



The benefits of installing MZX Technology into a power generation facility

// Overview:

Designing a suitable fire detection and alarm system for a power plant would normally be based on a risk assessment by the operator and could combine both a manual system, with detection in critical and high risk areas. The system might be subject to more stringent requirements than for a “more normal environment”, due to the risk of fire within a nuclear powered station where further requirements relating to Safety Integrity **(SIL)** might be required. Any areas with a presence of flammable liquids could also be subject to other standards such as **EN60079-14** (gas vapour or mist) and **EN50281-1-2** (dusts) where explosive gas or dust mixtures could exist. In addition there is the European directive, **(ATEX)** covering systems installed in hazardous areas.

The main concerns within power plants are the turbine halls, cable tunnels and transformers. Other areas such as the control room and those vital to the operation such as computer room and communications areas would also be protected.

MZX systems are built to the highest standards and tested and approved by independent third parties to all European standards and have SIL2 certification.

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// **Risk:** Flame detection is often the favoured technology for detecting fires in turbine enclosures.

A fire in a turbine will invariably result in the machine shutting down. If fixed fire suppression is fitted it will discharge automatically and irrespective of the nature of the alarm. Unnecessary shut downs are costly and one way to overcome this is to fit more than one detector and have a coincidence arrangement whereby two or more detectors have to operate before the shutdown occurs.

// **Solution:**

The FV300 Array Based Flame Detector uses a 256 cell multi infra-red array to detect fires. Not only does this allow the detector to provide the same degree of coverage across its full field of view, whereas most other detectors are most sensitive only down their axis, it pinpoints the position of the fire. Additionally the detector can incorporate an integral CCTV camera which can transmit a bird's eye view of the fire allowing the response to be more precise. Fixed suppression systems can be discharged manually eliminating the risk of a discharge due to a false alarm or a small incident which can be effectively extinguished with a hand appliance. Fixed suppression systems can also be designed to cover smaller areas minimising the cost of refilling. **Flame Vision provides confirmation of a real incident saving time and money throughout its lifetime.**

// **Risk:** Control Rooms are vital to the smooth running of a power plant; Fire in a control room could have serious consequences even causing the plant to shut down. Sensitive computers and instrumentation needs protection of the highest order.

// **Solution:**

The VESDA range of detectors interface directly to the MX loop via the VIO800 module. VESDA detectors operate across a sensitivity range of between 0.005 and 20% obscuration making them substantially more sensitive than point detection. EN54-20 is the

classification system under which aspirating systems are tested and graded as Very High, Enhanced or Normal sensitivity. Installing a VESDA system within the control room enable detection of fires in their very early stages of development, whether from within an equipment cabinet, under floor or ceiling void or within the room space. The detectors range from the single pipe Focus and Compact to a four pipe, Laser Plus and Laser Scanner, system where detection is recognized from each individual pipe. Air flow is monitored through the pipe so any restriction will be indicated as a fault. Faults can be categorized as Minor, Urgent or Power related and together with three levels of alarm, Alert, Action and Fire 1 report direct to the MZX system. A further output on the VIO 800 interface allows the system to be reset from the MX control panel.

// **Risk:** Systems requirements may vary and standard panels don't always match the requirements.

// **Solution:**

MZX technology offers a range of controllers with **SIL2 approval** including the **MX4000, ZX4, T2000** and the **MZX2** panel which extends up to 8 loops. Where required panels and modules can be rack mounted, preassembled, wired and tested, complete with field wiring terminals, ideal for situations where the field wiring is installed by a third party. Controllers can be easily networked by adding the **TLI800EN network** card in up to 99 panels (99000 addresses), with panels interacting with each other where required. The MZX network is a robust and true peer to peer network which remains unaffected by a single node failure. Furthermore failure of any panel's main processor will not inhibit transmission of any fire alarm or fault signal from that panel across the network to a designated panel's zonal display. **The network is LPCB, EN54-2 and EN54-13 approved.**

Additionally windows based **TXG graphics system** can be installed providing a layout of the site, with additional text, emergency

file data, instructions and other useful functions, ideal for the larger sites. **Third party interfaces** are standard with MZX technology and include the **MZX BACnet and MODbus (CCU3)** converters allowing the full networked system to be easily interfaced with third party systems such as **SCADA**.

// **Risk:** Cable tunnels below ground level are extensive, the atmosphere is often damp, dusty and sometimes corrosive.

Not ideal conditions for any kind of electronic fire detection, yet fires in cable ducts can spread rapidly and therefore some early warning system is desirable for when cables start to overheat.

// **Solution:**

Linear heat detection systems are ideal for such risks, being robust in their construction and easy to install. The LD40 Linear heat detection system is such a system which easily interfaces to an MX loop via the DDM800 module. Increases in temperature over the entire length of the cable, or a hot spot affecting a shorter length of cable are both detectable conditions. The limiting factor for this type of sensor is the length of the cable, as temperature sensing levels determines the length of the zone and the alarm signal is common over the entire zone.

MZX Sensor Laser Plus is a fibre optic sensor cable which detects temperature change in a single fibre of lengths up to 8km. Sensor Laser will detect relatively minor changes up to those representative of a fire and can be configured with up to 256 zones. Alarm and/or warning status can be set to any of 5 criteria within any zone and can be based on rate of rise or predetermined temperature levels. Data provided will indicate a hot spot in a cable to within 1 metre. The cable can be used in all atmospheres including zone 0 without additional measures. The Sensors control unit can be connected to a fire alarm system using on board relay outputs or direct to a **SCADA** system using the **MODBUS** output.

ZETTLER, is a leading brand of fire detection, security, and care communications products in the European market. The ZETTLER fire detection product line includes a wide range MZX TECHNOLOGY EN54 CPD approved fire detection products carrying approvals and cross-listings, including VdS and NF, for all European countries. The ZETTLER care communications product line is a technology leader providing the latest IP based Nursecall, Emergency Call, Communication and Management solutions for care homes, hospitals, prisons, and related markets. The ZETTLER product lines are available through ZETTLER dealers as well as many ADT and Tyco offices around the world. For more information, visit www.tycoemea.com.