INDUSTRIAL “HOW TO INSTALL” SERIES

DIRTY ENVIRONMENTS

Introduction

The term “Dirty Environments” can be applied to many industrial applications - but what is “dirty”?

Whatever the interpretation may be, each individual site needs to be assessed to determine the best approach, and yes, Aspirating Smoke Detection (ASD) can be applied effectively in these environments.

A dirty environment, that may have high levels of airborne dust, can also have high levels of humidity, steam, heat and other vapour discharges which combine to make the environment particularly difficult when applying any form of smoke detection.

Some examples are:

- Power plants
- Rendering plants
- Tanneries
- Processing/production plants
- Garbage - Waste treatment
- Fertiliser plants
- Recycling plants
- Various types of manufacturing

Dirty Environments

Regardless of the type of the dirty environment certain fire risks will be present. These may be in electrical switch areas, machinery, process equipment or production areas.

Similar to high dusty sites many applications will also have some unique aspects or special areas that can influence smoke detection performance.

When applying ASD technology in dirty environments many of the system design aspects applied in other applications (i.e. dusty, high temp., wet, corrosive, vibration, etc.) may also need to be applied here.

When correctly installed, detectors such as the VESDA VLI are suitable for most dirty environments. Even though ASDs can be used to protect dirty environments the installer must have experience in doing so. Often we see ASD detectors improperly installed in dirty environments by unqualified installers as shown in Figure 1.

Figure 1: VESDA VLI detector in dirty environment without protection

Technicians will likely take more interest in working on a detector that is free from dirt, dust or other external contaminants. Dirty detectors can also allow contaminates to enter the ports if and when pipes are removed.

Figure 2: VESDA VLI in protective enclosure

Inverting the detector to have the sample pipes enter from the bottom will also assist in minimizing contamination entering the detector when the pipes are removed.

Dirty environments may also have specific needs in terms of sampling pipe, i.e. there may be a need for special pipe, other than PVC, perhaps ABS, HFT, metal or other types, depending upon where the pipe will be located. These considerations should be part of the design requirements.

Fundamentally, any ASD sampling pipe design must take into consideration all the conditions and industrial processes that may be undertaken at the dirty site to avoid pipe contamination such as that shown below in Figure 3.

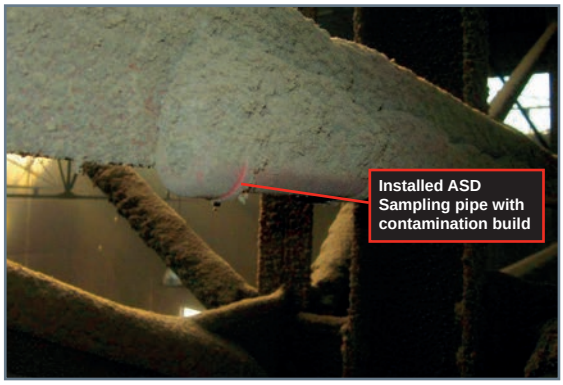

Figure 3: Contaminated sampling pipe

The location and positioning of the detector, pipe network, sampling holes, including hole sizes and spacing are as important in the overall system design as is the selection of the detector. The use of a blow back (pipe purge) system is also a key consideration often included to periodically clean the pipe network.

Because of the unique nature of industrial sites a performance based approach, instead of a prescriptive Codes or Standards design may likely be required to ensure a reliable and effective detection solution.

Smoke testing in the environment is a way of determining air/smoke movement and can essentially show where sampling pipe should be located. This can minimise pipe quantity, installation, time and costs, since the focus will be only on those areas where the smoke will drift. This is particularly critical in dirty environments since minimising sampling pipe and sampling holes without compromising detection performance is a key consideration. System contamination also increases maintenance frequency and cost. Ideally the approach is, the less there is to contaminate the better the system will be, having due regard for the best possible early detection.

The following photo shows an example of a simple yet effective sampling pipe configuration at the top of a dirty coal transfer station. Rather than installing the sampling pipe within the transfer area itself where dust is heaviest, this design method captures airflow/smoke from the lower area providing effective detection of any potential machinery fire.

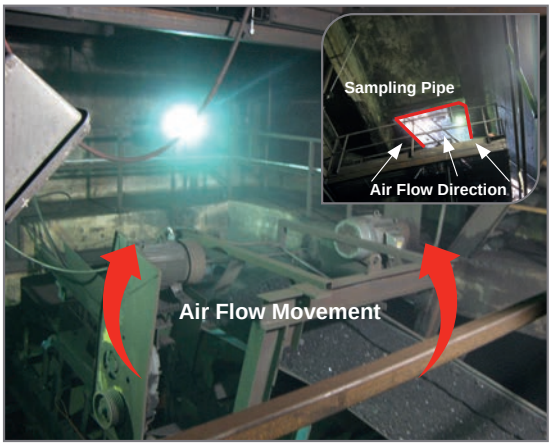

Figure 4: Sampling pipe layout to capture movement of rising air/smoke in the dirty dusty area

Many of today's industrial sites also install air purification or extraction systems. Typically these are fitted as a requirement to comply with Occupational Health and Safety regulations.

ASD can be used to sample for potential fires in conjunction with these systems, e.g. air purification or extraction systems by locating sampling pipe on the clean side of the filter. This simple technique allows ASD to effectively detect smoke at one location rather than having to design large systems for an entire complex.

Suffice to say that when designing ASD systems for fire risks in dirty environments consider all aspects associated with the application.

For more information on how your business can benefit from the Xtralis solution for Industrial Applications, please visit www.xtralis.com/industrial or contact your local office or Authorised Partner for expert advice and assistance with design.