to resonance effects. This is due to the possibility that with long pockets in lines containing fluids at high velocity, the frequency induced in the process fluid by vortex detachment from the pocket will exceed the natural frequency of the pocket. If such a condition occurs the pocket will oscillate and is liable to snap off where the tube is welded into the flange. All pockets, therefore, must be examined from this aspect and the length determined accordingly. The maximum allowable probe length is normally limited by the natural and shed frequency of the probe, not the maximum flow induced bending stress. A calculation for "Bending Stress of Sample Probe" is also available in the reference.

Reference is made to:

ASME PTC 19.3 Thermowells – Performance Test Codes

A2.3.2 Shed Frequency (Page 38)

The shed frequency (f_s) of a cylinder is given by:

$$f_s = \frac{S \times V}{D} \times 1000$$

where:

V = Velocity of the fluid relative to the cylinder (m/sec)

D = Projected depth of the cylinder in the direction of flow and may be taken as its diameter (mm)

S = Strouhal No.

The Strouhal number is dependent on the Reynolds No. and shape of the cylinder but 0.4 should be used for a worst case.

Appendix 6 Analyser Houses with Forced Ventilation, Ventilation Failure and Flammable Gas Detection Trip Logic
(Page 58)

Analyser house logic functions may be carried out via traditional relays and timers or via Programmable Logic Controllers (PLCs).

The equipment handling analyser house ventilation alarms, gas detection alarms and trip functions should where required be considered as 'Safety Critical' and should be designed as 'fail safe'. They should be powered by Uninterruptable Power Supplies (UPS) or have fail safe indication (normally powered lamp) outside the analyser house entrance door(s).

PLCs provide the flexibility to enable modification and updates to the shelter logic as required, however management of change procedures need to be considered to prevent inadvertent changes to critical safety functions.

Where possible, consideration should be given to including the analyser house safety logic in the plant fire and gas system or PLC system, which are specifically designed to meet safety standards and regulations, and normally have established management of change processes for access, modification and testing of the logic functions.

These fire and gas systems may have the capacity to handle the logic for multiple analyser shelters ensuring a consistency in design philosophy, and also ensure shelter safety functions are isolated from other non–safety related analyser functions such as measurement data transmission and analyser fault alarms.

The example logic in Appendix 6 is based on traditional relay logic with switch inputs but as above is now more commonly implemented via PLC's and can use transmitter inputs.

References **(Page 61)**

L. American Society of Mechanical Engineers

ASME PTC 19.3 Thermowells – Performance Test Codes)